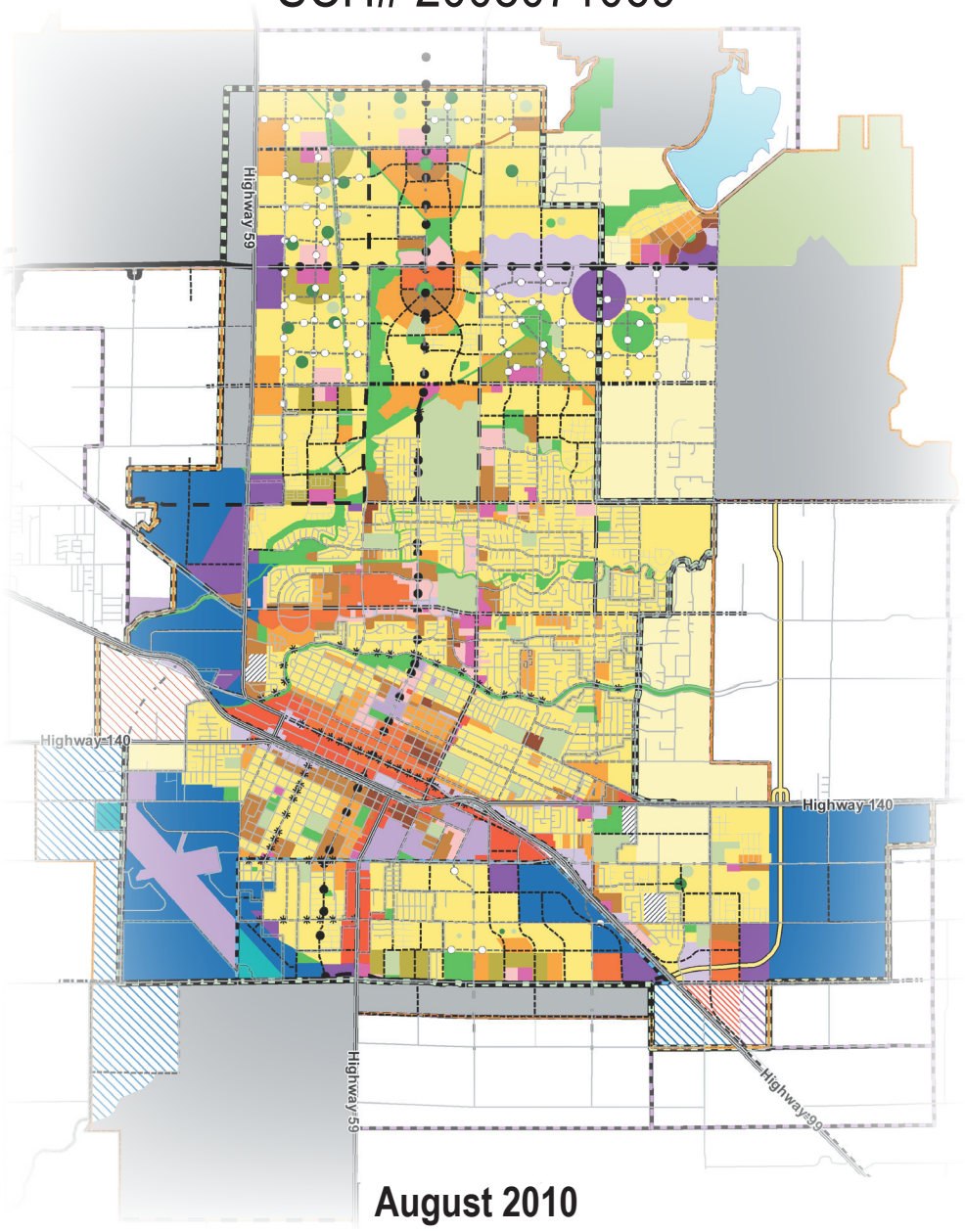
DRAFT
PROGRAM ENVIRONMENTAL IMPACT REPORT

CITY OF MERCED

Merced Vision 2030 General Plan

SCH# 2008071069



August 2010

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Prepared for:
City of Merced Development Services Department
Planning & Permitting Division
678 West 18th Street, 2nd Floor
Merced, CA 95340
Contact Person: Kim Espinosa, Planning Manager
Phone: (209) 385-6858

Consultant:



Quad Knopf

One Sierragate Plaza, Suite 270c
Roseville, California 95678
Contact: Ronald Mauck, AICP
Phone: (916) 784-7823
Fax: (916) 784-3520

August 2010

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Introduction

Under the California Environmental Quality Act (CEQA), when discretionary projects are undertaken by public agencies, an Environmental Impact Report (EIR) is required if the Lead Agency determines that the project may cause a significant environmental impact. This was concluded by the Notice of Preparation (NOP) prepared and published for this project in July 2008 (Appendix A). Comments received during the public review of the Notice of Preparation follow in Appendix A. The purpose of an EIR is to provide full disclosure of the potentially significant environmental effects of the project to the public and their decision-makers and explore means to mitigate (i.e., reduce, avoid, or eliminate) those impacts through special mitigation measures or alternatives to the project. CEQA intends the preparation of an EIR to be a public process that provides meaningful opportunities for public input with regard to potential environmental effects.

The project evaluated in this EIR involves the adoption of the *Merced Vision 2030 General Plan* for the City of Merced.

It is the intent of the Executive Summary to provide the reader with a clear and simple description of the proposed project and its potential environmental impacts. Section 15123 of the CEQA Guidelines requires that the summary identify each significant impact, and recommend mitigation measures and alternatives that would minimize or avoid potential significant impacts. The summary is also required to identify areas of controversy known to the lead agency, including issues raised by agencies and the public, and issues to be resolved, including the choice among alternatives and whether or how to mitigate significant impacts. This section focuses on the major areas of the proposed project that are important to decision-makers and utilizes non-technical language to promote understanding.

This EIR will be used as a Program EIR. The City of Merced is the Lead Agency for the preparation of this Program EIR. Further environmental review may be required for specific activities resulting from the proposed Merced Vision 2030 General Plan's adoption. Section 15168 of the CEQA Guidelines defines a Program EIR as:

> An EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:
>
> 1) Geographically,
>
> 2) As logical parts in the chain of contemplated actions,
>
> 3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or

4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

Project Description

The proposed project includes an update of the City of Merced's General Plan. California state law requires each city and county to adopt a general plan "for all the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (§65300). The General Plan will include Urban Expansion, Land Use, Transportation & Circulation, Public Facilities & Services, Urban Design, Open Space, Conservation & Recreation, Sustainable Development, Housing, Noise and Safety Elements. The Housing Element has been previously adopted and certified by the California Department of Housing and Community Development. The Housing Element (last updated in 2003 with minor revision in 2004) has a set schedule for review, generally every five years, based on State law. The Housing Element is currently being updated by the City and will be included in the General Plan document after its adoption. Figure 2-4 shows the proposed 2030 Land Use and Circulation Map for the General Plan. The expansion of the urban land use designations define the limits for extending City services and infrastructure so as to accommodate new development anticipated within the 2010-2030 time-frame of the General Plan. Policies in the proposed General Plan limit leap-frog development and provide for an orderly transition from rural to urban land uses.

The Plan includes Guiding Principles, developed during Community Workshops, described below. Table ES-1 shows the acreage of General Plan land use designations for both the current and proposed General Plans (City limits and Specific Urban Development Planning Area (SUDP)).

Table ES-1
Existing & Proposed General Plan Land Use Comparison Within the City Limits and SUDP/SOI (Acres)

Land Use	City Limits	Existing SUDP	Total	Proposed SUDP/SOI	All Land in new SUDP/SOI
RR (Rural Residential)	15.25	280.84	296.09	2004.91	2301.00
AG (Agriculture)	92.33	21.51	113.84	0	113.84
Total Ag Res	**107.58**	**302.35**	**409.93**	**2004.91**	**2414.84**
LD (Low-Density Residential)	5516.28	2981.05	8497.33	274.08	8771.41
LMD (Low-Medium Density)	824.05	305.48	1129.53	46.96	1176.49
Total Single-Family Res	**6340.33**	**3286.53**	**9626.86**	**321.04**	**9947.90**
HMD (High-Medium Density)	745.08	61.84	806.92	25.35	832.27
HD (High Density Residential)	92.44	0	92.44	23.56	116.00
RMH (Residential Mobile Home)	79.34	0.18	79.52	0	79.52

Land Use	City Limits	Existing SUDP	Total	Proposed SUDP/SOI	All Land in new SUDP/SOI
Total Multi-Family	**916.86**	**62.02**	**978.88**	**48.91**	**1027.79**
P/G (Public/Government)	533.16	5.30	538.46	39.82	578.28
CO (Commercial Office)	341.74	132.32	474.06	0	474.06
Total Office	**874.90**	**137.62**	**1012.52**	**39.82**	**1052.34**
IND (Industrial)	1882.22	994.73	2876.95	0	2876.95
IND-R (Industrial Reserve)	0	150.40	150.40	1072.34	1222.74
Total Industrial	**1882.22**	**1145.13**	**3027.35**	**1072.34**	**4099.69**
BP (Business Park)	128.59	453.35	581.94	77.43	659.37
BP-R (Business Park Reserve)	2.94	85.27	88.21	0	88.21
Total Business Park	**131.53**	**538.62**	**670.15**	**77.43**	**747.58**
CG (General Commercial)	321.55	172.04	493.59	0	493.59
CN (Neighborhood Commercial)	200.75	51.71	252.46	22.84	275.30
CT (Thoroughfare Commercial)	212.89	292.01	504.90	173.92	678.82
RC (Regional/Community)	475.46	42.37	517.83	0	517.83
Total Commercial	**1210.65**	**558.13**	**1768.78**	**196.76**	**1965.54**
OS-PK (Open Space/Park)	786.85	167.24	954.09	152.91	1107.00
Total Open Space	**786.85**	**167.24**	**954.09**	**152.91**	**1107.00**
Total School	**677.91**	**68.32**	**746.23**	**994.18**	**1740.41**
Other Lands					
COM-R (Commercial Reserve)	7.15	83.18	90.33	0	90.33
RES-R (Residential Reserve)		360.34	360.34	0	360.34
PARK-F (Park-Future)	5.83	65.18	71.01	0	71.01
SCHOOL-F (School-Future)	5.83	42.78	48.61	0	48.61
VR (Village Residential)	238.67	205.11	443.78	0	443.78
Total Other Lands	**257.48**	**756.59**	**1014.07**	**0**	**1014.07**
Total Community Plan Areas*	**0**	**389.14**	**389.14**	**7956.00**	**8345.14**
Overall Total	**13186.31**	**7411.69**	**20598.00**	**12864.30**	**33462.30**

* Shown as "Reserve" in Merced Vision 2015 General Plan.
Source: Quad Knopf, City of Merced, 2010

Guiding Principles:

- Expansion of the Sphere of Influence and City boundary with phasing of development to avoid premature conversion of agricultural land and to plan for cost-effective extension of municipal services.

- Foster compact and efficient development patterns.

- Connectivity between existing and planned urban areas. Examples include the northeast area toward UCM, the University Community, and South Merced.

- Merced as the single municipal service provider in the expanded sphere of influence.

- New development provides or pays its fair share of public services and facilities to avoid burdening existing city residents (in short, new growth pays for itself).

- Mixed-use, transit and pedestrian friendly urban villages in growth areas with direct access to commercial cores from surrounding neighborhoods.

- Commercial nodes in new growth areas to avoid the aesthetic and circulation issues associated with more common "strip commercial".

- Circulation: Recognition of the cost and importance of the arterial street system and protect capacity with access standards. Designs that encourage all modes of transportation.

- Build community quality. High community standards for Merced's services, infrastructure, and private development as a strategy for attracting business and industry and to benefit the City's residents.

- Planning well in advance for industrial/business park uses and for the infrastructure needed to support such development.

- A diversity of housing types and opportunities.

- Encouraging Sustainable and "Green" Development.

- Planning for the provision of infrastructure ahead of development.

- Maintaining Merced's high quality of life and keeping it a nice place to live.

- Encouraging new research parks and the use of new technologies.

- Protection of the Merced Regional Airport as an important community asset.

- Maintaining a quality educational environment for pre-school, K-12, and higher education.

- Maintaining our quality parks and recreation systems, including the bike path system.

- Encouraging a healthy community through improved medical facilities, air quality, parks & recreation opportunities, etc.

MERCED SPECIFIC URBAN DEVELOPMENT PLANNING (SUDP) AREA

Merced's current SUDP (adopted in 1997 as part of the Merced Vision 2015 General Plan) is based on policy contained in the *Merced County Year 2000 General Plan*. The Plan utilizes an

"urban centered" concept to focus population growth in defined urban areas. The goal of the plan is *"to provide for intensive urban development and to protect agricultural and open space land from uncontrolled sprawling urban development."* The current SUDP is approximately 20,000 acres.

The County of Merced (County) applies the "urban centered" concept through the designation of Specific Urban Development Plans (SUDP), Rural Residential Centers (RRC), Highway Interchange Centers (HIC), and Agricultural Services Centers (ASC). Of these, only SUDP's and RRC's relate to Merced's planning efforts. Specific Urban Development Plans are intended to accommodate all classifications of urban land use (residential, commercial, industrial, and institutional).

> An SUDP has a boundary line which is recognized as the ultimate growth boundary of the community over the life of the Plan, and all land within the SUDP is planned for eventual development in a mixture of urban and urban-related uses. *(Merced County Year 2030 General Plan)*

Each of the County's six incorporated cities, as well as eighteen unincorporated communities, are presently designated as SUDP's. The City of Merced General Plan proposes to expand its SUDP and combine it with the Sphere of Influence (see below) to 52.4 square miles to provide sufficient developable area to accommodate future growth through the Year 2030 and beyond.

PROPOSED MERCED SPECIFIC URBAN DEVELOPMENT PLAN BOUNDARY (SUDP)/SPHERE OF INFLUENCE (SOI)

The proposed Merced SUDP would result in a coterminous Sphere of Influence (SOI) and SUDP boundary. The proposed SUDP/SOI boundary would also reduce the current SOI boundary in the northeast to reflect the revised location of the U.C. Merced campus. The proposed SUDP/SOI contains approximately 33,463 acres (52.4 square miles of land area); almost the same area as the 1997 Sphere of Influence.

1) Approximately 3,995 acres will be added in Northwest Merced. The new SUDP/SOI boundary would generally move to Franklin Road on the west, north of Old Lake Road, and south to Santa Fe Drive. This area is proposed for industrial and business park uses along Highway 59 and a large mixed-use community north of Bellevue Road. This area will be able to accommodate a significant amount of the residential growth in the City for the next 20 years.

   The business park and industrial areas along Highway 59 are included in order to provide a better "jobs-housing" balance in North Merced, as well as alleviate circulation and air quality concerns. Most existing employment opportunities in Merced are located Downtown and south of Highway 99.

2) The second area of expansion consists of approximately 3,824 acres. It would move the SUDP/SOI south of Highway 99 to the vicinity of McNamara Road and west to a line 1/4 mile west of Thornton Road. South of the Merced Regional Airport, a large community plan

has been proposed. Although impacted by airport land use restrictions, the proposal includes significant residential and recreational growth.

3) The third area to be included encompasses 6,748 acres and moves the SUDP/SOI boundary to take in the property between the current City limit/SUDP, and the U.C. Merced campus and community. These will be brought within the SOI as well.

   Inclusion of this area within the SUDP/SOI will form a more logical urban boundary, which will ultimately facilitate the provision of City services to the University.

These areas referenced above represent logical expansion areas for the City, primarily because they are adjacent to major road improvements (Merced-Atwater Expressway, Mission/Highway 99 Interchange, etc.). They also encompass areas needed for long-term commercial and industrial development. The residential areas included in this expansion were for the most part large tracts with significant planning efforts currently underway. Given the environmental and physical limitations elsewhere around the City, these are the most logical areas for the next phase of expansion. These areas will give the City enough land to accommodate expected growth over the next 20 to 40 years.

Potential Areas of Controversy and Issues to be Resolved

The following issues could produce controversy in reviewing and considering the proposed project:

AESTHETICS:

- The proposed project could have a cumulatively adverse effect on aesthetic resources including the generation of light and glare

AGRICULTURE AND FOREST RESOURCES:

- Directly or indirectly result in conversion of Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland) to non-agricultural use

- Conflict with existing zoning for agricultural use, or a Williamson Act contract

- Have a cumulatively adverse affect on agricultural resources

AIR QUALITY:

- Development and operation under the General Plan would result in emissions of criteria pollutants, ozone precursors, and other pollutants caused by mobile source activity, area sources, and stationary sources.

NOISE:

- Buildout of the General Plan may contribute to increased traffic noise levels, and a significant increase in overall traffic noise levels at existing sensitive receptors.

TRANSPORTATION/TRAFFIC:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system and/or exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

GREENHOUSE GAS EMISSIONS (GLOBAL CLIMATE CHANGE):

- Development of the Project could potentially result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change.

Alternatives to the Project

Section 15126.6 of the State CEQA Guidelines requires the EIR to describe a reasonable range of alternatives to the project or to the location of the project which would reduce or avoid significant impacts, and which could feasibly accomplish the basic objectives of the proposed project, and to evaluate the comparative merits of the alternatives. Alternatives that would reduce or avoid significant impacts represent an environmentally superior alternative to the proposed project. However, if the environmentally superior alternative is the "no project" alternative, the EIR must also identify an environmentally superior alternative among the other alternatives. Based on Chapter Four, Table 4-1 and the analyses developed in this EIR, the Reduced Project Area Alternative is the environmentally superior alternative because it reduces more potential impacts than other alternatives relative to the proposed General Plan and serves to reduce the severity of three significant cumulative impacts (agriculture, air quality, and transportation/traffic). The No Project alternative (existing General Plan) is environmentally inferior to the proposed General Plan and the other alternatives because it fails to achieve the objectives of the plan update.

The alternatives identified for consideration are as follows:

EXISTING GENERAL PLAN (NO PROJECT) ALTERNATIVE

In accordance with Section 15126.6(e)(3)(B) of the State CEQA Guidelines, the No Project Alternative consists of a description of an analysis of the circumstances under which the proposed project does not proceed. This alternative entails a general discussion of what can reasonably be expected to occur on the project site in the foreseeable future if the proposed project is not approved, based on the existing general plan land use designations, zoning, and available infrastructure and services.

Under this alternative, the 2030 General Plan would not be adopted, and the existing Merced Vision 2015 General Plan would remain in effect. Future development would occur as allowed under the existing LAFCO approved SOI with the same General Plan Land Use Diagram in effect (reference Figure 2-3).

REDUCED PROJECT AREA ALTERNATIVE

The Reduced Project Area Alternative would update the General Plan elements but would restrict growth to a smaller area. In this Alternative, the two Community Plan areas identified in the northwest and southwest corners of the 2030 Plan area are deleted from the proposed Plan. This alternative was considered feasible because the City could grow at a slower pace than is being planned for. Further, the potential population of the Project exceeds that projected for 2030. Figure 4-1 shows the Reduced Project Area Alternative.

CONCENTRATED GROWTH ALTERNATIVE

The Concentrated Growth Alternative assumes the same number of residential units at buildout as the proposed project, as well as the same goals, objectives, and policies. However, the density of residential development would increase to reduce the amount of land needed to provide the same growth capacity. Residential land use densities would be increased significantly (25-50%), and minimum densities would be imposed. As a result, more of the land in the proposed SUDP/SOI would be left in agricultural use.

Summary of Impacts and Mitigation Measures

Section 15123(b)(1) of the Guidelines for Implementation of the CEQA Guidelines provides that the summary shall identify each significant effect with proposed mitigation measures that would reduce or avoid that effect. This information is summarized in Table ES-2, Summary of Impacts and Mitigation Measures.

Table ES-2
Summary of Impacts and Mitigation Measures

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.1 Aesthetics					
3.1-1	Substantial adverse effect on a scenic vista	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.1-2	Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway	No Impact		No mitigation measures are required.	No Impact
3.1-3	Substantially degrade the existing visual character or quality of the site and its surroundings	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.1-4	Create a new source of substantial light or glare that would adversely affect day or night views in the area	Potentially Significant	3.1-4	The following guidelines will be followed in selecting and designing any outdoor lighting: 1. All outdoor lights including parking lot lights, landscaping, security, path and deck lights should be fully shielded, full cutoff luminaries. 2. Complete avoidance of all outdoor up-lighting for any purpose. 3. Avoidance of tree mounted lights unless they are fully shielded and pointing down towards the ground or shining into dense foliage. Ensure compliance over time. 4. Complete avoidance of up-lighting and unshielded	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				lighting in water features such as fountains or ponds.	
3.1-5	The proposed project could have a cumulatively adverse effect on aesthetic resources including the generation of light and glare	Potentially Significant and Cumulatively Considerable		No mitigation measures are available.	Significant, Cumulatively Considerable, and Unavoidable
3.2 Agriculture and Forest Resources					
3.2-1	Directly or indirectly result in conversion of Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland) to non-agricultural use	Potentially Significant	3.2-1	The City will encourage property owners outside the City limits but within the SUDP/SOI to maintain their land in agricultural production until the land is converted to urban uses. The City will also work cooperatively with land trusts and other non-profit organizations to preserve agricultural land in the region. This may include the use of conservation easements. Infill development will be preferred and encouraged over fringe development. Sequential and contiguous development is also preferred and encouraged over leap-frog development.	Significant and Unavoidable
3.2-2	Conflict with existing zoning for agricultural use, or a Williamson Act contract	Potentially Significant		No mitigation measures available.	Significant and Unavoidable
3.2-3	Conflict with existing zoning for, or cause rezoning of, forest land (as defined by Public Resources Code section 1220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by	No Impact		No mitigation measures are required.	No Impact

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
	Government Code section 51104(g))				
3.2-4	Result in the loss of forest land or conversion of forest land to non-forest use	No Impact		No mitigation measures are required.	No Impact
3.2-5	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.	No Impact		No mitigation measures are required.	No Impact
3.2-6	Have a cumulatively adverse effect on agricultural resources	Significant, Unavoidable, and Cumulative		No mitigation measures are available.	Significant, Cumulatively Considerable, and Unavoidable
3.3 Air Quality					
3.3-1	Construction activities associated with development under the Merced Vision 2030 General Plan would result in criteria pollutants, ozone precursors, and other pollutants.	Potentially Significant	3.3-1a	For any phase of construction in which an area greater than 22 acres, in accordance with Regulation VIII of the SJVAPCD, will be disturbed on any one day, the project developer(s) shall implement the following measures: 1. Basic fugitive dust control measures are required for all construction sites by SJVAPCD Regulation VIII. 2. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				a slope greater than one percent. 3. Traffic speeds on unpaved roads shall be no greater than 15 mph. 4. Install wind breaks at windward side(s) of construction areas.	
		Potentially Significant	3.3-1b	To reduce emissions and thus reduce cumulative impacts, the City of Merced shall consider adoption of an ordinance requiring the following measures to be implemented in conjunction with construction projects within the City: 1. The idling time of all construction equipment used in the plan area shall not exceed ten minutes when practicable. 2. The hours of operation of heavy-duty equipment shall be minimized when practicable. 3. All equipment shall be properly tuned and maintained in accord with manufacturer's specifications when practicable. 4. When feasible, alternative fueled or electrical construction equipment shall be used at the project site. 5. The minimum practical engine size for construction equipment shall be used when practicable. 6. When feasible, electric carts or other smaller	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				equipment shall be used at the project site. 7. Gasoline-powered equipment shall be equipped with catalytic converters when practicable.	
3.3-2	Development and operation under the General Plan would result in emissions of criteria pollutants, ozone precursors, and other pollutants caused by mobile source activity, area sources, and stationary sources.	Significant and Cumulative	3.3-2	The following BACT (Best Available Control Technology) installations and mitigation shall be considered for new discretionary permits, to the extent feasible as determined by the City: • Trees shall be carefully selected and located to protect building(s) from energy consuming environmental conditions, and to shade paved areas when it will not interfere with any structures. Trees should be selected to shade paved areas that will shade 50% of the area within 15 years. Structural soil should be used under paved areas to improve tree growth. • If transit service is available to a project site, development patterns and improvements shall be made to encourage its use. If transit service is not currently available, but is planned for the area in the future, easements shall be reserved to provide for future improvements such as bus turnouts, loading areas, route signs and shade structures. • Multi-story parking facilities shall be considered instead of parking lots to reduce exposed concrete surface and save green space. • Sidewalks and bikeways shall be installed throughout as much of any project as possible, in	Significant, Cumulative, and Unavoidable

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				compliance with street standards, and shall be connected to any nearby existing and planned open space areas, parks, schools, residential areas, commercial areas, etc., to encourage walking and bicycling. • Projects shall encourage as many clean alternative energy features as possible to promote energy self-sufficiency. Examples include (but are not limited to): photovoltaic cells, solar thermal electricity systems, small wind turbines, etc. Rebate and incentive programs are offered for alternative energy equipment. As many energy-conserving features as possible shall be included in the individual projects. Energy conservation measures include both energy conservation through design and operational energy conservation. Examples include (but are not limited to): • Increased energy efficiency (above California Title 24 Requirements) • Energy efficient widows (double pane and/or Low-E) • Use Low and No-VOC coatings and paints • High-albedo (reflecting) roofing material • Cool Paving. "Heat islands" created by development projects contribute to the reduced air quality in the valley by heating ozone precursors	

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				• Radiant heat barrier • Energy efficient lighting, appliances, heating and cooling systems • Install solar water-heating system(s) • Install photovoltaic cells • Install geothermal heat pump system(s) • Programmable thermostat(s) for all heating and cooling systems • Awnings or other shading mechanism for windows • Porch, patio and walkway overhangs • Ceiling fans, whole house fans • Utilize passive solar cooling and heating designs (e.g. natural convection, thermal flywheels) • Utilize daylighting (natural lighting) systems such as skylights, light shelves, interior transom windows etc. • Electrical outlets around the exterior of the unit(s) to encourage use of electric landscape maintenance equipment • Bicycle parking facilities for patrons and employees in a covered secure area. Bike storage should be located within 50' of the project's entrance.	

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				Construct paths to connect the development to nearby bikeways or sidewalks • On-site employee cafeterias or eating areas • Low or non-polluting landscape maintenance equipment (e.g. electric lawn mowers, reel mowers, leaf vacuums, electric trimmers and edger's, etc.) • Pre-wire the unit(s) with high speed modem connections/DSL and extra phone lines • Natural gas fireplaces (instead of wood-burning fireplaces or heaters) • Natural gas lines (if available) and electrical outlets in backyard or patio areas to encourage the use of gas and/or electric barbecues • Low or non-polluting incentives items should be provided with each residential unit (such items could include electric lawn mowers, reel mowers, leaf vacuums, gas or electric barbecues, etc.)	
3.3-3	Development and Operation under the General Plan would Expose Sensitive Receptors to Pollutant Concentration.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.3-4	Implementation of the General Plan Update Would Create Odor Impact	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.4 Biological Resources					
3.4-1	Result in substantial adverse impacts on candidate, special-status, or sensitive species.	Potentially Significant	3.4-1a	**Vernal Pools and Vernal Pool Associates** To protect vernal pools and species associated with vernal pools including vernal pool smallscale, succulent owl's-clover, pincushion navarretia, Colusa grass, hairy Orcutt grass, spiny-sepaled button celery, San Joaquin Orcutt grass, Greene's tuctoria, Conservancy fairy shrimp, vernal pool fairy shrimp, Midvalley fairy shrimp, vernal pool tadpole shrimp, California linderiella, and Molestan blister beetle, surveys shall be conducted to determine the presence of vernal pools prior to or concurrent with application for annexation in areas identified as having potential habitat. Surveys to detect vernal pools are most easily accomplished during the rainy season or during early spring when pools contain water. If vernal pools are found to occur on a project site, the pools and a 100 foot-wide buffer around each pool or group of pools will be observed. If the vernal pools and buffer areas cannot be avoided, then the project proponent must consult with and obtain authorizations from, but not limited to, the California Department of Fish and Game, the United States Fish and Wildlife Service, the Army Corps of Engineers, and the State Water Resources Quality Control Board. Consultation and authorizations may require that additional surveys for special-status species be completed. Because there is a federal policy of no net loss of wetlands, mitigation to reduce losses and compensation to offset losses to vernal pools and associated special-status species will be required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
		Potentially Significant	3.4-1b	**Special-Status Plants** To protect special-status plants, the City shall ensure that a botanical survey be conducted for projects containing habitat suitable for special-status plant species. Surveys shall be conducted by a qualified biologist or botanist during the appropriate flowering season for the plants and shall be conducted prior to issuance of a grading or building permit for the project. If special-status plants are found to occur on the project site, the population of plants shall be avoided and protected. If avoidance and protection is not possible, then a qualified biologist will prepare a mitigation and monitoring plan for the affected species. The plan shall be submitted to the CDFG and/or the USFWS for review and comment. Details of the mitigation and monitoring plan shall include, but not be limited to: • Removing and stockpiling topsoil with intact roots and seed bank in the disturbance area, and either replacing the soil in the same location after construction is complete or in a different location with suitable habitat; or • Collect plants, seeds, and other propogules from the affected area prior to disturbance. After construction is complete, then the restored habitat will be replanted with propogules or cultivated nursery stock; or • These and other mitigations will only be considered successful if the populations of the affected species are sustained for a minimum of three years and are of	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				a similar size and quality as the original population.	
		Potentially Significant	3.4-1c	**Valley Elderberry Longhorn Beetle** To protect the Valley elderberry longhorn beetle (VELB), the project proponent shall ensure that a survey for elderberry bushes be conducted by a qualified biologist at each project site containing habitat suitable for VELB prior to the issuance of a grading permit or building permit. If elderberry bushes are found, the project proponent shall implement the measures recommended by the biologist, which shall contain the standardized measures adopted by the USFWS.	Less Than Significant
		Potentially Significant	3.4-1d	**Burrowing Owls** To protect burrowing owls on proposed projects where suitable habitat exists, the following shall be implemented: • To protect burrowing owls, preconstruction surveys shall be conducted by a qualified biologist at all project sites that contain grasslands, fallowed agricultural fields, or fallow fields along roadsides, railroad corridors, and other locations prior to grading. If, during a pre-construction survey, burrowing owls are found to be present, the project proponent shall implement the measures recommended by the biologist and include the standardized avoidance measures of CDFG.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
		Potentially Significant	3.4-1e	**Special-Status Birds** To protect raptors and other special-status birds on proposed projects where suitable habitat exists, the following measures shall be implemented: • Trees scheduled to be removed because project implementation shall be removed during the non-breeding season (late September to the end of February). • Prior to construction, but not more that 14 days before grading, demolition, or site preparation activities, a qualified biologist shall conduct a preconstruction nesting survey to determine the presence of nesting raptors. Activities taking place outside the breeding season (typically February 15 through August 31) do not require a survey. If active raptor nests are present in the construction zone or within 250-feet of the construction zone, temporary exclusion fencing shall be erected at a distance of 250-feet around the nest site. Clearing and construction operations within this area shall be postponed until juveniles have fledged and there is no evidence of a second nesting attempt determined by the biologist. • If nesting Swainson's hawks are observed during field surveys, then consultation with the CDFG regarding Swainson's hawk mitigation guidelines shall be required. The guidelines include, but are not limited to, buffers of up to one quarter mile, monitoring of the nest by a qualified biologist, and	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				mitigation for the loss of foraging habitat. • To avoid impacts to common and special-status migratory birds pursuant to the Migratory Bird Treaty Act and CDFG codes, a nesting survey shall be conducted prior to construction activities if the work is scheduled between March 15 and August 31. If migratory birds are identified nesting within the construction zone, a 100-foot buffer around the nest site must be designated. No construction activity may occur within this buffer until a qualified biologist has determined that the young have fledged. A qualified biologist may modify the size of the buffer based on site conditions and the bird's apparent acclimation to human activities. If the buffer is modified, the biologist would be required to monitor stress levels of the nesting birds for at least one week after construction commences to ensure that project activities would not cause nest site abandonment or loss of eggs or young. At any time the biologist shall have the right to implement the full 100-foot buffer if stress levels are elevated to the extent that could cause nest abandonment and/or loss of eggs or young.	
		Potentially Significant	3.4-1f	**Special-Status Amphibians** To protect California tiger salamander and western spadefoot on proposed projects where suitable habitat exists, the following shall be implemented: • To protect special-status amphibians, preconstruction surveys shall be conducted by a qualified biologist at	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				all project sites that contain appropriate habitat. If, during a pre-construction survey, special-status amphibians are found to be present, the project proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS or the CDFG.	
		Potentially Significant	3.4-1g	**Special-Status Reptiles** To protect western pond turtle and giant garter snake on proposed projects where suitable habitat exists, the following shall be implemented: • To protect special-status reptiles, preconstruction surveys shall be conducted by a qualified biologist at all project sites that contain appropriate habitat. If, during a pre-construction survey, special-status reptiles are found to be present, the project proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS or the CDFG.	Less Than Significant
		Potentially Significant	3.4-1h	**Special-Status Fish** To protect special-status fish, including hardhead, on proposed projects where suitable habitat exists, the following shall be implemented: • To protect special-status fish, preconstruction surveys shall be conducted by a qualified fish biologist at all project sites that contain appropriate habitat. If, during a pre-construction survey, special status fish are found to be present, the project	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS, National Marine Fisheries Service (NMFS) or the CDFG.	
		Potentially Significant	3.4-1i	**Special-Status Mammals** To protect Merced kangaroo rat, western mastiff bat, western red bat, hoary bat, Yuma myotis, San Joaquin pocket mouse, American badger, and San Joaquin kit fox on proposed projects where suitable habitat exists, the following shall be implemented: • To protect special-status mammals, preconstruction surveys shall be conducted by a qualified biologist at all project sites that contain appropriate habitat. If, during a pre-construction survey, special-status mammals are found to be present, the project proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS or the CDFG.	Less Than Significant
3.4-2	Result in substantially adverse affect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS.	Potentially Significant	3.4-2	**Streambed Alteration Agreement** To minimize impacts to riparian habitat and other sensitive natural communities, the following the measures shall be implemented when streambed alterations are proposed: • The project proponent shall have a qualified biologist map all riparian habitat, or other sensitive natural communities. To the extent feasible and practicable, all planned construction activity shall be designed to	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				avoid direct effects on these areas. • In those areas where complete avoidance is not possible, then all riparian habitat, or other sensitive natural communities, shall be mitigated on a "no-net-loss" basis in accordance with either CDFG regulations and/or a Section 1602 Streambed Alteration Agreement, if required. Habitat mitigation shall be replaced at a location and with methods acceptable to the CDFG.	
		Potentially Significant	3.4-1a	See Mitigation Measure #3.4-1a above.	Less Than Significant
3.4-3	Result in substantially adverse affect on federally protected wetlands through direct removal, filling, hydrological interruption, or other means.	Potentially Significant	3.4-3a	**Conduct a delineation of Waters of the U.S. and Wetlands (WOUS/Wetlands) and Obtain Permits.** In order to determine if there are wetlands or waters of the U.S. on a proposed project site which fall under the U.S. Army Corps of Engineers (Corps) jurisdictional authority under Section 404 of the CWA, a delineation of the Waters of the U.S. and wetlands shall be performed and submitted to the Corps for verification prior to annexation. A Section 404 permit and a Section 401 Water Quality Certification or Waiver of Waste Discharge shall be acquired from the Corps and the Regional Water Quality Control Board (RWQCB) and a Section 1602 Streambed Alteration Agreement from DFG respectively prior to the onset of construction related activities.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
		Potentially Significant	3.4-3b	Any jurisdictional waters that would be lost or disturbed due to implementation of any proposed project within the plan area shall be replaced or rehabilitated on a "no-net-loss" basis in accordance with the Corps' and the RWQCB mitigation guidelines. Habitat restoration, rehabilitation, and/or replacement if required shall be at a location and by methods agreeable to the Corps, the RWQCB, and the City of Merced. The project applicant shall abide by the conditions of any executed permits.	Less Than Significant
3.4-4	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	Potentially Significant	3.4-1e	See Mitigation Measure #3.4-1e above.	Less Than Significant
3.4-5	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	No Impact		No mitigation measures are required.	No Impact
3.4-6	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	No Impact		No mitigation measures are required.	No Impact

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.5 Cultural Resources					
3.5-1	Cause a substantial adverse change in the significance of a historic or archaeological resource	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.5-2	Potentially disturb human remains or destroy a unique paleontological resource, site, or geologic feature	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.6 Geology and Soils					
3.6-1	Expose people or structures to potential substantial adverse effects from seismic hazards	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.6-2	The proposed project would not result in substantial soil erosion or the loss of topsoil	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.6-3	The proposed project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.6-4	The proposed project could be located on expansive soils creating substantial risks to life or property	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.6-5	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.7 Hazards and Hazardous Materials					
3.7-1	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.7-2	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.7-3	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.7-4	Would the proposed project be located on a site, or proximate to a site, that is included on a list of hazardous materials	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
	sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment				
3.7-5	Would the proposed project be located within an airport land use plan, or within two miles of a public airport or private airstrip, creating a safety hazard for people residing or working in the project area	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.7-6	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.7-7	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residence are intermixed with wildlands	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.8 Hydrology and Water Quality					
3.8-1	Violation of water quality standards or waste discharge requirements or otherwise	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
	substantially degrade water quality				
3.8-2	The proposed project could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.	Significant		No mitigation measures are available.	Significant
3.8-3	The proposed project could substantially alter the existing drainage pattern of the area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or substantially increase the rate or amount of surface runoff in a manner, which would result in on- or offsite flooding.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.8-4	The proposed project could create or contribute runoff water which would exceed the capacity of existing stormwater drainage systems or provide substantial	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
	additional sources of polluted runoff.				
3.8-5	The proposed project could place housing or other structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, or other flood hazard delineation map or place within a 100-year flood hazard area structures which could impede or redirect flood flows.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.8-6	The proposed project could expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or inundation by seiche, tsunami or mudflow.	No Impact		No mitigation measures are required.	No Impact
3.9 Land Use and Planning					
3.9-1	Physically divide an established community	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.9-2	Conflict with any applicable land use plan, policy, or regulation	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.9-3	Conflict with any applicable habitat conservation plan or natural community conservation plan.	No Impact		No mitigation measures are required.	No Impact
3.10 Mineral Resources					
3.10-1	The proposed project could adversely affect the availability of a known mineral resource of value to the region and/or residents of the state	No Impact		No mitigation measures are required.	No Impact
3.10-2	The proposed project could adversely affect the availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan	No Impact		No mitigation measures are required.	No Impact
3.11 Noise					
3.11-1	Buildout of the General Plan may contribute to increased traffic noise levels, and an exceedance of the City's noise standards and resulting in potential noise impacts to new sensitive receptors.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.11-2	Buildout of the General Plan may contribute to increased traffic noise levels, and a	Potentially Significant		No mitigation measures are available.	Significant and Unavoidable

<table>
<tr><th>Impact #</th><th>Impact</th><th>Significance</th><th>Mitigation #</th><th>Mitigation Measure</th><th>Significance After Mitigation</th></tr>
<tr><td></td><td>significant increase in overall traffic noise levels at existing sensitive receptors.</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3.11-3</td><td>Buildout of the General Plan will result in construction activities which will contribute to the overall ambient noise environment.</td><td>Less Than Significant</td><td></td><td>No mitigation measures are required.</td><td>Less Than Significant</td></tr>
<tr><td>3.11-4</td><td>Proposed General Plan Buildout will result in construction activities which could contribute to vibration levels at building facades.</td><td>Potentially Significant</td><td>3.11-4</td><td>Table 3.11-13 provides criteria for evaluating construction vibration impacts. If construction activities include the use of pile drivers or large vibratory compactors, an analysis of potential vibration impacts should be conducted. The vibration impacts should not exceed a peak particle velocity of 0.1 inches/second.

Table 3.11-13
Effects of Vibration on People and Buildings
<table>
<tr><th>Peak Particle Velocity inches/second</th><th>Peak Particle Velocity mm/second</th><th>Human Reaction</th><th>Effect on Buildings</th></tr>
<tr><td>0-.006</td><td>0.15</td><td>Imperceptible by people</td><td>Vibrations unlikely to cause damage of any type</td></tr>
<tr><td>.006-.02</td><td>0.5</td><td>Range of Threshold of perception</td><td>Vibrations unlikely to cause damage of any type</td></tr>
<tr><td>.08</td><td>2.0</td><td>Vibrations clearly perceptible</td><td>Recommended upper level of which ruins and ancient monuments should be subjected</td></tr>
<tr><td>0.1</td><td>2.54</td><td>Level at which continuous vibrations begin to annoy people</td><td>Virtually no risk of architectural damage to normal buildings</td></tr>
</table></td><td>Less Than Significant</td></tr>
</table>

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				<table><tr><td>0.2</td><td>5.0</td><td>Vibrations annoying to people in buildings</td><td>Threshold at which there is a risk of architectural damage to normal dwellings</td></tr><tr><td>1.0</td><td>25.4</td><td></td><td>Architectural Damage</td></tr><tr><td>2.0</td><td>50.4</td><td></td><td>Structural Damage to Residential Buildings</td></tr><tr><td>6.0</td><td>151.0</td><td></td><td>Structural Damage to Commercial Buildings</td></tr></table> *Source: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans 1976.*	
3.11-5	Proposed General Plan Buildout could expose new noise-sensitive receptors to railroad noise levels.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.11-6	The Proposed General Plan Buildout may include stationary noise sources such as automotive and truck repair facilities, tire installation centers, car washes, loading docks, corporation yards, parks, and play fields may create noise levels in excess of the City standards.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.11-7	Proposed General Plan Buildout could expose new noise sensitive receptors to aircraft operations noise levels.	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.12 Population and Housing					
3.12-1	Induce substantial population growth in an area, either directly or indirectly	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.12-2	Displace a substantial number of people or existing housing, necessitating the construction of replacement housing elsewhere	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.13 Recreation					
3.13-1	Increase the use of existing neighborhood and regional parks or other recreational facilities or require the construction or expansion of recreational facilities.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.13-2	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.14 Public Services					
3.14-1	Result in a substantial adverse physical impact to the continued provision of law enforcement services in the City	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.14-2	Result in a substantial adverse physical impact to the continued provision of fire protection services in the City	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.14-3	Result in a substantial adverse physical impact to the continued provision of school services in the City	No Impact		No mitigation measures are required.	Less Than Significant
3.14-4	Result in a substantial increase in the demand for other public services and facilities	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.15 Transportation/Traffic					
3.15-1	Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system and/or exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.	Potentially Significant	3.15-1a	Table 3.15-4 indicates the recommended number of travel lanes for several of the road segments analyzed to keep traffic levels-of-service at the City's preferred LOS "D" at General Plan buildout. Implementation of the following projects will permit the City to manage its traffic volumes at Level of Service "D", or better: 1. SR 59 from 16th to Olive (2 lanes to 6 lanes) Existing LOS=F / Future LOS=D 2. SR 59 from Olive to Yosemite (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D 3. SR 59 from Yosemite to Cardella (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D 4. SR 59 from Cardella to Bellevue (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D	Significant and Unavoidable

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				5. SR 59 from Bellevue to Old Lake (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C 6. SR 59 from Old Lake to Castle Farms (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D 7. "R" Street from Old Lake to Area of Influence Boundary (Future Extension 0 lanes to 2 lanes) Existing LOS= none / Future LOS=C+ 8. "M" Street from Cardella to Bellevue (Future Extension 0 lanes to 4 lanes) Existing LOS=none / Future LOS = C+ 9. "M" Street from Bellevue to Old Lake (Future Extension 0 lanes to 4 lanes) Existing LOS=none / Future LOS = C+ 10. Martin Luther King Jr. Way/South SR 59 from Roduner to Mission (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D 11. Martin Luther King Jr. Way/South SR 59 from Mission to Gerard (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D 12. "G" Street from Yosemite to Cardella (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=C+ 13. "G" Street from Cardella to Bellevue (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D	

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				14. "G" Street from Bellevue to Old Lake (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D 15. "G" Street from Old Lake to Snelling (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=C 16. Parsons/Gardner from Childs to SR 140 (2 lanes to 4 lanes) Exiting LOS=D / Future LOS=D 17. Parsons/Gardner from Bear Creek to Olive (2 lanes to 4 lanes) Exiting LOS=C+ / Future LOS=D 18. Parsons/Gardner from Olive to Yosemite (2 lanes to 6 lanes) Exiting LOS=D / Future LOS=D 19. Parsons/Gardner from Yosemite to Cardella (2 lanes to 4 lanes) Exiting LOS=C+ / Future LOS=D 20. Parsons/Gardner from Cardella to Bellevue (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 21. Parsons/Gardner from Bellevue to Old Lake (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C+ 22. Parsons/Gardner from Old Lake to Golf Club (Future Extension 0 lanes to 2 lanes) Existing LOS= none / Future LOS=D 23. Campus Parkway SR 99/Mission to Childs (Future Extension 0 lanes to 6 lanes) Existing LOS= none / Future LOS=D	

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				24. Campus Parkway from Childs to SR 140 (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 25. Campus Parkway from SR 140 to Olive (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 26. Campus Parkway from Olive to Yosemite (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 27. Campus Parkway from Yosemite to Cardella (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 28. Campus Parkway from Cardella to Bellevue (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 29. Tyler Road from Childs to Mission (Future Extension 0 lanes to 2 lanes) Existing LOS= none / Future LOS=D 30. Old Lake Road SR 59 to "R" Street (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C+ 31. Old Lake Road "R" Street to "M" Street (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C	

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				32. Old Lake Road "M" Street to "G" Street Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C 33. Bellevue Road from Atwater/Merced Expressway to Thornton (2 lanes to 8 lanes Exiting LOS=C+ / Future LOS=C+ 34. Bellevue Road from Thornton to SR 59 (2 lanes to 8 lanes Exiting LOS=C+ / Future LOS=D 35. Bellevue Road from Parsons/Gardner to Campus Parkway (2 lanes to 6 lanes) Exiting LOS=C+ / Future LOS=D 36. Cardella Road from SR 59 to "R" Street (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 37. Cardella Road from "M" Street to "G" Street (2 lanes to 4 lanes) Existing LOS= C+ / Future LOS=D 38. Cardella Road from "G" Street to Parsons/Gardner (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 39. Cardella Road from Parsons/Gardner to Campus Parkway (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D 40. Yosemite Avenue from Parsons/Gardner to Campus Parkway (2 lanes to 4 lanes) Existing LOS=D / Future LOS=D	

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				41. Olive Avenue West of Hwy 59 (Santa Fe Avenue) (4 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C 42. SR 99 from Atwater/Merced Expressway to Mariposa (4 lanes to 6 lanes through Merced) Existing LOS=C+ and D / Future LOS=C+ and D 43. Childs Avenue from SR 59 to Tyler (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D 44. Childs Avenue from Parsons/Gardner to Coffee (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D 45. Childs Avenue from Coffee to Campus Parkway (2 lanes to 4 lanes) Existing LOS=D / Future LOS=D 46. Childs Avenue from Campus Parkway to Tower (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C+ 47. Dickerson Ferry/Mission Avenue from Thornton to West Avenue (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D 48. Dickerson Ferry/Mission Avenue from West Avenue to SR 59 (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C+ 49. Dickerson Ferry/Mission Avenue from SR 50 to Tyler (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C+	

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
				50. Dickerson Ferry/Mission Avenue from SR 99 to Coffee (Future Campus Parkway)(2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C+ 51. Dickerson Ferry/Mission Avenue from Tyler to Henry (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D 52. Dickerson Ferry/Mission Avenue from Coffee to Tower (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=C+ 53. Thornton from Dickerson Ferry/Mission to SR 140 (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D	
		Potentially Significant	3.15-1b	Traffic studies should be performed to satisfy the requirements of the California Environmental Quality Act (CEQA) for all proposed General Plan Amendments which intensify development, proposed specific plans, annexations, and other projects at the discretion of the Development Services Department. Future traffic studies should generally conform to any guidelines established by the City. The studies should be performed to determine, at a minimum, opening-day impacts of proposed projects and as confirmation or revision of the General Plan. The studies should address queue lengths and (at a minimum) peak-hour traffic signals warrants in addition to LOS and provide appropriate mitigations. At the discretion of the City, a complete warrant study in accordance with the most recent edition of the California Manual on Uniform Traffic Control Devices may be required to evaluate the need for traffic signals.	Significant and Unavoidable

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.15-2	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.15-3	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.15-4	Result in Inadequate Emergency Access	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.15-5	Result in Inadequate Parking Capacity	No Impact		No mitigation measures are required.	No Impact
3.15-6	Conflict with Adopted Polices Supporting Alternative Transportation	No Impact		No mitigation measures are required.	No Impact
3.16 Utilities/Services					
3.16-1	The proposed project would result in the exceedance of wastewater treatment requirements of the CVRWQCB	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.16-2	The proposed project would require or result in the construction of new water or wastewater treatment facilities	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
	or expansion of existing facilities, the construction of which could cause significant environmental effects				
3.16-3	The proposed project would require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.16-4	The proposed project would require new or expanded water supply entitlements	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.16-5	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.16-6	The proposed project would increase demand for solid waste disposal services	Less Than Significant		No mitigation measures are required.	Less Than Significant

Impact #	Impact	Significance	Mitigation #	Mitigation Measure	Significance After Mitigation
3.16-7	Will the proposed project comply with federal, state, and local statutes and regulations related to solid waste?	Less Than Significant		No mitigation measures are required.	Less Than Significant
3.17 Greenhouse Gas Emissions (Global Climate Change)					
3.17-1	Development of the Project could potentially result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change	Significant, Cumulatively Considerable, and Unavoidable		No mitigation measures are available.	Significant, Cumulatively Considerable, and Unavoidable
3.17-2	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less Than Significant		No mitigation measures required.	Less Than Significant
3.17-3	Climate Change could potentially result in an impact on City of Merced water resources	Less Than Significant		No mitigation measures required.	Less Than Significant

CHAPTER ONE

INTRODUCTION

CHAPTER ONE
INTRODUCTION

This Draft Program Environmental Impact Report (EIR) is an informational document prepared for the City of Merced (herein referred to as "City") to evaluate potential environmental impacts of the proposed *Merced Vision 2030 General Plan*. This Draft Program EIR has been prepared in accordance with the California Environmental Quality Act (CEQA) Statutes and Guidelines.

In accordance with *Guidelines for Implementation of the California Environmental Quality Act* (CEQA Guidelines), this Draft Program EIR is a document intended to inform public decision makers, responsible or interested agencies, and the general public of the potential environmental effects of the adoption of the General Plan Update. The environmental review process has been established to enable interested parties to evaluate a proposed project in terms of its environmental consequences, to examine and implement methods to eliminate or reduce potential adverse impacts, and to consider a reasonable range of alternatives to the proposed project. While CEQA requires that major consideration be given to avoiding adverse environmental effects, the Lead Agency and other responsible public agencies must balance adverse environmental effects against other public objectives, including the economic and social benefits of a proposed project, in determining whether a proposed project should be approved. This document is also intended to serve CEQA compliance purposes for the Local Agency Formation Commission (LAFCO) review of the revised Sphere of Influence boundary.

1.1 Procedures and Purpose

Pursuant to Section 15168 of the CEQA Guidelines, a Program EIR is prepared for a series of related actions that can be characterized as one large project, such as a general plan or specific plan. In contrast, a project EIR, the most common type of EIR, examines the impacts that would result from a specific development proposal or project. As prescribed by CEQA, the City, in its role as Lead Agency, has determined that a Program EIR shall be prepared for the update of the General Plan. On July 17, 2008, the City prepared and circulated a Notice of Preparation (NOP) to responsible, trustee, and local agencies for review and comment. A copy of the NOP and copies of written responses to the NOP are included in Appendix A of this EIR. A public scoping meeting was held for the EIR on the proposed General Plan on July 29, 2008. Comments received advised extensive analysis on impacts to air quality, agricultural resources and transportation.

The Draft Program EIR will consider all potential environmental effects of the update of the General Plan to determine the level of significance of the environmental effect, and will analyze these potential effects to the detail necessary to make a determination of significance. The Program EIR discussion of less-than-significant environmental effects will be limited to a brief explanation of why those effects are not considered potentially significant.

Section 15121(a) of the CEQA Guidelines defines an EIR as an informational document that will:

> ...inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.

As defined by Section 15378 of the CEQA Guidelines, a "project" is any action that "...has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment..." Section 15093 of the CEQA Guidelines requires decision makers to balance the benefits of a proposed project against any unavoidable adverse environmental effects of the proposed project. If the benefits of the proposed project outweigh the unavoidable adverse environmental effects, then the decision-makers may adopt a statement of overriding considerations, finding that the environmental effects are acceptable in light of the proposed project's benefits to the public.

The CEQA process requires that the Lead Agency consider input from other interested agencies, citizen groups, and individuals. CEQA provides for a public process requiring full public disclosure of the expected environmental consequences of the proposed action. The public must be given a meaningful opportunity to comment on the environmental document. CEQA also requires monitoring of the mitigation measures to ensure that they are in fact carried out.

CEQA requires a public review period, normally 45 days, for commenting on the Draft EIR. During the review period, any agency, group, or individual may comment in writing on the Draft EIR, and the Lead Agency must respond to each comment on environmental issues in the Final EIR. According to Section 15202(a) of the CEQA Guidelines, CEQA does not require formal hearings at any stage of the environmental review process; however, it is typical to consider the EIR and its findings during public hearings required for the proposed project.

If the City finds that the Final EIR is "adequate and complete," the City may certify the Final EIR in writing in accordance with CEQA Guidelines Section 15091, and if applicable, Section 15093. CEQA Guidelines Section 15091 specifies that the lead agency shall state findings, in writing, of any environmental impacts and the changes made to lessen the impact or the reason why such mitigation is infeasible. CEQA Guidelines Section 15093 requires a statement of overriding considerations in cases where the lead agency deems the proposed project's benefits outweigh the unavoidable environmental impacts. The rule of adequacy generally holds that the EIR can be certified if:

1) The EIR shows a good faith effort at full disclosure of environmental information; and,

2) The EIR provides sufficient analysis to allow decisions to be made regarding the proposed project in contemplation of environmental considerations.

Public Resources Code Section 21081.6(a) and CEQA Guidelines Section 15097 require lead agencies to adopt a Mitigation Monitoring and Reporting Program (MMRP) to describe measures that have been adopted or made a condition of project approval in order to mitigate or

avoid significant effects on the environment. Any mitigation measures adopted by the City as conditions of project approval will be included in this report to verify compliance. The MMRP is adopted by Resolution at the time of project approval.

All comments or questions regarding this DEIR must be made in writing and should be addressed to:

Kim Espinosa, Planning Manager
City of Merced
678 West 18th Street
Merced, CA 95340
(209) 385-6858 (Phone for questions only)
(209) 725-8775 (Fax)
Email: espinosak@cityofmerced.org

1.2 Organization of the EIR

CHAPTER ONE

Chapter One briefly describes the procedures and purpose for environmental evaluation of the proposed project, the contents and organization of the Draft EIR and a brief methodology discussion.

CHAPTER TWO

Chapter Two provides the proposed project intent and objectives, project location, project setting, project description, purpose, project characteristics, proposed action, and the uses of the EIR, and agency actions, permits and consultation requirements.

CHAPTER THREE

Chapter Three provides an environmental analysis evaluating each topical area. Each topical area is organized as follows:

Introduction. Each environmental topic is preceded by a description of the topic and a brief statement of the rationale for addressing the topic.

Environmental Setting. Description of the existing environment in and around the proposed project area.

Regulatory Setting. A discussion of the regulatory environment that may be applicable to the proposed project.

Thresholds of Significance. The thresholds of significance are the standards or thresholds by which impacts are measured, with the objective being the determination of whether an impact

will be significant or less than significant. The purpose is to establish the level at which an environmental impact will be considered significant.

Impacts and Mitigation Measures. Each impact and mitigation measure associated with an environmental topic is described and listed by number for reference.

Discussion/Conclusion. This is an analysis and concluding statement identifying whether the impact is significant or less-than-significant. If found to be significant, the conclusion states whether the impact can be avoided or reduced to an acceptable level through implementation of mitigation measures, or whether the impact is significant and unavoidable.

Mitigation Measures. Each feasible mitigation measure is described and listed by number. Existing regulations are described, but are not treated as mitigation measures that must be repeated in the EIR. Rather, they are assumed to be existing law with which the proposed project must comply.

Effectiveness of Mitigation Measure. For significant impacts, a statement is made regarding whether the impact is mitigated to a less than significant level or, alternatively, whether the impact is only partially mitigated, immitigable, unavoidable, and/or irreversible, based on the Significance Thresholds.

CHAPTER FOUR

Chapter Four describes and evaluates alternatives to the proposed project. The proposed project is compared to each alternative, and the environmental ramifications of each are analyzed. Per requirements of CEQA Guidelines Section 15126.6(e)(1), the "no project" alternative must be considered to compare the environmental consequences of the project as proposed to the consequences of taking no action.

CHAPTER FIVE

Chapter Five evaluates and describes the following CEQA required topics: unavoidable significant environmental effects, significant irreversible environmental changes, growth-inducing impacts, and effects found not to be significant. Chapter Five also examines the cumulative impacts associated with the proposed General Plan.

APPENDICES

References to published literature or technical reports cited in the text have been included at the end of this Draft EIR to facilitate full environmental review of the proposed project. Also included are the names and agencies of individuals contacted for information during EIR preparation.

1.3 Methodology

The City has determined that a program level EIR shall be prepared for the update of the Merced General Plan. An Initial Study was not prepared for the proposed project and the City has not made any determinations regarding less than significant environmental effects of the project. Section 15168 of the CEQA Guidelines provides the following description of when a program EIR is used:

> (a) General. A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:
>
> (1) Geographically,
>
> (2) As logical parts in the chain of contemplated actions,
>
> (3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or
>
> (4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

Section 15168(c) and (d) also describe the use of a program EIR with later activities.

> (c) Use With Later Activities. Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.
>
> (d) Use with Subsequent EIRs and Negative Declarations. A program EIR can be used to simplify the task of preparing environmental documents on later parts of the program.

The update of the Merced General Plan is evaluated at a program level of detail in this EIR. This EIR is intended to provide the information and environmental analysis necessary to assist public agency decision-makers in considering adoption of the revised General Plan. Based upon the comments received on the NOP prepared by the City, it has been determined that the EIR should focus on the environmental aspects outlined below:

AESTHETICS

This section of the EIR evaluates potential impacts associated with the update that include the introduction of new areas where urban lighting may conflict with rural or agricultural land uses, increased production of light and glare, change in the visual character of existing rural and agricultural areas, impacts to a scenic highway or area, and reduction in visibility at night within the urbanized area. These issues are examined within the framework of the existing General Plan EIR, and General Plan policies will be reviewed for their ability to address these problems.

AGRICULTURE AND FOREST RESOURCES

This section examines how the proposed changes in the SUDP and Sphere of Influence may result in the conversion of existing agricultural lands to non-agricultural uses, including residential, commercial, institutional, and other urban uses. This section will address the potential loss of agricultural lands within the context of the local agricultural setting. The analysis identifies the impacts to agricultural and forest resources, and identifies mitigation measures designed to reduce the impact.

AIR QUALITY

The air quality analysis contains a description of the climate and meteorology of the project area, historical air quality data, and current efforts to attain and maintain the State and federal ambient air quality standards. The setting section of the EIR provides a summary of health effects of criteria and TAC pollutants, summarizes air quality data from monitoring sites, and identifies all sensitive receptors for air pollutants in Merced. The air quality analysis covers the meteorological and vehicle mix characteristics, forecast years, emissions and air quality models to be used. The analysis predicts future trends in air quality under the proposed General Plan using the URBEMIS modeling software.

BIOLOGICAL RESOURCES

The biological section of this EIR contains: a) a list of state and federal regulations, local policies, habitat conservation plans, and natural community conservation plans that are applicable to the City; b) existing environmental and regulatory setting; c) a list and description of special status species that are likely to occur within or immediately adjacent to the City; d) the standards and thresholds for determining the significance of biological impacts; e) an impacts analysis discussion; and f) a list of available mitigation measures that could reduce potentially significant environmental impacts.

CULTURAL RESOURCES

Existing cultural resources (archaeological and historical) that could be affected by adoption and implementation of the proposed General Plan are described in this section, and impacts and mitigation measures are identified.

GEOLOGY AND SOILS

This section discusses potential geological hazards caused by adoption and implementation of the Merced Vision 2030 General Plan. The analysis will include the review of the City's current General Plan, published documents, geologic maps and other geological and geotechnical literature pertaining to the City and the region to aid in evaluating the adequacy of the proposed General Plan relative to geologic resources, hydrology, and geologic hazards that may be present.

HAZARDS AND HAZARDOUS MATERIALS

This section of the EIR addresses the potential impacts associated with hazards and hazardous materials. The General Plan is not expected to result in significant new generation of health hazards that were not adequately considered in the existing General Plan EIR. However, changes in State law, as well as new standards for treatment and removal of hazardous materials, will likely necessitate the incorporation of additional mitigation measures to offset potential impacts associated with the proposed General Plan.

HYDROLOGY AND WATER QUALITY

The hydrology section of the EIR contains analysis and mitigation measures to address potential impacts associated with impacts to water quality, groundwater recharge, flooding, erosion, and area surface waterways. The application of water quality standards from the Central Valley Regional Water Quality Control Board will be used as the basis for assessing impacts, and development of mitigation measures will build upon those contained in the existing General Plan EIR.

LAND USE AND PLANNING

The land use analysis within the EIR addresses potential land use conflicts created by the proposed General Plan changes, and reviews existing mitigation measures and findings to determine what level of further analysis is warranted. The land use analysis follows recent case law and CEQA statutes in ensuring that the EIR provides adequate review and consideration of the land use issues associated with the project, and provides acceptable levels of guidance for future developments within the City.

MINERAL RESOURCES

This section describes the regulatory framework and existing conditions related to mineral resources in and around Merced, and the potential mineral resources impacts of the proposed General Plan.

NOISE

This section of the EIR includes future noise contours for transportation noise sources, discussion of impacts, and mitigation measures. The noise analysis contained within the EIR will be based on the noise model and contours created in the *Merced Vision 2030 General Plan*, and will conform to all CEQA requirements for noise analysis.

POPULATION AND HOUSING

This section of the EIR addresses the potential impacts to population and housing associated with the proposed changes to the General Plan. It is anticipated that the Update will result in an increase in population from the 1997 General Plan, and that such an increase may have impacts on the housing market and housing conditions within the City.

RECREATION

This section of the EIR addresses the adoption and incorporation of the Parks and Open Space Master Plan (2004) into the *Merced Vision 2030 General Plan.* The change in development areas of the SUDP/SOI, as well as the adoption of the Parks Master Plan, may result in changes in the distance of residents from area parks, resulting in new demand for parkland and recreational facilities, and other similar impacts. This section of the EIR addresses recreational impacts associated with the General Plan, and provides adequate mitigation, where necessary, to reduce potentially significant impacts.

PUBLIC SERVICES

This section of the EIR presents information on existing public services in Merced, including police and fire protection, schools, libraries, health services and government facilities, and describes the potential effects of the proposed General Plan related to the provision of these services.

TRANSPORTATION/TRAFFIC

This section of the EIR addresses the potential transportation related impacts of the proposed General Plan. The first part of the section discusses the environmental and regulatory setting, while the last part of the section analyzes the potential transportation impacts of the proposed General Plan and provides mitigation measures where appropriate. The City of Merced General Plan Update Traffic Analysis (Fehr and Peers, May 9, 2009) entailed technical analysis used as a basis for this section of the Draft EIR. Traffic count data and a summary of the traffic impact modeling are presented in Appendix K.

UTILITIES/SERVICES

The impacts of the proposed General Plan and proposed changes on existing City Master Plans, including water, sewer, and storm drainage, are evaluated. In addition, the projected demand for water and wastewater services, as well as storm drainage, solid waste, gas and electricity, and telecommunications will be addressed to the greatest extent possible. This section also addresses other potential issues associated with the extension of these services, including infrastructure improvements, plant expansion, and other related improvements.

GREENHOUSE GAS EMISSIONS (GLOBAL CLIMATE CHANGE)

This section of the EIR describes the environmental setting including the availability of scientific information and the sources of CO_2 emissions, describes the regulatory context, and discloses the proposed General Plan's potential impacts on greenhouse gas emissions and climate change including consideration of feasible mitigation measures that the proposed General Plan is incorporating to reduce those impacts.

CHAPTER TWO

PROJECT DESCRIPTION

CHAPTER TWO
PROJECT DESCRIPTION

Section 15124 of the California Environmental Quality Act (CEQA) Guidelines requires that a project description contain specific information that can be used consistently throughout an EIR. This consistency is critical to ensure that various environmental aspects of the project are adequately evaluated.

2.1 Statement of Project Intent and Objectives

The *Merced Vision 2030 General Plan* is a long-range plan intended to guide growth and development of the City through the Year 2030. During this period, the population of the City of Merced Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) area is expected to more than double from its present (2010) level of 80,985 to over 155,000. The U.C. Merced (UCM) campus had an enrollment of approximately 2,700 full time students in 2008 with an expected population impact on the area of approximately 5,000 full time students by the year 2012.

By the year 2035, the UC Merced campus is expected to contribute approximately 37,135 people to the urban growth of the City's urban area; the urban population of Merced is expected to approach 200,000 people by 2035.

The *Merced Vision 2030 General Plan* aims to achieve the following guiding principles as well as many others. (A complete summary of the General Plan's goals and policies can be found in Table 2-2 of this Chapter):

- Expansion of the Sphere of Influence and City boundary with phasing of development to avoid premature conversion of agricultural land and to plan for cost-effective extension of municipal services.

- Foster compact and efficient development patterns.

- Connectivity between existing and planned urban areas. Examples include the northeast area toward UCM, the University Community, and South Merced.

- Merced as the single municipal service provider in the expanded sphere of influence.

- New development provides or pays its fair share of public services and facilities to avoid burdening existing city residents (in short, new growth pays for itself).

- Mixed-use, transit and pedestrian friendly urban villages in growth areas with direct access to commercial cores from surrounding neighborhoods.

- Commercial nodes in new growth areas to avoid the aesthetic and circulation issues associated with more common "strip commercial".

- Circulation: Recognition of the cost and importance of the arterial street system and protect capacity with access standards. Designs that encourage all modes of transportation.

- Build community quality. High community standards for Merced's services, infrastructure, and private development as a strategy for attracting business and industry and to benefit the City's residents.

- Planning well in advance for industrial/business park uses and for the infrastructure needed to support such development.

- A diversity of housing types and opportunities.

- Encouraging Sustainable and "Green" Development.

- Planning for the provision of infrastructure ahead of development.

- Maintaining Merced's high quality of life and keeping it a nice place to live.

- Encouraging new research parks and the use of new technologies.

- Protection of the Merced Regional Airport as an important community asset.

- Maintaining a quality educational environment for pre-school, K-12, and higher education.

- Maintaining our quality parks and recreation systems, including the bike path system.

- Encouraging a healthy community through improved medical facilities, air quality, parks & recreation opportunities, etc.

2.1.1 INTENT

In broad terms, the *Merced Vision 2030 General Plan* is a strategy for accommodating population growth in a manner that minimizes adverse "physical" impacts of growth and development. "Physical" adverse impacts are within the purview of CEQA. Social and economic impacts are typically beyond the scope of CEQA, and this Program EIR, unless they will result in a "physical" impact (CEQA Guidelines Section 15131).

The *Merced Vision 2030 General Plan* relies on the concept of "sustainable development" as a means of accommodating expected future growth. In application, the term "sustainable development" in the City of Merced is defined in Chapter 8 of the *Merced Vision 2030 General Plan* and means accommodating growth and development without unnecessarily:

- Consuming valuable and limited agricultural soils,
- Contaminating or over-taxing water supplies,
- Destroying or diminishing the value of important wildlife habitat,
- Reducing air quality to a point where our quality of life is threatened,
- Consuming limited non-renewable energy resources, or

- Destroying cultural and historical resources.

2.1.2 PLAN OBJECTIVES

The *Merced Vision 2030 General Plan* contains a comprehensive set of goals and policies that establish the planning philosophy that will direct future City growth. To achieve its purpose of providing for future population growth, the plan contains land use policies that provide adequate area for housing, employment and commercial activities. The plan also contains policies and standards for the provision of public services and infrastructure necessary to support future population growth.

Beyond the physical needs of future population growth, the plan contains design and open space provisions. These provisions provide an important element to the planning process. Future growth and development are expected to contribute to the overall well being of the community while preserving and enhancing the City's present quality of life.

From the standpoint of "sustainable growth," the *Merced Vision 2030 General Plan* contains provisions to ensure that future growth and development:

- Are directed away from concentrations of "prime" agricultural soils,
- Conserve water and do not over-tax or contaminate the region's water resources,
- Preserve and protect important area wildlife habitat,
- Promote development which minimizes adverse growth related impacts on the region's air quality,
- Conserve non-renewable energy resources, and,
- Preserve important area cultural and historic resources.

2.2 Project Location

Located in the Central San Joaquin Valley, the City of Merced is the seat of the Merced County government, as well as a major retail commercial/service center for the surrounding region. The City is located at the intersection of several state highways and is one of the primary access points to Yosemite National Park. Known as the "Gateway to Yosemite," Merced is approximately 80 miles west of the valley floor of the Park, along Highway 140.

Merced is approximately 150 miles southeast of San Francisco and is one of a chain of cities located along State Highway 99. Highway 99 is one of the two major north-south arteries passing through the San Joaquin Valley and connecting Southern California to the Pacific Northwest region. Major cities to the north along Highway 99 include Modesto (40 miles), Stockton (65 miles), and Sacramento (100 miles). To the south are Madera (20 miles), Fresno (55 miles) and

Bakersfield (165 miles). Smaller cities in the vicinity of Merced along the Hwy 99 corridor are Atwater to the immediate northwest and Chowchilla to the southeast.

The City is served by two rail lines, the Burlington Northern & Santa Fe (B.N.S.F.) and the Union Pacific Transportation Company (U.P.), which pass through the City. The Merced Regional Airport provides regional air service. To the north, Castle Air Force Base has been converted to civilian use (Castle Airport).

The City of Merced is located near the geographic center of the County of Merced. To the east of the City is the western slope of the Sierra Nevada mountain range. The County of Merced is bounded on the north by Tuolumne and Stanislaus Counties, on the east by Mariposa County, on the south by Fresno and Madera Counties, and on the west by Santa Clara and San Benito Counties.

Merced County contains about 1,031 square miles of land area. In 2010, the incorporated City of Merced included 23.1 square miles and the planning area of the City (SUDP) contained approximately 32.4 square miles. Figure 2-1 shows Merced's Regional Location and Figure 2-2 shows Merced's current City limits and Proposed Sphere of Influence (SOI). Figure 2-3 shows Merced's existing 2015 General Plan Land Use diagram.

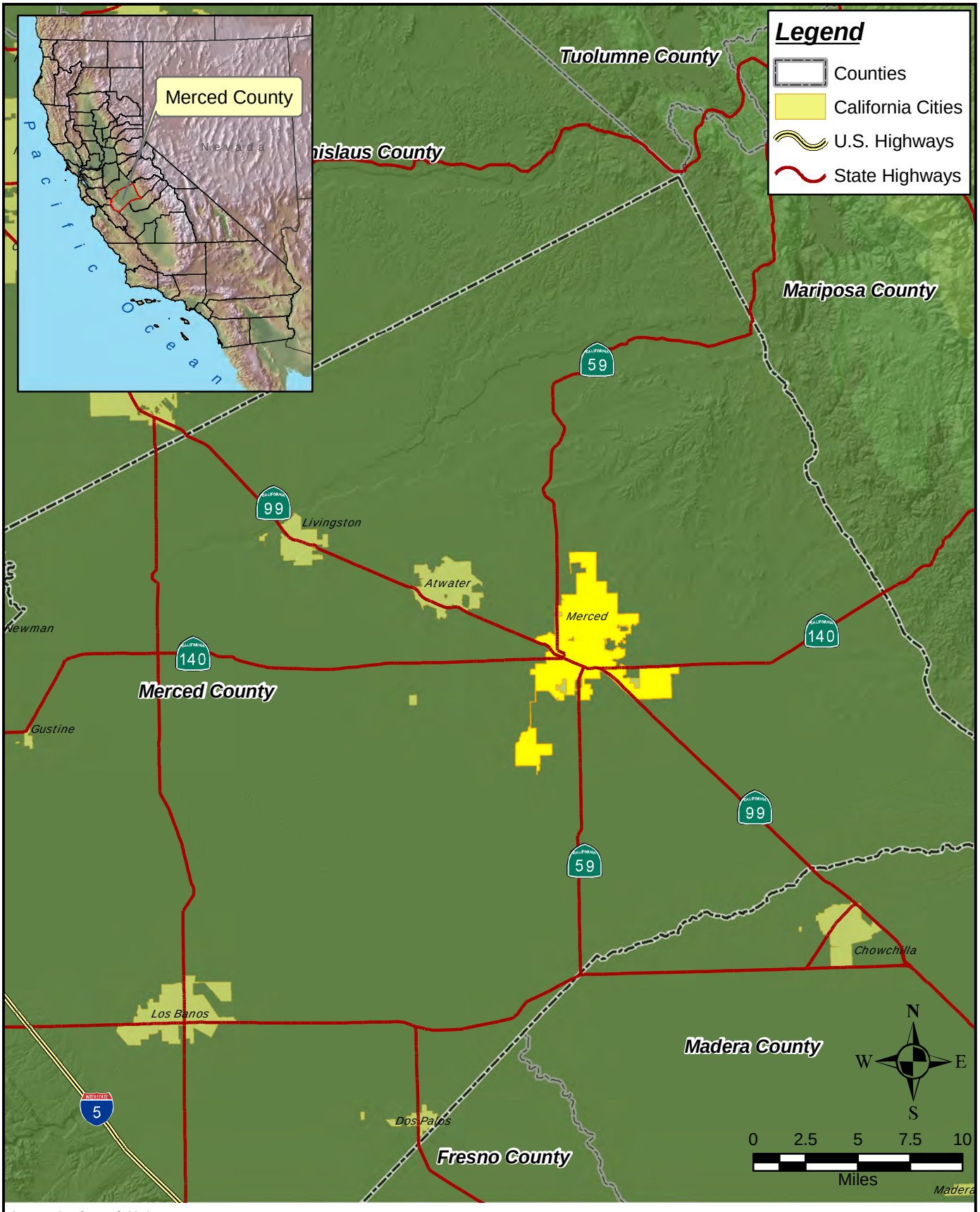
2.3 Project Setting

The City of Merced's 2010 City limits are generally bounded on the west by State Highway 59 and the El Capitan Canal, and on the east by McKee Road. The northerly City limits include Nevada Street and Cardella Road, while the southerly city limits are generally bounded by the Merced Regional Airport, Childs Avenue and by State Highway 99 to the southeast.

The northern portion of the City is characterized by gently rolling terrain, while the southern portion is relatively flat. The area surrounding the City is largely used for agricultural production. The northern, western, and eastern portions of the City contain a number of creeks and canals including Bear Creek, Black Rascal Creek, Fahrens Creek, and Cottonwood Creek. Lake Yosemite is located approximately three miles north and east of the City center. The City of Atwater and Castle Airport is located approximately four miles northwest of the City.

2.4 Project Description

The proposed project includes an update of the City of Merced's General Plan. California state law requires each city and county to adopt a general plan "for all the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (§65300). The General Plan will include Urban Expansion, Land Use, Transportation & Circulation, Public Facilities & Services, Urban Design, Open Space, Conservation & Recreation, Sustainable Development, Housing, Noise and Safety Elements. The Housing Element has been previously adopted and certified by the California Department of Housing and Community Development and is available under separate cover. The Housing Element (last updated in 2003 with minor revision in 2004) has a set schedule for review, generally every five years, based on State law. The Housing Element is currently being updated by the City and will



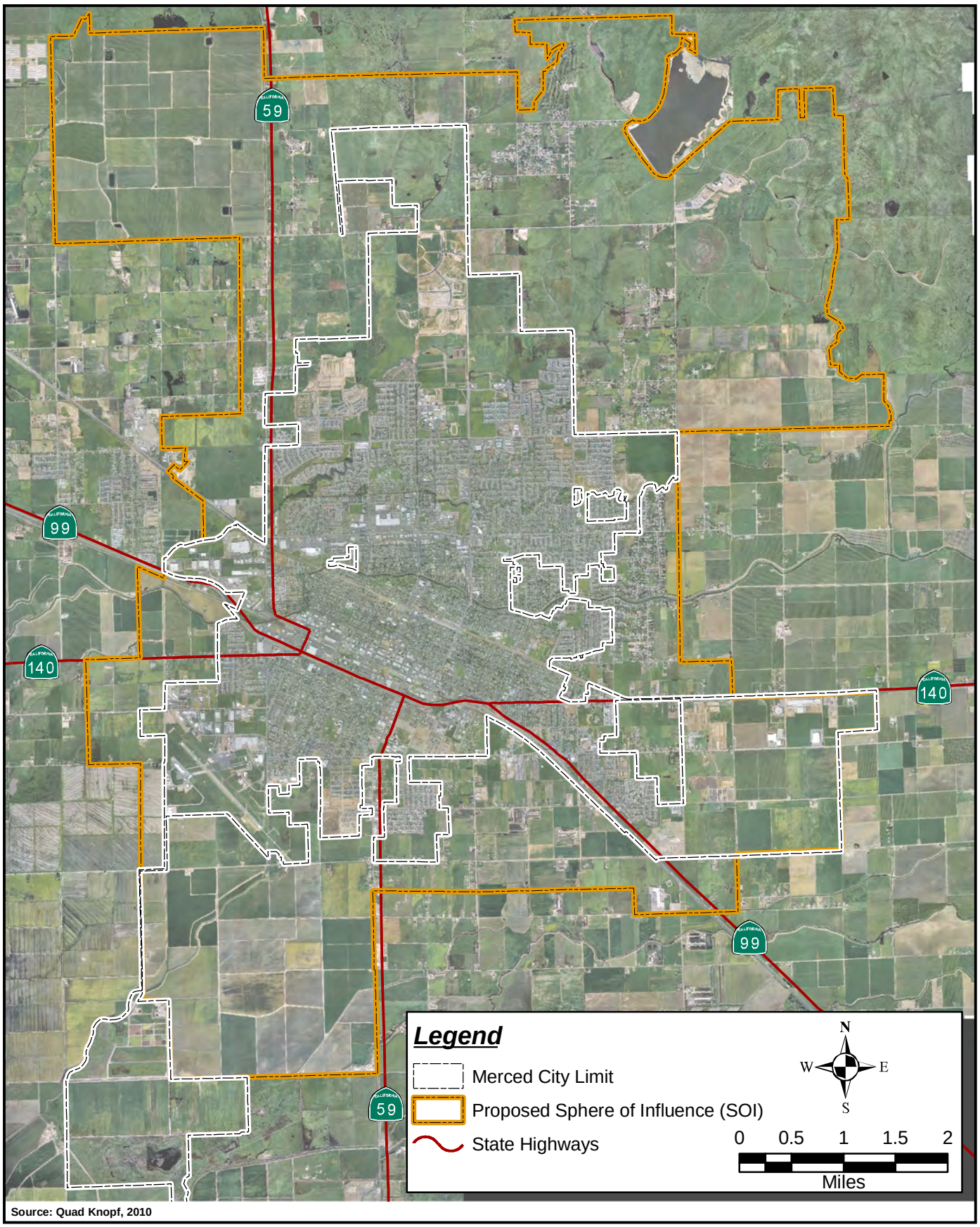
Source: Quad Knopf, 2010

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
REGIONAL LOCATION MAP

Figure 2-1

Job No.: 060429



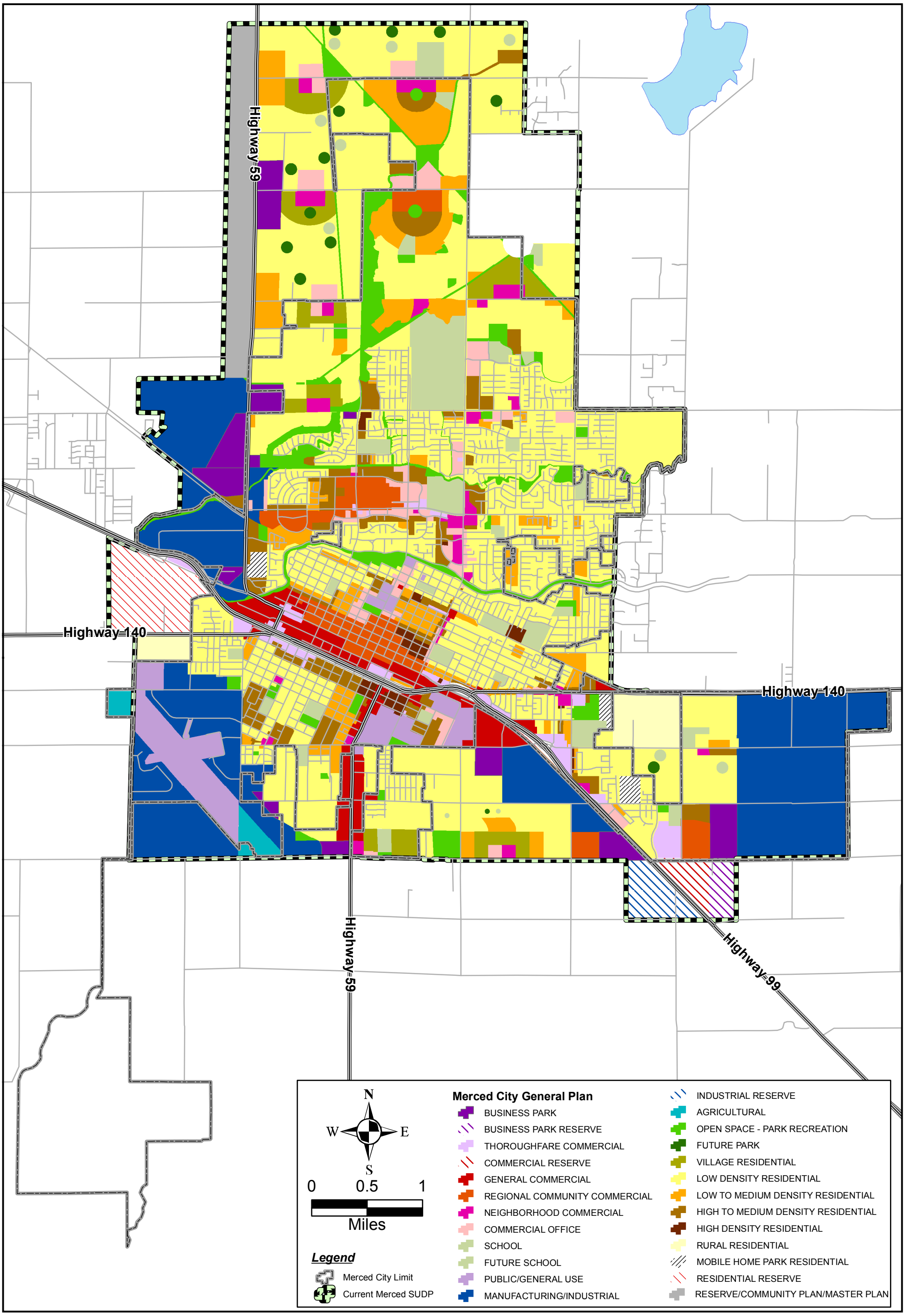
Source: Quad Knopf, 2010

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MERCED VISION 2030 GENERAL PLAN EIR
VICINITY MAP

Figure 2-2

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Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
2015 LAND USE MAP

Figure 2-3

Job No.: 060429

be incorporated into the General Plan after its adoption. Figure 2-4 shows the proposed 2030 Land Use and Circulation Map for the proposed General Plan. The expansion of the urban land use designations define the limits for extending City services and infrastructure so as to accommodate new development anticipated within the 2010-2030 time-frame of the General Plan. Policies in the proposed General Plan limit leap-frog development and provide for an orderly transition from rural to urban land uses.

The Plan includes Guiding Principles, developed during Community Workshops, described above in Section 2.1. Table 2-1 shows the acreage of General Plan land use designations for both the current and proposed General Plans (City limits and SUDP/SOI).

Table 2-1
Existing & Proposed General Plan Land Use Comparison Within the City Limits and SUDP/SOI (Acres)

Land Use	City Limits	Existing SUDP	Total	Proposed SUDP/SOI	All Land in new SUDP/SOI
RR (Rural Residential)	15.25	280.84	296.09	2004.91	2301.00
AG (Agriculture)	92.33	21.51	113.84	0	113.84
Total Ag Res	**107.58**	**302.35**	**409.93**	**2004.91**	**2414.84**
LD (Low-Density Residential)	5516.28	2981.05	8497.33	274.08	8771.41
LMD (Low-Medium Density)	824.05	305.48	1129.53	46.96	1176.49
Total Single-Family Res	**6340.33**	**3286.53**	**9626.86**	**321.04**	**9947.90**
HMD (High-Medium Density)	745.08	61.84	806.92	25.35	832.27
HD (High Density Residential)	92.44	0	92.44	23.56	116.00
RMH (Residential Mobile Home)	79.34	0.18	79.52	0	79.52
Total Multi-Family	**916.86**	**62.02**	**978.88**	**48.91**	**1027.79**
P/G (Public/Government)	533.16	5.30	538.46	39.82	578.28
CO (Commercial Office)	341.74	132.32	474.06	0	474.06
Total Office	**874.90**	**137.62**	**1012.52**	**39.82**	**1052.34**
IND (Industrial)	1882.22	994.73	2876.95	0	2876.95
IND-R (Industrial Reserve)	0	150.40	150.40	1072.34	1222.74
Total Industrial	**1882.22**	**1145.13**	**3027.35**	**1072.34**	**4099.69**
BP (Business Park)	128.59	453.35	581.94	77.43	659.37
BP-R (Business Park Reserve)	2.94	85.27	88.21	0	88.21
Total Business Park	**131.53**	**538.62**	**670.15**	**77.43**	**747.58**
CG (General Commercial)	321.55	172.04	493.59	0	493.59
CN (Neighborhood Commercial)	200.75	51.71	252.46	22.84	275.30
CT (Thoroughfare Commercial)	212.89	292.01	504.90	173.92	678.82

Land Use	City Limits	Existing SUDP	Total	Proposed SUDP/SOI	All Land in new SUDP/SOI
RC (Regional/Community)	475.46	42.37	517.83	0	517.83
Total Commercial	**1210.65**	**558.13**	**1768.78**	**196.76**	**1965.54**
OS-PK (Open Space/Park)	786.85	167.24	954.09	152.91	1107.00
Total Open Space	**786.85**	**167.24**	**954.09**	**152.91**	**1107.00**
Total School	**677.91**	**68.32**	**746.23**	**994.18**	**1740.41**
Other Lands					
COM-R (Commercial Reserve)	7.15	83.18	90.33	0	90.33
RES-R (Residential Reserve)		360.34	360.34	0	360.34
PARK-F (Park-Future)	5.83	65.18	71.01	0	71.01
SCHOOL-F (School-Future)	5.83	42.78	48.61	0	48.61
VR (Village Residential)	238.67	205.11	443.78	0	443.78
Total Other Lands	**257.48**	**756.59**	**1014.07**	**0**	**1014.07**
Total Community Plan Areas*	**0**	**389.14**	**389.14**	**7956.00**	**8345.14**
Overall Total	**13186.31**	**7411.69**	**20598.00**	**12864.30**	**33462.30**

* Shown as “Reserve” in Merced Vision 2015 General Plan.
Source: Quad Knopf, City of Merced, 2010

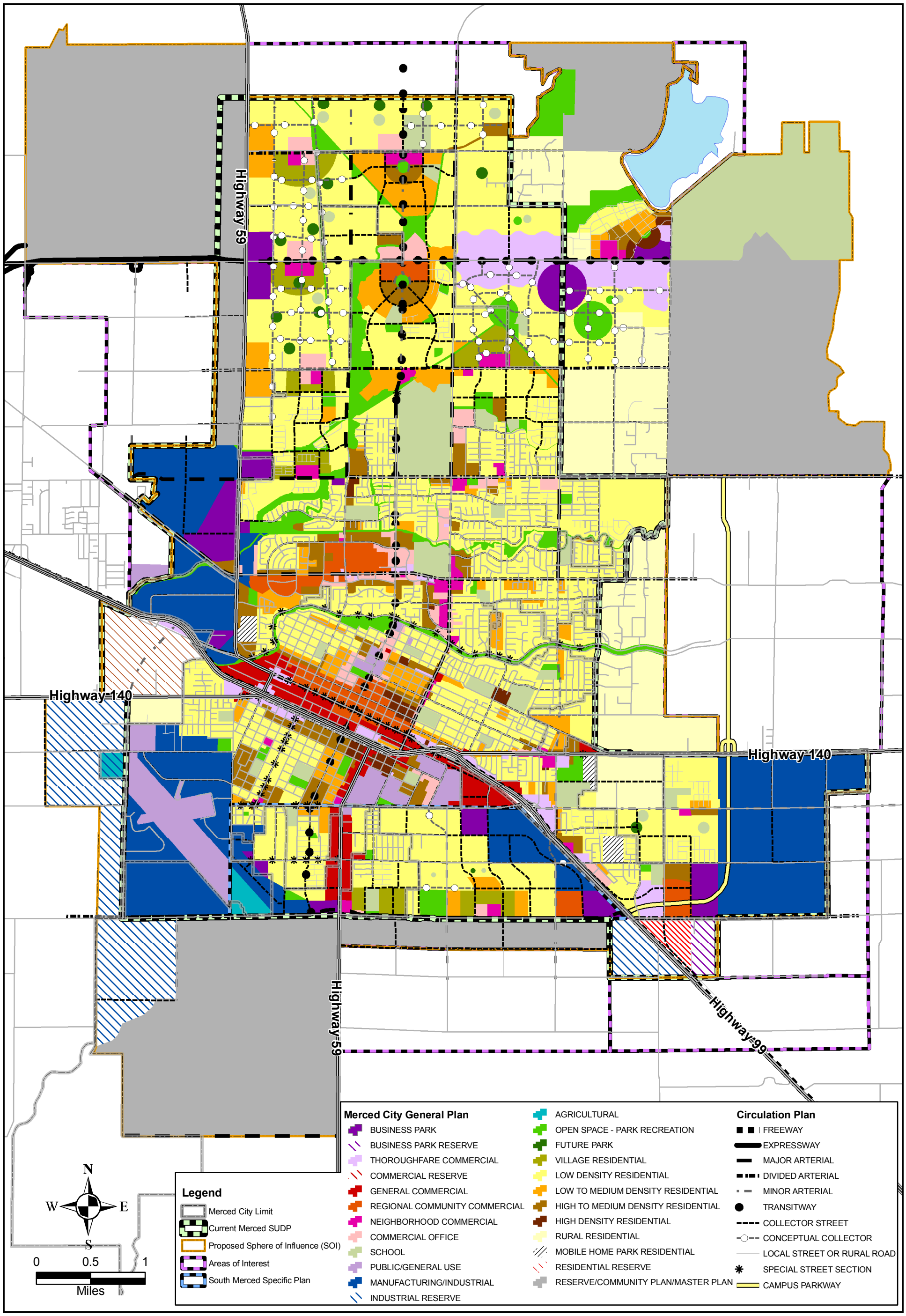
CURRENT MERCED SPECIFIC URBAN DEVELOPMENT PLANNING (SUDP) AREA

Merced's current SUDP (adopted in 1997 with the *Merced Vision 2015 General Plan*) is based on policies contained in the *Merced County Year 2000 General Plan*. The Plan utilizes an “urban centered” concept to focus population growth in defined urban areas. The goal of the plan is *"to provide for intensive urban development and to protect agricultural and open space land from uncontrolled sprawling urban development."* The current SUDP is approximately 20,000 acres.

The County applies the “urban centered” concept through the designation of Specific Urban Development Plans (SUDP), Rural Residential Centers (RRC), Highway Interchange Centers (HIC), and Agricultural Services Centers (ASC). Of these, only SUDP's and RRC's relate to Merced's planning efforts. Specific Urban Development Plans are intended to accommodate all classifications of urban land use (residential, commercial, industrial, and institutional).

> An SUDP has a boundary line which is recognized as the ultimate growth boundary of the community over the life of the Plan, and all land within the SUDP is planned for eventual development in a mixture of urban and urban-related uses. *(Merced County Year 2030 General Plan)*

Each of Merced County's six incorporated cities, as well as eighteen unincorporated communities, are presently designated as SUDP's. The City of Merced General Plan proposes to expand its SUDP to provide sufficient developable area to accommodate future growth through the Year 2030 and beyond.



Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
2030 LAND USE MAP

Figure 2-4

Job No.: 060429

PROPOSED MERCED SPECIFIC URBAN DEVELOPMENT PLAN BOUNDARY (SUDP)/SPHERE OF INFLUENCE (SOI)

The proposed Merced SUDP would result in a coterminous Sphere of Influence (SOI) and SUDP boundary. The proposed SUDP/SOI boundary would also reduce the current SOI boundary in the northeast to reflect the revised location of the U.C. Merced campus. The proposed SUDP/SOI contains approximately 33,463 acres (52.4 square miles of land area); almost the same area as the 1997 Sphere of Influence.

1) Approximately 3,995 acres will be added in Northwest Merced. The new SUDP/SOI boundary would generally move to Franklin Road on the west, north of Old Lake Road, and south to Santa Fe Drive. This area is proposed for industrial and business park uses along Highway 59 and a large mixed-use community north of Bellevue Road.

   This area will be able to accommodate a significant amount of the residential growth in the City for the next 20 years.

   The business park and industrial areas along Highway 59 are included in order to provide a better "jobs-housing" balance in North Merced, as well as alleviate circulation and air quality concerns. Most existing employment opportunities in Merced are located Downtown and south of Highway 99.

2) The second area of expansion consists of approximately 3,824 acres. It would move the SUDP/SOI south of Highway 99 to the vicinity of McNamara Road and west to a line 1/4 mile west of Thornton Road. South of the Merced Regional Airport, a large community plan has been proposed. Although impacted by airport land use restrictions, the proposal has some significant residential and recreational potential.

3) The third area to be included encompasses 6,748 acres and moves the SUDP/SOI boundary to take in the property between the current city limit/SUDP, and the U.C. Merced campus and community. These will be brought within the SOI as well.

   Inclusion of this area within the SUDP will form a more logical urban boundary, which will ultimately facilitate the provision of City services to the university.

These areas referenced above represent logical expansion areas for the City, primarily because they are adjacent to major road improvements (Merced-Atwater Expressway, Mission / Highway 99 Interchange, etc.). They also encompass areas needed for long-term commercial and industrial development. The residential areas included in this expansion were for the most part large tracts with significant planning efforts currently underway. Given the environmental and physical limitations elsewhere around the City, these are the most logical areas for the next phase of expansion. These areas will give the City enough land to accommodate expected growth over the next 20 to 40 years.

Area of Interest

Some of the original General Plan study areas were found to have constraints which limited their development potential within the current plan timeline. In the interest of flexibility, and to provide interested property owners with some options, certain study areas have been designated as being within the Area of Interest (AOI). This area is a concern to the City, as it is likely going to be the location of City expansion in the next general plan update, 20-40 years hence. Should it be found that some property within the AOI can be developed sooner, criteria have been developed which would allow land to be incorporated within the SUDP/SOI when appropriate, and ultimately annexed.

In addition, including these areas in the AOI would allow the City to comment on any development proposals which might occur in these areas and impact current and future City development patterns, public service provision, and circulation routes. These areas are not considered for urban development within the 20-year planning horizon.

MERCED COUNTY URBAN DEVELOPMENT

Within the vicinity of the City of Merced SUDP/SOI, several unincorporated urban areas have been developed under the jurisdiction of Merced County. These areas, while outside of the City's SUDP/SOI area, have a considerable impact on the City.

Franklin/Beachwood SUDP

This is an unincorporated urban area of a little under 3,000 people located on the western boundary of the City's SUDP/SOI. The area is north of Highway 99 between the City SUDP/SOI and Franklin Road and is served Santa Fe Drive.

East Merced RRC

Located generally east of the City's 1997 SUDP and west of Lake Road, this area has been developing for many years with one-acre and larger home sites. Development in this area is not served by public sewer or water which accounts for the large lot sizes. This area has served as a buffer between the City's urban growth and the agricultural areas east of Lake Road.

Weaver Area RRC

This area contains a mixture of incorporated and unincorporated urban developments. The area east of Doane-Hartley is incorporated up to Kibby Road, and includes the City's Eastern Industrial Park. This area was included in the City's SUDP since the 1980's.

Celeste RRC

Located northwest of the intersection of Kibby Rd. and Highway 140, this area is a small residential community surrounded by agricultural land to the east, north and west.

2.4.1 PURPOSE

The purpose of the *Merced Vision 2030 General Plan* is to address various issues that have arisen since the adoption of the *Merced Vision 2015 General Plan* in 1997. Most of the changes have arisen due to the new location of the UC Merced campus and its adjacent University Community. Rapid growth and increasing land costs in Merced have also led to the need to consider additional areas for expansion, thus, one major component of the General Plan Update was to expand the City's existing growth boundary known as the Specific Urban Development Plan boundary (SUDP boundary). Modifications were made to the City's SUDP/Sphere of Influence to add the University Community area and to remove areas north and east of Lake Yosemite that have been identified as significant wetlands preservation areas. The SUDP and the SOI were also combined into one boundary.

2.4.2 GENERAL PLAN ELEMENTS/CHAPTERS

The *Merced Vision 2030 General Plan* contains 14 chapters, including the major chapters outlined below. In addition to the mandated and optional elements, the General Plan contains an Executive Summary, an Introduction (Chapter 1), a Glossary of Terms (Chapter 12), a Bibliography (Chapter 13), and a Subject and Policy Index (Chapter 14). It is anticipated that the Executive Summary, the Introduction, and Chapters 12, 13 and 14 required very minor updates to reflect the revised General Plan chapters below. The extent of the updates on the other 10 chapters is outlined in detail below. Each of the seven State-Mandated Elements needed to be updated to reflect the latest edition of the State of California's General Plan Guidelines and changes to State General Plan law since 1997.

Urban Expansion Chapter

The Urban Expansion Chapter was originally adopted in April 1997 as part of the *Merced Vision 2015 General Plan*. The Urban Expansion Chapter needed substantial updating to reflect current issues and an expanded Specific Urban Development Plan (SUDP) boundary and a modified Sphere of Influence, which have been combined into one boundary. Issues that were addressed include, but are not limited to:

1) One of the primary purposes of this General Plan Update is to expand the City's SUDP/SOI to include the UC Merced Campus, University Community, and other areas. The existing Urban Expansion Chapter justified the expansion of the SUDP to its 1997 configuration. The modified Chapter addresses the proposed SUDP Expansion, justifying the expansion based on specific criteria and discussing issues associated with that expansion.

2) The City's Sphere of Influence needs to be modified to remove wetlands preservation areas north and east of Lake Yosemite from the Sphere and to include the University Community Plan area. Criteria used by the Local Agency Formation Commission (LAFCO) to evaluate Sphere modifications were addressed as well.

3) The current Urban Expansion Chapter addresses UC Merced and the University Community at its 1997 location. The Updated Chapter was modified to reflect the new location and discusses issues associated with including these areas in the City's SUDP/SOI.

4) With the new location of UC Merced and the University Community, the future of the existing Rural Residential Centers between the City's SUDP and the Campus and Community needed to be addressed in cooperation with Merced County. Much of the area is already subdivided into one-acre estate lots on individual wells and septic systems, but there is also a significant amount of vacant land with potential for development. The residents in this area have traditionally not been interested in annexation to the City and City infrastructure master plans have not been designed to serve these areas. However, with the new location of the University Community, interest in annexation and higher density/intensity development has been expressed by some property owners in the area. Issues that were addressed include the types of land uses that should be allowed, how the area would be serviced with City infrastructure and services, interface issues between new developing areas and existing estate lots, and others.

5) In 2004, the County of Merced approved the Yosemite Lakes SUDP within the City's Sphere of Influence. This approval was authorized by the City (as required in the City/County Tax Sharing Agreement) only if the developer and County entered into an agreement to consider this area in the City's SUDP expansion and for future City annexation. The Yosemite Lakes Project area encompasses approximately 655 acres located north of Old Lake Road and north and east of the Merced Golf & Country Club. No land use plan for the area has yet to be established, but the developer is required by the County to move forward with a Community Specific Plan. The City has proposed for this area to be included in the City's proposed SUDP/SOI. Appropriate land use, circulation, and biological constraints were among the issues that needed to be addressed for this area by the applicant and the County in consultation with the City.

6) The *Merced Vision 2015 General Plan* identified the City's desire to establish a greenbelt between the City of Merced and the City of Atwater, approximately five miles to the west. Recent development proposals in Atwater, the expansion of the Franklin-Beachwood SUDP, the proposed alternative alignments of the Merced-Atwater Expressway, and other recent developments have served to help determine that such a greenbelt should not be included in the General Plan.

Land Use Chapter

The Land Use Chapter was originally adopted in April 1997 as part of the *Merced Vision 2015 General Plan*. The Land Use Chapter and Diagram depict a series of "Urban Villages" throughout the City's new growth areas. These Urban Villages are mixed use, transit and pedestrian friendly communities with commercial nodes, surrounding higher density residential uses within walking distance, and outlying lower density areas. The Land Use Chapter required updating to reflect current issues and expansion of the "Urban Village" land use concept to areas within the proposed SUDP/SOI. Issues that were addressed but not limited to, include:

1) In order to determine if the land supply within the City's proposed SUDP/SOI will be adequate to accommodate at least 20 years of growth, the General Plan needed to provide the following analysis: a) Inventory existing residential, commercial, and industrial land uses in the planning area; b) assess population and employment projections; c) analyze the existing land supply; and d) determine and assign land use designations to areas within the proposed SUDP/SOI.

2) "Urban Village" land use concept was applied to the proposed SUDP/SOI areas where other plans did not exist. This land use concept from the City's General Plan has also been used in the University Community Plan adopted by the County and should be incorporated with all new growth areas.

3) The *Merced Vision 2015 General Plan* identified two South Merced Specific Plan areas which needed further study. Until such time as Specific Plans were adopted, a "Residential Reserve" land use designation was applied to all areas that were not annexed to the City in 1997. As an interim measure prior to adoption of the Specific Plans, in 2004, the City adopted the South Merced Strategic Plan, which outlines a draft land use and circulation concept for South and Southeast Merced and a series of strategies to address development issues in the area. The City launched the Community Plan process in mid-2005 as a separate process from the General Plan Update. The South Merced Community Plan was adopted in 2008. Various concepts from the South Merced Strategic Plan and Community Plans were incorporated into the General Plan.

4) The *Merced Vision 2015 General Plan* refers to a number of adopted and future Specific Plans, which will now be known as Community Plans. Various modifications to the four adopted specific plans (Fahrens Park, Campus North, Northeast Yosemite, and Bellevue Ranch) have taken place since that time that needed to be reflected in the General Plan text and diagrams. A fifth Specific Plan, Fahrens Creek, has since been adopted and needed to be reflected in the text of the General Plan.

Transportation & Circulation Chapter

The Transportation and Circulation Chapter was originally adopted in April 1997 as part of the *Merced Vision 2015 General Plan*. The General Plan contains a circulation system concept for the undeveloped areas of North Merced. The system is based on one-mile square grids, formed by two sets of intersecting major roadways (arterials or higher order streets), featuring shorter east-west distributor arterials and longer north-south cross-town arterials. The cross-town (north-south) arterials have signalized access to them only at one-half mile intervals, by alternating collectors and distributor (east-west) arterials. The distributor arterials are intended to have signalized access to them by cross-town arterials (one mile apart) and intervening collectors one-quarter mile apart. This circulation system needed to be expanded into the new SUDP and Sphere of Influence areas.

The Transportation and Circulation Chapter also required updating to reflect current issues and an expanded circulation system to serve the proposed SUDP/SOI. Issues that have been addressed include, but are not limited to:

1) An amended Circulation Map has been provided which addresses the expansion of City roadway designations into the proposed SUDP/SOI and other issues outlined below.

2) The City's 2015 General Plan outlines a concept for an "Eastern Beltway" to serve the UC Merced Campus and growth within the City's northern growth areas as part of a planned "loop system" of roadways along the City's perimeter, but no alignment is designated on the Circulation Map. This project, now known as the Campus Parkway, would generally run from the new Mission Avenue/Highway 99 Interchange north through the City's Southeast Merced area, over Highway 140, and continue north to Yosemite Avenue and eventually into the University Community and UC Merced Campus. The alignment of this roadway has been determined. The County of Merced was the lead agency on the project and prepared an EIR for the Project. The City's General Plan has been amended to reflect the most current information regarding this roadway.

3) The City's 2015 General Plan identifies the need for a "Highway 59 (Western) Beltway" as part of the loop system around the City's perimeter. The alignment for this roadway was generally to correspond to North Highway 59 north of Yosemite Avenue and then curving south and west toward a future interchange with Highway 99 in the vicinity of Thornton Road extended. As part of the Regional Transportation Planning process, it has been determined that the City's Western Beltway may need to be combined with a prospective beltway ("Atwater-Merced Expressway") to the east of the City of Atwater. To that end, the Merced County Association of Governments has launched a planning process for a "Merced-Atwater Expressway" with three possible corridors between the Cities of Merced and Atwater. The City's General Plan has been amended to reflect the most current information regarding this project.

4) The City's General Plan has been amended to reflect the most current regional transportation information as outlined in the 2004 Merced County Regional Transportation Plan (RTP), prepared by the Merced County Association of Governments (MCAG). This includes planned improvements to State Highways and regionally significant roadways.

5) The City of Merced maintains an extensive series of on and off-street bikeways. A Bikeway Circulation Plan exists for the current SUDP. This plan has been expanded to serve areas within the proposed SUDP/SOI and provides bikeway connections to the UC Campus and University Community.

Public Facilities and Services Chapter

The Public Facilities and Services Chapter was originally adopted in April 1997 as part of the *Merced Vision 2015 General Plan*. The Public Facilities and Services Chapter required updating to reflect current issues, the expanded SOI/SUDP, and the 2003/2004 updates to the City's Public Facilities Financing Plan. Issues that were addressed, but not limited to, include:

1) With an expanded SOI/SUDP, additional sites for public facilities (parks, fire stations, etc.) needed to be identified in the expansion areas in order to serve these areas and meet current City standards.

2) The City adopted its Public Facilities Impact Fees schedule and associated Public Facilities Financing Plan in 1998. The Financing Plan and the Impact Fees program were then substantially amended in 2003 (with minor revisions in 2004), May 2006, and August 2009 (with another amendment proposed for consideration in August 2010). The General Plan needed to be updated to reflect the current list of public facility projects anticipated in the Financing Plan.

3) An analysis of the ability of the City's Wastewater Treatment Plant (WWTP) and associated lines to serve the expanded areas needs were included. From an environmental perspective, growth inducement analysis was needed for placement of the line outside the SUDP/SOI on the eastern and western edges of the City.

Urban Design Chapter

The Urban Design Chapter was originally adopted in April 1997 along with the rest of the *Merced Vision 2015 General Plan*. The Urban Design chapter outlines policies and guidelines for implementing the City's "Urban Village" concept. No major updates to the Urban Design Chapter were anticipated in this General Plan Update process. However, minor reformatting and minor text changes were made.

Open Space, Conservation, and Recreation Chapter

The Open Space, Conservation, and Recreation Chapter was originally adopted in April 1997 as part of the *Merced Vision 2015 General Plan*. This Chapter combines two State-mandated Elements-Open Space and Conservation. The Open Space Chapter needed substantial updating to reflect current issues and the recently adopted Parks and Open Space Master Plan (October 2004). Issues that were addressed are:

1) Much of the current General Plan language regarding park facilities is based on the 1984 City of Merced Parks and Open Space Master Plan. In 2003-04, the City of Merced was involved in a substantial update of that 1984 Plan, including significant public and stakeholder input. The result was the City of Merced Park and Open Space Master Plan, prepared by Moore Iacofano Goltsman, Inc. of Portland, Oregon, adopted in October 2004. The General Plan needs to be updated to reflect the contents of the 2004 Parks and Open Space Master Plan.

2) When the *Merced Vision 2015 General Plan* was adopted in 1997, information about the extent of wetlands and habitat for endangered species in the Merced SUDP and Sphere of Influence was limited. Since that time, extensive information has been obtained through the UC Merced Long Range Development Plan, Merced County University Community Plan, and the Merced County Habitat Conservation Plan (now suspended) processes regarding wetlands and habitat resources. The City's General Plan needed to be updated to reflect that new information for areas within its proposed SUDP/SOI and additional policies need to be developed to address these resources. Some overlap is possible with the Sustainable Development Chapter (see below). If the consultants findings conclude that future development in the expanded SOI/SUDP would likely result in a "take" of protected species, then the General Plan needs to include a plan or at a minimum create new General Plan

policies and action items that explain how the City will protect species and permit development.

3) The General Plan identified "issues for future study" in Section 7.6 of the General Plan (beginning on page 7-34). These issues included Lake Yosemite Regional Park, Greenbelts and Urban Limit Lines, Future Park Sites and Parks and Open Space Resources (addressed in the 2004 Park and Open Space Master Plan), Highway 59 Landfill Site, and Groundwater Recharge. These issues will need to be evaluated and discussed.

4) The General Plan contains strong policies regarding the preservation of agricultural land to the east of the City's SUDP/SOI. Some of these lands are now planned for the UC Merced campus and the adjacent University Community. These policies have been revisited and modified as necessary. Impacts caused by changes to these Policies will also need to be addressed in this EIR.

Sustainable Development Chapter

The Sustainable Development Chapter was originally adopted in April 1997 as part of the *Merced Vision 2015 General Plan*. The Sustainable Development Chapter addresses the environmental, natural, and cultural resources of the City, including soil resources, water resources, wildlife resources, air resources, energy resources, and historic resources. The Sustainable Development Chapter needed updates to reflect current issues, such as climate change, healthy communities, and wetlands preservation. Issues that were addressed, but not limited to, include:

1) The air quality section needed to be updated to reflect the most current information regarding the San Joaquin Valley Air Basin and the most recent air quality attainment plans of the San Joaquin Valley Air Pollution Control District (SJVAPCD).

2) The wildlife and water resources sections needed to be updated to reflect the most up-to-date information about wetlands and endangered species habitat within the City's SUDP/SOI.

3) In 2003 and 2004, Scenic California undertook a project in the City of Merced to identify scenic resources in Merced. Information from that photo database and scenic resources map and report were incorporated into the General Plan.

Housing Chapter

The Housing Element was adopted in December 2003, with slight modifications adopted in July 2004. The adopted Housing Element was certified by the State to be in compliance with State Housing Element law. No updates to the Housing Element were done in this General Plan Update process. The Housing Element is currently being updated by the City and in accordance with State housing law and will be incorporated into the General Plan document after its adoption.

Noise Chapter

The Noise Element was originally adopted in March 1993. Minor formatting changes were made in 1997 to match the rest of the *Merced Vision 2015 General Plan* document. The Noise Chapter needed to be updated to reflect current information and updated noise contours. Issues that were addressed, but not limited to, include:

1) Updated noise contours based on the latest available traffic modeling and circulation system, updated railway traffic projections, and current and future Merced Regional Airport and Castle Airport flight patterns.

2) An evaluation of the acceptable noise level standards to determine if they are realistic in the current and future environment. Incorporate new noise reduction techniques and provide flexibility in the noise standards for certain areas.

3) In April 1999, Merced County adopted the Merced County Airport Land Use Compatibility Plan. This Plan identified land use impacts associated with airports throughout Merced County. Of interest to the City of Merced are the parts of the Plan dealing with the Merced Regional Airport and the Castle Airport. The Plan recommends several amendments to the City's General Plan to address impacts associated with those airports. Revisions to the Land Use, Noise, and Safety Chapters were required to address these issues.

Safety Chapter

The Safety Element was originally adopted in January 1995. Minor formatting changes were made in 1997 to match the rest of the *Merced Vision 2015 General Plan* document. The Safety Chapter needed to be updated to reflect current information and to maintain internal consistency. Issues that were addressed, but not limited to, include:

1) Updated information on hazards, including flooding (including the current status of the long-planned Army Corps of Engineers flood channel project in Merced) and dam failure.

2.4.3 ASSUMPTIONS AND CONSIDERATIONS

The *Merced Vision 2030 General Plan* and Program EIR analysis rely on several assumptions regarding existing and future conditions in the Merced SUDP/SOI area. Specifically, these assumptions are:

1. Continued development of the 10th University of California (UC) campus will take place southeast of Lake Yosemite on the northeastern edge of the Merced SUDP/SOI.

2. Future population growth in the Merced SUDP/SOI area will approach 155,000 by the year 2030.

3. Regional urban development (residential, commercial and industrial) will be focused within the Merced City’s SUDP/SOI and not in the unincorporated areas surrounding the City in order to accommodate efficient levels of service delivery.

4. The average household size in the SUDP will remain at approximately 3.02 people per dwelling unit.

5. The City's SUDP/SOI will need to accommodate 50,000 housing units.

6. The City's SUDP/SOI will accommodate approximately 35,000 employment opportunities.

7. Projected growth estimates will occur within the planning time-frames.

It should be noted that there are several events that could occur and result in these assumptions being invalidated. In order to make the plan's vision of the future as reasonably accurate as possible, some policies and analysis contemplate these "special events" occurring. Unless otherwise stated, however, the above assumptions are the primary basis of analysis.

2.4.4 PROJECT CHARACTERISTICS

As a General Plan under California law, the "project" is a policy document used by the City to guide future growth and development. State Law requires that the City's development regulations be "consistent" with the General Plan. Additionally, zoning and subdivision proposals are required to be consistent with the General Plan.

General plan goals and policies tend to be broad and far reaching. As a result, environmental analysis is conducted in a "broad" manner that reflects the nature of the General Plan. (See CEQA Guidelines Section 15146 for a more detailed discussion of this topic.)

Goals

Each Chapter of the *Merced Vision 2030 General Plan* contains goals, policies and a list of potential implementing actions. A goal is the broad vision of what the community wants to achieve or provide to residents, landowners, business-owners, and visitors. It is a statement of a desired condition. The goal is general in nature and usually timeless.

Policies and Actions are short to intermediate range. Policies state the City's clear commitment on how Goals will be achieved. Actions are specific and describe the means by which the City may carry out a policy.

Table 2-2 contains a list of the goals and policies contained in the *Merced Vision 2030 General Plan* organized by the Chapter within which they appear.

Table 2-2
Merced Vision 2030 General Plan Goals and Policies

Chapter 2 -- Urban Expansion
Goal Area UE-1: Urban Expansion

GOALS

- **A Compact Urban Form**
- **Preservation of Agriculturally Significant Areas**
- **Efficient Urban Expansion**

POLICIES

UE-1.1 Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

UE-1.3 Control the annexation, timing, density, and location of new land uses within the City's urban expansion boundaries.

UE-1.4 Continue joint planning efforts on the UC Merced and University Community plans.

UE-1.5 Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) during the planning period.

UE-1.6 Consider expansion of the City's SUDP/SOI boundary for areas within the Area of Interest when certain conditions are met.

Chapter 3 -- Land Use
Goal Area L-1: Residential & Neighborhood Development

GOALS

- **Housing Opportunities in Balance with Jobs Created in the Merced Urban Area**
- **A Wide Range of Residential Densities and Housing Types in the City**
- **Preservation and Enhancement of Existing Neighborhoods**
- **Quality Residential Environments**
- **Mixed-use, Transit and Pedestrian-Friendly Residential Environments**
- **Ensure Adequate Housing is Available to All Segments of the Population**

POLICIES

L-1.1 Promote balanced development which provides jobs, services and housing.

L-1.2 Encourage a diversity of building types, ownership, prices, designs, and site plans for residential areas throughout the City.

L-1.3 Encourage a diversity of lot sizes in residential subdivisions.

L-1.4 Conserve residential areas that are threatened by blighting influences.

L-1.5 Protect existing neighborhoods from incompatible developments.

L-1.6 Continue to pursue quality single-family and higher density residential development.

L-1.7 Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.

L-1.8 Create livable and identifiable residential neighborhoods.

L-1.9 Ensure connectivity between existing and planned urban areas.

Goal Area L-2: Economic & Business Development

GOALS

- **Increased Employment Opportunities for the Citizens of Merced**
- **A Diverse and Balanced Merced Economy**
- **Preservation and Expansion of the City's Economic Base [Quintero]**
- **High Quality Industrial Areas, Including Technology Parks**
- **More High-Quality Research &Development Parks**
- **Ready Access to Commercial Centers and Services Throughout the City**
- **A Distinguished Downtown**

POLICIES

L-2.1 Encourage further development of appropriate commercial and industrial uses throughout the City.

L-2.2 Locate new or expanded industrial, research & development, technology, and business parks in appropriate areas.

L-2.3 Promote the retention and expansion of existing industrial and commercial businesses.

L-2.4 Provide a range of services adjacent to and within industrial areas to reduce auto trips.

L-2.5 Maintain attractive industrial areas and business parks.

L-2.6 Provide neighborhood commercial centers in proportion to residential development in the City.

L-2.7 Locate and design new commercial development to provide good access from adjacent neighborhoods and reduce congestion on major streets.

L-2.8 Encourage a mixture of uses and activities and reinvestment that will maintain the vitality of the downtown area.

L-2.9 Identify locations and develop standards for campus-type research and development parks.

L-2.10 Encourage well-planned freeway-oriented developments

Goal Area L-3: Urban Growth and Design

GOALS

- **Living Environments which Encourage People to Use a Variety of Transportation Alternatives**

- **A Compact Urban Village Design for New Growth Areas**
- **Self-sustaining, Mixed-Use, Pedestrian-Friendly Neighborhoods**
- **Transit-Oriented Development Adjacent to the High Speed Rail Station**

POLICIES

L-3.1 Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.

L-3.2 Encourage infill development and a compact urban form.

L-3.3 Promote site designs that encourage walking, cycling, and transit use.

L-3.4 Build identity, character, and enhanced community design in the South Merced Community Plan area.

L-3.5 Develop a Transit-Oriented Development Overlay Zone Adjacent to the Planned High Speed Rail Station in Downtown Merced

L-3.6 Require community plans for large new development areas within the City's SUDP/SOI prior to development.

L-3.7 Implement policies and principles to conform to the intent of the San Joaquin Valley Regional Blueprint.

Chapter 4.0 -- Transportation and Circulation
Goal Area T-1: Streets and Roads

GOALS

- **An Integrated Road System that is Safe and Efficient for Motorized and Non-motorized Uses**
- **A Circulation System that is Accessible, Convenient and Flexible**
- **A Circulation System that Minimizes Adverse Impacts upon the Community**
- **A Comprehensive System of "Complete Streets" Which Address All Modes of Transportation**

POLICIES

T-1.1 Design streets consistent with circulation function, affected land uses, and all modes of transportation.

T-1.2 Coordinate circulation and transportation planning with pertinent regional, State and Federal agencies.

T-1.3 Design major roads to maximize efficiency and accessibility.

T-1.4 Promote traffic safety for all modes of transportation.

T-1.5 Minimize unnecessary travel demand on major streets and promote energy conservation.

T-1.6 Minimize adverse impacts on the environment from existing and proposed road systems.

T-1.7 Minimize street system impacts on residential neighborhoods and other sensitive land uses.

T-1.8 Use a minimum peak hour Level of Service (LOS) "D" as a design objective for all new streets in new growth areas and for most existing City streets except under special circumstances.

Goal Area T-2: Bicycles, Pedestrians, and Public Transit

GOALS

- **An Efficient and Comprehensive Public Transit System**
- **A Comprehensive System of Safe and Convenient Bicycle Routes (Within the Community and Throughout the Urban Area)**
- **A Comprehensive System of Safe and Convenient Pedestrianways**
- **A Comprehensive System of "Complete Streets" Addressing All Modes of Transportation**

POLICIES

T-2.1 Provide for and maintain a major transitway along "M" Street and possibly along the Bellevue Road/Merced-Atwater Expressway and Campus Parkway corridors.

T-2.2 Support and enhance the use of public transit.

T-2.3 Support a safe and effective public transit system.

T-2.4 Encourage the use of bicycles.

T-2.5 Provide convenient bicycle support facilities to encourage bicycle use.

T-2.6 Maintain and expand the community's existing bicycle circulation system.

T-2.7 Maintain a pedestrian-friendly environment.

T-2.8 Improve planning for pedestrians.

T-2.9 Ensure that new development provides the facilities and programs that improve the effectiveness of Transportation Control Measures and Congestion Management Programs.

Goal Area T-3: Air and Rail Services

GOALS

- **Air and Rail Systems that Provide Safe and Convenient Service to the Community**

POLICIES

AIR

T-3.1 Preserve the Merced Regional Airport and its protective zones from incompatible encroachment and incompatible development within the Airport Industrial Park.

T-3.2 Promote and encourage the orderly and timely development of commercial and general aviation facilities.

T-3.3 Provide adequate ground transportation systems that complement air transportation facilities.

RAIL

T-3.4 Reduce rail system impacts on circulation within the urban area.

T-3.5 Support enhanced railroad passenger service and high speed rail service for Merced.

T-3.6 Retain and expand as needed rail facilities serving industrial development.

Chapter 5 -- Public Services & Facilities
Goal Area P-1: Public Facilities and Services

GOALS

- **Maintenance and Improvement of Merced's Existing Infrastructure**
- **New Development Which Includes a Full Complement of Infrastructure and Municipal Public Facilities**
- **Efficient and Cost-Effective Public Service Delivery**

POLICIES

P-1.1 Provide adequate public infrastructure and municipal services to meet the needs of future development.

P-1.2 Utilize existing infrastructure and public service capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of municipal infrastructure and services where necessary.

P-1.3 Require new development to provide or pay for its fair share of public facility and infrastructure improvements.

Goal Area P-2: Police and Fire Protection Services

GOAL

- **Maximum Crime and Fire Protection Services**

POLICY

P-2.1 Maintain and enhance public protection facilities, equipment, and personnel to the maximum extent feasible within the resource constraints of the City to serve the City's needs.

Goal Area P-3: Water

GOAL

- **An Adequate Water Source, Distribution and Treatment Infrastructure System in Merced**

POLICIES

P-3.1 Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.

P-3.2. In cooperation with the County and the Merced Irrigation District, work to stabilize the region's aquifer.

Goal Area P-4: Wastewater

GOAL

- **An Adequate Wastewater Collection, Treatment and Disposal System in Merced**

POLICIES

P-4.1 Provide adequate wastewater collection, treatment and disposal capacity for existing and projected future needs.

P-4.2 Consider the use of reclaimed water to reduce non-potable water demands whenever practical.

Goal Area P-5: Storm Drainage and Flood Control

GOAL

- **An Adequate Storm Drainage Collection and Disposal System in Merced.**

POLICIES

P-5.1 Provide effective storm drainage facilities for future development.

P-5.2 Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.

Goal Area P-6: Solid Waste

GOAL

- **Solid Waste Management Services That Accommodate the Local Population Without Causing Significant Damage to Environmental Resources**

POLICIES

P-6.1 Establish programs to recover recyclable materials and energy from solid wastes generated within the City.

P-6.2 Minimize the potential impacts of waste collection, transportation and disposal facilities upon the residents of Merced.

Goal Area P-7: Schools

GOAL

- **Adequate School Facilities for All Students in the Merced Urban Area**
- **Excellent Cooperative Relationships between the City, the School Districts, and the Development Community**

POLICIES

P-7.1 Cooperate with Merced area school districts to provide elementary, intermediate and high school sites that are centrally located to the populations they serve and adequate to serve community growth.

P-7.2 Support higher educational opportunities.

Goal Area P-8: Cultural and Community Services

GOAL

- **Support for Cultural and Community Services that Improve and Maintain the Quality of Life for the Residents of Merced**

POLICIES

P-8.1 The City will support the cultural and health related needs of the community by incorporating such facilities and services in development and redevelopment proposals.

P-8.2 The City will promote consolidation of complementary or support services to avoid duplication of programs.

P-8.3 Work with others to study innovative ways of delivering library services at the neighborhood level to promote community education and provide a focus for community activity and cultural development.

Goal Area P-9: Telecommunications

GOAL

- **Development of Infrastructure and Service to Allow All Merced Residents to Utilize New Technologies to Communicate with the Region, the Nation, and the World**

POLICIES

P-9.1 Develop City standards for telecommunications infrastructure and encourage its installation in all new development.

P-9.2 Make information regarding City government and decision-making, local services, and opportunities to participate in City governance available to Merced citizens in electronic form.

P-9.3 Make use of telecommunications services to increase public safety.

Chapter 6 -- Urban Design
Goal Area UD-1: Transit Ready Development or Urban Villages

GOALS

- **An Integrated Urban Form**
- **Transit-Ready Community Design**
- **Pedestrian- and Bicycle-Compatible Neighborhoods**

POLICIES

UD-1.1 Apply Transit-Ready Development or Urban Village design principles to new development in the City's new growth areas.

UD-1.2 Distribute and design Urban Villages to promote convenient vehicular, pedestrian, and transit access.

UD-1.3 Promote and facilitate Core Commercial design principles in Village commercial areas.

UD-1.4 Promote and facilitate Urban Village residential area design principles**.**

UD-1.5 Design and develop public and quasi-public buildings and uses utilizing Transit-Ready Development or Urban Village principles.

Goal Area UD-2: Overall Community Appearance

GOALS

- **A Unique Community Image**
- **Attractive Neighborhoods and Districts**
- **Attractive and Memorable Public Streets**

POLICIES

UD-2.1 Use Urban Village design concepts in neighborhood revitalization programs.

UD-2.2 Maintain and enhance the unique community appearance of Merced.

Chapter 7-- Open Space, Conservation, and Recreation
Goal Area OS-1: Open Space for the Preservation of Natural Resources

GOALS

- **Maintenance of Merced's Biological Resources**
- **A High-Quality, Expanding Urban Forest**
- **Preservation of Scenic Corridors and Resources**
- **Improvement and Enhancement of Water Quality**

POLICIES

OS-1.1 Identify and mitigate impacts to wildlife habitats which support rare, endangered, or threatened species.

OS-1.2 Preserve and enhance creeks in their natural state throughout the planning area.

OS-1.3 Promote the protection and enhancement of designated scenic routes.

OS-1.4 Improve and expand the City's urban forest.

OS-1.5 Preserve and enhance water quality.

(Notes: The preservation and protection of important soil resources is addressed under Conservation [erosion], Open Space for the Managed Production of Resources [agricultural preservation policies], and the Urban Expansion Chapter of this General Plan, where the issue of growth impacts on prime soils is addressed.)

Goal Area OS-2: Open Space for the Managed Production of Resources

GOAL

- **Protection of Regional Agricultural Resources**

POLICIES

OS-2.1 Protect agricultural areas outside the City's SUDP/SOI from urban impacts.

OS-2.2 Relieve pressures on converting areas containing large concentrations of "prime" agricultural soils to urban uses by providing adequate urban development land within the Merced City SUDP/SOI.

Goal Area OS-3: Open Space for Outdoor Recreation

GOALS

- **High-Quality Recreational Open Space**
- **Adequate Public Recreation Facilities**
- **Comprehensive Urban Trail and Bike Path System**

POLICIES

OS-3.1 Provide high-quality park and open space facilities to serve the needs of a growing population.

OS-3.2 Maintain and expand the City's Bikeway and Trail System.

OS-3.3 Maintain the City's existing high-quality open space facilities.

OS-3.4 Develop a diverse and integrated system of park facilities throughout Merced.

Goal Area OS-4: Open Space for Public Health and Safety

GOAL

- **A Safe Environment For Merced's Citizens**

POLICY

OS-4.1 Preserve open space areas which are necessary to maintaining public health and safety.

Goal Area OS-5: Conservation of Resources

GOALS

- **Conservation of Water Resources**
- **Preservation and Protection of Soil Resources**

POLICIES

OS-5.1 Promote water conservation throughout the planning area.

OS-5.2 Protect soil resources from the erosive forces of wind and water.

Chapter 8 -- Sustainable Development
Goal Area SD-1: Air Quality and Climate Change

GOALS

- **Clean Air with Minimal Toxic Substances and Odor**
- **Clean Air with Minimal Particulate Content**

- **Effective and Efficient Transportation Infrastructure**
- **Coordinated and Cooperative Inter-Governmental Air Quality Programs**
- **Reduction in the Generation of Greenhouse Gases (GHG) from New Development**

POLICIES:

SD-1.1 Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.

SD-1.2 Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.

SD-1.3 Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment**.**

SD-1.4 Educate the public on the impact of individual transportation, lifestyle, and land use decisions on air quality.

SD-1.5 Provide public facilities and operations which can serve as a model for the private sector in implementation of air quality programs.

SD-1.6 Reduce emissions of PM10, PM2.5 and other particulates with local control potential**.**

SD-1.7 Develop and implement a Climate Action Plan for the City.

SD-1.8 Implement Policies in Other General Plan Chapters to Address Air Quality and Greenhouse Gas Emissions Reduction Goals

Goal Area SD-2: Cultural Resources

GOALS:

- **A Diverse And Rich Historic and Cultural Resource Environment**
- **A Long-Term Community Historic Preservation/Improvement Program**

POLICIES:

SD-2.1 Identify and preserve the City's archaeological resources.

SD-2.2 Identify and preserve the City's historic and cultural resources.

SD-2.3 Develop and promote financial incentive programs for historic preservation efforts.

Goal Area SD-3: Energy Resources

GOAL

- **Sustainable Energy Resource Use in the City of Merced**

POLICIES

SD-3.1 Promote the use of Solar Energy technology and other Alternative Energy Resources**.**

SD-3.2 Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

Goal Area SD-4: Healthy Communities

GOALS

- **Healthy Lives for Community Residents**
- **A Healthy Environment for All Residents**

POLICIES

SD-4.1 Create a healthy built environment.

SD-4.2 Encourage increased physical activity of residents and healthier food choices.

Chapter 9 -- Housing

Note: The Housing Element is due to be updated per the schedule in State Law and is NOT included in the comprehensive General Plan Update.

Chapter 10 -- Noise
Goal Area N-1: Noise

GOALS

- **To Protect City residents from the Harmful and Annoying Effects of Exposure to Excessive Noise.**
- **To Protect the Economic Base of the City by Preventing Incompatible Land Uses from Encroaching upon Existing or Planned Noise-Producing Uses.**
- **To Encourage the Application of State of the Art Land Use Planning Methodologies in Areas of Potential Noise Conflicts.**

POLICIES

N-1.1 Minimize the impacts of aircraft noise.

N-1.2 Reduce surface vehicle noise.

N-1.3 Reduce equipment noise levels.

N-1.4 Reduce noise levels at the receiver where noise reduction at the source is not possible.

N-1.5 Coordinate planning efforts so that noise-sensitive land uses are not located near major noise sources.

N-1.6 Mitigate all significant noise impacts as a condition of project approval for sensitive land uses.

Chapter 11 -- Safety
Goal Area S-1: Disaster Preparedness

GOAL

- **General Disaster Preparedness**

POLICY

S-1.1 Develop and maintain emergency preparedness procedures for the City.

Goal Area S-2: Seismic Safety

GOAL

- **Reasonable Safety for City Residents from the Hazards of Earthquake and Other Geologic Activity**

POLICIES

S-2.1 Reduce the potential danger from earthquake and seismic-related activity from existing buildings where necessary.

S-2.2 Encourage the improvement of all public facilities and infrastructure such as natural gas, fuel, sewer, water, electricity, and railroad lines and equipment with up-to-date seismic safety features.

S-2.3 Restrict urban development in all areas with potential ground failure characteristics.

Goal Area S-3: Flooding

GOAL

- **A City Free From Other Than Street Flooding**

POLICIES

S-3.1 Implement Protective Measures for Areas in the City and the SUDP/SOI, Within the 100-Year and the 200-Year Floodplains.

S-3.2 Maintain essential City services in the event of flooding or dam failure.

Goal Area S-4: Fire Protection

GOAL

- **Fire and Hazardous Material Safety for the Residents of the City and For Those Working in Fire Suppression**

POLICIES

S-4.1 Promote the concept of fire protection master planning with fire safety goals, missions, and supporting objectives for the community.

S-4.2 Maintain a reasonable level of accessibility and infrastructure support for fire suppression, disaster, and other emergency services.

Goal Area S-5: Airport Safety

GOAL

- **A Safe Airport Environment Both Above and On the Ground**

POLICIES

S-5.1 Continue to protect approach areas and control zones for both existing and future runway systems through land use regulations and property acquisition where necessary.

S-5.2 Prevent the encroachment of potential hazards to flight within the Airport's airspace.

Goal Area S-6: Crime

GOAL

- **Reduced Criminal Activity and An Increased Feeling of Safety and Security in the Community**

POLICIES

S-6.1 Provide superior community-based police services within the resource constraints of the City.

S-6.2 Provide services and personnel necessary to maintain community order and public safety.

Goal Area S-7: Hazardous Materials

GOAL

- **Hazardous Materials Safety for City Residents**

POLICIES

S-7.1 Prevent injuries and environmental contamination due to the uncontrolled release of hazardous materials.

S-7.2 Ensure that hazardous materials are cleaned up before a property is developed or redeveloped.

Land Use Concept

The fundamental land use concept of the *Merced Vision 2030 General Plan* is the "Village." The "Village" concept applies principally to the City's designated growth areas. Within developed areas of the City, "Village" development policies attempt to promote in-fill development with mixed use and other types of development/redevelopment that promotes transit use.

Within the City's *Merced Vision 2030 General Plan*, a "Village" is a compact, mixed-use district. The "Village" concept is expected to efficiently accommodate projected growth, maintain Merced's present quality of life and ensure the continued economic vitality of the City.

The "Villages" land use concept encourages pedestrian and transit travel. The concept minimizes single-use, low density developments that generate traffic congestion, air pollution, a scarcity of affordable housing, monotonous landscapes and poor utilization of environmental and land resources.

The "Villages" land use concept takes the typical elements of urban growth (retail centers, single family and multifamily housing, roads, and public services) and reorganizes them to form a more efficient and pedestrian-oriented development pattern.

In the "Villages" land use concept, medium density housing, core commercial uses, and public facilities are concentrated within easy walking distance of transit service. Additionally, office uses are located immediately across from the larger core commercial areas. Consequently, the

"Villages" are more human-scaled and community-oriented than typical commercial strips and residential subdivisions.

As a result, residents can walk to shop, to work, or to ride transit. Workers in or near the village core can walk for local errands, to have lunch or to use parks and recreation facilities. By locating transit stops near core commercial areas, shopping can occur to and from work. By providing a compact mixture of land uses, many of a person's daily trips can be accommodated on foot. Nevertheless, the street system is designed to accommodate those who wish to drive or need to drive for major purchases such as weekly grocery shopping.

Centrally-located public uses, such as post offices, libraries, civic centers, day care, and neighborhood parks, are also an important component of the "Village" land use concept. They provide convenient community services and meeting places, as well as support local stores.

Less compact Outer Village Areas surround the Villages and contain lower density housing, schools, and open space. Outer Village Areas are tied to the "Village Core" by a local network of connector streets so that arterials and thoroughfares are not relied upon for local travel. This reduces demand on these roads and provides safe paths for pedestrians and bicyclists. Overall, the "Villages" concept provides a formula for more sustainable development patterns in the City of Merced.

Land Use Diagram

The City's Land Use Diagram for the General Plan is shown in Figure 2-4. It presents the general distribution of the uses of land within the City of Merced and its SUDP/SOI (or growth boundary).

The Land Use Diagram combined with General Plan Policy text set forth the number of people and dwelling units per net acre of land for each property planned for residences and the building intensity for all other proposed development. This building intensity is expressed in terms of a floor area ratio, which is the gross floor area permitted on a site divided by the total net land area of the lot. Other pertinent features of the Land Use Diagram include the locations of existing and proposed parks, public schools, and other public facilities such as fire stations.

General plans also must contain a circulation element. This element shows the location and extent of existing and proposed thoroughfares, transportation routes, terminals, and other local public utilities and facilities, and correlates them with the land use element. Maps are needed to show location. Merced's Circulation Plan shows current and proposed arterials, collector streets, and local streets as well as bikeways and rail lines (on separate maps). This roadway system has been tested against the planned level proposed in this plan and has been found to be adequate.

Together, the Land Use Diagram and Circulation Plan graphically show the managed growth of the City for the next 20 years. The General Plan also contains other maps and diagrams that show various features of Merced and help illustrate various goals and policies of the General Plan.

2.5 Proposed Action

The purpose of the General Plan Update is to address various issues that have arisen since the adoption of the *Merced Vision 2015 General Plan* in 1997. Most of the changes have arisen due to the new location of the University of California Merced campus and its adjacent University Community. Rapidly fluctuating growth and increasing costs in Merced have also led to the need to consider additional areas for expansion, thus, one major component of the General Plan Update was to expand the City's existing growth boundary known as the Specific Urban Development Plan boundary (SUDP boundary). Modifications were made to the City's Sphere of Influence to add the University Community area and to remove areas that have been identified as significant wetlands preservation areas. The SUDP and SOI boundaries were combined into one single boundary. In addition, the land-use designation for certain areas within the City limits has been amended to allow a broader mix of uses than currently allowed. With the implementation of the proposed General Plan, buildout would result in a variety of potential uses including: increased residential development, commercial development, and open space.

2.6 Uses of the EIR and Required Agency Actions and Permits

With the exception of the Merced County LAFCO, which reviews changes to Spheres of Influence, annexations to cities and special districts in Merced County; no other agencies must approve the City's actions as described above, as no permits will be issued from resource, regulatory, or planning agencies as part of project approval. In the interest of disclosure, this Program EIR has been sent to the following agencies for review and comment:

- County of Merced
- California Department of Fish & Game
- U.S. Fish & Wildlife Service
- National Office of Historic Preservation
- California Regional Water Quality Control Board
- San Joaquin Valley Air Pollution Control District
- Merced County Airport Land Use Commission
- Merced Police Department
- University of California, Merced
- Merced Union High School District
- Merced City School District
- Merced Community College District
- McSwain Union Elementary School District
- Weaver Union Elementary School District

CHAPTER THREE

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

3.1

AESTHETICS

CHAPTER THREE
ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

3.1 Aesthetics

This section of the Draft EIR addresses the aesthetic and visual impacts of the project on the surrounding area. Aesthetic impacts are considered to be those issues and impacts which can be objectively analyzed and quantified. These include light pollution, glare production, reflectivity, change in visual character, and impacts to a scenic vista. The analysis does not include subjective measures of aesthetics, such as the attractiveness of structural design, the color of the buildings, or other matters of opinion or preference. The analysis focuses only on those impacts which are objectively significant to the environment. During the Notice of Preparation (NOP) period, no comments were received regarding aesthetic impacts.

3.1.1 SETTING

Environmental Setting

Located in the Central San Joaquin Valley, the City of Merced is the seat of Merced County government as well as a major retail commercial/service center for the surrounding region. The City is located at the intersection of several state highways and is one of the primary access points to Yosemite National Park. Known as the "Gateway to Yosemite," Merced is approximately 80 miles west of the Valley floor of the Park, along Highway 140.

The City of Merced is located near the geographic center of the County of Merced. To the east of the City is the western slope of the Sierra Nevada mountain range. The City of Merced's 2010 City limits are generally bounded on the west by State Highway 59 and the El Capitan Canal, on the east by McKee Road, on the north by Bellevue Road and Nevada Street, and on the south by the Merced Regional Airport and Childs Avenue.

The northern portion of the City is characterized by gently rolling terrain, while the southerly portion is relatively flat. The area surrounding the City is largely used for agricultural production. The northern, western, and eastern portions of the City contain a number of creeks and canals including Bear Creek, Black Rascal Creek, Fahrens Creek, and Cottonwood Creek. Lake Yosemite is located approximately three miles north and east of the City. The City of Atwater and Castle Airport is located approximately four miles north of the City. Several photos were taken around the City to give perspective of the primarily undeveloped open space lands surrounding the City of Merced that are proposed for inclusion within the SUDP/SOI to be ultimately developed with a variety of urban uses. Figure 3.1-1 provides the location of individual photo views and is followed by Figures 3.1-2 through 3.1-7 which show several views of lands that will ultimately be converted to a variety of urbanized uses in accordance with the proposed General Plan.

SCENIC VIEWS AND RESOURCES

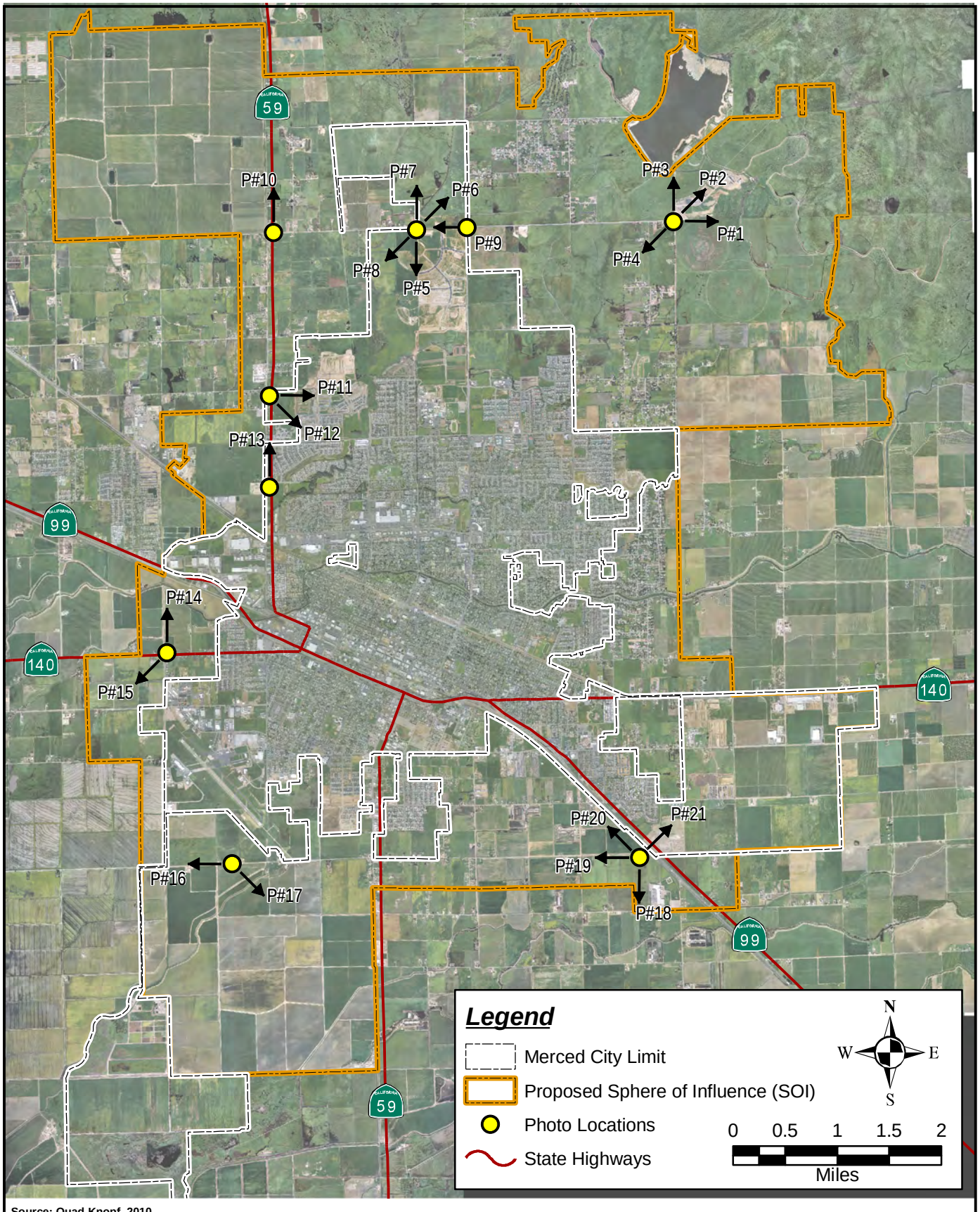
Visual resources are classified into two categories: scenic views and scenic resources. Scenic views are elements of the broader view shed such as mountain ranges, valleys, and ridgelines. They are usually middle ground or background elements of a view shed that can be seen from a range of viewpoints, often along a roadway or other corridor. Scenic resources are specific features of a viewing area (or view shed) such as trees, rock outcroppings, and historic buildings. They are features that act as the focal point of a view shed and are usually foreground elements.

An impact will occur if the proposed project changes the view to the middle ground or background elements of the broad view shed or removes visually significant trees, rocks, or historic buildings in the foreground. Since aesthetic considerations are often subjective and difficult to judge, two generally objective criteria are used in this EIR to establish the level of significance of the change. The first addresses the visibility of the landscape being altered and whether it will appear in the foreground, middle ground, or background of most viewers. Changes in the foreground are most significant, with distance and topography or vegetative screening acting to reduce impact. The second criterion concerns visual contrast, which is a measure of the degree of perceptible change. This is often characterized as being a strong, moderate, or weak change. Using this approach, a strong change would be immediately apparent and would dominate the landscape, whereas a weak change would be barely noticeable.

The view shed in the project area is primarily that of an urban environment surrounded by low-density rural residential development and agricultural uses. The project vicinity does not contain notable features that would typically fall under the heading of visual resources, such as unique geological features. The project site lies along the valley floor with little vertical differentiation that might provide scenic quality (hillside areas, rock outcrops, etc.). The features of the project's visual setting that might shape an appreciation of its visual character are limited to typical urban elements and are subject to personal interpretation. General Plan policies and implementing actions that address visual resources associated with development proposals are a reflection of the City of Merced's sensitivity to the alteration of view sheds in and around the City.

Aesthetic effects are somewhat subjective and are influenced by such factors as the location of the viewer, the duration of exposure, and the status of the viewer in relation to the project. The "status of the viewer" is a reference to the fact that a resident of a property that has a direct view of the project site from an adjacent property is likely to feel differently about the new development than a nonresident who catches a brief glimpse of the project site.

Light and glare effects also are somewhat subjective and are more likely to disturb permanent residents than transient highway travelers. Light and glare effects must be evaluated from two viewpoints: 1) the viewpoint from the project site toward surrounding uses and 2) the viewpoint from surrounding uses toward the project site. The degree of impact is proportional to the perceived negative effect on surrounding land uses. If there is a continuous light or glare that is visible from nearby residences and if it creates a nuisance to residents, the impact is potentially significant. Light sources in the area are currently generated by vehicles on local roadways, and that of the urban environment of the City of Merced. Overall, light levels are at a medium intensity due to the urban agricultural interface of the plan area.



Source: Quad Knopf, 2010

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
PHOTOGRAPH LOCATIONS

Figure 3.1-1

Job No.: 060429



Bellevue Road and
North Lake Road
Looking East (P #1)



Bellevue Road and
North Lake Road
Looking Northeast
To UC Merced (P #2)



Bellevue Road and
North Lake Road
Looking North (P #3)



Bellevue Road and
North Lake Road
Looking Southwest
(P #4)

Source: Quad Knopf, 2008

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
PHOTOPLATE 1

Figure 3.1-2

Job No.: 060429



Bellevue Road and
M Street Looking
Southeast (P #5)



Bellevue Road and
M Street Looking
Northeast (P #6)



Bellevue Road and
M Street Looking North
(P #7)



Bellevue Road and
M Street Looking
Southwest (P #8)

Source: Quad Knopf, 2008

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
PHOTOPLATE 2

Figure 3.1-3

Job No.: 060429



Bellevue Road and
G Street Looking West
(P #9)



Bellevue Road and
Highway 59 Looking
North (P #10)



Highway 59 and
Belcher Ave Looking
East (P #11)



Highway 59 and
Belcher Ave Looking
Southeast (P #12)

Source: Quad Knopf, 2008

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
PHOTOPLATE 3

Figure 3.1-4

Job No.: 060429



Highway 59 and
Buena Vista Ave
Looking North
(P #13)



Highway 140 and
Thornton Ave Looking
North (P #14)



Highway 140 and
Thornton Ave Looking
Southwest (P #15)

Source: Quad Knopf, 2008

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
PHOTOPLATE 4

Figure 3.1-5

Job No.: 060429



Dickenson Ferry Road
South of Merced Regional Airport
Looking West (P #16)



Dickenson Ferry Road
South of Merced Regional Airport
Looking Southeast (P #17)

Source: Quad Knopf, 2008

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
PHOTOPLATE 5

Figure 3.1-6

Job No.: 060429



Highway 99 and
Mission Ave
Looking South (P #18)



Highway 99 and
Mission Ave
Looking West (P #19)



Highway 99 and
Mission Ave
Looking Northwest
(P #20)



Highway 99 and
Mission Ave
Looking Northeast
(P #21)

Source: Quad Knopf, 2008

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
PHOTOPLATE 6

Figure 3.1-7

Job No.: 060429

Regulatory Setting

FEDERAL

National Scenic Byways Program

There are no National Scenic Byways within the Plan Area.

STATE

California Scenic Highway Program

As with the Federal program, there are no State designated Scenic Highways within the Plan Area.

LOCAL

General Plan Policy Consistency

The Merced Vision 2030 General Plan contains a number of policies that apply to Aesthetic impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Land Use, Urban Design and the Open Space, Conservation, and Recreation Elements are designed to ensure that aesthetic impacts are minimized as development occurs in accordance with the Merced Vision 2030 General Plan.

Urban Expansion Policies:

UE-1.1 Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

UE-1.3 Control the annexation, timing, density, and location of new land uses within the City's urban expansion boundaries.

UE-1.4 Continue joint planning efforts on the UC Merced and University Community plans.

UE-1.5 Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) during the planning period.

Urban Design Policies:

UD-2.1 Use Urban Village design concepts in neighborhood revitalization programs.

UD-2.2 Maintain and enhance the unique community appearance of Merced.

Open Space, Conservation, and Recreation Policies:

OS-1.1 Identify and mitigate impacts to wildlife habitats which support rare, endangered, or threatened species.

OS-1.2 Preserve and enhance creeks in their natural state throughout the planning area.

OS-1.3 Promote the protection and enhancement of designated scenic routes.

OS-1.4 Improve and expand the City's urban forest.

OS-2.1 Protect agricultural areas outside the City's SUDP/SOI from urban impacts.

OS-2.2 Relieve pressures on converting areas containing large concentrations of "prime" agricultural soils to urban uses by providing adequate urban development land within the Merced City SUDP/SOI.

Land Use Policies:

L-2.5 Maintain attractive industrial areas and business parks.

3.1.2 THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

3.1.3 IMPACTS AND MITIGATION MEASURES

Impact #3.1-1: Substantial adverse effect on a scenic vista

Discussion/Conclusion: Scenic vistas may be defined as expansive views of highly valued landscapes from publicly accessible viewpoints. Scenic vistas include views of natural features such as topography, water courses, rock outcrops, and natural vegetation as well as manmade scenic structures. Given the unrelieved topography of Merced, the majority of vistas will be local. Most areas of the City have views of the Sierra Nevada and the Coast Range, when air

quality permits. It is not expected that new development on the perimeter will be tall enough to impact the views of existing residents.

The proposed General Plan will emphasize compact development in the planning area in an effort to protect the existing visual resources. The visual character of the proposed SUDP/SOI area will eventually change from open agricultural fields and pasture land, to urban development. The General Plan contains a number of policies to reduce the impact of new development on the existing visual character and scenic vistas within the planning area.

Policy OS-1.3 of the Open Space Element aims to preserve the scenic corridors and resources by promoting the protection and enhancement of scenic routes through the following implementation measures:

1.3.a Identify, and where appropriate, designate additional scenic routes within the City's proposed SUDP and Sphere of Influence.

1.3.b Preserve the designated Scenic Corridors. The Scenic Corridors are as follows:

a) North and South Bear Creek Drive within the City limits.
b) N Street from 16th Street to the Merced County Courthouse.
c) 21st Street from the Merced County Courthouse to Glen Avenue.
d) M Street from Black Rascal Creek to Bellevue Road.
e) West 28th Street from Mercy Hospital to G Street.
f) Lake Road from Yosemite Avenue to Lake Yosemite.
g) R Street (extended) from Black Rascal Creek to Bellevue Road.
h) Olive Avenue East of McKee Road.
i) M Street from 18th Street to Bear Creek.
j) Campus Parkway.
k) Bellevue Road from Lake Road to "G" Street.

Most of these corridors are within current city limits, and are developed. Route "d" has approved urban development along both sides, though not all of it has been built. Routes "f", "g" and "h" go through areas that are proposed to be within either the SUDP/SOI or AOI, and will be subject to the requirements of the 2030 Plan (see Figure 3.1-8).

1.3.c Utilize established guidelines for the review of projects proposed within a designated Scenic Corridor.

1.3.d Explore the feasibility of creating some scenic corridors in South Merced through the use of special standards.

The General Plan also contains policies intended to protect regional agricultural resources and the scenic view sheds they provide. Policy OS 2.1 of the Open Space Element calls for the protection of "agricultural areas outside of the City's SUDP/SOI from urban impacts." Policy OS-2.2 intends to "relieve pressures on converting areas containing large concentrations of

"prime" agricultural soils to urban uses by providing adequate urban development land within the Merced City SUDP/SOI."

Policies within the Urban Design Element, the Urban Expansion Element and the Land Use Element contain standards which will reduce any impacts to scenic vistas. Low Floor Area Ratios (FAR) ensure that commercial structures will not be high enough to restrict views. Maximum residential building heights similarly prohibit excessively tall structures. The only residents who experience a change to their views will be those directly adjacent to new development.

These, and several more policies in the General Plan, reduce the impact development will have on the scenic vistas within and surrounding the planning area. This impact is ***less than significant.***

Mitigation Measures

No mitigation measures are required.

Impact #3.1-2: Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway

Discussion/Conclusion: The planning area does not contain a state designated scenic byway or highway. There will be ***no impact*** to scenic resources including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway view shed.

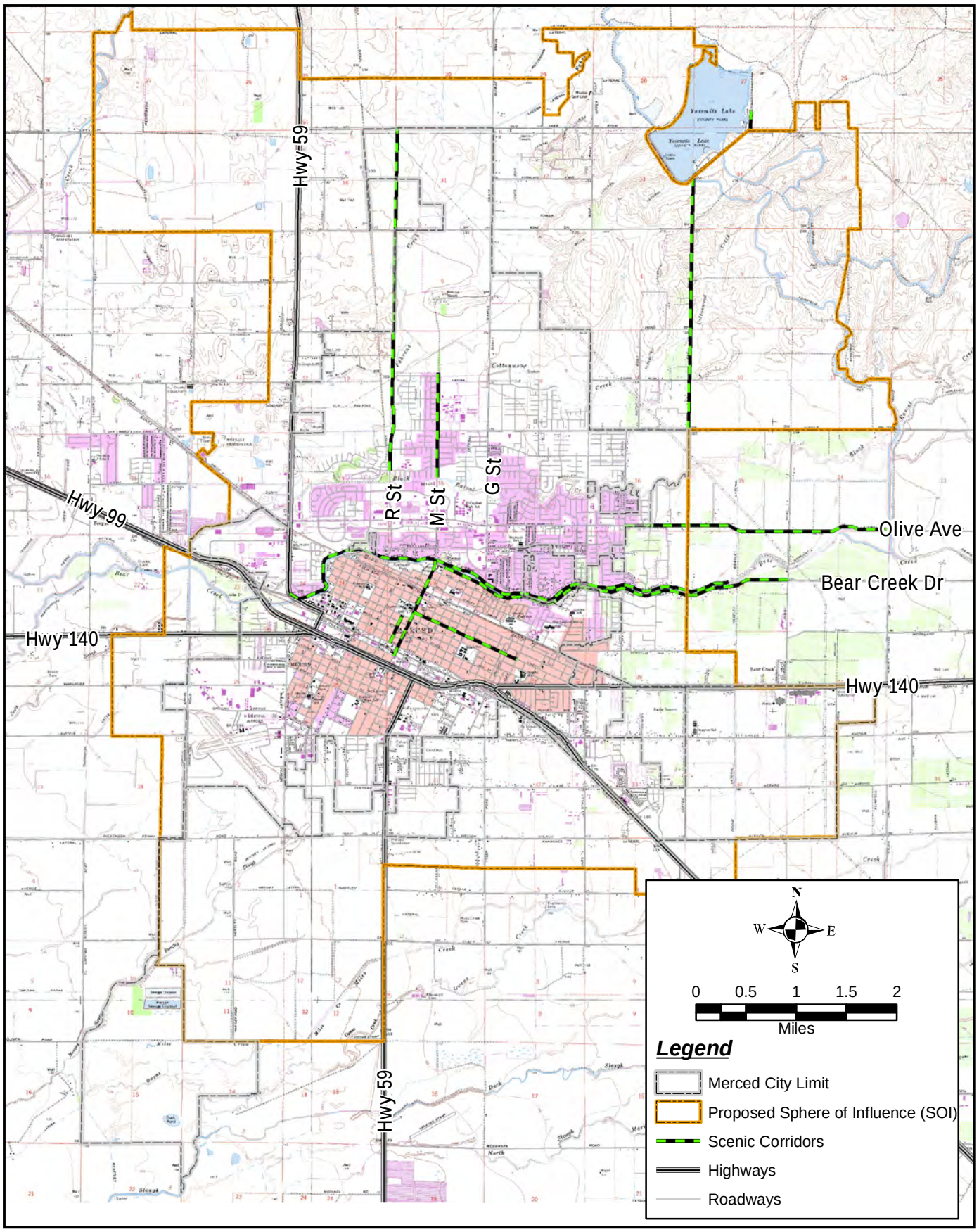
Mitigation Measures

No mitigation measures are required.

Impact #3.1-3: Substantially degrade the existing visual character or quality of the site and its surroundings

Discussion/Conclusion: Existing developed areas located on the urban edge of the City, as well as travelers on roads and highways traversing the periphery of the City have views of rural/agricultural areas that will ultimately convert to urban settings with implementation of the proposed General Plan Land Use Element. The City is located in an area of intense agricultural operations, gradually transitioning to pasture land on the north and east. Orchards, vineyards, row crops and dairies constitute the bulk of the active agricultural operations along the west, south and southeast boundaries of the City.

Also located on the periphery are areas of higher intensity residential development, such as Franklin-Beechwood area, between Santa Fe Avenue and Highway 99. These areas have been developed within the County, but are now adjacent to, or within the City SUDP/SOI. Lower-density rural residential development (1-5 acre parcels) has occurred in several areas proposed to be within the SUDP/SOI. These include the area between N. Lake Road and N. Gardner Avenue,



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MERCED VISION 2030 GENERAL PLAN EIR
SCENIC CORRIDORS

Figure 3.1-8

Job No.: 060429

neighborhoods just south of the Merced Golf & Country Club, and the area east of McKee Road. These areas are not proposed for changes in land use, but may eventually be surrounded by higher intensity urban-type land uses. Along the north and northeast periphery lies pasture land. This area contains sensitive habitat that has been left outside the SUDP/SOI. Implementation of the General Plan will have no effect on these areas. Implementation of the proposed General Plan Land Use Element will ultimately alter the existing visual character by transforming views from the existing rural setting to urban residential, commercial and industrial vistas. Policies within the Land Use, Urban Expansion and Urban Design elements will assure that development will enhance the visual character of the site and its surroundings.

The policies listed above in the Local Regulatory Setting discussion will, together, minimize visual impacts that will result from General Plan implementation particularly within already developed, areas and areas planned for development within the City. The policies and implementing actions contained within the General Plan will result in urban development that is compact, low profile and architecturally interesting. While the visual character of the proposed SUDP/SOI will change over time, it will not be degraded. The impact will be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.1-4: Create a new source of substantial light or glare that would adversely affect day or night views in the area

Discussion/Conclusion: Each development project within the City's SUDP/Sphere of Influence could potentially result in an incremental contribution to a cumulative light and glare impact. General Plan Policy OS-1.4 will reduce the potential impact of light and glare by improving and expanding the City's urban forest through many implementation measures that promote tree planting and explore alternate funding sources for providing long-term maintenance. Trees not only create an attractive atmosphere for residents and visitors but also reduce glare. The City does not have any standards for outdoor lighting that would reduce this impact. This is a ***potentially significant*** impact.

Mitigation Measure #3.1-4:

The following guidelines will be followed in selecting and designing any outdoor lighting:

1. *All outdoor lights including parking lot lights, landscaping, security, path and deck lights should be fully shielded, full cutoff luminaries.*

2. *Complete avoidance of all outdoor up-lighting for any purpose.*

3. *Avoidance of tree mounted lights unless they are fully shielded and pointing down towards the ground or shining into dense foliage. Ensure compliance over time.*

4. *Complete avoidance of up-lighting and unshielded lighting in water features such as fountains or ponds.*

Effectiveness of Mitigation Measure:

Mitigation Measure #3.1-4 will ensure that all future lighting is directed downward and away from adjacent properties, and will not contribute additional glare. This will reduce the impact to ***less than significant***.

CUMULATIVE IMPACT ANALYSIS

Impact #3.1-5: The proposed project could have a cumulatively adverse affect on aesthetic resources including the generation of light and glare

Discussion/Conclusion: Cumulative impacts from implementation of the General Plan and within the proposed SUDP/Sphere of Influence will result from the introduction of new urban development to traditionally rural agricultural areas surrounding the City of Merced. There would be a cumulative visual impact in terms of loss of agricultural land as viewed from the City and public roadways discussed in this section of the EIR.

Nighttime illumination and daytime glare would also be increased in the project vicinity as a result of cumulative General Plan build-out over time. Although individual project developments would be responsible for incorporating mitigation to minimize their visual impacts, the net result would still be a general conversion of a large area with a rural character to an urban and developed character. Some may see the loss of the area's rural character as a negative change in visual quality. This impact is considered ***potentially significant and cumulatively considerable.***

Mitigation Measures

No mitigation measures are available that would fully mitigation this impact; therefore, this impact remains ***significant, cumulatively considerable, and unavoidable***.

3.2

AGRICULTURAL AND FOREST RESOURCES

3.2 Agriculture and Forest Resources

This section of the Draft EIR addresses potential impacts to agricultural resources in the plan area and its surroundings. The analysis specifically focuses on the potential productivity of the soils onsite to support agriculture and the potential impacts that the project may have on the continued use of surrounding properties for agricultural production. Comments received during the Notice of Preparation (NOP) period addressing agricultural issues included a request from a citizen representative for mitigation in the EIR requiring at least one acre preserved for each acre converted to urban development.

3.2.1 SETTING

Environmental Setting

Merced County is among the largest agriculture producing counties in California (ranked fifth), with a gross income of more than $2.4 billion in 2006. The County's leading agricultural commodities include milk, chickens, almonds, cattle and calves, tomatoes and sweet potatoes. As of 2002, Merced County encompassed 2,964 farms with a cumulative land area of 1,006,127 acres.

IMPORTANT FARMLANDS

The Farmland Mapping and Monitoring Program is a farmland classification system that is administered by the California Department of Conservation. The system classifies agricultural land according to its soil quality and irrigation status. The best quality agricultural land is called "Prime Farmland." Prime Farmland is land that has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed according to current farming methods. The land must have been used for the production of irrigated crops at least sometime during the two cycles prior to the mapping date.

Important Farmland is land characterized by one or more of the following characteristics: (1) presence of prime agricultural soils; (2) presence of soils of statewide agricultural importance; and (3) active agricultural lands. The 2006 FMMP Merced County Land Use Conversion Table (Appendix B) indicates that 589,615 acres of the County are Important Farmland, 272,096 acres of which are considered Prime Farmland. Between 2004 and 2006, the County experienced a net gain of 289 acres of Important Farmland. However, the County experienced a net loss of approximately 709 acres of Prime Farmland to Urban and Built-up land. Overall the County lost a total of 3,512 acres of agricultural lands. Of the 3,512 acres of agricultural lands lost, 1,823 acres where converted to Urban and Built-up lands and another 1,800 acres was categorized as being lost to other land use.

Figure 3.2-1 shows the Prime Farmlands, unique, and Farmland of Statewide Importance located in and around the plan area. These three categories are considered Important Farmland according to the CEQA checklist.

WILLIAMSON ACT

Since 2005, Merced County participates in the State of California Williamson Act agricultural land preservation program. The purpose of the Act is to preserve agricultural and open space lands by discouraging premature and unnecessary conversion to urban uses. As of 2007, there were more than 450,000 acres in the County under Williamson Act contracts.

Figure 3.2-2 shows the Williamson Act lands located in and around the plan area.

Regulatory Setting

FEDERAL

Farmland Protection Policy Act

The Farmland Protection Policy Act was passed into federal law as part of the Agriculture and Food Act of 1981 (Public Law 97-98). The Act was passed in response to the National Agricultural Land Study of 1980-1981 which found that millions of acres of farmland were being converted in the United States each year and a related report which found that much of this conversion was the result of programs funded by the federal Government. The intent of the Act is to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that – to the extent possible – federal programs are administered to be compatible with state and local units of government and private programs and policies to protect farmland.

STATE

Williamson Act

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to assessed value pursuant to Proposition 13.

LOCAL

Merced County Local Agency Formation Commission (LAFCo)

Urban growth and expansion, under California State Law, is subject to a local review body called the Merced County Local Agency Formation Commission (LAFCo). LAFCo, comprised of City and County elected officials, must review and approve all municipal boundary revisions (including annexations).

Merced County LAFCo adopted a set of Local LAFCo Goals, Objectives, and Policies to address local concerns and priorities regarding annexations and the preservation of agricultural-land.

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Legend

- Merced City Limit
- Proposed Sphere of Influence (SOI)

FMMP

- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Irrigated Farmland
- Nonirrigated Farmland
- Farmland of Local Importance
- Farmland of Local Potential
- Grazing Land
- Other Land
- Urban and Built-Up Land
- Water Area
- Out of Survey Area

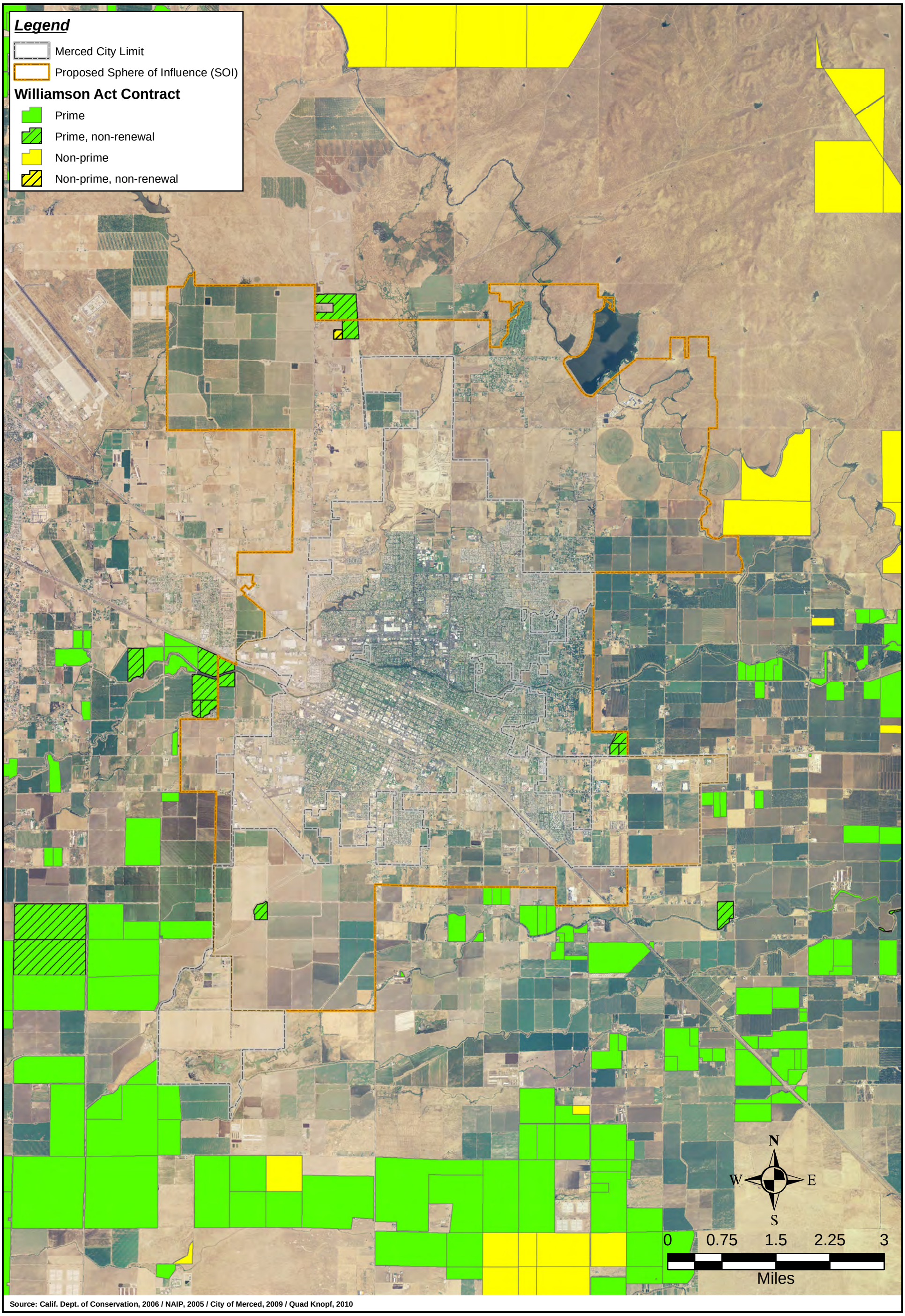
Source: USGS, 2006 / City of Merced, 2010 / Quad Knopf, 2010

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
IMPORTANT FARMLAND MAP

Figure 3.2-1

Job No.: 060429



Source: Calif. Dept. of Conservation, 2006 / NAIP, 2005 / City of Merced, 2009 / Quad Knopf, 2010

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
WILLIAMSON ACT LANDS

Figure 3.2-2

Job No.: 060429

The specific objectives and policies can be found in the *Policy and Procedures Chapter II: Merced County LAFCo Policies.* This document can be found in Appendix C.

Merced County Ordinance 1213

Merced County Ordinance 1213 is the county's right-to-farm ordinance. It requires that parcel maps of all parcels within 1,000-feet of an agricultural zone and dwelling units of more than 500 square feet have a notice advising of the potential inconveniences created by agricultural operations but that these inconveniences are acceptable customs and standards of agricultural operations in the vicinity of the property. Additionally, the ordinance requires that building permit applicants acknowledge the ordinance before a permit can be issued.

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to agricultural impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Urban Design, and the Open Space, Conservation, and Recreation Elements are designed to ensure that agricultural impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Urban Expansion Policies:

UE-1.1 Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

UE-1.3 Control the annexation, timing, density, and location of new land uses within the City's urban expansion boundaries.

UE-1.5 Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) during the planning period.

Urban Design Policies:

UD-1.1 Apply Transit-Ready Development or Urban Village design principles to new development in the City's new growth areas.

UD-1.4 Promote and facilitate Urban Village residential area design principles**.**

Land Use Policies:

L-3.2 Encourage infill development and a compact urban form.

Open Space, Conservation, and Recreation Policies:

OS-1.1 Identify and mitigate impacts to wildlife habitats which support rare, endangered, or threatened species.

OS-2.1 Protect agricultural areas outside the City's SUDP/SOI from urban impacts.

OS-5.2 Protect soil resources from the erosive forces of wind and water.

3.2.2 THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined by Public Resources Code section 1220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));
- Result in the loss of forest land or conversion of forest land to non-forest use; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

3.2.3 IMPACTS AND MITIGATION MEASURES

Impact #3.2-1: Directly or indirectly result in conversion of Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland) to non-agricultural use

Discussion/Conclusion: Adoption of the *Merced Vision 2030 General Plan* will result in existing agricultural areas being re-designated for residential, commercial and public land uses. Such re-designation will indirectly result in the conversion of Farmland to urban uses over time. According to the 2006 Farmland Mapping and Monitoring Program Map (Figure 3.2-1), the Plan Update could result in conversion of approximately 8,750 acres of undeveloped land to developed urban land within the proposed SUDP/SOI and outside the City limits of Merced, of which 1,898 acres are Prime Farmland.

The General Plan includes Policies and Implementing Actions to ensure that the existing farmland within and surrounding the SUDP/SOI are not developed before needed by future growth. Policy UE-1.1 calls for the City to designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area. With Implementing Action 1.1.a, the City shall direct development away from significant concentrations of "Prime" agricultural soils and give priority to the conversion of non-prime agricultural land if reasonable alternatives exist. With Implementing Action 1.1.d, the City shall work with Merced County to establish policies to protect prime agricultural areas around the SUDP/Sphere of Influence. With Implementing Action 1.1.b, the City shall limit development and development related impacts on agricultural lands along the City's urban fringe. Policy L-3.2 encourages infill development and a compact urban form. With Implementing Action 3.2.a, the City encourages infill of vacant parcels.

The General Plan includes policies and implementing actions to ensure managed production of farmland within and surrounding the SUDP/SOI are protected. Policy OS-2.1 calls for the City to protect agricultural areas outside the City's SUDP/SOI from urban impacts. With Implementing Action 2.1.a, the City shall continue to explore the use of Farmland Trusts, exclusive agricultural zoning, and the transfer of development rights to protect prime agricultural areas. Policy OS-2.2 call for the City to relieve pressures on converting areas containing large concentrations of "Prime" Agricultural Soils to Urban Uses by providing adequate urban development land within the Merced City SUDP/SOI. This important policy will be carried out through several implementing actions found in the Land Use, Public Services and Facilities, and Urban Expansion Chapters of the *Merced Vision 2030 General Plan*.

Implementation of the policies proposed in the General Plan would ensure that increased demand for additional land associated with an increase in population would minimize the conversion of Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland) to Non-agricultural use; however, the conversion of Prime Farmland is considered a ***potentially significant*** impact.

Mitigation Measures

Implementation of the following mitigation measures and the Goals, Policies, and Implementing Actions measure of the General Plan will reduce the impact to farmland conversion; however, the impact of the conversion of farmland to non-agricultural uses is ***significant and unavoidable***.

Mitigation Measure #3.2-1

The City will encourage property owners outside the City limits but within the SUDP/SOI to maintain their land in agricultural production until the land is converted to urban uses. The City will also work cooperatively with land trusts and other non-profit organizations to preserve agricultural land in the region. This may include the use of conservation easements. Infill development will be preferred and encouraged over fringe development. Sequential and contiguous development is also preferred and encouraged over leap-frog development.

Effectiveness of Mitigation Measures:

While implementation of the mitigation above will help reduce the impact, the impact remains ***significant and unavoidable***.

Impact #3.2-2: Conflict with existing zoning for agricultural use, or a Williamson Act contract

Discussion/Conclusion: The proposed General Plan will directly and indirectly conflict with existing agricultural zoning and Williamson Act Contracts within the proposed SUDP/SOI. Adoption of the Plan may result in the indirect conversion of existing agricultural areas for residential, commercial and public uses over time. The proposed SUDP/SOI will affect approximately 8,758 acres of land currently designated for agricultural use by the County of Merced, of which, approximately 71 acres are subject to Williamson Act Contracts. Upon implementation of the Plan, designation of lands under Williamson Act Contract for residential, commercial and public uses will conflict with the Contracts. All 71 acres of land under Williamson Act Contract are currently undergoing the non-renewal process. These lands will no longer be subject to Williamson Act Contracts over the course of the next ten years.

The conversion of agricultural lands to urban uses will take place over the planning period at varying times and in varying locations. This variation may result in conflicting land uses abutting one another for long periods in time. Future residents of urban development could be exposed to nuisances related to agricultural activities which include dust, odors, and elevated noise levels. The General Plan includes policies and implementing actions to reduce conflict between proposed land uses of the proposed General Plan and lands in agricultural production, including lands under Williamson Act Contract. Policy OS-2.1, calls for the City to protect agricultural areas outside the City's SUDP/SOI from urban impacts. With Implementing Action 2.1.b, the City shall establish policies and programs which minimize conflicts between urban and agricultural uses. With Implementing Action 2.1.c, the City shall minimize conflict between agricultural and urban uses by requiring buffers, such as landscape areas, roadways, or creeks, to separate these uses.

Implementation of the policies proposed in the General Plan would ensure that conflict with existing zoning for agricultural use or a Williamson Act contract would be minimized. However, there is still potential for conflict, therefore, this is a ***potentially significant*** impact.

Mitigation Measures

Implementation of the Goals, Policies, and Implementing Actions of the General Plan will reduce the conflict with existing zoning for agricultural use or a Williamson Act contract; however, this will not prevent the conversion of prime farmland to non-agricultural uses, nor will it prevent changes to existing agricultural land use designations. Therefore, the conversion of prime farmland is a ***significant and unavoidable*** impact.

Impact #3.2-3: Conflict with existing zoning for, or cause rezoning of, forest land (as defined by Public Resources Code section 1220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))

Discussion/Conclusion: Forest land as defined by Public Resources Code section 1220(g), timberland as defined by Public Resources Code section 4526 and timberland zoned Timberland Production as defined by Government Code section 51104(g) does not exist within the proposed City of Merced SUDP/SOI. There is ***no impact.***

Mitigation Measures

No mitigation measures are required.

Impact #3.2-4: Result in the loss of forest land or conversion of forest land to non-forest use

Discussion/Conclusion: Forest land does not exist within the proposed City of Merced SUDP/SOI. There is ***no impact.***

Mitigation Measures

No mitigation measures are required.

Impact #3.2-5: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

Discussion/Conclusion: See Impacts #3.2-1, #3.2-3 and #3.2-4. There is ***no impact.***

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Impact #3.2-6: Have a cumulatively adverse effect on agricultural resources

Discussion/Conclusion: With the implementation of the proposed project there would be a loss of existing agricultural lands within the City's planning area. While the proposed project includes policies to minimize this impact, there would still be a project level significant and unavoidable impact. The loss of agricultural land within the City's planning area as a result of urban development is part of an overall trend within Merced County and the County will continue to face development pressure in the foreseeable future. The proposed project includes

policies directing the City to work at a regional level to control the conversion of agricultural uses. However, since the County is projected to continue to urbanize at a significant rate, the loss of agricultural lands as a result of the proposed project would contribute considerably to a ***significant and unavoidable cumulative impact*** to agricultural resources.

Mitigation Measures

No mitigation measures are available that would fully mitigate this impact; therefore, this impact remains ***significant, cumulatively considerable, and unavoidable***.

3.3

AIR QUALITY

3.3 Air Quality

This section of the Draft EIR describes the impacts of the implementation of the proposed City of Merced General Plan on local and regional air quality, based on the assessment guidelines of the San Joaquin Valley Air Pollution Control District (SJVAPCD). This section describes existing air quality, construction-related impacts, direct and indirect emissions associated with the proposed plan, the local and regional impacts of those emissions, and mitigation measures warranted to reduce or eliminate any identified significant impacts.

3.3.1 SETTING

Environmental Setting

The project is located in the San Joaquin Valley Air Basin (SJVAB) (Figure 3.3-1), which occupies the southern half of the Central Valley and is approximately 250 miles in length and, on average, 35 miles in width. The Coast Range, which has an average elevation of 3,000 feet, serves as the western border of the SJVAB. The San Emigdio Mountains, part of the Coast Range, and the Tehachapi Mountains, part of the Sierra Nevada, are both located to the south of the SJVAB. The Sierra Nevada extends in a northwesterly direction and forms the eastern boundary of the SJVAB. The SJVAB is basically flat with a downward gradient to the northwest.

The climate of the SJVAB is strongly influenced by the presence of these mountain ranges. The mountain ranges to the west and south induce winter storms from the Pacific to release precipitation on the western slopes, producing a partial rain shadow over the valley. A rain shadow is defined as the region on the leeward side of a mountain where precipitation is noticeably less because moisture in the air is removed in the form of clouds and precipitation on the windward side. In addition, the mountain ranges block the free circulation of air to the east, resulting in the entrapment of stable air in the valley for extended periods during the cooler months.

Winter in the SJVAB is characterized as mild and fairly humid, and the summer is hot, dry, and cloudless. During the summer, a Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind.

Existing Ambient Air Quality

The California Air Resources Board (CARB) and the United States Environmental Protection Agency (EPA) currently focus on the following air pollutants as indicators of ambient air quality: Ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants."

The EPA has established primary and secondary National Ambient Air Quality Standard (NAAQS) for the following criteria air pollutants: O_3, CO, NO_2, SO_2, PM_{10}, fine particulate

matter ($PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect the public welfare. In addition to the NAAQS, CARB has established California Ambient Air Quality Standard (CAAQS) for the following criteria air pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter. In most cases, the CAAQS are more stringent than the NAAQS. The NAAQS and CAAQS as discussed further in the regulatory section below.

Criteria air pollutant concentrations are measured at several monitoring stations in the SJVAB. From 1991 to the present, there have been two monitoring stations within the City of Merced: S Coffee Avenue and 2334 M Street. Table 3.3-1 summarizes the air quality data from these locations for the most recent years available. Ambient air quality conditions with respect to each separate criteria pollutant are described below.

Table 3.3-1
Ambient Air Quality in City of Merced
(Number of Days Exceeding State and Federal Standards)

Year	Merced- S Coffee Avenue					Merced- 2334 M Street				
	State Ozone	Federal Ozone	State PM_{10} [1]	Federal PM_{10} [1]	Federal $PM_{2.5}$ [2]	State Ozone	Federal Ozone	State PM_{10} [1]	Federal PM_{10} [1]	Federal $PM_{2.5}$ [2]
2009	0	0	*	*	*	*	*	32.5	0	25.1
2008	14	3	*	*	*	*	*	87.2	0	*
2007	5	0	*	*	*	*	*	36.5	0	3.3
2006	4	0	*	*	*	*	*	47.4	0	0
2005	6	0	*	*	*	*	*	29	0	0
2004	14	0	*	*	*	*	*	12.3	0	0
2003	54	0	*	*	*	*	*	44.4	*	*
2002	55	2	*	*	*	*	*	84.8	0	3.1
2001	26	0	*	*	*	*	*	*	0	*
2000	32	0	*	*	*	*	*	69.6	0	*
1999	42	2	*	*	*	*	*	*	*	*
1998	37	3	*	*	*	*	*	*	*	*
1997	1	0	*	*	*	*	*	*	*	*
1996	44	1	*	*	*	*	*	*	*	*
1995	38	3	*	*	*	*	*	96.3	0	*
1994	31	0	*	*	*	*	*	60.8	0	*
1993	22	1	*	*	*	*	*	108.8	0	*
1992	39	0	*	*	*	*	*	138.8	0	*
1991	13	2	*	*	*	*	*	151.6	0	*

[1]Measurements of PM_{10} are made every sixth day. Data is the estimated number of days that the standard would have been exceeded had measurements been collected every day.
[2]National 1997 24-Hour $PM_{2.5}$ Standard
*There was insufficient (or no) data available to determine the value.

Source: Air Resources Board Aerometric Data Analysis and Management System (ADAM)

Both CARB and EPA use monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of the designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional



Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CALIFORNIA REGIONAL AIR BASINS

Figure 3.3-1

Job No.: 060429

designation is given to nonattainment areas that are progressing and nearing attainment. Attainment designations with respect to the Planning Area are shown in Table 3.3-2 for each criteria pollutant.

Table 3.3-2
Merced County Attainment Designation (Federal and State)

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone - One hour	No Federal Standard (See note below)	Non-attainment/Severe
Ozone - Eight hour	Non-attainment	Non-attainment
PM_{10} (Particulate matter 10 micrometers in diameter)	Unclassified/Attainment	Non-attainment
$PM_{2.5}$ (Particulate matter 2.5 micrometers in diameter)	Non-attainment	Non-attainment
Carbon Monoxide	Unclassified/Attainment	Unclassified
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified/Attainment	Attainment
Lead (Particulate)	Unclassified/Attainment	Attainment
Hydrogen Sulfide	*No Federal Standard*	Unclassified
Sulfates	*No Federal Standard*	Attainment
Visibility Reducing Particles	*No Federal Standard*	Unclassified
Note: The Federal One-Hour Ozone National Ambient Air Quality Standard was revoked on June 15, 2005.		

Source: California Air Resources Board, 2009, U.S. EPA, 2009

OZONE

Ozone (O_3) is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. O_3 is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of Reactive Organic Gases (ROG's) and NOx, the combined emissions of Nitrous Oxide (NO) and NO_2, in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_x are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

O_3 occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level or "bad" ozone is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog because sunlight and heat serve as catalysts for the reaction between O_3 precursors, peak O_3 concentrations typically occur during the summer in the Northern Hemisphere. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric or "good" ozone layer extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B).

The adverse health effects associated with exposure to O_3 pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of O_3 affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of O_3 ranging from 0.10 to 0.40 ppm for 1 to 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal

volumes, and impairing respiratory mechanics. Ambient levels of O_3 above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating O_3 exposure to an increase in the permeability of respiratory epithelia; such increased permeability leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system's ability to defend against infection.

With respect to the NAAQS, Merced County is currently designated as a non-attainment area for the 8-hour ozone standard shown in Table 3.3-2. In addition, Merced County is currently designated as a severe non-attainment area for the state 1-hour ozone standard and non-attainment for the state 8-hour ozone standard.

As shown in Table 3.3-1, the national 1-hour ozone standard was exceeded at the S Coffee Avenue monitoring station on 14 days from 1991 to 2002. Between 2003 and 2009, the 1-hour standard was only exceeded 3 times (all 3 events occurred in 2008). State 1-hour ozone standard violations, however, occurred on 380 days from 1991 to 2002, and on another 97 days from 2003 to 2008. The ozone problem in the SJVAB ranks among the most severe in California. Table 3.3-3 summarizes the ozone data in the San Joaquin Basin for the years 1986 to 2009.

Table 3.3-3
Ozone Trends Summary: San Joaquin Valley Air Basin

Year	Days> Standards			1-Hour Observations		8-Hour Averages			1-Year Coverage
	1-Hour		8-Hour	3-Year		3-Year			
	State	Nat'l	Nat'l	Maximum	4thHigh	Maximum	4th High	EPDC	
2009	82	4	98	0.135	0.140	0.110	0.105	n/a	100
2008	95	19	127	0.157	0.136	0.132	0.108	0.128	100
2007	69	3	110	0.138	0.135	0.110	0.107	0.124	100
2006	90	18	120	0.141	0.135	0.122	0.110	0.119	100
2005	83	8	102	0.134	0.149	0.114	0.113	0.124	100
2004	106	9	143	0.155	0.151	0.126	0.116	0.127	99
2003	137	37	160	0.156	0.1551	0.127	0.115	0.128	100
2002	127	31	158	0.164	0.151	0.133	0.115	0.124	100
2001	123	32	162	0.149	0.146	0.120	0.109	0.123	100
2000	114	30	144	0.165	0.161	0.132	0.111	0.132	100
1999	123	28	153	0.155	0.161	0.123	0.113	0.132	100
1998	90	39	112	0.169	0.161	0.137	0.115	0.134	99
1997	110	16	138	0.147	0.164	0.127	0.115	0.139	100
1996	120	56	143	0.165	0.165	0.137	0.119	0.136	100
1995	124	44	142	0.173	0.165	0.134	0.119	0.134	99
1994	118	43	137	0.175	0.160	0.129	0.111	0.127	99
1993	125	43	144	0.160	0.160	0.125	0.112	0.131	99
1992	127	29	155	0.160	0.160	0.121	0.115	0.129	99
1991	133	51	145	0.180	0.160	0.130	0.118	0.132	99
1990	131	45	153	0.170	0.160	0.124	0.119	0.125	99
1989	148	54	159	0.180	0.170	0.136	0.120	0.136	99
1988	156	74	178	0.190	0.170	0.128	0.121	0.135	98
1987	156	65	179	0.200	0.170	0.150	0.118	0.134	100
1986	147	59	167	0.180	0.170	0.135	0.117	0.130	98

Years: Ozone data are available for this basin from 1974 through 2009.
Notes: All concentrations expressed as parts per million.

Year	Days> Standards			1-Hour Observations		8-Hour Averages			1-Year Coverage
	1-Hour		8-Hour	3-Year		3-Year			
	State	Nat'l	Nat'l	Maximum	4thHigh	Maximum	4th High	EPDC	
*There was insufficient (or no) data available to determine the value									

Source: California Air Resources Board, Air Quality Trend Summaries, July 2009 (http://www.arb.ca.gov)

Maximum peak ozone values in the SJVAB have trended downwards over the last twenty years, as shown in Table 3.3-1 and Table 3.3-3. The number of days in which the national 1-hour standard was exceeded has been varied over the years, but indicates an overall improvement.

CARBON MONOXIDE

Unlike ozone, carbon monoxide (CO) is released directly into the atmosphere by stationary and mobile sources and typically found at high concentrations near the source of emission. CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources of pollution. In fact, 77 percent of the nationwide CO emissions are from mobile sources. The other 23 percent consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases.

Merced County is currently designated as an unclassified or unclassified/attainment area for the state and national CO standards (Table 3.3-2).

With respect to CO air quality trends according to the 2009 California Almanac of Emissions and Air Quality (California Air Resources Board 2007), the maximum peak 8-hour trend for the SJVAB shows a fairly consistent downward trend from 1982 to 2001, with year-to-year variability especially in the 1980's because of meteorological conditions (Table 3.3-4). The national CO standards have not been exceeded since 1991 and the state standards have not been exceeded since 1995. The decline in ambient CO is attributable to the introduction of cleaner fuels and newer, cleaner motor vehicles.

Table 3.3-4
Carbon Monoxide Trends Summary: San Joaquin Valley Air Basin

Year	Peak 8-hr. Indicator (State)	Max 8-hr. Concentration (State)	Max 1-hr Concentration	Days Above State 8-hr. std.	Days Above Nat. 8-hr. std.
2007	3.4	3.2	4.4	0	0
2006	3.4	3.7	6.9	0	0
2005	3.7	3.0	4.3	0	0
2004	4.2	3.0	4.6	0	0
2003	4.8	4.1	5.8	0	0

Year	Peak 8-hr. Indicator (State)	Max 8-hr. Concentration (State)	Max 1-hr Concentration	Days Above State 8-hr. std.	Days Above Nat. 8-hr. std.
2002	5.3	4.5	6.1	0	0
2001	6.4	6.0	8.4	0	0
2000	8.4	6.6	10.1	0	0
1999	5.5	7.8	11.9	0	0
1998	8.3	8.0	10.3	0	0
1997	9.0	7.5	9.9	0	0
1996	9.9	7.0	11.0	0	0
1995	10.9	9.1	12.0	1.0	0
1994	10.0	8.9	15.0	0.0	0
1993	10.0	9.3	13.0	2.0	0
1992	11.5	8.3	13.0	0	0
1991	13.2	11.4	19.0	3.0	3.0
1990	19.9	11.5	17.0	10.0	9.0
1989	13.7	13.4	23.0	24.0	18.0
1988	14.1	16.5	19.0	5.0	6.0
1987	13.9	12.9	16.0	4.0	4.0
1986	13.9	16.3	21.0	13.0	11.0

Source: 2009 California Almanac of Emissions and Air Quality

NITROGEN DIOXIDE

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NOx, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (O_3), the NO_2 concentration in a particular geographical area may not be representative of the local NOx emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions.

Merced County is currently designated as an attainment or unclassified/attainment area for the state and national NO_2 standards (Table 3.3-2).

SULFUR DIOXIDE

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Merced County is currently designated as an attainment or unclassified/attainment area for the state and national SO_2 standards (Table 3.3-2).

PARTICULATE MATTER

Particulate matter pollution consists of very small particles suspended in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when industry and gaseous pollutant undergo chemical reactions in the atmosphere. Respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) represent fractions of particulate matter. PM_{10} refers to particulate matter less than 10 microns in diameter and $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter. Major sources of $PM_{2.5}$ results primarily from diesel fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. PM_{10} include all $PM_{2.5}$ sources as well as emissions from dust generated by construction, landfills, and agriculture; wildfires and brush/waste burning, industrial sources, windblown dust from open lands, and atmospheric chemical and photochemical reactions.

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances absorbed onto fine particulate matter, which is referred to as the piggybacking effect, or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated PM_{10} concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death. $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

Merced County is currently designated as a non-attainment area for the state and national PM_{10} and $PM_{2.5}$ standards (Table 3.3-2).

Direct emissions of PM_{10} have decreased from 1991 to 2007 and in 2009 in Merced County as shown in Table 3.3-1; however, PM_{10} emissions in the San Joaquin Valley Air Basin (Table 3.3-5) have not shown a significant downward trend. CARB's Almanac of Emissions and Air Quality (California Air Resources Board 2007) projects that PM_{10} emissions will remain nearly constant between 2005 and 2020. PM_{10} emissions in the SJVAB are dominated by

emissions from area-wide sources, primarily from vehicle travel on unpaved and paved roads, waste burning, and residential fuel combustion.

Table 3.3-5
PM_{10} Trends Summary: San Joaquin Valley Air Basin

Year	Est Days>Standard		Annual Average		3-Year Average		High 24-Hr Average			1-Year Coverage
	Nat'l	State	Nat'l	State	Nat'l	State	Nat'l	State	EPDC	
2009	1.9	123.4	*	46.5	*	56	423.8	139.5		
2008	4.8	182.3	59.7	56.0	57	56	358.8	353.5	244.5	--
2007	1.4	145.2	54.8	48.5	51	56	172.1	135	207.6	100
2006	4.2	166.8	55.4	56.5	47	56	304	255	206.5	100
2005	0	146.3	44.3	44.5	46	52	131	137	190.0	100
2004	0.9	113	47.9	43.6	51	60	217	219	202.4	100
2003	0	167.2	52.4	52.3	55	60	150	150	202.5	100
2002	2.9	255.8	59.2	59.9	56	60	189	194	216.6	100
2001	4	167.9	57.4	52.3	56	60	212	221	217.5	100
2000	0	195.6	53.1	53.9	49	60	145	153	208.0	100
1999	3.8	182.1	59.5	60.1	45	60	183	186	*	100
1998	5.4	101.8	52.5	40.5	42	40	160	167	*	100
1997	1.9	106.7	48.2	47.3	53	58	227.7	199	216.6	100
1996	0	204	52	54.1	*	58	153	153	207.4	100
1995	4.2	184.2	58.2	57.9	52	58	279	279	245.8	100
1994	1.9	166.1	50.1	49.6	54	62	192	192	229.5	100
1993	2.9	183.3	56.9	56.3	65	70	239	239	266.4	100
1992	9.2	246.1	62.9	62.4	73	80	186	186	289.8	100
1991	40.2	225.3	76.3	70	78	80	279	279	289.5	100
1990	54	292.5	79.3	80.1	75	80	439	439	263.1	100
1989	28.8	208.2	79.3	67	*	67	237	237	*	100
1988	46.3	158.5	74.3	52.7	*	53	206	206	*	98

Years: PM_{10} data are available for this basin from 1988 through 2009.

Notes: All concentrations expressed in micrograms per cubic meter. State and national statistics may differ for the following reasons:

- State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.
- State and national statistics may therefore be based on different samplers.
- State statistics for 1998 and later are based on local conditions (except for the South Coast Air Basin, where State statistics for 2002 and later are based on local conditions).
- National statistics are based on standard conditions.
- State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

*There was insufficient (or no) data available to determine the value.

Source: California Air Resources Board, 2010

LEAD

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in the air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995.

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94 percent between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13 percent of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78 percent decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline (as well as the removal of lead from soldered cans).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is one of California's most dramatic success stories. As stated above, the rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent CARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (the EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, the CARB identified lead as a toxic air contaminant.

Regulatory Setting

FEDERAL AND STATE

Federal Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: national ambient air quality standards for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The US Environmental Protection Agency (EPA) is responsible for administering the FCAA. The FCAA requires the EPA to set National Ambient Air Quality Standards (NAAQS) for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

The FCAA recognizes the importance for each state to locally carry out the Clean Air Act, as special consideration of local industries; geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the EPA requires each state

to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A State Implementation Plan (SIP) is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. The CARB is the state agency that is responsible for preparing the California SIP.

National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61, Subpart M)

The NESHAPs are emissions standards set by the US EPA for an air pollutant not covered by National Ambient Air Quality Standards that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness. The standards for a particular source category require the maximum degree of emission reduction that the EPA determines to be achievable, which is known as the Maximum Achievable Control Technology (MACT).

California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out in statute the state's air quality goals, planning and regulatory strategies, and performance. The CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards.

Ambient Air Quality Standards

National ambient air quality standards are determined by the Environmental Protection Agency. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM_{10}) and lead. In addition, California has created standards for pollutants that are not covered by federal standards including sulfates and hydrogen sulfide. The federal and state primary standards for major pollutants are shown in Table 3.3-6 below.

Table 3.3-6
Federal and State Air Quality Standards

Pollutant	Average Time	California Standards[a] Concentration[c]	Federal Standards[b] Primary[c, d]
Ozone (O_3)	1 hour	0.09 ppm (180µg/m^3)	—
	8 hours	0.07 ppm (137 mg/m^3)	0.08 ppm (157 µg/m^3
Respirable Particulate Matter (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3
	Annual arithmetic mean	20 µg/m^3	50 µg/m^3
	24 hours	65 µg/m^3	65 µg/m^3

Pollutant	Average Time	California Standards[a] Concentration[c]	Federal Standards[b] Primary[c, d]
Fine Particulate Matter ($PM_{2.5}$)	24 hours	65 µg/m^3	65 µg/m^3
	Annual arithmetic mean	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 µg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO_2)*	Annual arithmetic mean	—	0.053 ppm (100 µg/m^3)
	1 hour	0.25 ppm (470 µg/m^3)	—
Sulfur Dioxide (SO_2)	Annual arithmetic mean	—	0.030 ppm (80 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	—
Lead (Pb)[e]	30-day average	1.5 µg/m^3	—
	Calendar quarter	—	1.5 µg/m^3
Visibility Reducing Particles	8 hours	[f]	—
Sulfates	24 hours	25	—
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)	—
Vinyl Chloride[e]	24 hours	0.010 ppm (26 µg/m^3)	—

ppm = Parts Per Million
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter

* The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become eff3ective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 ad 24 hour), nitrogen dioxide, suspended particulate matter – PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest either hour concentration or a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration of 150 µg/m^3) is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact US EPA for further clarification and current federal policies.

[c] Concentrations expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[f] Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.

Source: California Air Resources Board, 2010

State Implementation Plan

The State Implementation Plan (SIP) is the blueprint for meeting federal air quality standards by the applicable deadlines set in the Federal Clean Air Act. California's SIP is a compilation of region-specific plans that detail how each area will meet the air quality standards. The plan includes an estimate of the emission reductions needed to meet each air quality standard based on air monitoring results, data on emission sources, and complex air quality modeling. It reflects the benefits of the pollution control program adopted by air agencies at all levels, and may also include commitments to implement new strategies. Together, these elements must reduce emissions by an amount sufficient to meet the air quality standard in each region. Once the local element of the plan is adopted by the air district(s) and other responsible local agencies, it is sent to the CARB for adoption and then formally submitted to the Environmental Protection Agency for approval as a revision to the California SIP.

Assembly Bill 170

AB 170 was adopted by state lawmakers in 2003 creating Government Code Section 65302.1 which requires cities and counties in the San Joaquin Valley to amend their general plans to include data and analysis, comprehensive goals, policies and feasible implementation strategies designed to improve air quality. These amendments are due no later than one year from the due date specified for the next revisions of a jurisdiction's housing element

As required in Section 65302.1.b, cities and counties within the San Joaquin Valley must amend the general plan to include a discussion of the status of air quality and strategies to improve air quality. The elements to be amended include, but are not limited to, those elements dealing with land use, circulation, housing, conservation, and open space. Section 65302.1.c identifies four (4) areas of air quality discussion required in these amendments. These areas include: (1) a report describing local air quality conditions, attainment status, and state and federal air quality and transportation plans; (2) a summary of local, district, state, and federal policies, programs, and regulations to improve air quality; (3) a comprehensive set of goals, policies, and objectives to improve air quality; and (4) feasible implementation measures designed to achieve these goals.

LOCAL

Air pollution does not respect political boundaries. Therefore, many air quality problems are best managed on a regional basis. This was the case for the San Joaquin Valley where until 1991, each County operated a local air pollution control district (APCD). The State Legislature than determined that management of the entire air basin by a single agency would be more effective. Air basins are geographic areas sharing a common "air-shed." Most major metropolitan areas in California now fall under unified air pollution control districts (UAPCDs), or air quality management districts (AQMDs).

San Joaquin Valley Air Pollution Control District

The SJVAPCD attains and maintains air quality conditions in Merced County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the SJVAPCD

includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The SJVAPCD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the FCAA and the CCAA.

In January 2002, the SJVAPCD released a revision to the previously adopted guidelines document (SJVAPCD 1998). This revised Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD 2002) is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The GAMAQI contains the following applicable components:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;

- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts;

- Methods available to mitigate air quality impacts;

- Information for use in air quality assessments and EIR's that will be updated more frequently such as air quality data, regulatory setting, climate, topography, etc.

The SJVAPCD has also prepared the Air Quality Guidelines for General Plans (AQGGP) (revised June 2005) to provide local planning agencies with a comprehensive set of goals and policies that will improve air quality if adopted in a general plan; to provide a guide to cities and counties for determining which goals and policies are appropriate in their particular community; and to provide justification and rationale for the goals and policies that will convince decision makers and the public that they are appropriate and necessary.

ISR- Indirect Source Review. The ISR Rule (Rule 9510) and the Administrative ISR Fee Rule (Rule 3180) are the result of state requirements outlined in the California Health and Safety Code, Section 40604 and the SIP. The District's SIP commitments are contained in the District's 2003 PM_{10} Plan and Extreme Ozone Attainment Demonstration Plan (Plans), which identify the need to reduce PM_{10} and NOx in order to reach the ambient air-pollution standards on schedule. The Plans identify growth and reductions in multiple source categories. The Plans quantify the reduction from current District rules and proposed rules, as well as state and federal regulations, and then model future emissions to determine if the District may reach attainment for applicable pollutants (http://www.valleyair.org/ISR/ISROverview.htm).

This rule applies to new developments that are over a certain threshold size. Any of the following projects require an application to be submitted unless the projects have mitigated emissions of less than two tons per year each of NO_X and PM_{10}. Projects that are at least:

- 50 residential units
- 2,000 square feet of commercial space

- 9,000 square feet of educational space
- 10,000 square feet of government space
- 20,000 square feet of medical or recreational space
- 25,000 square feet of light industrial space
- 39,000 square feet of general office space
- 100,000 square feet of heavy industrial space
- Or, 9,000 square feet of any land use not identified above

Air Quality Plans. The SJVAPCD submitted the 1991 Air Quality Attainment Plan in compliance with the requirements set forth in the CCAA. In addition, the CCAA requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of this assessment, the attainment plan must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The CCAA requirement for a first triennial progress report and revisions of the 1991 Air Quality Attainment Plan was first fulfilled with the preparation and adoption of the 1995-1997 Triennial Progress Report and Plan Revision. Triennial reports were also prepared for 1995-1997, 1997-1999, and 1999-2001 in compliance with the CCAA.

In an effort to reach attainment for ozone, the SJVAPCD has adopted and submitted several ozone and PM_{10} plans in its planning history in an effort to reach attainment. In the most current effort to reach attainment for ozone, the SJVAPCD submitted the 2007 Ozone Plan. This plan contains a comprehensive and exhaustive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the Valley. Additionally, this plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution, and a significant increase in state and federal funding for incentive-based measures to create adequate reductions in emissions to bring the entire Valley into attainment with the federal ozone standard. The proposed plan calls for a 75% reduction in ozone-forming oxides of nitrogen (NOx) emissions.

In June 2003, the District prepared the 2003 PM_{10} Plan. The 2003 PM_{10} Plan was amended in 2003 and in 2005. The 2006 PM_{10} Plan Update was adopted by the SJVAPCD in February 2006 and contains the existing measures adopted by EPA, CARB and the SJVAPCD and the additional measures needed to reach attainment of the PM_{10} standards.

The SJVAPCD's planning documents also identify voluntary strategies to further reduce air quality impacts in the San Joaquin Valley Air Basin (SJVAB). Included in these strategies are an enhanced California Environmental Quality Act (CEQA) program and the promotion of air quality elements or policies for General Plans in all SJVAB cities and counties. The SJVAPCD reviews and comments on CEQA documents and permit applications sent from SJVAB public agencies. Comments from the SJVAPCD include expert advice on level of significance, applicable rules and regulations, and suggested mitigation measures.

In addition to the above mentioned items, the SJVAPCD has submitted numerous plans with respect to ozone, PM_{10}, $PM_{2.5}$ and CO in compliance with the FCAA and CCAA, as listed below:

- ***Carbon Monoxide Plans***

  - 1992 Federal Attainment Plan for Carbon Monoxide

- ***Ozone Plans***

  - Air Quality Attainment Plan (AQAP), Jan. 1992
  - Revised 1993 Rate of Progress (ROP) Plan, Nov. 1994
  - Ozone Attainment Demonstration Plan (OADP), Nov. 1994
  - Revised Post 1996 ROP Plan, Sept. 1995
  - California Clean Air Act (CCAA) Triennial Progress Report and Plan Revision 1995-1997 (1997 Triennial Update), Dec. 1998
  - CCAA Triennial Progress Report and Plan Revision 1997-1999 (2000 Triennial Plan Update), March 2001
  - 2000 Ozone ROP Report, April 2000
  - 2002 – 2005 Ozone ROP Plan, May 2002
  - 2002 – 2005 Ozone ROP Plan (Amended), Dec. 2002
  - 2004 Extreme Ozone Attainment Demonstration Plan, Oct. 2004
  - 2004 Extreme Ozone Attainment Demonstration Plan (Amended), Oct. 2005
  - 2007 Ozone Plan, April 30, 2007

- ***PM_{10} Plans***

  - PM_{10} Attainment Demonstration Plan, May 1997 (Withdrawn)
  - PM_{10} Attainment Demonstration Plan Progress Report 1997-1999, Aug. 2000
  - 2003 PM_{10} Plan, June 2003
  - 2003 PM_{10} Plan (Amended), Dec. 2003
  - 2005 Amendments to the 2003 PM10 Plan, May 2005
  - 2006 PM_{10} Plan Update, February 2006

- ***$PM_{2.5}$ Plan***

  - Draft 2008 $PM_{2.5}$ Plan

General Plan Consistency

The Merced Vision 2030 General Plan contains a number of policies that apply to Air Quality impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Urban Design, Land Use, and Sustainable Development Elements are designed to ensure that air quality impacts are minimized as development occurs in accordance with the Merced Vision 2030 General Plan.

Urban Expansion Policies:

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

Urban Design Policies:

UD-1.1 Apply Transit-Ready Development or Urban Village design principles to new development in the City's new growth areas.

UD-1.4 Promote and facilitate Urban Village residential area design principles**.**

Land Use Policies:

L-3.2 Encourage infill development and a compact urban form.

Sustainable Development Policies:

SD-1.1 Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.

SD-1.2 Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.

SD-1.3 Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment**.**

SD-1.4 Educate the public on the impact of individual transportation, lifestyle, and land use decisions on air quality.

SD-1.5 Provide public facilities and operations which can serve as a model for the private sector in implementation of air quality programs.

SD-1.6 Reduce emissions of PM10, PM2.5, and other particulates with local control potential**.**

SD-3.1 Promote the use of Solar Energy technology and other Alternative Energy Resources**.**

SD-3.2 Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

3.3.2 THRESHOLDS OF SIGNIFICANCE

Adoption of a General Plan Update establishes the parameters within which future development projects will be reviewed and establishes some of the project standards of approval. Growth due to implementation of the General Plan is expected to occur over the span of 20 years or more.

Over the next 20 years, it is also expected that mitigation technology and environmental regulatory frameworks will change. Due to anticipated advances in air quality mitigation techniques, methods, laws, and regulations, it is anticipated the changes will be made in the way that future air quality impacts are assessed.

Future specific development proposals will be evaluated within the context of proposed planning policy. Air quality impacts will be further mitigated using available technology as part of the normal City review process.

Present methods used for evaluating potential Air Quality impacts rely on both qualitative and quantitative analytical techniques. Quantitative techniques are only able to assess expected future growth impacts by using present day assumptions about technology and the regulatory environment. For this reason, quantitative data is provided as a benchmark for evaluating impacts of the proposed City of Merced General Plan.

The SJVAPCD has established thresholds of significance for determining environmental significance. These thresholds separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project, which are recognized to be short in duration. The long-term emissions are primarily related to the activities that will occur indefinitely as a result of project operations.

Impacts will be evaluated both on the basis of CEQA Appendix G criteria and SJVAPCD significance criteria.

In order, the impacts to be evaluated will be those involving construction, operational emissions of criteria pollutants (Particulate Matter (PM_{10}) and reactive organic gas precursors to ozone), and cumulative air quality impacts. Because the area is non-attainment for ozone and PM_{10}, a major criteria for review is whether the project will result in a net increase of pollutants impacting ozone precursor pollutants and of PM_{10}.

Where environmental impacts are found to be significant or potentially significant, mitigation measures are identified to mitigate or avoid significant environmental effects.

In addition to the site-specific mitigation measures delineated for this plan, the City shall be required to implement reasonably feasible management practices required by the San Joaquin Valley Air Pollution Control District, or any other federal or state air quality regulatory agency, for the purpose of mitigating any significant impacts from the emission of Particulate Matter, Fine Particulate Matter, Reactive Organic Gases, Nitrogen Oxide, and any other criteria air pollutant or precursor emanating from implementation of the City of Merced General Plan.

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality

standard (including releasing emissions which exceed quantitative thresholds for ozone precursors;

- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Thresholds Used for Odor Evaluation

While odors are considered to be offensive and seldom cause any physical harm to people, they certainly can be unpleasant and lead to considerable amounts of anguish to the public and often leads to complaints made to the local jurisdiction from the community. Any project with the potential to expose the community to offensive odors would be considered a significant impact. Odor impacts on residential areas and sensitive receptors are often closely scrutinized, consideration should be given to other land uses that are commonly used by large amounting of people, such as open space, recreational facilities and commercial centers. The GAMAQI states that an evaluation "should be conducted for both of the following situations: 1) a potential source of objectionable odors is proposed for a location near existing sensitive receptors, and 2) sensitive receptors are proposed to be located near an existing source of objectionable odors."

Thresholds Used for Sensitive Receptors

One of the criteria for significance includes potential impacts of Hazardous Air Pollutants (HAPs) on sensitive receptors. The GAMAQI, Section 3, defines a sensitive receptor as a location where human populations, especially children, seniors, and sick persons are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include, but are not limited to: residential land uses, schools, hospitals, convalescent homes, and day care centers.

Examples of HAPs include emissions of criteria or toxic air pollutants that have health effects (PM_{10}, ammonia, H_2S sulfur dioxide, etc.). Sensitive receptors would not be directly affected by emissions of regional pollutants such as ozone precursors (VOC and NOx).

The potential for impacts to sensitive receptors can occur when a sensitive receptor is proposed near an existing source of HAPs, or when a development that is a source of HAPs is proposed near sensitive receptors, including siting a source of HAPs near an undeveloped, but designated sensitive receptor land use.

3.3.3 IMPACTS AND MITIGATION MEASURES

Impact #3.3-1: Construction activities associated with development under the Merced Vision 2030 General Plan would result in criteria pollutants, ozone precursors, and other pollutants.

Discussion/Conclusion: Construction activity that would occur as a result of the plan would cause temporary, short-term emissions of various air pollutants. ROG and NOx, which are ozone precursors, as well as PM_{10} and $PM_{2.5}$ and CO_2 (a greenhouse gas) would be emitted by

construction equipment during various activities, such as grading and excavation, infrastructure construction, building demolition, and a variety of other construction activities. Several types of diesel-powered heavy equipment will operate during development of the plan area. It is unknown at this time as to the type of uses; therefore, it is speculative as to the exact type of equipment to be used.

Compliance with the SJVAPCD's Regulation VIII is required during construction phases in plan area. The SJVAPCD indicates that implementation of Regulation VIII measures reduces dust generation by 50 percent. The provisions of Regulation VIII pertaining to construction activities require:

- Effective dust suppression for land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill and demolition activities;

- Effective stabilization of all land disturbed areas of a construction site, including storage piles not used for seven or more days;

- Control of fugitive dust from on-site unpaved roads and off-site unpaved access roads;

- Removal of accumulations of mud or dirt at the end of the work day or once every 24 hours from public paved roads, shoulders and access ways adjacent to the site; and

- Limit traffic speeds on unpaved roads to 15 mph.

These measures will be enforced by the SJVAPCD. Additionally, a Dust Control Plan will be prepared and appropriate fees paid for each development within the plan area. Violation of Regulation VIII requirements are subject to enforcement action. Violations are visible by the generation of dust clouds and/or generation of complaints.

The SJVAPCD has also identified an additional "enhanced control measure" that may be appropriate.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.

If the "enhanced control measure" will not be implemented for large or sensitive projects, then construction impacts would be considered significant unless the Lead Agency provides a satisfactory detailed explanation as to why a specific measure is unnecessary.

The SJVAPCD has also identified an additional measure that may be implemented if further emission reductions are deemed necessary by the Lead Agency.

- Install windbreaks at windward side(s) of construction areas.

This control measure is strongly encouraged at construction sites that are large in area, located near sensitive receptors, or which for any other reason, warrants additional emissions reductions.

In the absence of Regulation VIII requirements, construction activity could occur on a maximum of 11 acres per day without causing PM_{10} impacts to exceed the threshold of significance. With Regulation VIII in place, the maximum area of construction activity which falls below the threshold of significance rises to approximately 22 acres per day.

As construction activities could occur on areas large enough to exceed the threshold of significance for the generation of fugitive dust, the project will have a ***potentially significant*** impact on the generation of various pollutants (ROG, NO_X, PM_{10}, $PM_{2.5}$ and CO_2).

Mitigation Measure #3.3-1a:

For any phase of construction in which an area greater than 22 acres, in accordance with Regulation VIII of the SJVAPCD, will be disturbed on any one day, the project developer(s) shall implement the following measures:

1. *Basic fugitive dust control measures are required for all construction sites by SJVAPCD Regulation VIII.*

2. *Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.*

3. *Traffic speeds on unpaved roads shall be no greater than 15 mph.*

4. *Install wind breaks at windward side(s) of construction areas.*

Mitigation Measure #3.3-1b:

To reduce emissions and thus reduce cumulative impacts, the City of Merced shall consider adoption of an ordinance requiring the following measures to be implemented in conjunction with construction projects within the City:

1. *The idling time of all construction equipment used in the plan area shall not exceed ten minutes when practicable.*

2. *The hours of operation of heavy-duty equipment shall be minimized when practicable.*

3. *All equipment shall be properly tuned and maintained in accord with manufacturer's specifications when practicable.*

4. *When feasible, alternative fueled or electrical construction equipment shall be used at the project site.*

5. *The minimum practical engine size for construction equipment shall be used when practicable.*

6. *When feasible, electric carts or other smaller equipment shall be used at the project site.*

7. *Gasoline-powered equipment shall be equipped with catalytic converters when practicable.*

Effectiveness of Mitigation:

Implementation of the mitigation measures above will reduce construction exhaust emissions to a ***less than significant*** level.

Impact #3.3-2: Development and operation under the General Plan would result in emissions of criteria pollutants, ozone precursors, and other pollutants caused by mobile source activity, area sources, and stationary sources.

Discussion/Conclusion: Adoption and implementation of the proposed Merced Vision 2030 General Plan will result in additional development and urbanization in the Planning Area, which would in turn increase criteria air pollutants in an area that is currently designated as a severe non-attainment area.

The City of Merced proposes to: 1) improve infrastructure including streets, parking capacity, curbs, gutters, sidewalks, sewer lines, water lines, drainage systems, and similar improvements to remove blight from the community, 2) assemble adequate sites for construction of industrial facilities, 3) revitalize downtown through demolition and/or rehabilitation of deteriorated structures, and 4) assemble land to promote residential, commercial, and industrial development.

As blighted areas are revitalized, an increase in mobile emissions is expected. It is also expected that any new industrial facilities will increase criteria pollution emissions. Nearly all development projects in the San Joaquin Valley have the potential to generate pollutants that will reduce air quality or make it more difficult for state and national air quality standards to be attained.

The federal and state ambient air quality standards provide a basis for evaluating air quality related impacts (see Table 3.3-6). Exceedance of a federal or state emission standard for any pollutant is a significant impact. Because the state standards set forth under the CAA of 1988 are more restrictive than federal standards, the State standards are typically used for comparison of impacts.

Proposed projects within the City of Merced and unincorporated areas within the proposed SUDP/SOI will be required to comply with the SJVAPCD Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI). The GAMAQI has been developed to provide guidance in quantifying and evaluating whether a proposed project or plan will exceed the thresholds imposed by the SJVAPCD. If a proposed project exceeds the minimum threshold imposed by the SJVAPCD, the project must implement measures to reduce the impacts below the minimum threshold as approved by the City of Merced. In the event that an impact cannot be reduced

below the minimum threshold, the City of Merced must prepare a statement of overriding considerations to be approved by the City Council. The SJVAPCD has established a three-tiered approach to determining significance related to a projects quantified ozone precursor emissions. The following are the tiers established by the SJVAPCD; Small Project Analysis Level (SPAL), Cursory Analysis Level (CAL) and Full Analysis Level (FAL). Each tier requires a progressively more complex methodology in modeling and emissions calculations to determine air quality significance. Additionally, projects will be subject to the SJVAPCD's ISR rules. For projects subject to the rule, operational NOx and PM_{10} emissions must be reduced through onsite measures, an 'off-site fee', or a combination of the two. Application of the ISR requirements will further reduce operational impacts of the proposed General Plan. It is unknown at this time the amount of future development that will be subject to this rule.

Operational emissions (reactive organic gases), including increased mobile emissions and potential industrial emissions constitute a significant project impact as well as a significant cumulative impact. ROGs, NOx, CO, PM_{10} and $PM_{2.5}$, because of the Basin's non-attainment status, constitute ***significant cumulative impacts***.

Mitigation Measures

Mitigation Measure #3.3-2:

The following BACT (Best Available Control Technology) installations and mitigation shall be considered for new discretionary permits, to the extent feasible as determined by the City:

- *Trees shall be carefully selected and located to protect building(s) from energy consuming environmental conditions, and to shade paved areas when it will not interfere with any structures. Trees should be selected to shade paved areas that will shade 50% of the area within 15 years. Structural soil should be used under paved areas to improve tree growth.*

- *If transit service is available to a project site, development patterns and improvements shall be made to encourage its use. If transit service is not currently available, but is planned for the area in the future, easements shall be reserved to provide for future improvements such as bus turnouts, loading areas, route signs and shade structures.*

- *Multi-story parking facilities shall be considered instead of parking lots to reduce exposed concrete surface and save green space.*

- *Sidewalks and bikeways shall be installed throughout as much of any project as possible, in compliance with street standards, and shall be connected to any nearby existing and planned open space areas, parks, schools, residential areas, commercial areas, etc., to encourage walking and bicycling.*

- *Projects shall encourage as many clean alternative energy features as possible to promote energy self-sufficiency. Examples include (but are not limited to): photovoltaic cells, solar thermal electricity systems, small wind turbines, etc. Rebate and incentive programs are offered for alternative energy equipment.*

As many energy-conserving features as possible shall be included in the individual projects. Energy conservation measures include both energy conservation through design and operational energy conservation. Examples include (but are not limited to):

- *Increased energy efficiency (above California Title 24 Requirements)*
- *Energy efficient widows (double pane and/or Low-E)*
- *Use Low and No-VOC coatings and paints*
- *High-albedo (reflecting) roofing material*
- *Cool Paving. "Heat islands" created by development projects contribute to the reduced air quality in the valley by heating ozone precursors*
- *Radiant heat barrier*
- *Energy efficient lighting, appliances, heating and cooling systems*
- *Install solar water-heating system(s)*
- *Install photovoltaic cells*
- *Install geothermal heat pump system(s)*
- *Programmable thermostat(s) for all heating and cooling systems*
- *Awnings or other shading mechanism for windows*
- *Porch, patio and walkway overhangs*
- *Ceiling fans, whole house fans*
- *Utilize passive solar cooling and heating designs (e.g. natural convection, thermal flywheels)*
- *Utilize daylighting (natural lighting) systems such as skylights, light shelves, interior transom windows, etc.*
- *Electrical outlets around the exterior of the unit(s) to encourage use of electric landscape maintenance equipment*

- *Bicycle parking facilities for patrons and employees in a covered secure area. Bike storage should be located within 50' of the project's entrance. Construct paths to connect the development to nearby bikeways or sidewalks*

- *On-site employee cafeterias or eating areas*

- *Low or non-polluting landscape maintenance equipment (e.g. electric lawn mowers, reel mowers, leaf vacuums, electric trimmers and edger's, etc.)*

- *Pre-wire the unit(s) with high speed modem connections/DSL and extra phone lines*

- *Natural gas fireplaces (instead of wood-burning fireplaces or heaters)*

- *Natural gas lines (if available) and electrical outlets in backyard or patio areas to encourage the use of gas and/or electric barbecues*

- *Low or non-polluting incentives items should be provided with each residential unit (such items could include electric lawn mowers, reel mowers, leaf vacuums, gas or electric barbecues, etc.)*

Effectiveness of Mitigation:

The above mitigation measures would reduce project air quality impacts, but not below the SJVAPCD thresholds of significance; therefore, project impacts on air quality would be ***significant, cumulative, and unavoidable***.

Impact #3.3-3: Development and Operation under the General Plan would Expose Sensitive Receptors to Pollutant Concentration.

Discussion/Conclusion: Adoption of the proposed General Plan will result in additional development and urbanization in the Planning Area, which may result in the location of sensitive receptors near HAPs sources, or result in a CO hotspot.

Large sources of HAPs are required to obtain permits from the SJVAPCD and comply with emissions controls to limit the release of HAPs. The SJVAPCD will not issue permits for a source of HAPs if analysis shows that the emissions would cause a significant impact to the nearest sensitive receptor. In addition to the SJVAPCD's Air Toxics Program, the proposed General Plan contains policies to reduce operational impacts in the Merced area.

CO hotspots are temporary and localized areas of high CO concentration, occurring at heavily congested intersections or roadways with heavy traffic. The proposed General Plan contains policies to reduce vehicle miles traveled (VMT) and promote alternative modes of transportation, thereby reducing CO hotspots.

The potential for HAPs impacts primarily results from situating sensitive receptors near sources of HAPs or situating HAPs sources near sensitive receptors. Potential impacts could also result

from an emissions release in violation with SJVAPCD permitting requirements. Increased vehicular traffic could be a source of concern for CO impacts.

The HAPs impacts will be reduced through mitigation measures listed above. Analysis, such as a Health Risk Assessment, may be required on an individual project basis, as specific projects are proposed. However, additional analysis is not feasible at this time, as no specific project is proposed.

The CO impacts of future developments will be lessened by the SJVAPCD and policies of the proposed General Plan's that promote the use of alternative transportation, air quality mitigation for new developments, and strategies to minimize the number and length of vehicle trips. Per the GAMAQI's screening criteria, further analysis is required if the LOS is reduced to an E or an F on any roadway intersection or segment.

Impacts from CO and HAPs for the proposed project are ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.3-4: Implementation of the General Plan Update Would Create Odor Impacts

Discussion/Conclusion: Construction activity will require the operation of equipment which may generate exhaust from either gasoline or diesel fuel. Construction of new buildings will also require the application of architectural coatings and the paving of roads which would generate odors from materials such as paints and asphalt. These odors are of a temporary or short-term nature and quickly disperse into the surrounding atmosphere, thus, these are not significant.

Future residential development will also involve minor, odor-generating activities, such as backyard barbeque smoke, garden equipment exhaust, and the application of exterior paint for home improvement activities. These types of odors are typical of most residential communities and are not considered significant generators of odor impacts.

Specific industrial uses in the plan area are currently unknown, however; future uses shall be subject to General Plan policies to mitigate objectionable odors. Policies such as requiring new developments to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts; considering effects upon sensitive receptors; by preventing incompatible uses; and promoting flexibility and innovation through the use of PUDs, development agreements, specific plans, mixed-use projects, and other innovative development and planning techniques.

The City's General Plan includes policies that address air quality impacts, including odor generation; therefore, with implementation of these policies, this impact is considered ***less than significant.***

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Implementation of the proposed General Plan in combination with other reasonably foreseeable projects as planned for in the SJVAPCD would increase the density of development throughout the SJVAPCD and could further reduce air quality within the SJVAPCD. The SJVAPCD and other air quality analysis have recognized that population growth increases can potentially reduce air quality further without proper measures to better air quality in the region. However, the degree of probability is unknown as such cumulative impacts, if any, would be difficult to measure. Over recent decades, development in the SJVAPCD as well as the City of Merced has converted thousands of acres to urban uses. Thousands more of additional acres are proposed for development in the SJVAPCD in addition to the proposed City of Merced SUDP/SOI area. Such development could further reduce air quality in the SJVAPCD. Additionally, road construction, site grading, infrastructure installation, and construction of residential, commercial, and public facilities uses as well as the additional traffic created by these activities could result in increased significant impacts to air quality in the region. Most of the land that has been or is planned for development in SJVAPCD is made up of property similar to the proposed undeveloped lands within the proposed City of Merced SUDP/SOI.

Although individual project impacts can be mitigated, based on the standards of significance, the cumulative impacts of development in accordance with the proposed General Plan and other projects and plans within the SJVAPCD are significant, and the project's incremental contribution to this impact is itself is cumulatively considerable.

Cumulative air quality impacts were considered in terms of the various land uses proposed under the General Plan and the traffic projections generated by the traffic model. Because of the existing significant air quality issues in the San Joaquin Valley Air Basin, implementation of the 2030 General Plan Update would result in a ***significant, unavoidable and cumulatively considerable*** air quality impact.

3.4

BIOLOGICAL RESOURCES

3.4 Biological Resources

This section of the Draft EIR identifies existing biological resources located within the proposed City of Merced Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) boundary and analyzes potential impacts on these resources that would result from the proposed expansion of the City into currently undeveloped SUDP/SOI areas. The environmental setting, including an overview of local vegetation, flora, sensitive plant communities, wetlands, wildlife, and special-status species, is presented. This section provides discussion of the regulatory setting including applicable laws, ordinances, regulations, and standards and addresses the impacts that construction, and subsequent operation, of developments within the City of Merced SUDP/SOI may have on special-status plants, animals, and sensitive habitats.

3.4.1 SETTING

Environmental Setting

The plan area is located in the Central California Valley ecoregion (Omernik 1987). This ecoregion is characterized by flat, intensively farmed plains with long, hot dry summers and cool, wet winters (14-20 inches of precipitation per year). The Central California Valley ecoregion includes the Sacramento Valley to the north and the San Joaquin Valley to the south and it ranges between the Sierra Nevada foothills to the east to the Coastal Range foothills to the west. Nearly half of the region is actively farmed, and about three fourths of that farmed land is irrigated.

EXISTING CONDITIONS

Biological Communities/Habitat Types

The plan area is located along the valley floor, which is composed of a limited number of natural plant communities due to the long history of agricultural disturbance in this area. The plan area is currently a mosaic of land uses, including agricultural production, urban usage, and barren land.

A site visit was performed by Quad Knopf biologists in February 2008. During that visit, 13 land use types and biological communities/habitats were identified in the plan area, including: developed lands (commercial, urban, and rural residential); irrigation waters (canals and detention ponds); seasonal wetlands (including vernal pools); riparian; open water; agriculture (vineyards, orchards, irrigated row crops, rice, and dairy); and annual grassland. Descriptions of these land use types and biological communities are:

Developed Lands. There are three significantly different types of developed lands within the study area: urban, commercial, and rural residential.

- ***Urban*.** Urban areas consist of lawns, street strips, ornamental trees, and shrubs associated with homes and other structures, cemeteries, and subdivision green belts. Human

disturbance within urban areas limits wildlife habitat; however, the overall mosaic may be valuable to cosmopolitan wildlife.

- ***Commercial.*** The development in the plan area consists of large buildings on large parcels of land. Ground surface is almost entirely paved to allow for the movement of large trucks and equipment. With the high level of disturbance, there is virtually no habitat value on commercial properties within the plan area.

- ***Rural Residential.*** Rural Residential properties are scattered throughout the plan area. These areas consist of homes on several acres of land. Because the density of development is usually low in these areas, the quality of habitat is the highest of the developed lands. Although not ideal, there is more potential for nesting birds and movement of wildlife in these areas.

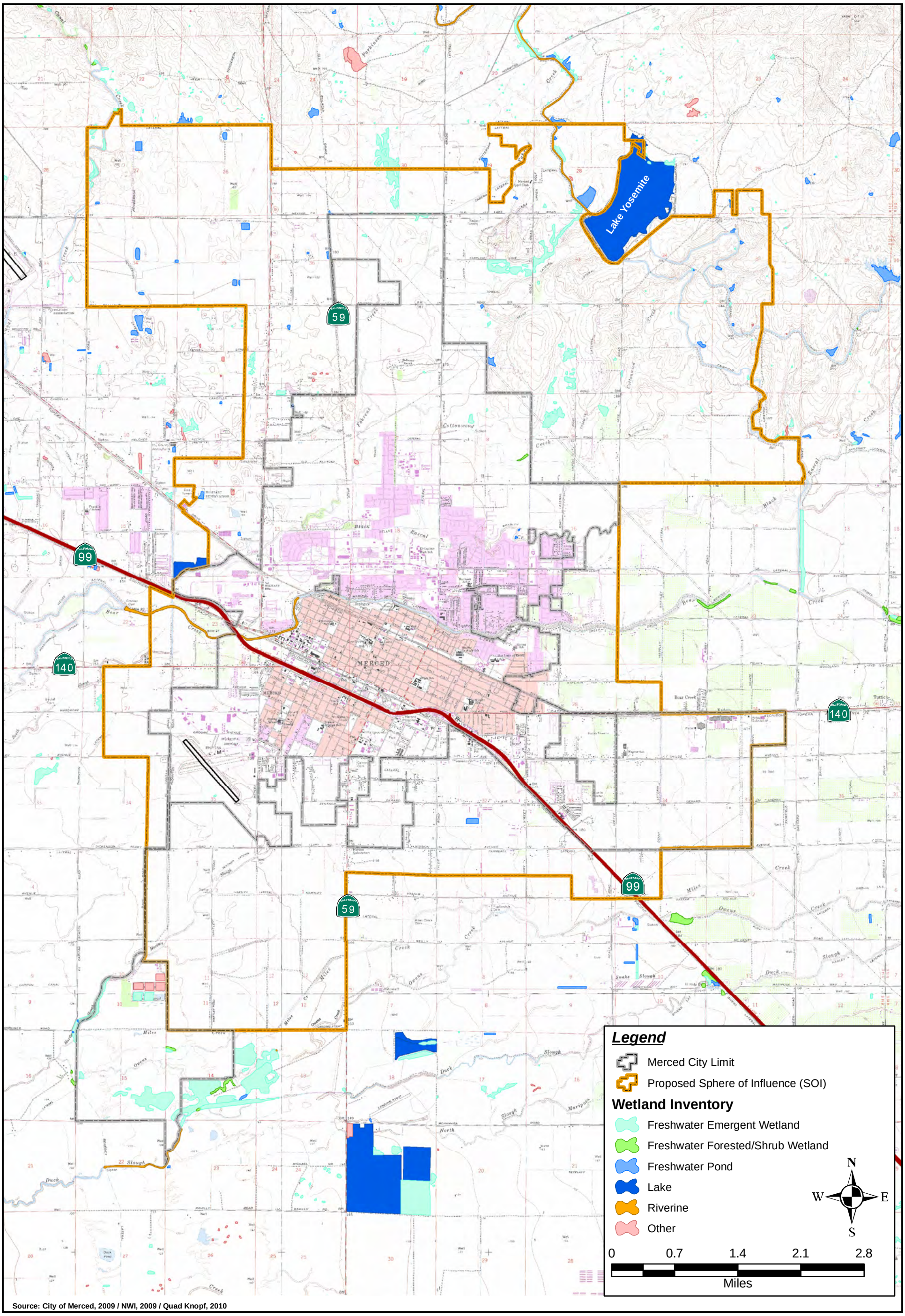
Irrigation Waters. There are numerous ditches, canals, and detention ponds scattered throughout the plan area that are used for delivering and storing irrigation water. Most of these features are devoid of vegetation with either a muddy or concrete substrate. Water level and flow is dependent on seasonal conditions and is not constant. Because of the intermittent usage, irrigation waters are not available as wildlife habitat year round; however, when in use they may be important for migrating and breeding wildlife.

Seasonal Wetlands (including vernal pools). Seasonal wetlands, including vernal pools, are scattered throughout the plan area with a high concentration in the northeast portion of the area (see Figure 3.4-1). Seasonal wetlands once dominated the landscape in the Central Valley, but now are largely segmented because of large scale agricultural activities and residential development. Seasonal wetlands are depressions in the land that fill with rain water in the rainy season and due to an impermeable substrate, hold water until it evaporates. Many plants and animals have evolved to specialize in this ecosystem and are therefore considered to be endangered because of declining populations resulting from habitat loss.

Riparian. Bear, Black Rascal, Cottonwood, Miles, and Owens Creeks form the main drainage systems flowing through the plan area. Stream-side vegetation varies depending on the location.

Willows (*Salix* spp.) and cattails (*Typha latifolia*) are the dominant plants in this habitat. Other plants occurring in this habitat include Fremont's cottonwood (*Populus fremontii*) and Himalayan blackberry (*Rubus discolor*). As is typical of this habitat type, the riparian areas on site are dense, shrub dominated plant communities highly associated with moist conditions and running water. Blue elderberry (*Sambucus mexicana*) shrubs, the host plant of the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), were observed along Bear Creek during the field survey.

Riparian areas are typically highly productive zones and provide excellent habitat for a wide variety of plants and animals. In addition to food and water, riparian habitats provide migration and dispersal corridors, roosting and thermal cover, and reproductive substrate.



Source: City of Merced, 2009 / NWI, 2009 / Quad Knopf, 2010

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
NATIONAL WETLANDS INVENTORY

Figure 3.4-1

Job No.: 060429

Bird species commonly associated with riparian habitat include northern flicker (*Colaptes auratus*), white-crowned sparrow (*Zonotrichia leucophrys)*, song sparrow (*Melospiza melodia)*, black phoebe (*Sayornis nigricans*), yellow-rumped warbler (*Dendroica coronata*), spotted towhee (*Pipilo erythrophthamnus*), and American goldfinch (*Carduelis tristis*). Common mammal species expected to occur in this habitat type include raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginiana*).

Open Water. Open water such as Yosemite Lake is located just outside of the plan area. Open water areas are important for migrating water fowl, as well as an important food source for wintering raptors.

Agriculture. There are five types of agriculture found within the SUDP/SOI. They are:

- ***Vineyards*.** There are several vineyards in the plan area.

- ***Orchards.*** Deciduous orchards in California are typically fruit tree monocultures of almonds, apricots, cherries, nectarines, peaches, pears, pecans, pistachios, plums, or walnuts. Depending on the tree type and pruning methods, they are usually low, bushy trees with an open understory to facilitate harvest. Trees range in height at maturity for many species from 15 to 30 feet. The understory is usually maintained and is composed of low-growing grasses, legumes, and other herbaceous plants. Herbaceous plants commonly growing in the understory consist of perennial grasses such as Bermuda grass (*Cynodon dactylon*) or johnsongrass (*Sorghum halepense*) and annual grasses such as soft brome (*Bromus hordeaceus*), red brome (*Bromus madritensis* ssp. *rebens*), and wild oat (*Avena fatua*).

- ***Irrigated Row Crops.*** Irrigated row crops consist of annual or perennial plants, usually planted in spring and harvested during summer or fall. Typical row crops of the area include cotton, milo, tomatoes, sugar beets, and leafy vegetables (lettuce and table greens). Unwanted vegetation growing between rows is reduced by tillage or the use of herbicides.

- ***Rice.*** Rice fields typically consist of large plots of land which are inundated with irrigation water during the growing season and left fallow after harvesting. Rice fields can be important foraging habitat for migrating waterfowl.

- ***Dairy/Cattle Feedlot.*** The plan area contains several dairies and/or cattle feedlots. These areas are composed mostly of bare ground and void of vegetation due to intensive use by cattle. In their operating state, dairies and cattle feedlots are not a highly valuable habitat to native plants and animals.

Annual Grassland. Non-native annual grassland habitat is scattered throughout the plan area in the following areas: Non-native annual grassland is dominated by non-native grasses. Annual and perennial herbaceous species, and some native grasses may occur. Common introduced grass species found in this community include wild oat (*Avena barbata*), Bermuda grass (*Cynodon dactylon*), rip-gut brome (*Bromus diandrus*), and Mediterranean barley (*Hordeum murinum* ssp. *Leporinum*). Native grasses that could occur in the study area include annual hairgrass (*Deschampsia danthonioides*), and oldfield three-awn (*Aristida oligantha*). Common

annual and perennial, non-native herbaceous species that occur in the SUDP/SOI area include filaree (*Erodium cicutarium*), bur clover (*Medicago polymorpha*), and smooth cat's-ear (*Hypochaeris glabrata*).

SPECIAL-STATUS SPECIES

Special-status species are: those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) under the Federal Endangered Species Act (FESA); those species listed or proposed for listing as rare, threatened, or endangered by the California Department of Fish and Game (CDFG) under the California Endangered Species Act (CESA); animals designated as "Species of Special Concern" (CSC) by the CDFG; animals designated "fully protected" by the California Fish and Game Code; migratory birds, including their nests, eggs, and young protected by the federal Migratory Bird Treaty Act (MBTA); those plant taxa cataloged in the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Vascular Plants of California*; and species may be considered and listed as "species of local concern" by local agencies (typically cities or counties) because of local or regional scarcity as determined by that agency (per Section 15380 of the California Environmental Quality Act (CEQA) Guidelines).

Plant taxa (or groups) considered for this document include species enumerated in the CNPS Lists 1, 2, 3, and 4. Even though many of these plants species may not have legal protections under federal and state regulations, they meet the criteria for listing as described in Section 15380 of the CEQA Guidelines. The CNPS code definitions are: List 1A species include those presumed extinct in California; List 1B species include those that are rare, threatened, or endangered in California and elsewhere; List 2 species include those that are rare, threatened, or endangered in California, but more common elsewhere; List 3 species is a review list for which necessary information is lacking; and List 4 species are of limited distribution or of infrequent distribution throughout their range and their vulnerability to threat appears low at this time.

Quad Knopf biologists developed a review list of special-status plant and animal species that could potentially occur on the proposed plan area. The entire review list is presented in Tables 3.4-1 and 3.4-2 below. The information in the table regarding special-status species was obtained from:

- The California Natural Diversity Database (CNDDB) (CDFG 2008a). Data query for the Atwater, El Nido, Haystack Mountain, Merced, Plainsburg, Planada, Sandy Mush, Winton, and Yosemite Lake USGS 7.5-minute quadrangles (Appendix D).

- Special Animals list (CDFG 2008b).

- Special Vascular Plants, Bryophytes, and Lichens List (CDFG 2008c).

- The USFWS (2008) list of Endangered and Threatened Species for the Atwater, El Nido, Haystack Mountain, Merced, Plainsburg, Planada, Sandy Mush, Winton, and Yosemite Lake USGS 7.5-minute quadrangles (Appendix E).

- The CNPS Online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2008). Data query for the Atwater, El Nido, Haystack Mountain, Merced, Plainsburg, Planada, Sandy Mush, Winton, and Yosemite Lake USGS 7.5-minute quadrangles (Appendix F).

The review list includes 59 species (26 plant and 33 animal species). The potential for occurrence of special status plant and animal species is ranked on the following criteria:

- **Absent:** Species have no potential to occur in the plan area because the species is restricted to habitats that do not occur on or adjacent to the plan boundaries; the plan area is located outside of the species' known distributional range; and/or the plan area is located out of the species' known elevational range.

- **Low:** Species with a low potential for occurrence are those for which the proposed plan area is on the boundary of the known distributional range; or those for which there are no known recorded occurrences of the species within 10 miles of the plan area and/or the habitat(s) needed to support the species are of poor or marginal quality.

- **Moderate:** Species with a moderate potential for occurrence are those for which the proposed plan area is within the known distributional range and for which there are known recorded occurrences of the species within 10 miles of the plan area, and the habitat(s) needed to support the species are present on site.

- **High:** Species with a high potential for occurrence are those for which the proposed plan area is within the known distributional range and for which there are known recorded occurrences of the species within five miles of the plan area, and habitats strongly associated with that species occur on the plan area.

Figures 3.4-2 and 3.4-3 depict the location of documented CNDDB occurrences on and around the plan area.

Special-Status Plant Species with Potential to Occur Within the Proposed Plan Area

Table 3.4-1
Special-Status Plant Species Reviewed for the Plan Area

Species*	Habitat Associations	Elevation	Status	Potential for Occurrence
Henderson's bent grass (*Agrostis hendersonii*)	Valley and foothill grassland (mesic); vernal pools	70-305 meters	List 3.2	**High**. Occurrence has been recorded within the proposed plan area.
Alkali milk-vetch (*Astragalus tener* var. *tener*)	Playas; valley and foothill grassland on adobe clay soil; vernal pools habitats. Grows on alkaline soil.	1-60 meters	List 1B.2	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.

Species*	Habitat Associations	Elevation	Status	Potential for Occurrence
Heartscale (*Atriplex cordulata*)	Chenopod scrub; meadows and seeps; valley and foothill grassland (sandy). Saline or alkaline soil.	1-375 meters	List 1B.2	**Absent**. No longer exist in plan area.
Brittlescale (*Atriplex depressa*)	Chenopod scrub; meadows and seeps; playas; valley and foothill grassland; vernal pools. Alkaline, clay soil.	1-320 meters	List 1B.2	**Absent.** No longer exist in plan area.
San Joaquin spearscale (*Atriplex joaquiniana*)	Chenopod scrub; meadows and seeps; playas; valley and foothill grassland. Alkaline soil	1-835 meters	List 1B.2	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Lesser saltscale (*Atriplex minuscula*)	Chenopod scrub; meadows and seeps; playas; valley and foothill grassland; vernal pools. Alkaline, sandy soil.	15-200 meters	List 1B.1	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Vernal pool smallscale (*Atriplex persistens*)	Vernal pools. Alkaline soil.	10-115 meters	List 1B.2	**High**. Occurrence has been recorded within the proposed plan area.
Subtle orache (*Atriplex subtilis*)	Valley and foothill grassland.	40-100 meters	List 1B.2	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Hoover's calycadenia (*Calycadenia hooveri*)	Cismontane woodland; valley and foothill grassland. Rocky soil.	40-100 meters	List 1B.3	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Succulent owl's-clover (*Castilleja campestris* ssp. *succulenta*)	Vernal pools. Often acidic soil.	50-750 meters	List 1B.3 FE, CE	**High**. Occurrence has been recorded within the proposed plan area.
Beaked clarkia (*Clarkia rostrata*)	Cismontane woodland; valley and foothill grassland.	60-500 meters	List 1B.3	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Recurved larkspur (*Delphinium recurvatum*)	Chenopod scrub, cismontane woodland, valley and foothill grasslands. Alkaline soil.	3-750 meters	List 1B.2	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.

Species*	Habitat Associations	Elevation	Status	Potential for Occurrence
Dwarf downingia (*Downingis pusilla*)	Valley and foothill grasslands (mesic); vernal pools. Alklaline soil.	1-445 meters	List 2.2	**High**. Occurrence has been recorded within the proposed plan area.
Delta button-celery (*Eryngium racemosum*)	Riparian scrub (vernally mesic clay depressions)	3-30 meters	List 1B.1	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Spiny-sepaled button-celery (*Eryngium spinosepalum*)	Valley and foothill grasslands; vernal pools	80-255 meters	List 1B.2	**High**. Occurrence has been recorded within one mile of the proposed plan area.
Boggs Lake hedge-hypssop (*Gratiola heterosepala)*	Marshes and swamps (lake margins); vernal pools. Clay soil.	10-2,375 meters	CE, List 1B.2	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Pincushion navarretia (*Navarretia myersii* ssp. *myersii*)	Vernal pools. Often acidic soil	20-330 meters	List 1B.1	**Low**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles. Known from less than 20 occurrences.
Shining navarretia (*Navarretia nigelliformis* ssp. *radians*)	Cismontane woodlands; valley and foothill grasslands; vernal pools	90-1,000 meters	List 1B.2	**High**. Occurrence has been recorded within the proposed plan area
Prostrate navarretia (*Navarretia prostrata*)	Coastal scrub; meadows and seeps; valley and foothill grassland; and vernal pools	15-700 meters	List 1B.1	**Moderate**. Moderate. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.
Colusa grass (*Neostapfia colusana*)	Vernal pools. Large pools with adobe soil.	5-200 meters	List 1B.2	**High**. Occurrence has been recorded within the proposed plan area.
San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)	Vernal pools	10-755 meters	List 1B.1	**High**. Occurrence has been recorded within 5 miles of the proposed plan area.
Hairy Orcutt grass (*Orcuttia pilosa*)	Vernal pools	55-200 meters	List 1B.1	**High**. Occurrence has been recorded within the proposed plan area

Species*	Habitat Associations	Elevation	Status	Potential for Occurrence
Merced phacelia (*Phacelia ciliate* var. *opaca*)	Valley and foothill grassland. Clay soil, sometimes alkaline.	60-150 meters	List 1B.2	**High**. Occurrence has been recorded within the proposed plan area
Sanford's arrowhead (*Sagittaria sanfordii*)	Marshes and swamps (assorted shallow freshwater)	0-650 meters	List 1B.2	**High**. Occurrence has been recorded within the proposed plan area
Keck's checkerbloom (*Sidalcea keckii*)	Cismontane woodlands; valley and foothill grasslands. Serpentinite, clay soil.	120-425 meters	List 1B.1	**High**. Occurrence has been recorded within the proposed plan area
Greene's tuctoria (*Tuctoria greenei*)	Vernal pools	30-1,070 meters	List 1B.1	**Moderate**. Potential habitat within the plan area. Nearest recorded occurrence within 10 miles.

Abbreviations:

Federal

FE Federal Endangered Species
FT Federal Threatened Species

State

CE California Endangered Species
CR California Rare Species
CT California Threatened Species

CNPS

List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened or Endangered in California, but more common Elsewhere
List 3 Plants about which we need more information – Review List

- 0.1 - Seriously threatened in California (high degree/immediacy of threat)
- 0.2 - Fairly threatened in California (moderate degree/immediacy of threat)
- 0.3 - Not very threatened in California (low degree/immediacy of threats or no current threats known)

Source: CNDDB (2008), USFWS Endangered & Threatened Species List (2008), CNPS Inventory of Rare and Endangered Plants (2008)
* Nomenclature follows Hickman (1993)

Plant Species Accounts

Below are species accounts for all the plant species considered to have at least a low potential or higher for occurrence within the plan area. Species reviewed and removed from further consideration do not have a corresponding account below.

Henderson's bent grass (*Agrostis hendersonii*) is an annual herb occurring in mesic valley and foothill grasslands and vernal pool habitats. Its status is shown on List 3.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 70 to 305 meters. The blooming period is from April to May. Occurrence has been recorded within the plan area near Yosemite Lake.

Alkali milk-vetch *(Astragalus tener var. tener)* is an annual herb occurring in playas, valley and foothill grassland on adobe clay soil, and vernal pools habitats. Its status is shown on List 1B.2

Legend

- Merced City Limit
- Proposed Sphere of Influence (SOI)
- 5 Mile Radius
- 10 Mile Radius

CNDDB Occurrences

- Boggs Lake hedge-hyssop
- Colusa grass
- Delta button-celery
- Greene's tuctoria
- Henderson's bent grass
- Hoover's calycadenia
- Hoover's spurge
- Keck's checkerbloom
- Merced phacelia
- Northern Claypan Vernal Pool
- Northern Hardpan Vernal Pool
- San Joaquin Valley orcutt grass
- San Joaquin spearscale
- Sanford's arrowhead
- alkali milk-vetch
- beaked clarkia
- dwarf downingia
- hairy orcutt grass
- heartscale
- lesser saltscale
- pincushion navarretia
- prostrate navarretia
- recurved larkspur
- shining navarretia
- spiny-sepaled button-celery
- subtle orache
- succulent owl's-clover
- vernal pool smallscale

N W E S

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Miles

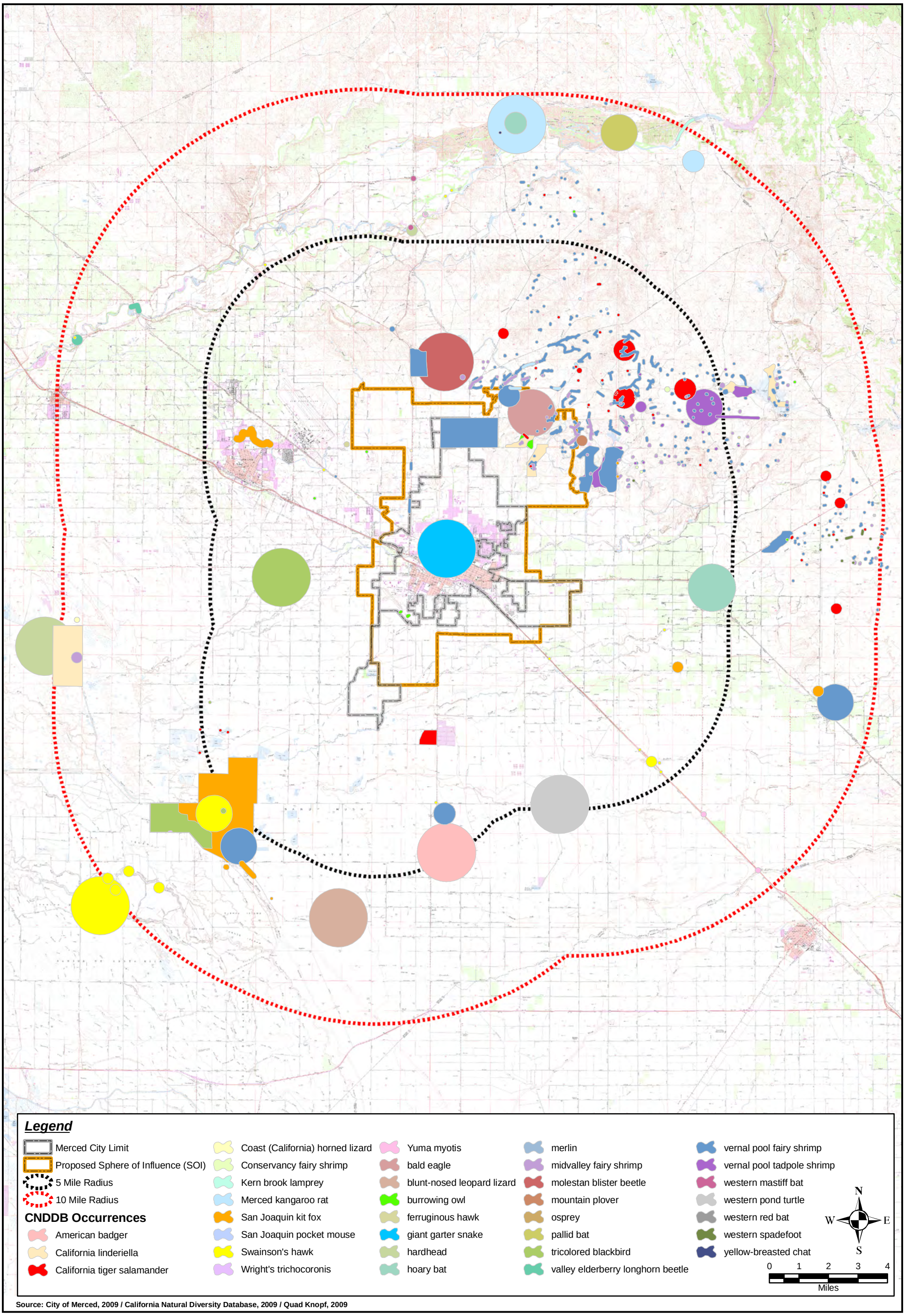
Source: City of Merced, 2009 / California Natural Diversity Database, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CNDDB OCCURRENCES - PLANTS

Figure 3.4-2

Job No.: 060429



Source: City of Merced, 2009 / California Natural Diversity Database, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CNDDB OCCURRENCES - WILDLIFE

Figure 3.4-3

Job No.: 060429

of the CNPS Inventory of Rare and Endangered Plants. It typically grows on alkaline soil. The elevation range is from 1 to 60 meters. The blooming period is from March to June. Alkali milk-vetch has been recorded within 10 miles of the plan area.

San Joaquin spearscale *(Atriplex joaquiniana)* is an annual herb occurring in Chenopod scrub, meadows and seeps, playas, and valley and foothill grassland habitats. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. It typically grows on alkaline soil. The elevation range is from 1 to 835 meters. The blooming period is from April to October**.** San Joaquin spearscale has been recorded within 10 miles of the plan area.

Lesser saltscale *(Atriplex miniscula)* is an annual herb occurring in Chenopod scrub, playas, and valley and foothill grassland habitats. Its status is shown on List 1B.1 of the CNPS Inventory of Rare and Endangered Plants. It typically grows in alkaline, sandy soil. The elevation range is from 15 to 200 meters. The blooming period is from May to October. Lesser saltscale has been recorded within 10 miles of the plan area.

Vernal pool *smallscale (Atriplex persistens)* is an annual herb occurring in vernal pool habitats with alkaline soil. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 10 to 115 meters. The blooming period is from June to October. Vernal pool smallscale has been recorded within the plan area.

Subtle orache *(Atriplex subtilis)* is an annual herb occurring in valley and foothill grassland habitats. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 40 to 100 meters. The blooming period is from June to August, sometimes extending into October. Subtle orache has been recorded within 10 miles of the plan area.

Hoover's calycadenia *(Calycadenia hooveri)* is an annual herb occurring in Cismontane woodland and valley and foothill grassland habitats. Its status is shown on List 1B.3 of the CNPS Inventory of Rare and Endangered Plants. It typically grows in rocky soil. The elevation range is from 65 to 300 meters. The blooming period is from July to September. Hoover's calycadenia has been recorded within 10 miles of the plan area.

Succulent owl's-clover *(Castilleja campestris ssp. succulenta)* is an annual herb occurring in vernal pool habitats. Its status is shown on List 1B.3 of the CNPS Inventory of Rare and Endangered Plants. It is also both a Federal and California Endangered Species. The elevation range is from 50 to 750 meters. The blooming period is from April to May. Succulent owl's-clover has been recorded within the plan area.

Beaked clarkia *(Clarkia rostrata)* is an annual herb occurring in cismontane woodland and valley and foothill grassland habitats. Its status is shown on List 1B.3 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 60 to 500 meters. The blooming period is from April to May. Beaked clarkia has been recorded within 10 miles of the plan area.

Recurved larkspur *(Delphinium recurvatum)* is an annual herb occurring in chenopod scrub, cismontane woodland, and valley and foothill grassland habitats. Its status is shown on List 1B.2

of the CNPS Inventory of Rare and Endangered Plants. It typically grows on alkaline soil. The elevation range is from 3 to 750 meters. The blooming period is from June to August, sometimes extending into October. Recurved larkspur has been recorded within five miles of the project area.

Dwarf downingia *(Downingia pusilla)* is an annual herb occurring in valley and foothill grassland and vernal pool habitats. Its status is shown on List 2.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 1 to 445 meters. The blooming period is from March to May. Dwarf downingia has been recorded within the plan area.

Delta button-celery *(Eryngium racemosum)* is an annual/perennial herb occurring in riparian scrub habitats with vernally mesic clay depressions. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 3 to 30 meters. The blooming period is from June to September. Delta button-celery has been recorded within 10-miles of the plan area.

Spiny-sepaled button-celery *(Eryngium spinosepalum)* is an annual/perennial herb occurring in valley and foothill grassland and vernal pool habitats. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range: 80 to 255 meters. The blooming period is from April to May. Spiny-sepaled button-celery has been recorded within five miles of the plan area. Species is known from approximately 20 occurrences.

Boggs Lake hedge-hyssop *(Gratiola heterosepala)* is an annual herb occurring in along the margins of marshes and swamps and vernal pool habitats. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. It is also a California Endangered Species. It typically grows on clay soil. The elevation range is from 10 to 2,375 meters. The blooming period is from April to August. Boggs Lake hedge-hyssop has been recorded within ten miles of the plan area.

Pincushion navarretia *(Navarretia myersii ssp. myersii*) is an annual herb occurring in vernal pool habitats that often have acidic soil. Its status is shown on List 1B.1 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 20 to 330 meters. The blooming period is in May. Pincushion navarretia has been recorded within 10-miles of the plan area. Species is known from fewer than twenty occurrences.

Shining navarretia *(Navarretia nigelliformis ssp. radians)* is an annual herb occurring in cismontane woodland, valley and foothill grassland, and vernal pool habitats. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 90 to 1,000 meters. The blooming period is from May to July. Shining navarretia has been recorded within the plan area.

Prostrate navarretia *(Navarretia prostrata)* is an annual herb occurring in coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pool habitats. Its status is shown on List 1B.1 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 15 to 700 meters. The blooming period is from April to July. Prostrate navarretia has been recorded within 10 miles of the plan area.

Colusa grass *(Neostapfia colusana)* is an annual herb occurring in large vernal pool habitats that often have adobe soil. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 5 to 200 meters. The blooming period is from May to August. Colusa grass has been recorded within the plan area. Species is known from fewer than twenty occurrences.

San Joaquin Valley orcutt grass *(Orcuttia inaequalis)* is an annual herb occurring in vernal pool habitats. Its status is shown on List 1B.1 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 10 to 755 meters. The blooming period is from April to September. San Joaquin Valley orcutt grass has been recorded within five miles of the plan area (see Figure 3.4-4).

Hairy orcutt grass *(Orcuttia pilosa)* is an annual herb occurring in coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pool habitats. Its status is shown on List 1B.1 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 15 to 700 meters. The blooming period is from April to July. Hairy orcutt grass has been recorded within ten miles of the plan area (see Figure 3.4-5).

Merced phacelia *(Phacelia ciliate var. opaca)* is an annual herb occurring in valley and foothill grassland habitats, sometimes on alkaline soil. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 60 to 150 meters. The blooming period is from February to May. Merced phacelia has been recorded within the plan area.

Sanford's arrowhead *(Sagittaria sanfordii)* is an annual herb occurring in assorted shallow freshwater marshes and swamp habitats. Its status is shown on List 1B.2 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 0 to 650 meters. The blooming period is from May to October. Sanford's arrowhead has been recorded within the plan area.

Keck's checkerbloom *(Sidalcea keckii)* is an annual herb occurring in cismontane woodland, valley and foothill grassland habitats. Its status is shown on List 1B.1 of the CNPS Inventory of Rare and Endangered Plants. It typically grows on serpentinite or clay soil. The elevation range is from 120 to 425 meters. The blooming period is from April to May. Keck's checkerbloom has been recorded within the plan area. Species is known from only three occurrences.

Greene's tuctoria *(Tuctoria greenei)* is an annual herb occurring in vernal pool habitats. Its status is shown on List 1B.1 of the CNPS Inventory of Rare and Endangered Plants. The elevation range is from 30 to 1,070 meters. The blooming period is from May to July, sometimes extending into September. Green's tuctoria has been recorded within 10 miles of the plan area (see Figure 3.4-6).

Special-Status Wildlife Species with Potential to Occur Within the Proposed Plan Area

Table 3.4-2
Special-Status Wildlife Species Reviewed for the Plan Area

Species*	Habitat Association	Status	Potential for Occurrence
Invertebrates			
Conservancy fairy shrimp (*Branchinecta conservatio*)	Seasonal pools and ponds	FE	**Moderate—**Suitable habitat on site. Occurs in the area.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	Seasonal pools and ponds	FT	**High.** Occurrence has been recorded in the proposed plan area.
Midvalley fairy shrimp (*Branchinecta mesovallensis*)	Seasonal pools and ponds	none	**High.** Occurrence has been recorded in the proposed plan area.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	Elderberry shrubs	FT	**Moderate.** Elderberry shrubs within the plan area. Nearest recorded occurrence within 10 miles.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Seasonal pools and ponds	FE	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 5 miles.
California linderiella (*Linderiella occidentalis*)	Seasonal pools and ponds	None	**High.** Occurrence has been recorded in the proposed plan area.
Molestan blister beetle (*Lytta molesta*)	The Molestan blister beetle occurs in vegetation surrounding vernal pools.	None	**High.** Occurrence has been recorded in the proposed plan area.
Fish			
Hardhead (*Mylopharodon conocephalus*)	Sacramento and San Joaquin river drainages.	CSC	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 10 miles.
Amphibians			
California tiger salamander (*Ambystoma californiense*)	Seasonal pools and ponds	FE, CSC	**High.** Occurrence has been recorded in the proposed plan area.
Western spadefoot toad (*Spea hammondii*)	Seasonal pools and ponds	CSC	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 5 miles.
Reptiles			
Western pond turtle (*Actinemys marmorata*)	Riverine environments, seasonal pools, and ponds	CSC	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 5 miles.
Blunt-nosed leopard lizard (*Gambelia sila*)	Sparsely vegetated alkali and desert scrub habitats	FE, CE	**Absent.** No longer exist in plan area

Species*	Habitat Association	Status	Potential for Occurrence
Coast horned lizard (*Phrynosoma coronatum*)	Grasslands, scrublands, and woodlands. Highly associated with sandy soil and ant colonies.	CSC	**Absent.** No longer exist in plan area
Giant garter snake (*Thamnophis gigas*)	Streams, marshes, and irrigation ditches with open basking sites	FT, CT	**Low.** Occurrence has been recorded in the proposed plan area.
Birds			
Tricolored blackbird (*Agelaius tricolor*)	Freshwater marshes and grasslands	CSC, MBTA	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 5 miles.
Burrowing owl (*Athene cunicularia*)	Open, dry grasslands	CSC, MBTA	**High.** Occurrence has been recorded in the proposed plan area.
Ferruginous hawk (*Buteo regalis*)	Wintering range	WL, MBTA	**Low.** Suitable wintering foraging habitat on site. Nearest recorded occurrence within 5 miles.
Swainson's hawk (*Buteo swainsoni*)	Grasslands and riparian areas	CE, MBTA	**High.** Occurrence has been recorded in the proposed plan area.
Mountain plover (*Charadrius montanus*)	Wintering range	CSC, MBTA	**High.** Occurrence has been recorded in the proposed plan area.
Northern harrier (*Circus cyaneus*)	Grasslands, open country, and marshes	CSC, MBTA	**High**. Observed on site during field surveys.
White-tailed kite (*Elanus leucurus*)	Open grasslands, marshes, and riparian areas	FP	**High.** Observed on site during field surveys.
Merlin (*Falco columbarius*)	Winter range.	WL, MBTA	**Low.** Uncommon winter visitor to the area.
Bald eagle (*Haliaeetus leucocephalus*)	Riverine and lake habitats	CE, MBTA	**High.** Within wintering range. Species observed during field survey.
Loggerhead shrike (*Lanius ludovicianus*)	Open grasslands	CSC, MBTA	**High.** Species observed on site during survey.
Osprey (*Pandion haliaetus*)	Wintering range	CSC, MBTA	**High.** Occurrence has been recorded in the proposed plan area.
Mammals			
Merced kangaroo rat (*Dipodomys heermanni dixoni*)	Grasslands and oak savannah habitats.	None	**High.** Occurrence has been recorded in the proposed plan area.
Western mastiff bat (*Eumops perotis californicus*)	Associated with riparian woodlands and rocky chaparral. Roosts on cliffs.	CSC	**High.** Occurrence has been recorded in the plan area.

Species*	Habitat Association	Status	Potential for Occurrence
Western red bat (*Lasiurus blossevillii*)	Highly associated with deciduous woodlands and riparian zones. Forages over open areas and along forest edges. Solitary roosting bat. Roosts mainly in trees.	CSC	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 10 miles.
Hoary bat (*Lasiurus cinereus*)	Highly associated with both deciduous and coniferous forests. Forages over aquatic features such as streams and ponds. Roosts in caves, trees, and buildings.	None	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 5 miles.
Yuma myotis (*Myotis yumanensis*)	Primarily an inhabitant of desert regions where it is most commonly encountered in lowland habitats near open water, where it prefers to forage. It roosts in caves, abandoned mine tunnels, and buildings	None	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 10 miles.
San Joaquin pocket mouse (*Perognathus inornatus inornatus*)	Dry grasslands and desert scrub, usually in sandy soils.	None	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 10 miles.
American badger (*Taxidea taxus*)	Dry, open grasslands and the edges of pastures and farmlands.	CSC	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 10 miles.
San Joaquin kit fox (*Vulpes macrotis mutica*)	The San Joaquin kit fox occurs in open, dry, grassland, shrub, and open forest habitats on the floor of the San Joaquin Valley and surrounding foothills	FE, CT	**Moderate.** Suitable habitat on site. Nearest recorded occurrence within 10 miles.

Abbreviations:

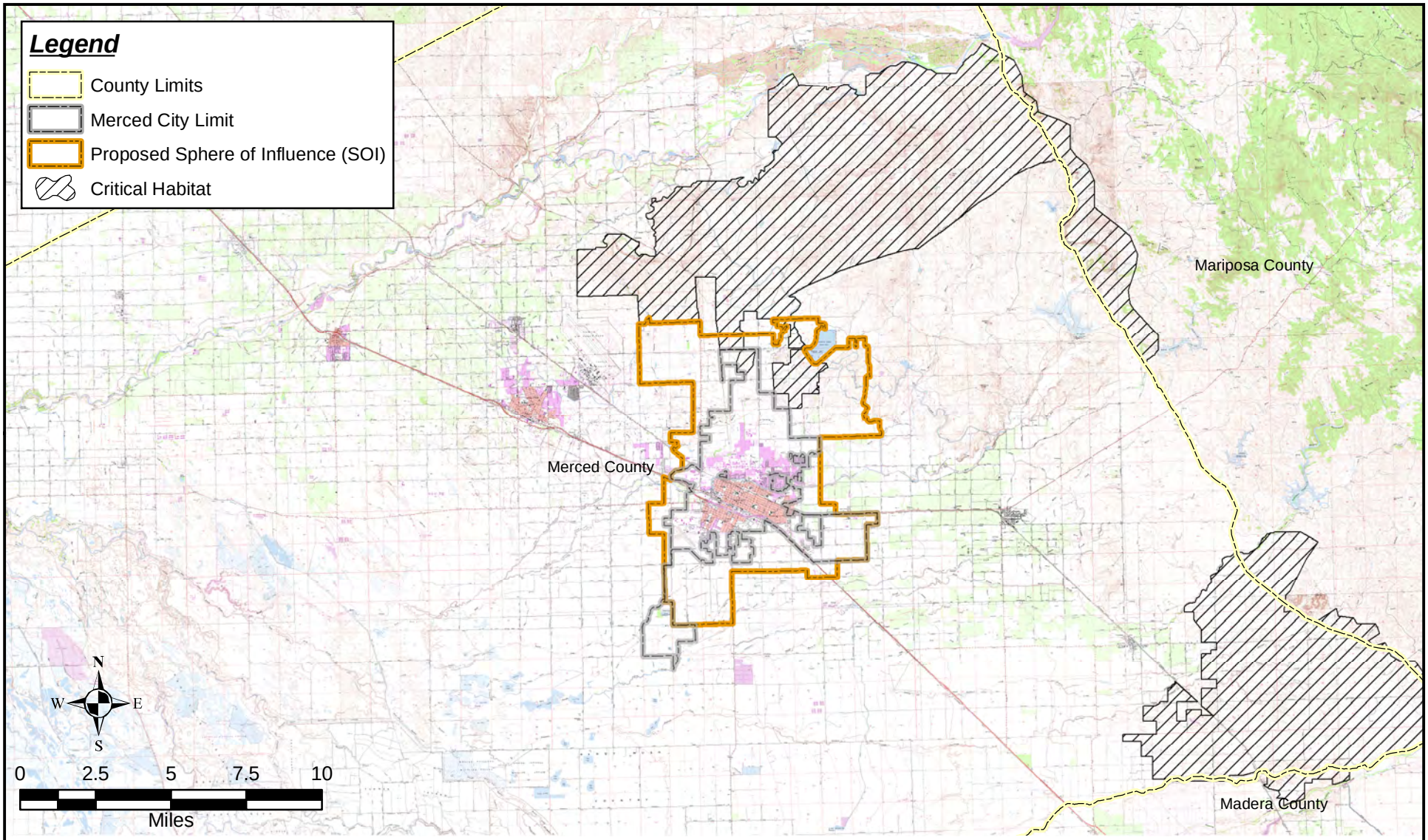
Federal

FE Federal Endangered Species
FT Federal Threatened Species
MBTA Species Protected under the auspices of the Migratory Bird Treaty Act

State

CE California Endangered Species
CT California Threatened Species
CSC California Department of Fish and Game Species of Special Concern
WL California Department of Fish and Game Watch List
FP California Department of Fish and Game Fully Protected Species

Source: CNDDB (2008) and USFWS Endangered and Threatened Species List (2008)
* Nomenclature follows A.O.U. (1998), Baker et al. (2003), Crother (2001, 2003), and Nelson et al. (2004)



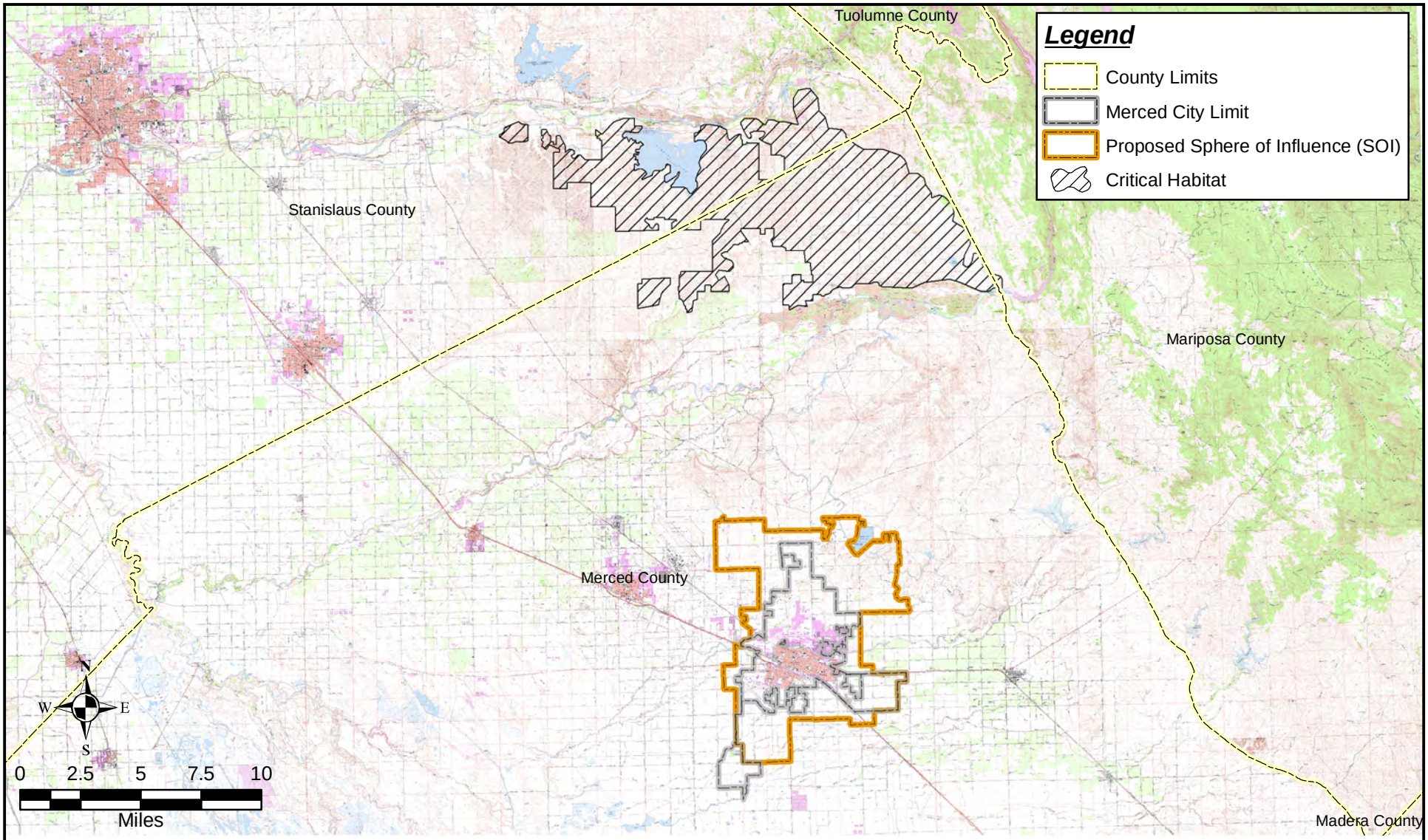
Source: U.S. Fish and Wildlife Service, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
SAN JOAQUIN VALLEY ORCUTT GRASS CRITICAL HABITAT MAP

Figure 3.4-4

Job No.: 060429



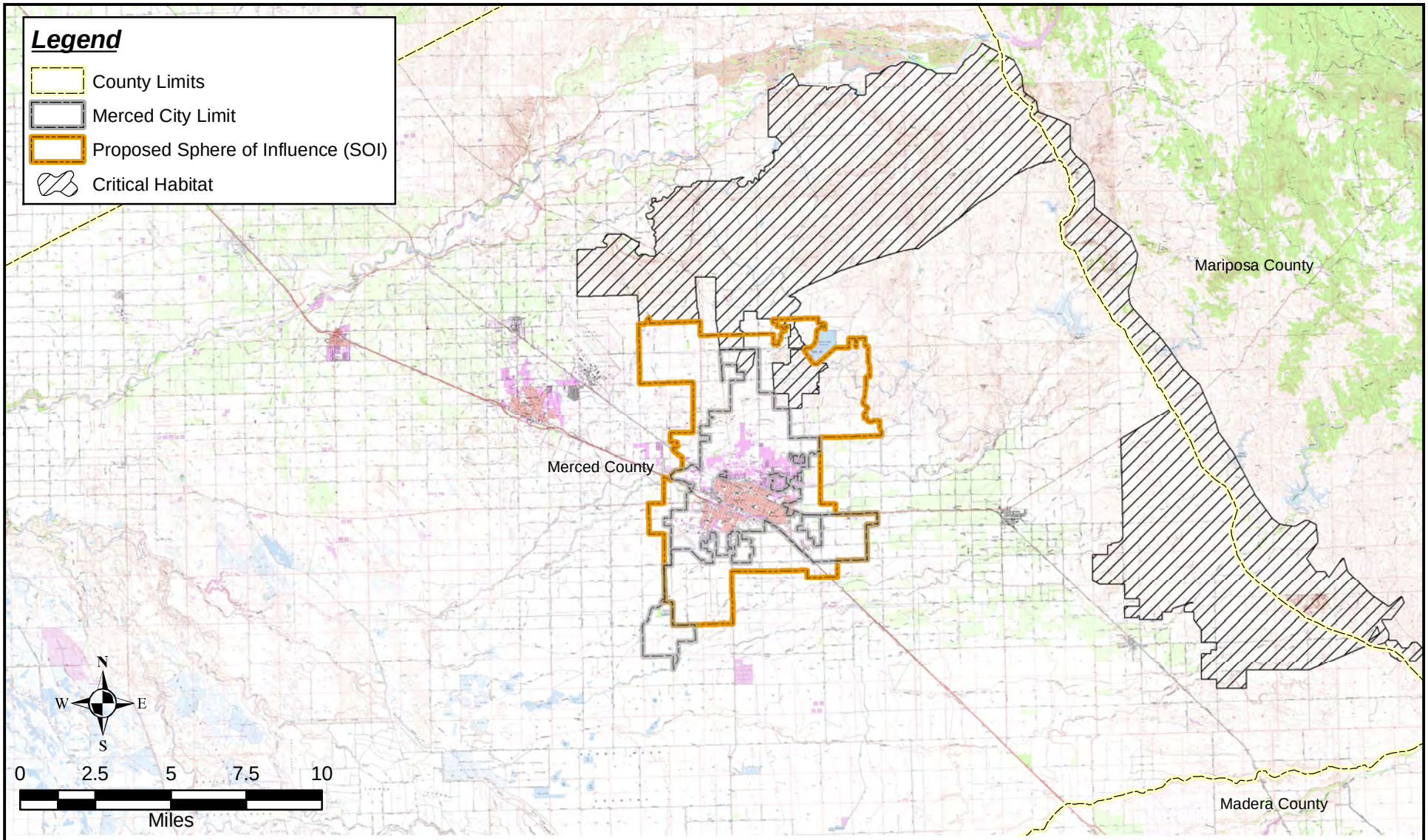
Source: U.S. Fish and Wildlife Service, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
HAIRY ORCUTT GRASS CRITICAL HABITAT MAP

Figure 3.4-5

Job No.: 060429



Source: U.S. Fish and Wildlife Service, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
GREEN TUCTORIA CRITICAL HABITAT MAP

Figure 3.4-6

Job No.: 060429

Wildlife Species Accounts

Below are species accounts for all the wildlife species considered to have at least a low potential or higher for occurrence within the plan area. Species accounts are not provided for those species that were determined to be absent from the plan area.

Conservancy fairy shrimp *(Branchinecta conservatio).* Conservancy fairy shrimp was designated as an endangered species on September 19, 1994 (Federal Register 59:48136). Critical habitat for this species was originally designated on August 6, 2003 and revised on August 11, 2005. Species by unit designations were published on February 10, 2006 (Federal Register 71:7117). Critical habitat for this species occurs within the boundaries of the plan area (see Figure 3.4-7).

The Conservancy fairy shrimp is currently known from six disjunct populations: Vina Plains in Tehama County; south of Chico in Tehama County; Jepson Prairie in Solano County; Sacramento National Wildlife Refuge in Glenn County; near Haystack Mountain northeast of Merced in Merced County; and the Lockewood Valley of northern Ventura County. This species inhabits large pools (such as the 36 hectare Olcott Lake at Jepson Prairie). Occurrences have been recorded within 10 miles of the plan area.

There are vernal pools in the plan area that potentially support this species; however, given the range of the species, its unique habitat requirements, and the failure of other surveys in the vicinity of the project site to locate this species in nearby areas, it is unlikely that this species occurs on the project site. Nonetheless, any pools occurring within the plan area that exhibit seasonal hydrology and which could support listed shrimp species should undergo formal presence/absence surveys.

Vernal pool fairy shrimp *(Branchinecta lynchi).* Vernal pool fairy shrimp was designated as threatened in its entire range on September 19, 1994 (Federal Register 59:48136-48153). Critical habitat for this species was designated on August 6, 2003 (Federal Register 68: 46683-46867).

The vernal pool fairy shrimp is a small aquatic crustacean that ranges in size from ½ to one inch long. Fairy shrimp feed on algae, bacteria, protozoa, rotifers and bits of detritus. The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. It tends to occur in smaller pools (less than 0.05-acre) that are most commonly found in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands. It has also been collected in large vernal pools (e.g. 25 acres). Vernal pool fairy shrimp have been collected from early December to early May (USFWS 1994).

The female drops eggs to the pool bottom or the eggs remain in the brood sac until the mother dies and sinks. When the pool dries out, so do the eggs (known as cysts when dry). They remain in the dry pool bed until rains and other environmental stimuli hatch them. Cysts can withstand heat, cold and prolonged desiccation. When the pools refill, some, but not all, of the cysts may hatch. The cyst bank in the soil may contain cysts from several years of breeding. Average time

to maturity is only forty-one days. In warmer pools, it can be as little as eighteen (Eriksen and Belk 1999).

The vernal pool fairy shrimp is widespread but not abundant. Known populations extend from Shasta County through most of the length of the Central Valley to Tulare County. Along the central coast, they range from northern Solano County to Pinnacles National Monument in San Benito County. Four additional, disjunct populations exist in Southern California. The ephemeral wetlands that support this network of populations are remnants of what was formerly a pristine vernal pool ecosystem, which has been converted to primarily agricultural and urban uses. Occurrences have been recorded within ten miles of the plan area (see Figure 3.4-8).

There are vernal pools in the plan area that potentially support this species. Pools occurring within the plan area that exhibit seasonal hydrology and which could support listed shrimp species should undergo formal presence/absence surveys.

Midvalley fairy shrimp *(Branchinecta mesovallensis).* The midvalley fairy shrimp currently has no federal protection, but does meet the requirements in CEQA as a rare, threatened or endangered species.

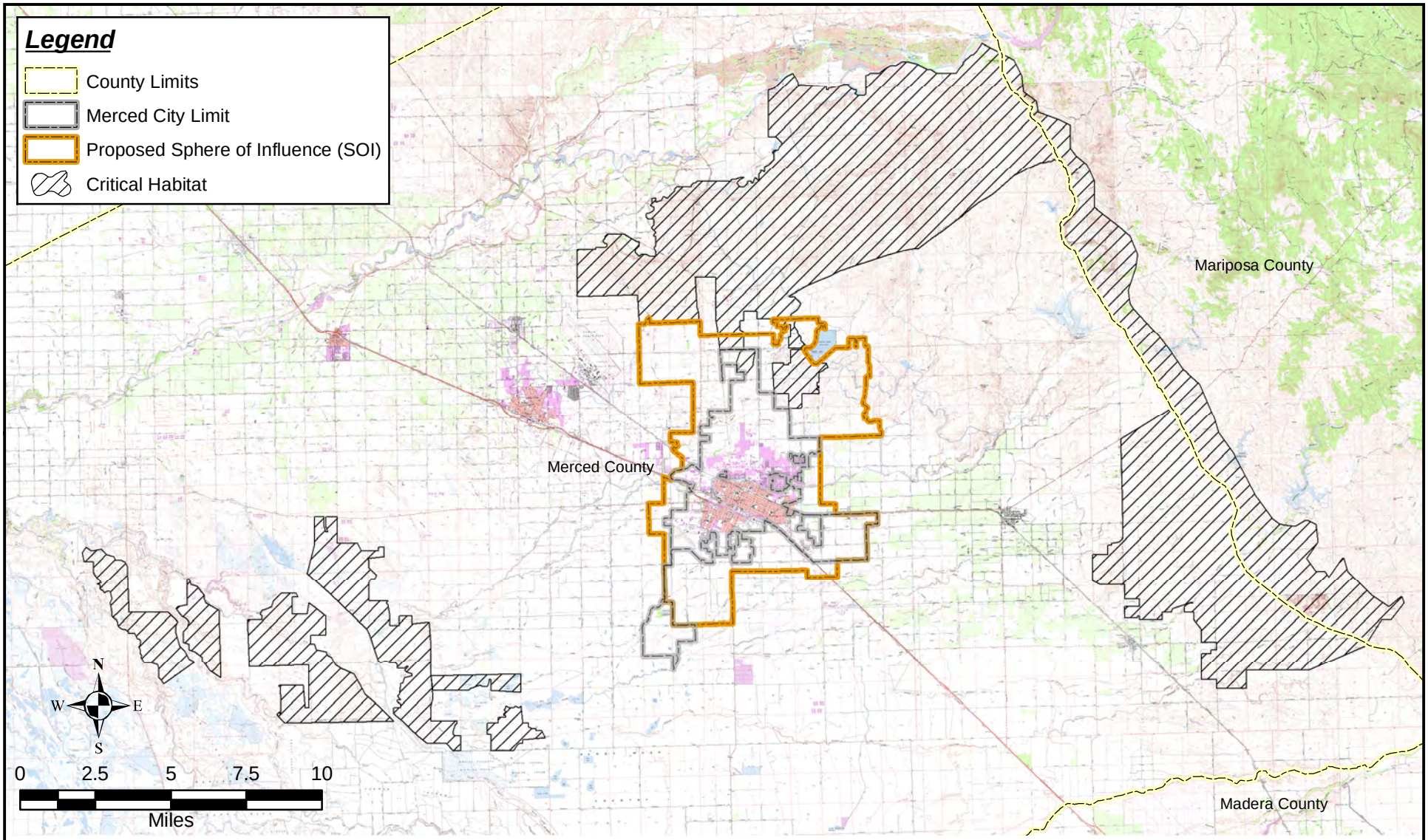
The midvalley fairy shrimp is closely related to three other federally listed species—vernal pool fairy shrimp, Conservancy fairy shrimp, and longhorn fairy shrimp. It is a recent discovery and was not described to science until 2000 (Belk and Fugate 2000).

Midvalley fairy shrimp are endemic to California Central Valley grassland vernal pools. Known occurrences are scattered in the Central Valley from Sacramento County south to Fresno County. Typical habitat for this species includes small, shallow, ephemeral vernal pools and swales. They are adapted to habitats that are inundated for short periods and appear to be able to complete a life cycle (cyst to adult with fertilized eggs) in as little as four days.

Midvalley fairy shrimp are threatened by the same activities that threaten other vernal pool invertebrates, namely, the conversion of vernal pool habitat to agriculture and development. Because of their limited and disjunct distribution, midvalley fairy shrimp are especially vulnerable to reductions in vernal pool habitat. Occurrences have been recorded within ten miles of the plan area.

There are vernal pools in the plan area that potentially support this species. Pools occurring within the plan area that exhibit seasonal hydrology and which could support listed shrimp species should undergo formal presence/absence surveys.

Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus).* Elderberry shrubs are present along South Slough, Black Rascal Creek, and Bear Creek and there is the potential for the valley elderberry longhorn beetle (VELB) to occur within the plan area. VELB is federally listed as threatened and is known to occur in association with its host plant, blue elderberry shrubs. Elderberry shrubs are a common component of riparian forests and adjacent upland habitats throughout the Central Valley and surrounding foothills (USFWS 1999). The use of the elderberry plant by VELB, a wood borer, is rarely apparent. Often, the only evidence of the



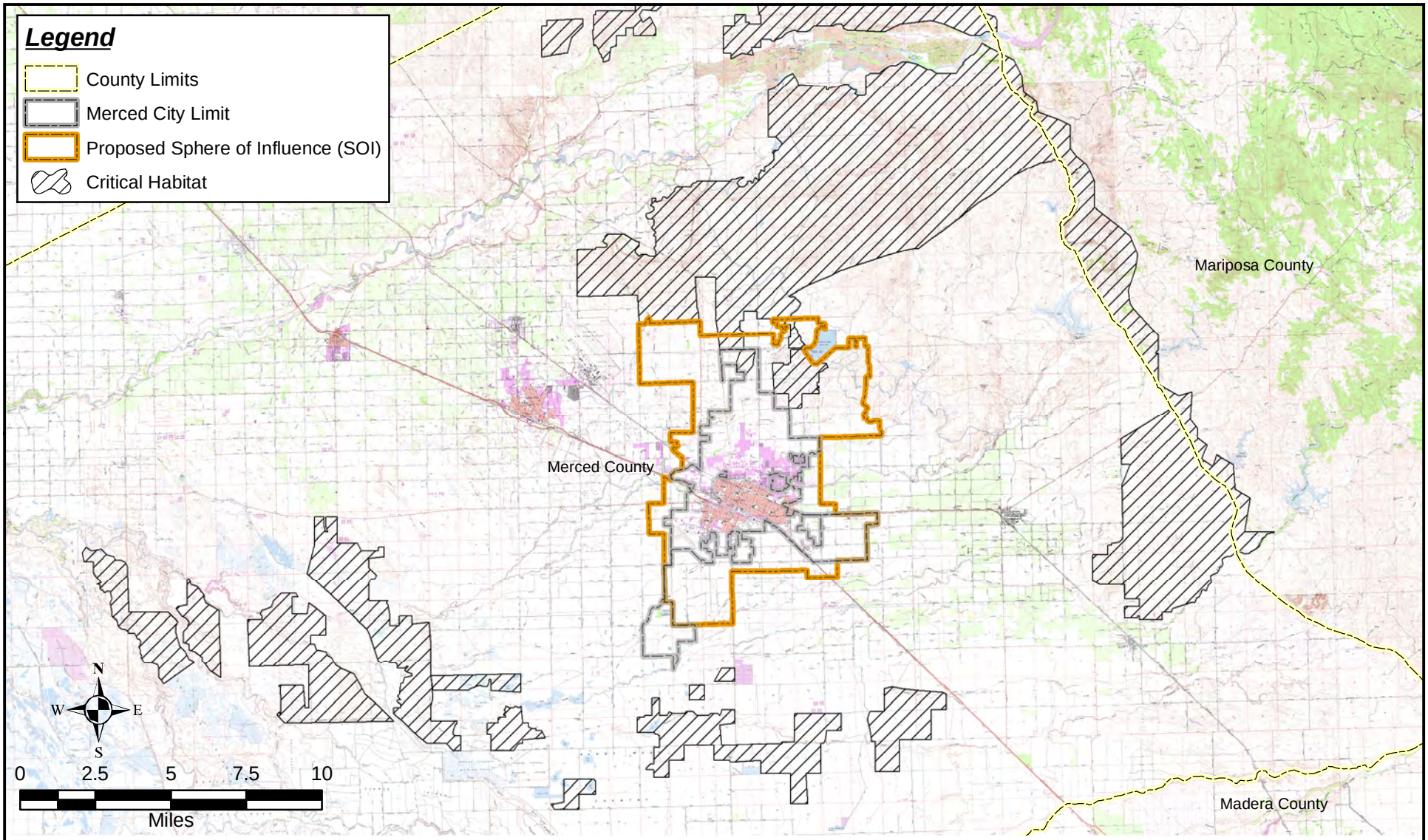
Source: U.S. Fish and Wildlife Service, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
CONSERVANCY FAIRY SHRIMP CRITICAL HABITAT MAP

Figure 3.4-7

Job No.: 060429



Source: U.S. Fish and Wildlife Service, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
VERNAL POOL FAIRY SHRIMP CRITICAL HABITAT MAP

Figure 3.4-8

Job No.: 060429

elderberry's use is an exit hole created by the larva just prior to the pupal stage. There are four stages in the VELB's life: egg, larva, pupa, and adult. The VELB spends most of its life in the larval stage, living within the stems of an elderberry plant (USFWS 1999). Females lay their eggs in May on the bark of elderberry plants. After hatching, approximately 10 days later, the larvae burrow into the stems where they will feed on the interior wood for one to two years. The larvae then enter the pupal stage and transform into the adult stage, which is short-lived. Adults are active from March through early June.

A protocol-level survey for VELB has not been conducted; therefore, it is unknown if the elderberry shrubs show indications of potential presence of VELB.

Occurrences of VELB have been recorded within ten miles of the plan area. Site-specific surveys should be conducted for this species prior to disturbance of potentially suitable habitat.

Vernal pool tadpole shrimp *(Lepidurus packardi).* Vernal pool tadpole shrimp was designated as threatened in its entire range on September 19, 1994 (Federal Register 59:48136-48153). Critical habitat for this species was designated on August 6, 2003 (Federal Register 68: 46683-46867).

The vernal pool tadpole shrimp is a small crustacean whose adults reach approximately two inches in length. Vernal pool tadpole shrimp require seasonally aquatic habitats that are wet for at least seven weeks and dry in summer. They occur in a variety of natural and artificial seasonally inundated habitats including vernal pools, seasonal wetlands, alkaline pools, clay flats, vernal swales, stockponds, railroad right-of-way pools, roadside ditches, and road rut pools resulting from vehicular activity. Occupied pools and wetlands typically have highly turbid waters or aquatic vegetation that may provide shelter from predators. They also have been observed in clear waters. Tadpole shrimp climb or scramble over objects, as well as plowing along or within bottom sediments. Their diet consists of organic debris and living organisms, such as fairy shrimp and other invertebrates.

The life history of the vernal pool tadpole shrimp is linked to the seasonal cycle of the vernal pool. After winter rainwater fills the pool, the population is reestablished from cysts that lie dormant in the dry pool sediments. Sexually mature adults have been observed in vernal pools three to four weeks after the pools had been filled. Some cysts hatch immediately and the others remain dormant in the soil to hatch during later rainy seasons.

The vernal pool tadpole shrimp is known from 19 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, from a small population near the Napa County airport, and from a single vernal pool complex on the San Francisco Bay National Wildlife Refuge in the City of Fremont, Alameda County. The ephemeral wetlands that support this network of populations are remnants of what was formerly a pristine vernal pool ecosystem, but which has been converted to mainly agricultural and urban uses. This highly disturbed remnant habitat is imperiled by a variety of human-caused activities, primarily urban development, water supply and flood control projects, and agriculture. Rapid urbanization of the Central Valley of California currently poses the most

severe threat to the continued existence of the listed vernal pool crustaceans. Occurrences have been recorded within ten miles of the plan area (see Figure 3.4-9).

There are vernal pools in the plan area that potentially support this species. Pools occurring within the plan area that exhibit seasonal hydrology and which could support listed shrimp species should undergo formal presence/absence surveys.

California linderiella *(Linderiella occidentalis).* The California fairy shrimp, also known as the California linderiella, is a small crustacean in the Linderiellidae family. The California fairy shrimp is the most common fairy shrimp in the Central Valley. It has been documented on most land forms, geologic formations and soil types supporting vernal pools in California, at altitudes as high as 3,800 feet above sea level.

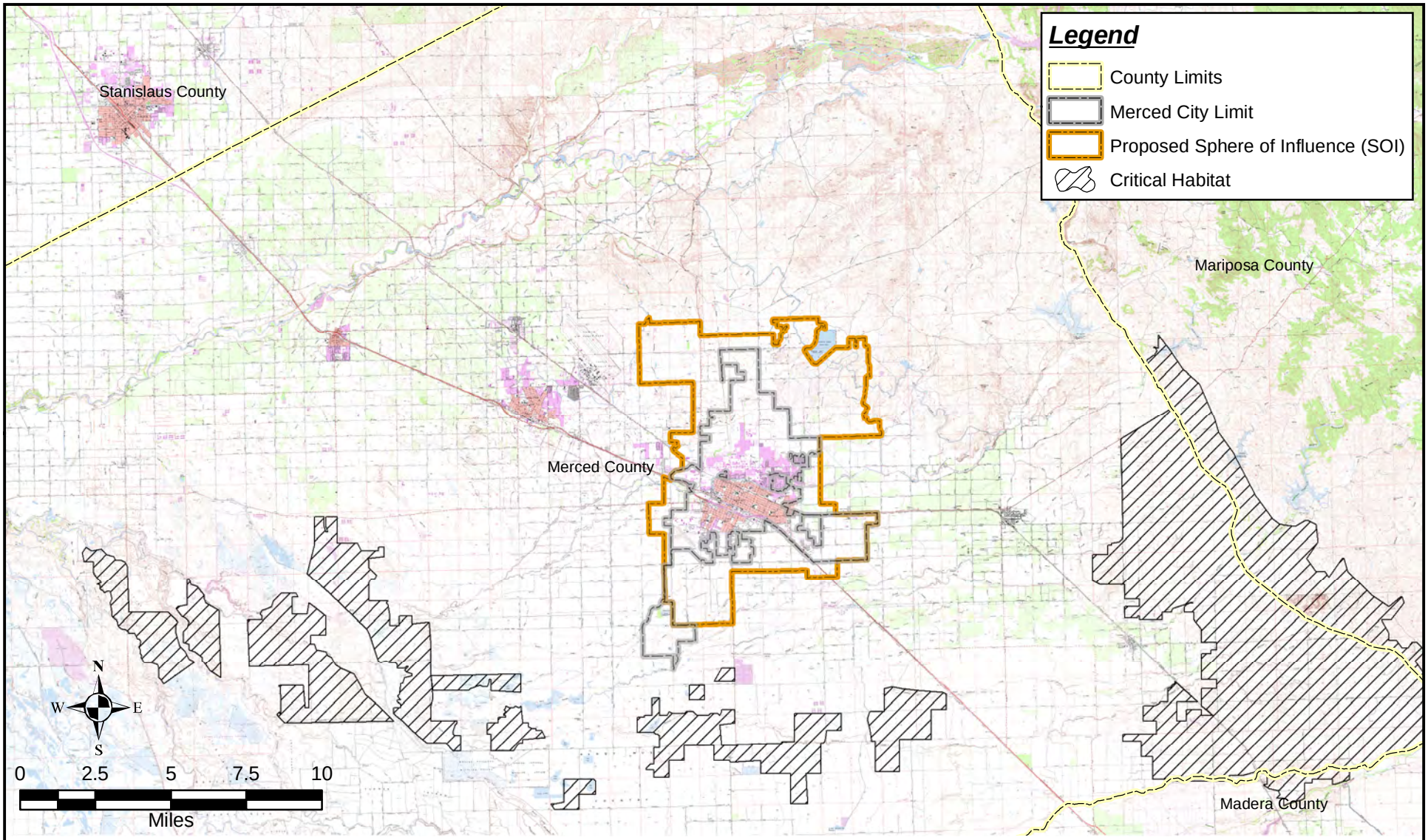
Fairy shrimp are aquatic species in the order Anostraca. They have delicate, elongated bodies, large stalked compound eyes, no carapaces and eleven pairs of swimming legs. They glide gracefully upside down, swimming by beating their legs in a complex, wavelike movement that passes from front to back. Fairy shrimp feed on algae, bacteria, protozoa, rotifers and bits of detritus.

California fairy shrimp tend to live in large, fairly clear vernal pools and lakes; however, they can survive in clear to turbid water with pH from 6.1 to 8.5, and they have been found in very small pools. They are tolerant of water temperatures from 41° to 85° F, making them the most heat tolerant fairy shrimp in California.

Female fairy shrimp carry their eggs in a ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the mother dies and sinks. When the pool dries out, so do the eggs. They remain in the dry pool bed until rains and other environmental stimuli hatch them. Resting fairy shrimp eggs are known as cysts. They are capable of withstanding heat, cold and prolonged desiccation. When the pools refill, some, but not all, of the cysts may hatch. The cyst bank in the soil may contain cysts from several years of breeding. Average time to maturity is about forty-five days. Thirty-one seems to be the minimum time required, which is the longest minimum for any Central Valley fairy shrimp. (Eriksen and Belk 1999). Adults have been collected from late December to early May. Occurrences have been recorded within ten miles of the plan area.

There are vernal pools in the plan area that potentially support this species. Pools occurring within the plan area that exhibit seasonal hydrology and which could support listed shrimp species should undergo formal presence/absence surveys.

Molestan blister beetle *(Lytta molesta).* The natural history of the molestan blister beetle is largely unknown. It is one of about 15 species in the blister beetle genus *Lytta* that occur in the Central Valley of California, primarily in the San Joaquin Valley. Adult beetles feed on the petals and pollen of various food plants that typically grow in valley grassland and vernal pool habitats. These same plants are also visited by *Anthophora* bees, which serve as hosts for developing larvae of blister beetles.



Source: U.S. Fish and Wildlife Service, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
VERNAL POOL TADPOLE SHRIMP CRITICAL HABITAT MAP

Figure 3.4-9

Job No.: 060429

Historical occurrences have been recorded within ten miles of the plan area.

Hardhead *(Mylopharodon conocephalus).* The hardhead is a California Species of Special Concern. The hardhead is a large, robust minnow (Cypriniformes: Cyprinidea) reaching lengths of nearly one meter in size. They are widely distributed in the Sacramento-San Joaquin River drainages, the Russian River drainages, and the Napa River drainages.

Hardhead are bottom-feeders that forage for benthic invertebrates and aquatic plants. They prefer rock or sandy-bottomed pools in streams and rivers. Although their reproductive behavior is not well documented, they appear to spawn in the spring in the foothill streams of the Sacramento-San Joaquin River system. Juveniles feed primarily on mayfly and caddisfly larvae. They tend to be absent when centrarchids (sunfish and bass) are present.

Occurrences have been recorded within ten miles of the plan area.

California tiger salamander *(Ambystoma californiense).* The California tiger salamander is endemic to California. Historically, the California tiger salamander probably occurred in grassland habitats throughout much of the state. Habitat conversion has reduced the species' range and decreased breeding populations (Stebbins 1985).

Currently, the California tiger salamander occurs in the Central Valley and Sierra Nevada foothills from Yolo County or Colusa County south to Tulare County, and in the coastal valleys and foothills from Sonoma County south to Santa Barbara County (Zeiner et al. 1988). Isolated populations are found at the Gray Lodge Wildlife Area in Butte County (Jennings et al. 1994) and at Grass Lake in Siskiyou County (Zeiner et al. 1988). Most populations occur at elevations below 1,500 feet, but tiger salamanders have been recorded at elevations up to 4,500 feet. Although populations have declined, the species continues to breed at a relatively large number of locations in its range (59 FR 18353-18354, April 18, 1994).

The California tiger salamander is terrestrial as an adult and spends most of its time underground in small-mammal burrows, emerging only for brief periods to breed. Adults are predators, eating earthworms, snails, insects, fish and small mammals. California tiger salamanders can overwinter in burrows as much as 0.75 mile from their breeding site (Jennings and Hayes 1994). Breeding occurs in both seasonal pools and permanent bodies of water. Adults migrate en masse to breeding sites during warm rains, primarily between November and March; California tiger salamanders may not reproduce during years of low rainfall (Jennings et al. 1994). Juveniles disperse from aquatic breeding sites to grassland habitats after metamorphosis.

California tiger salamanders inhabit valley and foothill grasslands and open woodlands, usually within one mile of water (Jennings and Hayes 1994). Tiger salamanders breed in reservoirs, ponds, vernal pools, small lakes and slow-flowing streams that do not support predatory fish or bullfrogs (Zeiner et al. 1988). Adult salamanders migrate from grassland habitats to aquatic breeding sites during the first major rainfall events of fall and early winter and return to grassland habitats after breeding. This species requires small-mammal (e.g., California ground squirrel) burrows for cover during the nonbreeding season and during migration to and from

aquatic breeding sites (Zeiner et al. 1988). California tiger salamanders also use logs, piles of lumber and shrink-swell cracks in the ground for cover.

California tiger salamander populations have declined primarily because of the widespread conversion of valley and foothill grassland and oak woodland habitats to agricultural and urban uses (Stebbins 2003). Residential development in the California tiger salamander's range has fragmented vernal pool complexes and reduced habitat suitability for the species. The introduction of the bullfrog and nonnative fishes has also contributed to declines in tiger salamander populations because bullfrogs and nonnative fishes prey on tiger salamander larvae and may eliminate larval populations from breeding sites (Jennings and Hayes 1994).

Occurrences have been recorded within five miles of the plan area (see Figure 3.4-10).

Western spadefoot toad *(Spea hammondii).* The western spadefoot toad is a California Species of Special Concern. The western spadefoot toad is a medium-sized toad (up to 2.5 inches long, not including legs) and one of five spadefoot toads occurring in the western United States. It is greenish gray on it's dorsal side and has small, but distinctive, spade-shaped protuberances on each hind foot, which is used for digging burrows. They are highly associated with grassland ecosystems, but also occur in open chaparral, pine-oak woodlands, and even in vineyards and orchards.

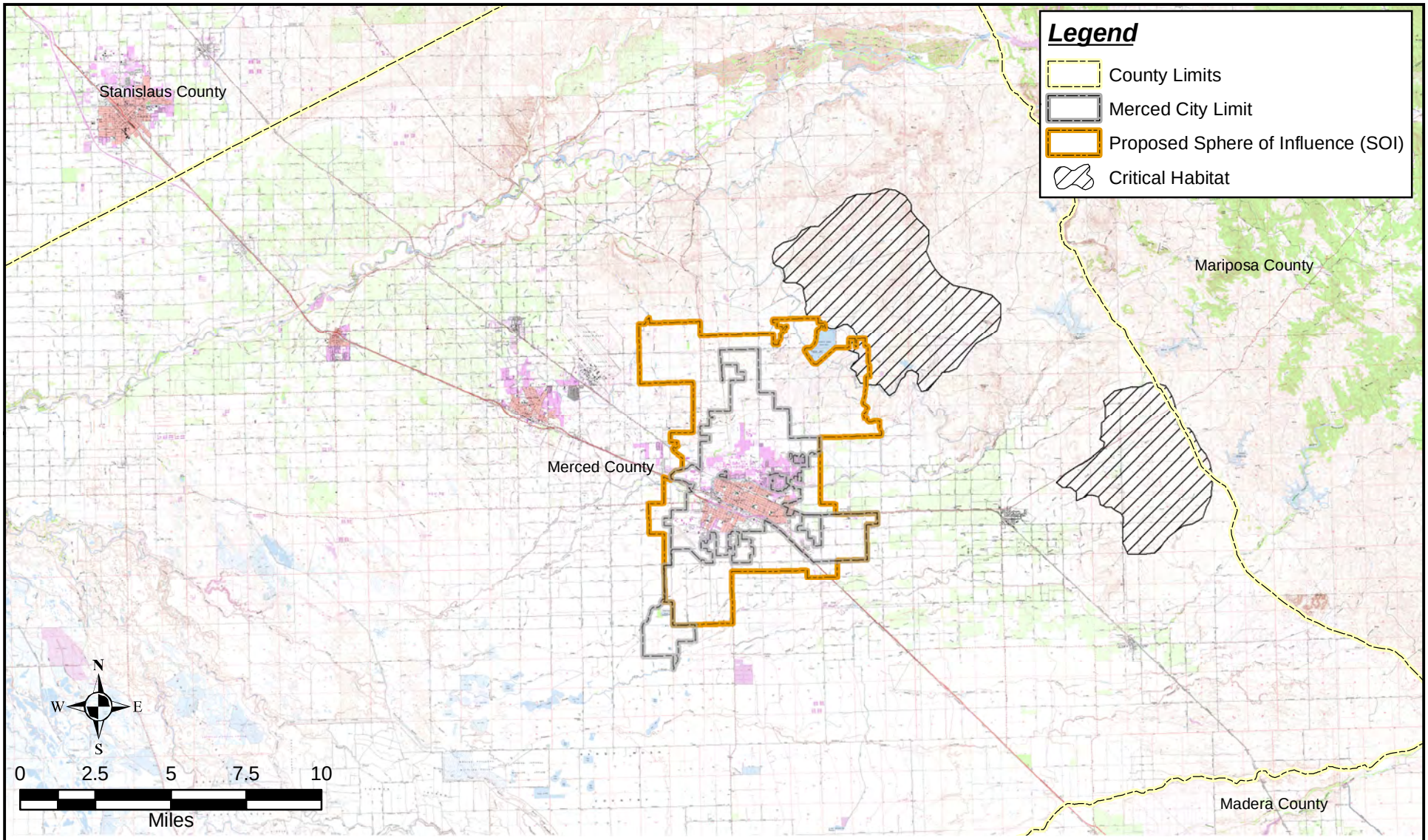
Adult spadefoots spend the majority of their lives underground in burrows they construct themselves, coming out to forage at night after rains or a period of high humidity. Spadefoots feed primarily on worms and insects, especially Lepidoptera (butterflies and moths) and Coleoptera (beetles).

Breeding season typically occurs from late winter to the end of March, but breeding activities can occur earlier in mild conditions. They breed in season wetlands, vernal pools and stock ponds. Eggs hatch in less than a week and usually reach metamorphosis and disperse within four weeks of hatching (Zeiner et al. 1988, Stebbins 2003).

Western spadefoots occur from the Sacramento Valley south through the San Joaquin Valley and the adjacent foothills of the Sierra Nevada and South Coast Ranges. South of the Coast Range it is found along the South Coast and Peninsular Ranges. They are uncommon in the south and uncommon to locally common in the northern portion of its range.

Occurrences have been recorded within five miles of the plan area.

Western pond turtle *(Actinemys marmorata).* Northwestern pond turtles are medium-sized (up to 8.5 inches long) aquatic turtles with an olive brown or blackish brown carapace (dorsal shell). Plastron (belly) markings range from no markings to dark brown blotches. Being a thoroughly aquatic turtle, they are highly associated with permanent ponds, lakes, reservoirs, canals, and low-gradient streams. While adults are habitat generalists, hatchlings and first year young require shallow, warm-water habitats with emergent vegetation. They occur in a wide variety of terrestrial habitats below 6,000 feet in elevation as long as there is a permanent water source.



Source: U.S. Fish and Wildlife Service, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CALIFORNIA TIGER SALAMANDER CRITICAL HABITAT MAP

Figure 3.4-10

Job No.: 060429

Northwestern pond turtles require upland sites in the vicinity of aquatic habitats for oviposition (process of laying eggs). Nest sites include sandy banks, but typically are dug (~ 4 inches deep) in dry soils with a high clay or silt content and are usually within 200 meters of water. Eggs are laid from March to August depending on local conditions and clutch size varies from three to twelve eggs. Incubation takes from about 70 to 90 days. In warmer areas of central and southern California, hatchlings may emerge in the fall, but most hatchlings overwinter and emerge in the spring.

In California, northwestern pond turtles occur west of the Cascade-Sierra crest to the coast and from between the northern border of the state south through the Transverse and Peninsular Ranges of southern California. They are common to uncommon in the northern parts of their range and are rare or locally common in the southern portion of their distribution.

Occurrences have been recorded within five miles of the plan area.

Giant garter snake *(Thamnophis gigas).* The giant garter snake is a California and federally threatened species. The giant garter snake inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley. Habitat requirements consist of an adequate water source during the snake's active season (early-spring through mid-fall) to provide food and cover, emergent, herbaceous wetland vegetation, such as cattails and bulrushes for escape cover and foraging habitat during the active season, grassy banks and openings in waterside vegetation for basking and higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter. Giant garter snake is a fully aquatic species of snake and dependent upon a permanent water source. Upland habitat used by the snake includes adjacent areas located up to 200-feet from the aquatic habitat. Although snakes typically move little from day to day, some have been documented as moving up to five (5) miles over the period of a few days.

One occurrence has been documented within the plan area. The occurrence was documented within the City of Merced; however, the exact location in the City is unknown and the record is from 1908. Although this is an old record, potential habitat exists within the plan area. Site-specific surveys should be conducted for this species prior to disturbance of potentially suitable habitat.

Tricolored Blackbird *(Agelaius tricolor).* The tricolored blackbird is a California Species of Special Concern." A gregarious species, the tricolored blackbird is typically found near freshwater, particularly near marsh habitat. Loss of wetland habitats is regarded as the principal factor responsible for this species population decline.

Nesting colonies are typically found in stands of cattail (*Typha* spp.) and bulrush (*Scirpus* spp.), although they are also known to utilize blackberry patches (*Rubus* sp.) and thistle clumps (*Cirsium* spp. and *Cynara* spp.) adjacent to water. Flooded lands, margins of ponds, and grassy fields in summer and winter provide typical foraging habitat for this species.

Occurrences have been recorded within five miles of the plan area.

Burrowing owl *(Athene cunicularia).* The burrowing owl is a California Species of Special Concern. Burrowing owls are small, ground-dwelling raptors that nest and forage in open grasslands, prairies, and farmlands. They are distinguished by their long legs and are approximately 9 to 10 inches in length. Adults are boldly spotted and barred with females being darker in coloration than the males. They nest in small mammal burrows, most frequently in the burrows of California ground squirrels (*Spermophilus beecheyi*).

Burrowing owls are primarily crepuscular in their foraging habits, but will hunt for insects and small vertebrates during both day and night.

Breeding season begins in March and April and extends through August. Average clutch size is 5 or 6 eggs and they rarely produce a second brood. Where site conditions are optimal, burrowing owls sometimes form loose colonies, which is unusual for avian predators (Haug et al. 1993).

Burrowing owls are summer residents in the western half of the United States and year-round residents in the southwestern portion of the U.S. and northern and central Mexico. In California, they inhabit the lowlands of the Central Valley and the desert environments of southeastern part of the state. Although burrowing owls still exist in most portions of their historic range, their population densities have declined due to habitat loss, degradation, and fragmentation.

Occurrences have been recorded within ten miles of the plan area.

Ferruginous hawk *(Buteo regalis).* The ferruginous hawk is a California Species of Special Concern. It is the largest buteo (soaring hawk) in North America. They are a broad-winged hawk with a large head, wide gape, and robust chest (24 inches in length and 56 inch wingspan). They are polymorphic in plumage, with light-morph individuals being much more common than dark-morphs. Ferruginous hawks are birds of the arid southwest and favor very open and dry country such as dry grasslands, rangelands, saltbush flats, sagebrush plains, and desert areas.

Ferruginous hawks exhibit a higher degree of stenophagy (utilizing a small variety of prey species) than other buteos. Diet consists almost entirely of rabbits (*Lepus* and *Sylvilagus* spp.) west of the Rocky Mountains and prairie dogs (*Cynomys* spp.) and ground squirrels (*Spermophilus* spp.) east of the continental divide. Population levels are related to prey density.

Breeding season typically runs from March though August. Breeding pairs usually produce a single brood per season with clutch size averaging three eggs (Bechard and Schmutz 1995, Clark and Wheeler 2001).

Ferruginous hawks are distributed generally in western North America from the Great Plains of southern Canada to northern Mexico. They are summer residents and permanent residents in the Great Basin, Colorado Plateau, and the steppes of the northern Great Plains. Winters in the southwestern United States and northern Mexico. They winter in low densities in the Modoc Plateau, the Central Valley, and the desert areas of southern California. Ferruginous hawks are uncommon and populations have declined throughout much of the 20th century, but current demographic trends appear stable.

Occurrences have been recorded within five miles of the plan area.

Swainson's hawk *(Buteo swainsoni).* The Swainson's hawk is a California threatened species. The Swainson's hawk is a large, slender Buteo (soaring hawk) of the open plains, prairies, and ranchlands. Sexes are similar in size and average 19 inches in total length with an average wingspread of 51 inches. This species occurs in three different color morphs—light, dark, and rufous colored morphs. They are long-distance migrants—nearly the entire summer breeding population moves from central North America to winter grounds in the pampas of South America, primarily Argentina.

Swainson's hawks forage in open plains and grassland ecosystems. They also forage in agricultural areas containing crops of hay, grain, and certain low growing row crops. During the summer breeding season, and while they are feeding young, Swainson's hawks prey mostly on small vertebrates, but the diet shifts to large arthropods (especially grasshoppers and dragonflies) during much of the rest of the year.

Swainson's hawks typically nest in solitary, mature trees such as oaks, cottonwoods, willows, and eucalyptus. Nests are often near or in riparian corridors and are usually constructed near foraging areas. Swainson's hawks exhibit high nest fidelity, returning to the same nest year after year. The breeding season begins in late March and lasts through August. Clutch size averages two to four eggs and they produce only one brood per season (England et al. 1997).

Swainson's hawks are summer residents of the plains and prairies of the western half of the United States and in the southern prairies of Canada. Summer distribution in California is mainly confined to the Sacramento Valley, the northern half of the San Joaquin Valley, and Northeastern Plateau of Lassen and Modoc Counties.

The California Swainson's Hawk Inventory: 2005-2006 is a collaborative research project directed by CDFG and the UC Davis Wildlife Health Center to inventory the current population levels of Swainson's hawk statewide. The goal of the study is to provide a robust estimate of the number of breeding pairs in California, which in turn will provide state and federal agencies with information necessary to make informed decisions regarding development and growth (see *California Swainson's Hawk Inventory: 2005-2006, Final Report, May 31, 200*7). Results of the inventory revealed that Merced County contains an estimated 174 pairs of Swainson's.

Occurrence of Swainson's hawk has been recorded within the plan area.

Mountain plover *(Charadrius montanus*). The mountain plover is a California Species of Special Concern. It is a medium-sized shore bird highly associated with shortgrass prairies and open plains with scattered vegetation. They breed in the high plains east of the Rocky Mountains and winter in the southwestern United States. Over 60% of the entire mountain plover population winters in the California Central Valley each year (Shuford and Gardali 2008, Knopf 1996).

The mountain plover is primarily an insectivorous bird. Beetles, grasshoppers, and crickets make up the majority of their diet. They forage (often in flocks) in open habitats often with little on no vegetation.

Winter occurrences have been recorded within the plan area.

Northern harrier *(Circus cyaneus).* The northern harrier is a California Species of Special Concern. This raptor is also protected under California Fish and Game Code Section 3503.5, which protects nesting raptors and their eggs/young. The Northern Harrier (formerly called the marsh hawk) is a white-rumped, medium-sized (17 to 23 inches in length), and low-flying raptor of open grasslands and freshwater marshes. It is the only member in North America of the cosmopolitan genus *Circus*, and breeds throughout North America and Eurasia. It is the most northerly breeding and most broadly distributed of all harriers and is a long-distance migrant throughout much of its range. They are strongly sexually dimorphic, with the smaller male being gray above with a light colored breast and the females brownish above with a streaked breast.

They feed mostly on small mammals, but will also take other small vertebrates and arthropods as well. Foraging takes place over meadows, open grasslands, and emergent wetlands—especially marshes.

Harriers nest and roost almost exclusively on the ground. They build stick and grass nests near the edges of marshes and other wetland, but will occasionally nest in dense grasslands. They often nest in diffuse, loose colonies. Breeding season begins in April and lasts until September. Clutch size averages four to five eggs and they produce only one brood per season (MacWhirter and Bildstein 1996, Clark and Wheeler 2001).

Northern harriers are breeding residents throughout the northern two-thirds of the United States and much of Canada. They are long distance migrants and winter as far south as southern Central America. Northern harriers are widely but locally distributed in California. They are year round residents in the Central Valley and winter along the coast, east of the Sierra Nevada, and in southern California. Densities fluctuate from season to season as they tend to be somewhat nomadic in character, but can be locally abundant where appropriate habitat is relatively undisturbed.

This species was observed within the boundaries of the plan area.

White-tailed kite *(Elanus leucurus).* The white-tailed kite is fully protected pursuant to the California Fish and Game Code. Fully protected birds may not be "taken" or possessed (i.e., kept in captivity) at any time (Section 3511). The white-tailed kite is a light colored, falcon-like raptor of a wide variety of open habitats. They are found primarily in open grasslands, agricultural areas, wide river valleys, open oak savannas, and desert grasslands. This medium–sized raptor averages 15 inches in total length with a nearly 40 inch wingspan. Conspicuous are the large, black scapulars and marginal coverts on an otherwise gray back, and black under wing coverts near the bend in the wing. Adults white underneath and grayish on back from crown to upper tail coverts.

They feed almost exclusively on small mammals, especially voles and are often seen hovering over foraging habitat much like kestrels. Occasionally form communal night roosts of a few individuals to several dozen kites in the fall and winter.

White-tailed kites build stick and straw nests near the top of dense stands of oaks (*Quercu*s sp.), willows (*Salix* sp.), cottonwoods (*Populus* sp.), and other tree species. Breeding season lasts from February through September. Clutch size averages four eggs and they will occasionally produce a second brood (Dunk 1995).

White-tailed kites are fairly common yearlong residents west of the Sierra Nevada, in the western portions of the Mojave Desert, and in south Texas. Their populations declined noticeably in the early part of the 20th Century, but have been increasing since the late 1970s and have expanded their breeding range into southern Oregon and southern Arizona. They are not regular migrants, but wander widely throughout their range and are considered a migratory species under MBTA.

This species was observed within the boundaries of the plan area.

Merlin *(Falco columbarius).* The merlin is on the CDFG's Watch List and is also protected under the Migratory Bird Treaty Act (MBTA). The merlin is a small, compact falcon that is a common breeder across the forests of North America and Eurasia. Merlins are sexually dimorphic with the male being on average approximately 25% smaller in body mass than the females. They are typically associated with open and semi-open terrain in forests, woodlands, and prairie groves.

Merlins feed mainly on small to medium-sized birds (usually under 50 grams in weight). They typically nest in an old raptor or corvid nest and make few, in any, modifications. Nest trees are usually located in riparian zones or in conifer stands near open prairie or grassland habitat. The breeding season begin in late March and lasts through August. Clutch size is usually 4 or 5 eggs and they typically produce one brood per year (Kaufman 1996).

Merlins are breeding residents throughout most of Canada and in the northern Rocky Mountains states (Idaho, Montana, and Wyoming). They migrate south during the fall and winter in the Great Plains, southern Rocky Mountains, and in California west of the Sierra Nevada range.

Occurrences have been recorded within ten miles of the plan area.

Bald eagle *(Haliaeetus leucocephalus).* The USFWS published five recovery plans for various regions of the United States. The Pacific Bald Eagle Recovery Plan covered the western states including California (USFWS 1986). The Final Rule to delist the bald eagle was published by the USFWS in the Federal Register on July 29, 2007 (Vol 72, No. 130).

The bald eagle, our national symbol, is the second largest bird of prey in North America; only the California condor is larger. Early explorers reported bald eagles as widely abundant throughout their range, but their population numbers decreased dramatically in the first part of the 20th century. Shooting and the paying of bounties was a major contributor to their decline as was DDT poisoning. After legal protections were put into place, their numbers increased and they were recently delisted by the United States Fish and Wildlife Service.

Bald eagles are best described as opportunistic foragers and their food habits vary according to local conditions and prey availability. Bald eagles do prefer fish over other vertebrates, but they

also preys on mammals and birds. Given their opportunistic feeding behavior, bald eagles scavenge on carrion to a greater degree than most other raptors and they will pilfer food from other raptors. Carrion is an important source of food during the winter or when fish are scarce.

Bald eagles typically nest in large, mature tress in close proximity to rivers, lakes, and reservoirs. Breeding season begins in February and continues through July. Clutch size averages two and they produce only one brood per season.

Bald eagles winter throughout the lower 48 states and in southern Canada and Alaska. The breeding range in California is primarily confined to the northern half of the state, particularly from the central Sierra Nevada north to the southern Cascades and Coast Ranges. Population levels have increased over the last 20 years to the degree that the USFWS has delisted this species.

Occurrence of bald eagle has been recorded within the plan area.

Loggerhead shrike *(Lanius ludovicianus*). The loggerhead shrike is a California Species of Special Concern. The loggerhead shrike is a common breeding resident and winter visitor in the open, lowlands and the Sierra Nevada and Coast Range foothills. They are highly associated with open landscapes and are usually observed perching on a fenceline along rural roadways. Nesting habitat is usually in densely foliated shrubs and trees. Nest locations based more on the degree of cover afforded than by shrub or tree species.

This species, like other shrikes, is a small avian predator that hunts from perches and impales its prey (arthropods and small vertebrates) on sharp objects such as thorns and barbed-wire fences (Yosef 1996, Zeiner et al. 1990).

Breeding season begins in March and April and extends through August. Average clutch size is six eggs and they occasionally produce a second brood. Both parents attend the young, which fledge about three weeks and hatching.

The loggerhead shrike is a common resident species throughout the southern half of the United States, with the breeding range extending north into the Great Plains of the northern US and Canada. This species appears to be declining in the eastern portion of its range.

This species was observed within the boundaries of the plan area.

Osprey *(Pandion haliaetus).* The osprey is a California Species of Special Concern. This raptor is a large (approximately 23 inches in length), long-winged (wingspan averages 63 inches) raptor with dark brown back and upper wing-coverts, mostly white breast (some speckling) and belly, white crown and forehead, and dark line through eye. They are exclusively associated with lakes, reservoirs, large river systems, and coastal marshes and estuaries. They are rarely away from water except during migration movements. Over 99% of its diet is composed of live fish species captured in their talons after spectacular feet-first dives into the water.

Breeding season begins in March and lasts until the fledging disperse in late August or early September. Breeding pairs usually produce a single brood of one to four eggs (usually three eggs) per reproductive season. Stick nests usually constructed at feeding grounds in large living trees, snags, cliff faces, and artificial locations such as power poles, channel markers, and duck blinds. DDT seriously depleted osprey populations in the mid-20th century, but they have made a good comeback over much of their range (Poole et al. 2002, Clark and Wheeler 2001).

The osprey breeds from Alaska south to the northern quarter of California and across Canada from British Columbia to the Atlantic Maritime Provinces. They are more common in northern California and are considered uncommon or localized in the southern half of California. Site-specific surveys should be conducted for this species prior to disturbance of potentially suitable habitat. Species was observed during the November 2007 survey of the plan area.

Occurrences have been recorded within five miles of the plan area.

Merced kangaroo rat *(Dipodomys heermanni dixoni).* The Merced kangaroo rat is a species of special concern. It is one of nine subspecies of the Heermann's kangaroo rat, which is endemic to central California (Hall 1981). It is the smallest of all the subspecies of *D. heermanni*. It occurs in annual grassland and oak savanna habitats (Williams 1986). Little is known of the specific life history traits of the species. Heermann's kangaroo rat feed on the seeds of grasses, annuals and forbs. Kangaroo rats dig burrows in which they sleep, rear young, and store food. They will also use burrows constructed by California ground squirrels.

Occurrence has been recorded within the plan area.

Western mastiff bat *(Eumops perotis californicus).* The western mastiff bat is a California Species of Special Concern. The mastiff bat roosts in crevices in cliff faces, high buildings, trees and tunnels. This bat needs a vertical face with a drop of approximately three meters when roosting in rock crevices, in order to take flight. Accordingly, roosts are generally high above the ground. In California, the mastiff bat is most commonly encountered in broad open areas, but occurs in many semi-arid to arid habitats, including dry desert washes, flood plains, conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, montane meadows, palm oases, chaparral, desert scrub, urban, and agricultural areas (Pierson 2005). The mastiff bat is an uncommon resident that ranges from the southeastern San Joaquin Valley and Coastal Ranges from Monterey County southward through southern California, and from the coast eastward to the Colorado desert.

Occurrences have been recorded within five miles of the plan area.

Western red bat *(Lasiurus blossevillii).* The western red bat is a California Species of Special Concern. This species is widespread, occurring in the southwestern United States and Central and South America. In California, western red bats occur throughout the Central Valley and along the coastal ranges from Mendocino County south to the Mexican border. They are often associated with riparian habitat dominated by mature cottonwoods and sycamores.

Western red bats are open-air foragers and feed primarily on moths. This non-colonial species typically roosts in mature trees that are generally hidden from view in all directions except below (Reid 2006 and Ziener et al. 1990b).

Occurrences have been recorded within ten miles of the plan area.

Hoary bat *(Lasiurus cinereus).* The hoary bat is a California Species of Special Concern. This species is found throughout most of California and is the most widespread of all the North American bats. Occurs from dry lowlands to deciduous and coniferous forests of the high mountains (to 9,000 feet MSL). They are solitary bats, roost primarily in trees, and migrate during the fall. They are aerial insectivores, but appear to take moths in large numbers. Foraging usually occurs over bodies of water—lakes, ponds, and streams.

Hoary bats mate during the fall and early winter. Females store the sperm and delay fertilization until after they cease hibernating in the early spring. Young are generally born from May to early July.

The project site contains suitable foraging habitat (ponds) and suitable roosting habitat in trees. There are no recorded CNDDB occurrences within five miles of the plan area.

Yuma myotis bat *(Myotis yumanensis).* Yuma myotis bats occur in a variety of habitats including riparian, scrublands and deserts, and forests. Mating typically occurs in the fall. Females give birth to one young from mid-spring to mid-summer in maternity colonies that may range in size to several thousand; males tend to roost singly in the summer. The species roosts in bridges, buildings, cliff crevices, caves, mines, and trees. Individuals become active and forage just after sunset, feeding primarily on aquatic emergent insects. Their diet is known to include caddis flies, midges, small moths and small beetles. After feeding, they periodically rest at night roosts where the food is digested.

Occurrences have been recorded within ten miles of the plan area.

San Joaquin pocket mouse *(Perognathus inornatus inornatus).* The San Joaquin pocket mouse is a sensitive species listed by the U.S. Bureau of Land Management. It inhabits annual grassland, saltbush scrub and oak savanna habitats, generally on friable soils (Williams 1986). It feeds primarily on the seeds of annuals, shrubs and forbs, but will also consume insects when seeds are less available.

Occurrences have been recorded within ten miles of the plan area.

American badger *(Taxidea taxus).* Adult badgers measure 30 to 35 inches in length, including a short furry tail averaging 5.5 inches. Their bodies are wide and give a flat-backed appearance. Colors are mostly gray, with a grizzled effect due to long guard hairs that have a black band ending in a white tip. Their "underfur" is either a light tan, or a creamy white. A white stripe from the nose leads between the eyes and back over the head of the badger, ending between the shoulders. Ears are set low along the sides of the head. Lower legs and feet are black in color. Badgers walk on their toes (digitigrade) with a characteristic, rolling gait.

Their front paws are rotated laterally and their long claws facilitate rapid digging, which they frequently use to capture prey. They can tunnel after ground dwelling rodents with amazing speed (Zeiner et al. 1990b). Badgers primarily prey on pocket gophers, ground squirrels, moles, marmots, prairie dogs, woodrats, kangaroo rats, deer mice, and voles. They also prey on ground nesting birds, such as bank swallows and burrowing owls. They also eat lizards, amphibians, carrion, fish, hibernating skunks, insects, including bees and honeycomb, and some plant foods, such as corn and sunflower seeds.

Mating occurs in late summer or early autumn but embryos are arrested early in development. Implantation is delayed until December or as late as February. After this period, embryos implant into the uterine wall and resume development. Although a female is technically pregnant for seven months, gestation is a mere six weeks. Litters of one to five offspring, with an average of three, are born in early spring. Females are able to mate when they are four months old, but males do not mate until the autumn of their second year. Most females mate after their first year.

Occurrences have been recorded within ten miles of the plan area.

San Joaquin kit fox *(Vulpes macrotis mutica).* The San Joaquin kit fox is federally listed as endangered and state listed as threatened. They are found in grasslands and scrublands, many of which have been extensively modified. Types of modified habitats include those with oil exploration and extraction equipment and wind turbines, and agricultural mosaics of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands. Oak woodland, alkali sink scrubland, and vernal pool and alkali meadow communities also provide habitat for kit foxes. This species requires underground dens to raise pups and to avoid predators, and to avoid adverse environmental conditions. An individual's home range is typically less than six square miles. However, some pups have been known to travel 60 miles or more when dispersing from the den.

Historically, the San Joaquin kit fox occurred extensively throughout California's Central Valley and parts of the Salinas and Santa Clara Valleys. The San Joaquin kit fox currently inhabits some areas of suitable habitat on the San Joaquin Valley floor and in the surrounding foothills of the coastal ranges, Sierra Nevada, and Tehachapi Mountains, from southern Kern County north to Contra Costa, Alameda, and San Joaquin Counties on the west, and near La Grange, Stanislaus County on the east side of the Valley and some of the larger scattered islands of natural land on the Valley floor in Kern, Tulare, Kings, Fresno, Madera, and Merced Counties.

Potential foraging habitat exists within the project area for this species. Prey species such as rabbits and other small mammals utilize the site.

Occurrences of San Joaquin Kit Fox have been recorded within 10 miles of the plan area.

SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities are those habitats that are of special concern to resource agencies, or that are afforded specific consideration through CEQA, by California Fish and Game Code,

and through conditions of a Section 404 permit under the Clean Water Act. All riparian habitats are subject to regulation under Section 1600 et seq. of the California Fish and Game. Habitats considered sensitive by CDFG are those identified as "rare and worthy of consideration" and are tracked in the CNDDB. Sensitive natural communities occurring in the plan area include:

- Northern Hardpan Vernal Pool
- Northern Claypan Vernal Pool

Either one of these two sensitive natural communities could occur within the boundaries of the proposed plan area.

RAPTORS

Nesting raptors (birds of prey) and raptor nests are protected under the Migratory Bird Treaty Act (MBTA) and by California Fish and Game Code. All six families of raptors occurring in North America are protected:

- Accipitridae (kites, hawks, and eagles)
- Cathartidae (New World vultures)
- Falconidae (falcons and caracaras)
- Pandionidae (ospreys)
- Strigidae (typical owls)
- Tytonidae (barn owls)

Protection includes not only the birds themselves but also extends to their nests, young, and eggs. Relative to many other animal taxa, raptors naturally exist at low population levels and are widely dispersed within their habitats. Disturbances related to construction activities causing nest abandonment and/or loss of reproductive effort may be considered a "take" and is potentially punishable by fines and/or imprisonment.

WILDLIFE MOVEMENT CORRIDORS

Movements of wildlife generally fall into three basic categories: a) movements along corridors or habitat linkages associated with home range activities such as foraging, territory defense, and breeding; b) dispersal movements – typically one-way movements (e.g., juvenile animals leaving their natal areas or individuals colonizing new areas), and; c) temporal migration movements – these movements are essentially dispersal actions which involve a return to the place of origin (e.g., deer moving from winter grounds to summer ranges and fawning areas).

The perennial drainage systems scattered throughout the area provide movement corridors for wildlife within the plan area boundaries. There are no designated movement corridors located within the borders of the plan area.

Regulatory Setting

FEDERAL

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed it is fully protected from a "take" unless a take permit is issued by the US Fish and Wildlife Service (USFWS). A take is defined as the killing, capturing, or harassing of a species. Proposed endangered or threatened species are those species for which a proposed regulation, but not final rule, has been published in the Federal Register.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) is an international treaty among the United States, Canada, Mexico, Japan, and Russia for the conservation and management of bird species that may migrate through more than one country. The MBTA (50 C.F.R. Section 10) is enforced in the United States by the USFWS and covers 972 bird species. According to the provisions of the MBTA, it is unlawful to pursue, hunt, take, capture, or kill, or attempt to do the same to any species covered by the Act, including their nests, eggs, or young. Any disturbance that causes nest abandonment or loss of reproductive effort is considered a take and is potentially punishable by fines or imprisonment. Birds covered under the Act include all waterfowl, shorebirds, gulls, wading birds, raptors, owls, hummingbirds, warblers, flycatchers, and most perching bird species. To kill, possess, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., Section 703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

Clean Water Act – Section 404

Section 404 of the Clean Water Act (CWA) regulates all discharges of dredged or fill material into water of the United States. These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as "Waters of the US", tributaries of waters otherwise defined as "Waters of the US", the territorial seas, and wetlands adjacent to "Waters of the US" (33 CFR, Part 328, Section 328.3).

Areas not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially-irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools and water-filled depressions (33 CFR, Part 328).

The United States Army Corps of Engineers (USACE) is the agency responsible for administering the permit process for activities that affect "Waters of the US." Executive Order 11990 is a federal implementation policy, which is intended to result in no net loss of wetlands.

Clean Water Act – Section 401

Section 401 of the Clean Water Act (CWA) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board. To obtain the water quality certification the Regional Water Quality Control Board must indicate that the proposed fill would be consistent with the standards set forth by the state.

STATE

Fish and Game Code Sections 2050-2097 - California Endangered Species Act

The California Endangered Species Act (CESA) protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the state. CESA established that it is state policy to conserve, protect, restore, and enhance endangered species and their habitats.

The CESA expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

Fish and Game Code Sections 1900-1913 - California Native Plant Protection Act

In 1977 the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the state. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants.

Public Resources Code Section 21000 - California Environmental Quality Act

The California Environmental Quality Act (CEQA) identifies that a species that is not listed on the federal or state endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e. candidate, or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency (i.e. USFWS or CDFG).

Fish and Game Code Sections 3503, 3503.5, 3800 - Predatory Birds

Under the California Fish and Game Code, all predatory birds in California, generally called "raptors," are protected. The law indicates that it is unlawful to take, posses, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

Fish and Game Code Sections 1601-1603 – Streambed Alteration

Under the California Fish and Game Code, the Department of Fish and Game (CDFG) has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project developers must obtain a "Streambed Alteration Agreement" from the CDFG prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFG may impose conditions to limit and fully mitigate impacts on fish and wildlife resources.

Public Resources Code Section 21083.4 - Oak Woodlands Conservation

In 2004, the California legislature enacted Senate Bill 1334 (SB 1334), which added oak woodland conservation regulations to the Public Resources Code. This new law requires a County to determine whether a project within its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. If a County determines that there may be a significant effect to oak woodlands, the County must require oak woodlands mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. Such mitigation alternatives include: conservation through the use of conservation easements; planting and maintaining and appropriate number of replacement of trees; contribution of funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and/or other mitigation measures developed by the County.

LOCAL

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to Biological Resource impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion and Parks, Open Space, and Conservation Elements of the General Plan are designed to ensure that biological resource impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Urban Expansion Policies:

UE-1.1 Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.

Parks, Open Space, and Conservation Policies:

OS-1.1 Identify and mitigate impacts to wildlife habitats which support rare, endangered, or threatened species.

Implementing Action 1.1.b Urban development should occur away from identified sensitive species critical habitats areas unless specific provisions to ensure adequate protection and monitoring exist.

Implementing Action 1.1.g Implement the Memorandum of Understanding (MOU) between the City of Merced and the U.S. Fish and Wildlife Service (USFWS), dated June 16, 2008, regarding the processing of development applications to ensure compliance with the Federal Endangered Species Act relating to Projects to be Served by the Wastewater Treatment Plant Water Quality Upgrade and Expansion Project.

OS-1.2 Preserve and enhance creeks in their natural state throughout the planning area.

OS-1.4 Improve and expand the City's urban forest.

OS-1.5 Preserve and enhance water quality.

3.4.2 THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment if it will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS;

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

- Conflict with the provisions of an adopted Habitat Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.4.3 IMPACTS AND MITIGATION MEASURES

Impact #3.4-1: Result in substantial adverse impacts on candidate, special-status, or sensitive species.

Discussion/Conclusion: The California Natural Diversity Database (CNDDB) search identified many documented special-status species within the study area. A reconnaissance level survey conducted by Quad Knopf biologists during February of 2008 confirmed that suitable habitat exists within the proposed SUDP/SOI area to support the species identified by the CNDDB search. The biotic habitat of the study area, like most of the remaining lands in the region, has been drastically altered from its original form. Human-caused disturbances such as agricultural activities and land conversion to urban uses within the plan area may result in loss of foraging and breeding habitat for many of these species. Land conversion within the plan area is a ***potentially significant*** impact on special-status species.

To protect special-status species and their habitats, the City shall ensure that appropriate biological surveys will be performed.

Mitigation Measures

The following survey methods, timing of surveys, and avoidance and protection measures will be implemented where appropriate habitat exists within the boundaries of proposed projects:

Mitigation Measure #3.4-1a: Vernal Pools and Vernal Pool Associates

To protect vernal pools and species associated with vernal pools including vernal pool smallscale, succulent owl's-clover, pincushion navarretia, Colusa grass, hairy Orcutt grass, spiny-sepaled button celery, San Joaquin Orcutt grass, Greene's tuctoria, Conservancy fairy shrimp, vernal pool fairy shrimp, Midvalley fairy shrimp, vernal pool tadpole shrimp, California linderiella, and Molestan blister beetle, surveys shall be conducted to determine the presence of vernal pools prior to or concurrent with application for annexation in areas identified as having potential habitat.

Surveys to detect vernal pools are most easily accomplished during the rainy season or during early spring when pools contain water. If vernal pools are found to occur on a project site, the pools and a 100 foot-wide buffer around each pool or group of pools will be observed. If the vernal pools and buffer areas cannot be avoided, then the project proponent must consult with and obtain authorizations from, but not limited to, the California Department of Fish and Game, the United States Fish and Wildlife Service, the Army Corps of Engineers, and the State Water Resources Quality Control Board.

Consultation and authorizations may require that additional surveys for special-status species be completed. Because there is a federal policy of no net loss of wetlands, mitigation to reduce losses and compensation to offset losses to vernal pools and associated special-status species will be required.

Effectiveness of Mitigation Measure:

The identification of vernal pools on a project specific basis and, when present on a project site, the consultation with regulatory agencies and implementation of mitigation and compensation will ensure that impacts to vernal pools and special-status species associated with vernal pools will be ***less than significant***.

Mitigation Measure #3.4-1b: Special-Status Plants

To protect special-status plants, the City shall ensure that a botanical survey be conducted for projects containing habitat suitable for special-status plant species. Surveys shall be conducted by a qualified biologist or botanist during the appropriate flowering season for the plants and shall be conducted prior to issuance of a grading or building permit for the project. If special-status plants are found to occur on the project site, the population of plants shall be avoided and protected. If avoidance and protection is not possible, then a qualified biologist will prepare a mitigation and monitoring plan for the affected species. The plan shall be submitted to the CDFG and/or the USFWS for review and comment. Details of the mitigation and monitoring plan shall include, but not be limited to:

- *Removing and stockpiling topsoil with intact roots and seed bank in the disturbance area, and either replacing the soil in the same location after construction is complete or in a different location with suitable habitat; or*

- *Collect plants, seeds, and other propogules from the affected area prior to disturbance. After construction is complete, then the restored habitat will be replanted with propogules or cultivated nursery stock; or*

- *These and other mitigations will only be considered successful if the populations of the affected species are sustained for a minimum of three years and are of a similar size and quality as the original population.*

Effectiveness of Mitigation Measure:

Implementation of Mitigation Measure #3.4-1b will ensure that impacts to special-status plants (Table 3.4-1) are reduced to a ***less than significant*** level.

Mitigation Measure #3.4-1c: Valley Elderberry Longhorn Beetle

To protect the Valley elderberry longhorn beetle (VELB), the project proponent shall ensure that a survey for elderberry bushes be conducted by a qualified biologist at each project site containing habitat suitable for VELB prior to the issuance of a grading

permit or building permit. If elderberry bushes are found, the project proponent shall implement the measures recommended by the biologist, which shall contain the standardized measures adopted by the USFWS.

Effectiveness of Mitigation Measure:

The implementation of this measure will prevent the loss of habitat (elderberry bushes) and prevent the incidental take of VELB. Implementation of these measures will ensure that impacts to elderberry shrubs and elderberry longhorn beetles will be ***less than significant***.

Mitigation Measure #3.4-1d: Burrowing Owls

To protect burrowing owls on proposed projects where suitable habitat exists, the following shall be implemented:

- *To protect burrowing owls, preconstruction surveys shall be conducted by a qualified biologist at all project sites that contain grasslands, fallowed agricultural fields, or fallow fields along roadsides, railroad corridors, and other locations prior to grading. If, during a pre-construction survey, burrowing owls are found to be present, the project proponent shall implement the measures recommended by the biologist and include the standardized avoidance measures of CDFG.*

Effectiveness of Mitigation Measure:

The mitigation measure listed above is a standardized survey protocol and avoidance measure that has been adopted by the CDFG. Implementation of this mitigation measure will prevent disrupting nesting behaviors and ensure nesting success of burrowing owls which may nest in and adjacent to project sites. This will result in impacts from the project being ***less than significant***.

Mitigation Measure #3.4-1e: Special-Status Birds

To protect raptors and other special-status birds on proposed projects where suitable habitat exists, the following measures shall be implemented:

- *Trees scheduled to be removed because project implementation shall be removed during the non-breeding season (late September to the end of February).*

- *Prior to construction, but not more that 14 days before grading, demolition, or site preparation activities, a qualified biologist shall conduct a preconstruction nesting survey to determine the presence of nesting raptors. Activities taking place outside the breeding season (typically February 15 through August 31) do not require a survey. If active raptor nests are present in the construction zone or within 250-feet of the construction zone, temporary exclusion fencing shall be erected at a distance of 250-feet around the nest site. Clearing and construction operations within this area shall be postponed until juveniles have fledged and there is no evidence of a second nesting attempt determined by the biologist.*

- *If nesting Swainson's hawks are observed during field surveys, then consultation with the CDFG regarding Swainson's hawk mitigation guidelines shall be required. The guidelines include, but are not limited to, buffers of up to one quarter mile, monitoring of the nest by a qualified biologist, and mitigation for the loss of foraging habitat.*

- *To avoid impacts to common and special-status migratory birds pursuant to the Migratory Bird Treaty Act and CDFG codes, a nesting survey shall be conducted prior to construction activities if the work is scheduled between March 15 and August 31. If migratory birds are identified nesting within the construction zone, a 100-foot buffer around the nest site must be designated. No construction activity may occur within this buffer until a qualified biologist has determined that the young have fledged. A qualified biologist may modify the size of the buffer based on site conditions and the bird's apparent acclimation to human activities. If the buffer is modified, the biologist would be required to monitor stress levels of the nesting birds for at least one week after construction commences to ensure that project activities would not cause nest site abandonment or loss of eggs or young. At any time the biologist shall have the right to implement the full 100-foot buffer if stress levels are elevated to the extent that could cause nest abandonment and/or loss of eggs or young.*

Effectiveness of Mitigation Measure:

The mitigation measure listed above is a standardized survey protocol and avoidance measure that has been adopted by the CDFG. Implementation of this mitigation measure will prevent disrupting nesting behaviors and ensure nesting success of raptors and migratory birds which may nest in and adjacent to project sites. This will result in impacts from the project being ***less than significant***.

Mitigation Measure #3.4-1f: Special-Status Amphibians

To protect California tiger salamander and western spadefoot on proposed projects where suitable habitat exists, the following shall be implemented:

- *To protect special-status amphibians, preconstruction surveys shall be conducted by a qualified biologist at all project sites that contain appropriate habitat. If, during a pre-construction survey, special-status amphibians are found to be present, the project proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS or the CDFG.*

Effectiveness of Mitigation Measure:

Implementation of this Mitigation Measure and Mitigation Measure #3.4-1a will ensure that impacts to special-status amphibians are reduced to a ***less than significant*** level.

Mitigation Measure #3.4-1g: Special-Status Reptiles

To protect western pond turtle and giant garter snake on proposed projects where suitable habitat exists, the following shall be implemented:

- *To protect special-status reptiles, preconstruction surveys shall be conducted by a qualified biologist at all project sites that contain appropriate habitat. If, during a pre-construction survey, special-status reptiles are found to be present, the project proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS or the CDFG.*

Effectiveness of Mitigation Measure:

Implementation Mitigation Measure #3.4-1g will ensure that impacts to special-status reptiles are reduced to a ***less than significant*** level.

Mitigation Measure #3.4-1h: Special-Status Fish

To protect special-status fish, including hardhead on proposed projects where suitable habitat exists, the following shall be implemented:

- *To protect special-status fish, preconstruction surveys shall be conducted by a qualified fish biologist at all project sites that contain appropriate habitat. If, during a pre-construction survey, special status fish are found to be present, the project proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS, National Marine Fisheries Service (NMFS) or the CDFG.*

Effectiveness of Mitigation Measure:

Implementation of Mitigation Measure #3.4-1h will ensure that impacts to special-status fish are reduced to a ***less than significant*** level.

Mitigation Measure #3.4-1i: Special-Status Mammals

To protect Merced kangaroo rat, western mastiff bat, western red bat, hoary bat, Yuma myotis, San Joaquin pocket mouse, American badger, and San Joaquin kit fox on proposed projects where suitable habitat exists, the following shall be implemented:

- *To protect special-status mammals, preconstruction surveys shall be conducted by a qualified biologist at all project sites that contain appropriate habitat. If, during a pre-construction survey, special-status mammals are found to be present, the project proponent shall implement the measures recommended by the biologist and standardized measures adopted by the USFWS or the CDFG.*

Effectiveness of Mitigation Measure:

Implementation of Mitigation Measure #3.4-1i will ensure that impacts to special-status mammals are reduced to a ***less than significant*** level.

Impact #3.4-2: Result in substantially adverse affect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS.

Discussion/Conclusion: Riparian habitat and sensitive natural communities such as vernal pools occur within the boundaries of the plan area. This impact is ***potentially significant.***

Mitigation Measures

The following mitigation measure along with Mitigation Measure #3.4-1a and the goals, policies, and implementation actions of the General Plan will be implemented to reduce potential impacts to riparian habitat and other sensitive natural communities.

Mitigation Measure #3.4-2: Streambed Alteration Agreement

To minimize impacts to riparian habitat and other sensitive natural communities, the following the measures shall be implemented when streambed alterations are proposed:

- *The project proponent shall have a qualified biologist shall map all riparian habitat, or other sensitive natural communities. To the extent feasible and practicable, all planned construction activity shall be designed to avoid direct effects on these areas.*

- *In those areas where complete avoidance is not possible, then all riparian habitat, or other sensitive natural communities, shall be mitigated on a "no-net-loss" basis in accordance with either CDFG regulations and/or a Section 1602 Streambed Alteration Agreement, if required. Habitat mitigation shall be replaced at a location and with methods acceptable to the CDFG.*

Effectiveness of Mitigation Measure:

Implementation of Mitigation Measure #3.4-1a and 3.4-2 will reduce impacts to ***less than significant***.

Impact #3.4-3: Result in substantially adverse affect on federally protected wetlands through direct removal, filling, hydrological interruption, or other means.

Discussion/Conclusion: Federally protected wetlands and jurisdictional Waters of the U.S. occur throughout the plan area. This is a ***potentially significant*** impact.

Mitigation Measures

The following mitigation measures will be implemented to reduce potential impacts to federally protected wetlands and Waters of the U.S.

Mitigation Measure #3.4-3a: Conduct a delineation of Waters of the U.S. and Wetlands (WOUS/Wetlands) and Obtain Permits.

In order to determine if there are wetlands or waters of the U.S. on a proposed project site which fall under the U.S. Army Corps of Engineers (Corps) jurisdictional authority under Section 404 of the CWA, a delineation of the Waters of the U.S. and wetlands shall be performed and submitted to the Corps for verification prior to annexation.

A Section 404 permit and a Section 401 Water Quality Certification or Waiver of Waste Discharge shall be acquired from the Corps and the Regional Water Quality Control Board (RWQCB) and a Section 1602 Streambed Alteration Agreement from DFG respectively prior to the onset of construction related activities.

Mitigation Measure #3.4-3b:

Any jurisdictional waters that would be lost or disturbed due to implementation of any proposed project within the plan area shall be replaced or rehabilitated on a "no-net-loss" basis in accordance with the Corps' and the RWQCB mitigation guidelines. Habitat restoration, rehabilitation, and/or replacement if required shall be at a location and by methods agreeable to the Corps, the RWQCB, and the City of Merced. The project applicant shall abide by the conditions of any executed permits.

Effectiveness of Mitigation Measure:

Implementation of Mitigation Measures #3.4-3a and #3.4-3b will reduce impacts to ***less than significant***.

Impact #3.4-4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Discussion/Conclusion: The project site is not within a designated wildlife corridor or linkage area for sensitive species. It is not within a local migratory corridor for other species. The entire San Joaquin Valley, including the subject site, is within the regionally significant Pacific Flyway for waterfowl. The site is not considered to be a wildlife nursery; however, construction activity on the site may disturb nesting, feeding, rearing, and foraging behaviors of migratory birds if active nests are within or near construction areas.

Construction activity will ***not significantly impact*** wildlife movements and will ***not significantly impact*** a wildlife movement corridor.

Mitigation Measures

Mitigation Measure #3.4-1e above will be implemented to reduce potential impacts to breeding birds and active birds' nests.

Effectiveness of Mitigation Measure:

Implementation of Mitigation Measure #3.4-1e above will reduce impacts to breeding birds and active birds' nests to ***less than significant***.

Impact #3.4-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Discussion/Conclusion: Adoption of the City of Merced General Plan will not conflict with any other local policies or ordinances protecting biological resources. There is ***no impact***.

Mitigation Measures

No mitigation measures are required.

Impact #3.4-6: Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Discussion/Conclusion: There are no applicable or pertinent habitat conservation plans or natural community preservation plans affecting the study area. There is a Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1997) and there is a Draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005). Both of these recovery plans cover special-status species that may occur within the study area. The policies, goals, and objectives of the Merced General Plan Update do not conflict with the provisions in these plans. There is ***no impact***.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Implementation of the proposed General Plan in combination with other reasonably foreseeable projects as planned for in the County of Merced General Plan and General Plans of incorporated cities within the County would increase the density of development throughout the County and could cumulatively impact biological resources within the County. The degree of probability is unknown as such cumulative impacts, if any, would be difficult to measure in consideration of General Plan policies and standards and implementation of agency-mandated surveys and mitigation measures for special-status species as development occurs. Over recent decades, development in the County as well as the City of Merced has converted hundreds of acres to

urban uses. Thousands of additional acres are proposed for development by the Merced County General Plan and the General Plans of its incorporated cities in addition to the proposed City of Merced SUDP/SOI area. Such development could further threaten significant biological resources in the County. Additionally, road construction, site grading, infrastructure installation, and construction of residential, commercial, and public facilities uses could result in the direct loss of biological resource habitat. Most of the land that has been or is planned for development in Merced County is made up of property similar to the proposed undeveloped lands within the proposed City of Merced SUDP/SOI which may include biological resources.

Although individual project impacts can be mitigated, based on the standards of significance with implementation of agency-mandated surveys and mitigation measures for special-status species, the cumulative impacts of development in accordance with the proposed General Plan and other General Plans in the County are significant, and the project's incremental contribution to this impact is itself ***cumulatively considerable***. This impact cannot be mitigated to a less than cumulatively considerable level and thus is ***significant and unavoidable***.

3.5

CULTURAL RESOURCES

3.5 Cultural Resources

This section of the Draft EIR is based on a cultural resources report prepared by Peak & Associates, Inc. The full text of the Peak & Associates report is contained in Appendix G.

Cultural resources are defined as prehistoric and historic archeological sites, architectural properties (e.g., buildings, bridges, and structures), and traditional properties with significance to Native Americans. This definition includes historic properties as defined by the National Historic Preservation Act (NHPA). Cultural resources which could be impacted by development within the City of Merced SUDP/SOI area are described within this section.

During the Notice of Preparation (NOP) period, no comments were received regarding the impact of the proposed General Plan on cultural resources.

3.5.1 SETTING

Environmental Setting

This section identifies known and potential cultural resources located within the City of Merced SUDP/SOI area and evaluates constraints that archaeological resources might have on the development of the General Plan. Research was conducted to identify previously recorded resources in the proposed SUDP/SOI area and to collect a general background of the prehistory and history of the City of Merced and vicinity. The background information collected in this exercise provides a basis for evaluation of the cultural and historical significance of individual resources of the area.

PREHISTORY AND NATIVE AMERICAN ETHNOGRAPHY

The City of Merced SUDP/SOI area lies within the ethnographic territory of the Yokuts people. The Yokuts were members of the Penutian language family which held all of the Central Valley, San Francisco Bay Area, and the Pacific Coast from Marin County to near Point Sur. The Yokuts differed from other ethnographic groups in California as they had true tribal divisions with group names (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 Yokuts held portions of the San Joaquin Valley from the Tehachapis in the south to Stockton in the north. On the north they were bordered by the Plains Miwok, on the west by the Saclan or Bay Miwok and Costonoan peoples. Although neighbors were often from distinct language families, differences between the people appear to have been more influenced by environmental factors as opposed to linguistic affinities. Thus, the Plains Miwok were more similar to the nearby Yokuts than to foothill members of their own language group. Similarities in cultural inventory co-varied with distance from other groups and proximity to culturally diverse people. The material culture of the southern San Joaquin Yokuts was more closely related to that of their non-Yokuts neighbors than to that of Delta members of their own language group.

Trade was well developed, with mutually beneficial interchange of needed or desired goods. Obsidian, rare in the San Joaquin 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 to some extent from the Napa Valley to the north. Shell beads, obtained by the Yokuts from coastal people, and acorns, rare in the Great Basin, were among many items exported to the east by Yokuts traders (Davis 1961).

Economic subsistence was based on the 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, wild fowl, and small mammals were trapped and hunted to provide protein augmentation of the diet. In general, the eastern portion of the San Joaquin Valley provided a lush environment of varied food resources, with the estimated large population centers reflecting this abundance (Cook 1955; Baurnhoff 1963).

Settlements were oriented along the water ways, with their village sites normally placed adjacent to these features for their nearby water and food resources. House structures 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. House pit depressions ranged in diameter from between three to 18 meters.

HISTORIC PERIOD

Merced County was first explored by Gabriel Moraga in 1806, when he named the Merced River, "El Rio de Nuestra Señora de la Merced." Moraga's explorations were designed to locate appropriate sites for an inland chain of missions. Moraga explored the region again in 1808 and 1810.

Fur traders began working the streams of the San Joaquin Valley in 1828. Beaver skins may have been gathered by Hudson's Bay Company trappers in the Merced region.

John C. Fremont, on his way leaving California in 1844, proceeded southward from Sutter's Fort, passing through what is now Merced County. His party crossed the Merced River in a boat they constructed, camping on the south bank near the Merced River's junction with the San Joaquin River. The expedition stopped and camped on Bear Creek, five miles from its mouth. They then crossed the Creek, and traveled on into Madera County.

Merced County was carved out of Mariposa County in 1855. The construction of the Southern Pacific Railroad in 1872 brought major changes to the region. The City of Merced was laid out in January of that year, when the railroad reached the spot. Merced became the county seat in December of 1872 (Hoover, Rensch and Rensch 1990; Gudde 1969: 198-199).

The development of the railroads through the region allowed the establishment of the communities. The small communities grew up as service centers for the surrounding areas, providing a means of marketing farm products to remote destinations as well as providing

supplies to the local residents. Freighting to the communities in the foothills became an important industry.

The completion of the Crocker-Huffman canal system led to the colonization of the territory around the City of Merced, and resulted in a rapid expansion of the population. The City of Merced is located in both the center of the State and the Valley, and serves as the gateway to Yosemite Park.

DATA SOURCES

A cultural resources records search was conducted by the Central California Information Center (CCIC) at California State University, Stanislaus for the Merced area on November 19, 2008 to identify previously recorded sites and previous cultural resources studies in and near the project area (IC#72431). In addition, historic maps from the California Room of the California State Library and historic maps provided by the Central California Information Center were reviewed. Maps reviewed include General Land Office plats of the townships, Official County maps, general County maps, early topographic maps (1916-1918) and more recent topographic base maps (1948- 1962).

The cultural resources records search included the following resources: review of maps for the area; the National Register of Historic Places; the California Register of Historic Resources; the *California Inventory of Historic Resources* (1976); the *California Historic Landmarks* (1990); the *California Points of Historic Interest* (May 1992); the Historic Property Data File and several other pertinent sources available at the CCIC. The SUDP/SOI area is located in five tracts. The land areas are located in portions of Township 6 South Range 13 East, Township 6 South Range 14 East, Township 7 South Range 13 East, Township 7 South Range 14 East, Township 8 South Range 13 East, Township 8 South Range 14 East, MDM, mapped on the Atwater, El Nido, Merced, Sandy Mush, Winton and Yosemite Lake 7.5 USGS topographic quadrangles.

The records search revealed that a total of 22 surveys, ranging in size from very small to large scale, have been completed within the City of Merced SUDP/SOI; seven within the southwesterly sector, three within the easterly sector, six within the northeasterly sector, four within the northwesterly sector and two within the westerly sector. Thirteen (13) historic resources were identified by the 22 City of Merced area surveys. These resources are shown in Table 3.5-1 and discussed below with reference to site status and which sector each resource is in within the SUDP/SOIarea.

Table 3.5-1
CCIC at California State University, Stanislaus Cultural Records Search Results

Resource Number (P-24-)	Description	Site Status	SUDP/SOI Sector
000073	Prehistoric bowl mortar	not evaluated	SW
000577	Segment of El Capitan Canal	not evaluated	SW
000579	Thomas Farms	not evaluated	SW
000656	Bridge #39-97	not eligible for NRHP	SW
001808	Bettencourt property/dairy	not eligible for NRHP	SW
001809	Campos property/former dairy	not eligible for NRHP	SW

Resource Number (P-24-)	Description	Site Status	SUDP/SOI Sector
000607	Segment of Hartley Doane lateral	not evaluated	E
000648	Bradley Overhead	eligible for NRHP; listed in the CRHR	E
001658	Caseretta Brothers pig farm	not evaluated	E
001660	Cattle trough	not evaluated	NE
001680	Fence	not evaluated	NE
001681	Smith Ranch (1913)	not evaluated	NE
000667	Yosemite Lake water tower	CA Point of Historical Interest	NE
NRHP: National Register of Historic Places CRHR: California Register of Historical Resources			

As shown above, the records search revealed that the SUDP/SOI surrounding the City of Merced contains only one recorded Native American archaeological resource listed with the Historical Resources Information System; a prehistoric bowl mortar in the south west sector of the SUDP.

There are, however, several natural waterways in the southwesterly, northeasterly and northwesterly portion of the SUDP/SOI with Bear Creek crossing the easterly portion of the study area, and there is a possibility of the presence of unrecorded prehistoric period sites near the water courses.

The Central California Information Center at CSU Stanislaus also searched for non Native American historical resources in the Merced SUDP/SOI 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 within the City of Merced SUDP/SOI area that are 45 years or older and considered as historical resources requiring further study and evaluation at the time of future development proposals by a qualified professional of the appropriate discipline.

As shown in Table 3.5-1, the CCIC records search revealed that the SUDP/SOI area surrounding the City of Merced contains 11 non Native American recorded historical resources with a twelfth site at the edge of Lake Yosemite just outside the SUDP/SOI boundary in the northeasterly sector of the SUDP/SOI. These resources are listed below:

- A section of the El Capitan Canal in the south west sector of the SUDP/SOI
- Thomas Farms in the south west sector of the SUDP/SOI
- A bridge in the south west sector of the SUDP/SOI
- Bettencourt property/dairy in the south west sector of the SUDP/SOI
- The Campos property/former dairy in the south west sector of the SUDP/SOI
- A segment of the Hartley Dome lateral in the easterly sector of the SUDP/SOI
- The Bradley Overhead in the easterly sector of the SUDP/SOI
- The Caseretta Brothers pig farm in the easterly sector of the SUDP/SOI
- A cattle trough in the northeasterly sector of the SUDP/SOI
- A fence in the northeasterly sector of the SUDP/SOI

- The 1913 Smith Ranch in the northeasterly sector of the SUDP/SOI
- The Lake Yosemite Water Tower at the edge of Lake Yosemite (just outside of the SUDP/SOI boundary) in the northeasterly sector of the SUDP/SOI

Early maps (1850s) of the southwest, easterly, northeasterly and northwesterly portion of the SUDP/SOI area show no historic features or development. Agricultural development began with the development of the water delivery systems. Later historic period maps of these areas show a number of features including buildings, structures, features and canals. By 1909 most of these lands had been subdivided and developed as agricultural colonies. Features related to this development could be present in the SUDP/SOI area such as buildings, structures and other features. Many of the canals and laterals that are shown on the older historic maps are still on the modern topographic maps and have been evaluated as not eligible for the National Register of Historic Places (i.e. the Fairfield Canal, the Le Grand Canal, Sells Lateral, and the Yosemite Lateral). The westerly portion of the SUDP/SOI area has been almost completely surveyed and no evidence of prehistoric or historic resources has been found. It is unlikely that prehistoric or historic period resources will be found in this portion of the plan area.

Regulatory Setting

FEDERAL

National Historic Preservation Act

The National Historic Preservation Act was enacted in 1966 as a means to protect cultural resources that are eligible to be listed on the National Register of Historic Places (NRHP). The law sets forth criterion that is used to evaluate the eligibility of cultural resources. The NRHP is composed of districts, sites, buildings, structures, objects, architecture, archaeology, engineering, and culture that are significant to American History.

Virtually any physical evidence of past human activity can be considered a cultural resource, although not all such resources are considered to be significant and eligible for listing. They often provide the only means of reconstructing the human history of a given site or region, particularly where there is no written history of that area or that period. Consequently, their significance is judged largely in terms of their historical or archaeological interpretive values. Along with research values, cultural resources can be significant, in part, for their aesthetic, educational, cultural and religious values.

National Environmental Policy Act of 1969

The National Environmental Policy Act of 1969 declares that it is the policy of the federal government to preserve important historic, cultural, and natural aspects of the Nation's heritage. Federal agencies must prepare environmental impact statements prior to making decisions about projects, which may significantly affect the quality of the human environment.

Archaeological Resources Protection Act of 1979

The Archaeological Resources Protection Act of 1979 regulates the taking of archaeological resources on federal lands by setting a broad policy that archaeological resources are important for the nation and should be protected. It establishes a requirement for the excavation or removal of archaeological resources from public or Indian lands with special permits. Violations of the law include civil and criminal penalties of fines and imprisonment.

American Indian Religious Freedom Act of 1978

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. This act establishes as national policy that traditional practices and beliefs, sites (including right of access) and the use of sacred objects shall be protected and preserved.

Native American Graves Protection and Repatriation Act of 1990

This law addresses the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to Native American human remains, funerary objects, sacred objects, and other cultural items.

Secretary of the Interior's Standards

The Secretary of the Interior is responsible for establishing professional standards and providing guidance related to the preservation and protection of all cultural resources listed in, or eligible for, listing in the NRHP. The Secretary of the Interior's Standards for the treatment of historic properties apply to all grant-in-aid projects assisted through the National Historic Preservation Fund, and are intended to be applied to a wide variety of resource types, including buildings, structures, sites, objects, and districts. The treatment standards, developed in 1992, were codified as 36 CFR 68 entitled, "The Secretary of the Interior's Standards for Historic Preservation Projects." The standards address four treatments:

- Preservation focuses on the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time (protection and treatment are also considered under this treatment).

- Rehabilitation as a treatment focuses on the repair and replacement of deteriorated features; when alterations or additions to the property are planned for a new or continued use; and when a depiction of a property at a particular point in time is not appropriate.

- Restoration is the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time, through the removal of features from other periods in its history and reconstruction of missing features from the target reconstruction period.

- Reconstruction addresses those aspects of treatment necessary to re-create an entire non-surviving building using new material.

STATE

California Register of Historic Resources (CRHR)

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in CEQA documents. Under CEQA, a cultural resource is considered an important historic resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the CRHR. Historic properties listed, or formally designated for eligibility to be listed, on The National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historic resource surveys.

California Environmental Quality Act (CEQA)

CEQA Guidelines Section 15064.5 provides guidance for determining the significance of impacts to archaeological and historical resources. Demolition or material alteration of a historical resource, including archaeological sites, is generally considered a significant impact. CEQA requires lead agencies to carefully consider the potential effects of a project on historical resources. An "historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant (Public Resources Code Section 5020.1). Section 15064.5 of the CEQA Guidelines specifies criteria for evaluating the importance of cultural resources, including:

- The resource is associated with events that have made a contribution to the broad patterns of California history;

- The resource is associated with the lives of important persons from our past;

- The resource embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of an important individual or possesses high artistic values; or

- The resource has yielded, or may be likely to yield, important information in prehistory or history.

Tribal Consultation Guidelines (Senate Bill 18)

Senate Bill 18 (SB 18), signed into law by Governor Arnold Schwarzenegger in September 2004, requires cities and counties to notify and consult with California Native American Tribes about proposed local land use planning decisions for the purpose of protecting Traditional Tribal Cultural Places.

Starting on March 1, 2005, cities and counties must send their general plan and specific plan proposals to those California Native American Tribes that are on the Native American Heritage

Commission's (NAHC) contact list and have traditional lands located within the city or county's jurisdiction. After March 1, 2005, cities and counties must also conduct consultations with these tribes prior to adopting or amending their general plans or specific plans. The City of Merced began this consultation process for the proposed project in April 2006.

California Health and Safety Code, Section 7050.5 (b)

California Health and Safety Code, Section 7050.5 (b) requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are identified as Native American, the coroner must contact the California Native American Heritage Commission.

Public Resources Code, Section 5024 and 5024.5

Public Resources Code, Section 5024 and 5024.5 requires State agencies to inventory and protect historical structures and artifacts under their jurisdiction.

Public Resources Code, Section 5097.9

This section of the Public Resources Code states that it is contrary to the free expression and exercise of Native American religion for a public agency or private party using, occupying or operating on public property to interfere with or cause severe or irreparable damage to any Native American cemetery, place of worship, religious or ceremonial site or sacred shrine.

Public Resources Code, Section 21083.2

If an archaeological resource does not meet the definition of a "historical resource" as defined by CEQA's criteria of significance (see discussion of CEQA Guidelines Section 15064.5 below), it may meet the definition of a "unique archaeological resource." An archaeological resource is "unique" if it: a) contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information; b) has a special and particular quality as being the oldest of its type or the best available example of its type; or c) is directly associated with a scientifically recognized important prehistoric or historical event or person. A non-unique archeological resource need be given no further consideration under CEQA, other than the simple recording of its existence by the lead agency if it so elects.

Confidentiality

California Government Code Section 6254.10 exempts archaeological site information from the California Public Records Act, to prevent vandalism, trespassing, and unauthorized artifact acquisition. Locational information is not circulated as part of public documents.

LOCAL

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to Cultural Resource impacts in conjunction with ultimate build-out of the City in accordance with the

General Plan. The specific policies listed below contained in the Sustainable Development of the General Plan are designed to ensure that cultural resource impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Sustainable Development Policies:

SD-2.1 Identify and preserve the City's archaeological resources.

SD-2.2 Identify and preserve the City's historic and cultural resources.

SD-2.3 Develop and promote financial incentive programs for historic preservation efforts.

3.5.2 THRESHOLDS OF SIGNIFICANCE

According to Section 15064.5 of the CEQA Guidelines, the proposed project will normally be considered to have a potentially significant impact on the environment if it will:

- Cause a substantial adverse change in the significance of a historical resource;
- Cause a substantial adverse change in the significance of an archaeological resource;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

3.5.3 IMPACTS AND MITIGATION MEASURES

Impact #3.5-1: Cause a substantial adverse change in the significance of a historic or archaeological resource

Discussion/Conclusion: Within the SUDP/SOI area there are few recorded resources, in large part due to a lack of systematic surveys. There is only one site that has been evaluated as a significant resource. Many other recorded resources have not been formally evaluated, again, in part due to a lack of development in these areas. There could be impacts to cultural resources resulting from development within the SUDP/SOI area. Both prehistoric and historic period resources may be present, with prehistoric period resources more likely to occur along the natural water courses.

Adoption of the proposed General Plan will not directly result in actions which would potentially disturb or destroy buried cultural resources. However, future development in accordance with the General Plan could result in earthmoving activities which have the potential to unearth previously undiscovered cultural resources.

Impacts on cultural resources can result either directly or indirectly from pre-construction activities and construction of a proposed project. Direct impacts are those which result from the

immediate disturbance of resources from vegetation removal, vehicle travel over the surface, earthmoving activities, excavation, or alteration of the setting of a resource. Indirect impacts are those which result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials which could occur due to improved accessibility.

There is no indication that subsurface prehistoric cultural deposits in the area of General Plan SUDP/SOI are likely to exist, or to have survived past uses of the land; however, the possibility cannot be totally eliminated based on a records search or surface inspection. Proposed new development will be guided by policies in the General Plan. The Sustainable Development Element of the proposed General Plan contains policies and implementing actions designed to protect historical and cultural resources. Policies SD-2.1, SD-2.2 and SD-2.3 call for the City to identify and preserve the City's archaeological resources; identify and preserve the City's historic and cultural resources; and develop and promote financial incentive programs for historic preservation efforts. Implementing actions of Policy SD-2.1 call for the City to utilize the inventory of known archeological sites maintained by the Central California Information Center for the review of development proposals (2.1.a); utilize standard practices for preserving archeological materials that are unearthed during construction, as prescribed by the State Office of Historic Preservation (2.1.b); and if appropriate, consider reconstruction of archaeological sites in city parks, on school grounds, in open space areas, or other suitable locations where they can serve an educational purpose (2.1.c). Implementing actions of Policy SD-2.2 call for the City to expand its cultural and historic information resources (2.2.a); support community groups and individuals working to preserve, protect and enhance the City's Historic and Cultural Resources (2.2.b); review and revise as necessary, the City's development/construction regulations to facilitate the preservation of historic structures (2.2.c); support, as feasible, efforts to promote the preservation of historically or architecturally significant structures in the City (2.2.d); and support efforts to designate historic districts within the City (2.2.e).

Implementation of theses policies included in the proposed General Plan and adherence to federal, state and local regulations would ensure that impacts to historical and archaeological resources would be reduced to a ***less than significant*** level.

Mitigation Measures

No mitigation measures are required.

Impact #3.5-2: Potentially disturb human remains or destroy a unique paleontological resource, site, or geologic feature

Discussion/Conclusion: Impacts on buried human remains or unique paleontological resources, sites, or geologic features can result either directly or indirectly from pre-construction activities and construction of a proposed project. Direct impacts are those which result from the immediate disturbance of resources from vegetation removal, vehicle travel over the surface, earthmoving activities, excavation, or alteration of the setting of a resource. Indirect impacts are those which result from increased erosion due to project site clearance and preparation, or from

inadvertent damage or outright vandalism to exposed resource materials which could occur due to improved accessibility.

Concordant with the mandates of Section 7050.5 of the California Health and Safety Code, if human remains are discovered during the construction phase of a development, all work must stop in the immediate vicinity of the find, and the County Coroner must be notified. If the remains are determined to be Native American, the Coroner will notify the Native American Heritage Commission, which in turn will inform a most likely descendant. The descendant will then recommend to the landowner the appropriate method for the disposition of the remains and any associated grave goods.

There is always the possibility that in the normal course of construction and land development, vegetation removal, earth moving, and other alterations could result in the discovery of previously unidentified human remains or unique paleontological resources. Damage or destruction to any human remains or resources encountered on project sites within the City's SUDP/SOI area during future construction is a potentially significant impact. As noted in Impact #3.5-1, the policies and implementing actions as proposed in the General Plan and adherence to federal, state and local regulations will result in a less than significant impact to historic and archaeological resources. The same holds true for unique paleontological resources, geologic features or human remains found as a result of construction activities. The impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Implementation of the proposed General Plan in combination with other reasonably foreseeable projects as planned for in the County of Merced General Plan and General Plans of incorporated cities within the County would increase the density of development throughout the County and could further threaten significant cultural resources within the County. Professional archaeologists generally recognize that population growth increases the probability for vandalism and other purposeful as well as inadvertent acts that destroy significant archaeological resources. However, the degree of probability is unknown as such cumulative impacts, if any, would be difficult to measure. Over recent decades, development in the County as well as the City of Merced has converted hundreds of acres to urban uses. Thousands of additional acres are proposed for development by the Merced County General Plan and the General Plans of its incorporated cities in addition to the proposed City of Merced SUDP/SOI area. Such development could further threaten significant cultural resources in the County. Additionally, road construction, site grading, infrastructure installation, and construction of residential, commercial, and public facilities uses could result in the direct loss of significant cultural resources. Most of the land that has been or is planned for development in Merced County is made up of property similar to the proposed undeveloped lands within the proposed City of Merced SUDP/SOI which may include remnants of cultural resources.

Although individual project impacts can be mitigated, based on the standards of significance, the cumulative impacts of development in accordance with the proposed General Plan and other General Plans in the County are significant, and the project's incremental contribution to this impact is itself ***cumulatively considerable***. This impact cannot be mitigated to a less than cumulatively considerable level and thus is ***significant and unavoidable***.

3.6

GEOLOGY AND SOILS

3.6 Geology and Soils

The potential for geologic hazards (including soil erosion, seismicity, landsliding, and liquefaction) is the focus of this section. This section also describes the existing geological setting and geologic hazards in the vicinity of the planning area, and identifies any specific geological impacts that are likely to result from implementation of the project along with feasible mitigation measures to address those impacts. A Geologic, Geohazards and Environmental Health Hazards Evaluation Report was prepared by Geocon Consultants, Inc. to evaluate geologic, geohazards, and environmental health hazards information for the areas within the City's proposed SUDP/SOI boundaries, but outside of the City's existing SUDP boundaries. Information from this report is used in the environmental setting and impact analysis sections of this EIR. The full text of the report is found in Appendix J of this EIR.

During the Notice of Preparation (NOP) period no comments were received regarding geology and soils.

3.6.1 SETTING

Environmental Setting

The City of Merced is located approximately 150 miles southeast of San Francisco along the west side of the southern portion of the Great Valley Geomorphic Province, more commonly referred to as the San Joaquin Valley. The valley is a broad lowlands bounded by the Sierra Nevada to the east and the Coast Ranges to the west. The San Joaquin Valley has been filled with a thick sequence of sedimentary deposits of Jurassic to recent age. A review of the geologic map indicates that the area around Merced is primarily underlain by the Pleistocene Modesto and Riverbank Formations with Holocene alluvial deposits in the drainages. Miocene-Pliocene Mehrten and Pliocene Laguna Formation materials are present in outcrops on the east side of the SUDP/SOI. Modesto and Riverbank Formation deposits are characterized by sand and silt alluvium derived from weathering of rocks deposited east of the SUDP/SOI. The Laguna Formation is made up of consolidated gravel sand and silt alluvium and the Mehrten Formation is generally a well consolidated andesitic mudflow breccia conglomerate.

FAULTS AND SEISMICITY

A fault, or a fracture in the crust of the earth along which rocks on one side have moved relative to those on the other side, are an indication of past seismic activity. It is assumed that those that have been active recently are the most likely to be active in the future, although even inactive faults may not be "dead." "Potentially Active" faults are those that have been active during the past two million years or during the Quaternary Period. "Active" faults are those that have been active within the past 11,000 years. Earthquakes originate as movement or slippage occurring along an active fault. These movements generate shock waves that result in ground shaking.

Based on review of geologic maps and reports for the area, there are no known active or potentially active faults, or Alquist-Priolo Earthquake Fault Zones (formerly referred to as a Special Studies Zone) in the SUDP/SOI. In order to determine the distance of known active

faults within 50 miles of the Site, the computer program EZ-FRISK was used. This program calculates deterministic seismic hazards in accordance with the 2007 American Society for Testing and Materials (ASTM) guidance. Table 3.6-1 shows the results of the EZ-FRISK analysis.

Table 3.6-1
Regional Active Faults within Approximately 60 Miles of the SUDP/SOI

Fault Name	Approximate Average Distance From SUDP/SOI (miles)	Maximum Moment Magnitude (M_W)
Great Valley, Segment 9	30	6.7
Great Valley, Segment 8	31	6.7
Great Valley, Segment 10	38	6.8
Ortigalita	38	7.1
Great Valley, Segment 7	39	6.8
Great Valley, Segment 11	47	6.8
Quien Sabe	54	6.8
Great Valley, Segment 12	57	6.7

The results of the EZ-FRISK query indicates that the Great Valley Fault, Segment 9 is the closest source of potential ground motion to the SUDP/SOI. The California Geological Survey maintains a web-based computer model that estimates probabilistic seismic ground motions for any location within California. The computer model estimates the "Design Basis Earthquake" ground motion, which is defined as the Peak Ground Acceleration (PGA) with a 10% chance of probability of being exceeded in 50 years (475-year return period). For an alluvial soil type, the estimated PGA within the SUDP/SOI is approximately 0.19g (means that the maximum horizontal acceleration is 19 percent of the earth's gravity with a 10 percent probability of being exceeded within the next 50 years).

While listing PGA is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the site. The SUDP/SOI could be subjected to ground shaking in the event of a major earthquake along the faults mentioned above or other area faults; however, the seismic risk within the SUDP/SOI is not considered to be significant.

SEISMIC HAZARDS

Ground Shaking

The most serious direct earthquake hazard is the damage or collapse of buildings and other structures caused by ground shaking. Ground shaking is the vibration which radiates from the epicenter of an earthquake. Damage to structures from ground shaking is caused by the transmission of earthquake vibration from the ground into the structure. The intensity of the vibration or shaking and its potential impact on buildings and other urban development is determined by several factors:

- The nature of the underlying materials, including rock and soil;

- The structural characteristics of a building;
- The quality of workmanship and materials used in its construction;
- The location of the epicenter and the magnitude of the earthquake; and
- The duration and character of the ground motion.

As PGA is a measure of the ground motion severity experienced at a site due to an earthquake. The PGA of 0.19g applicable to the area within the SUDP/SOI means that the maximum horizontal acceleration is 19 percent of the earth's gravity with a 10 percent probability of being exceeded within the next 50 years. Ground shaking can cause such indirect effects as ground failure, seiche, and dam failure. While listing PGA is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the SUDP/SOI. The area within the SUDP/SOI boundary could be subjected to ground shaking in the event of a major earthquake along the faults mentioned above or other area faults; however, the seismic risk within the SUDP/SOI is not considered to be significant.

Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of the soil is reduced by earthquake shaking or other rapid loading. Liquefaction and related phenomena have been responsible for tremendous amounts of damage in earthquakes around the world.

Liquefaction of granular soils can be caused by strong vibratory motion due to earthquakes. Soils that are highly susceptible to liquefaction are loose, granular and saturated. The liquefaction of soils causes surface distress, loss of bearing capacity, and settlement of structures that are founded on the soils. Based on the predicted seismic accelerations, and soil and groundwater conditions typically encountered in the region, general liquefaction potential is low within the SUDP/SOI.

Slope Stability and Erosion

The area within the City's SUDP/SOI is generally level to gently sloping. Slopes potentially subject to failure are not generally present within the SUDP/SOI where development is likely to have a significant impact. The currently stable conditions may be changed by slope alterations due to cuts or fills, and changes to drainage patterns. In general, the potential for land sliding or slope failure in the SUDP/SOI in its current condition is very low. The USDA generally describes the soils in the SUDP/SOI as having slight erosion potential. Naturally occurring soils in the plan are can be seen in Figure 3.6-1.

Seiche and Dam Failure

A seiche is a wave occurring in confined bodies of water, such as lakes, reservoirs, or bays, and can be initiated by winds, seismic events, or landslides. Earthquakes can also cause a tsunami (i.e., tidal waves) in large bodies of water.

Dam failures can result from a number of natural or man-made causes such as earthquakes (creating a "seiche" or an overtopping of a dam), erosion, improper siting, rapidly rising flood waters, and structural/design flaws.

There are three general types of dams: earth and rockfill, concrete arch or hydraulic fill, and concrete gravity. Each of these types of dams has different failure characteristics. Merced is presently in the inundation area of two dams, Bear Reservoir Dam and Lake Yosemite Dam. Both of these dams are earthen-fill which makes them more flexible and, therefore, more earthquake resistant. However, they are more likely to fail if over-topped.

An earthen dam will fail gradually due to erosion of the breach created during the over-topping; the flood wave will build gradually to peak and then decline until the reservoir is empty. A dam failure can cause loss of life, damage to property, and other ensuing hazards, as well as displacement of residents, the loss or partial loss of critical mass care facilities, and the destruction of bridges (evacuation routes) in the inundation path.

The effects of a possible dam failure upon the City of Merced, and the ability of the local community to respond, seem to vary greatly by which dam would fail. Lake Yosemite's inundation area covers a large portion of the City's SUDP/SOI in North Merced (reference Figure 3.8-2 in the Hydrology and Water Quality section).

The Merced Streams Group Project and Flood Control Plan authorized by Congress in 1970, but not as yet completed due to lack of local matching funds, would divert the flood waters from the flood control canals which created problems in 1968, thus reducing the risk of Yosemite Dam failure. Castle Dam is complete, and a diversion structure, which diverts more than 1,200 cubic feet of water per second from MID's main canal is also complete. This reduces the flow in Fahrens Creek, thus reducing the likelihood of flooding within a given event.

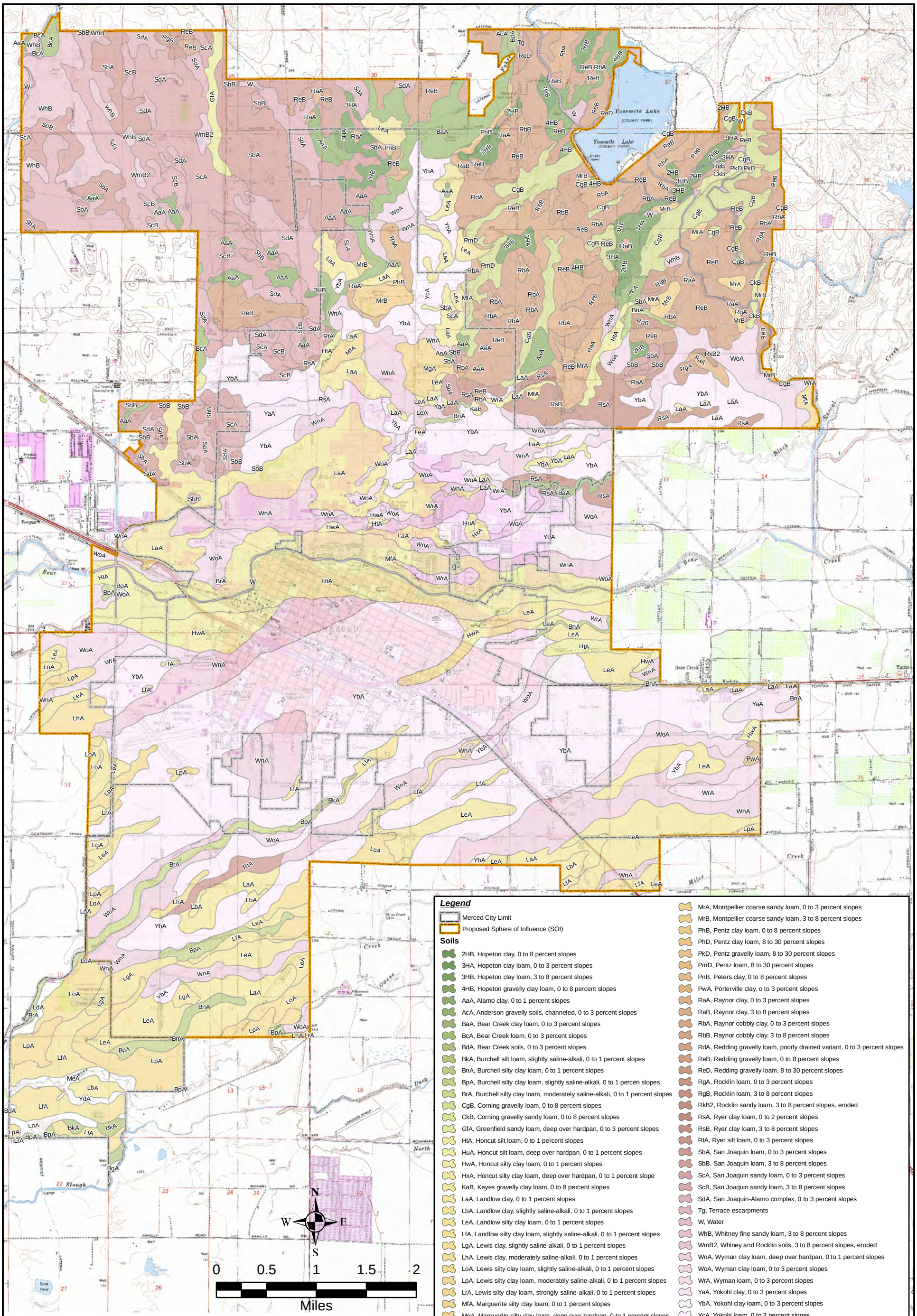
The Bear Reservoir Dam inundation area covers a good portion of the City's SUDP/SOI east to west as shown in Figure 3.8-2. The dam, also being earthen, would fail gradually due to the erosion of the breach. The flood wave would build gradually to a peak and then decline until the reservoir is empty.

Expansive Soils

Expansive soils are those soils that shrink and swell in response to changes in moisture content potentially causing serious damage to overlying structures. Soils in the area are generally moderate to deep, silty and clayey loams. Some gravely and cobbley loams are also present, primarily concentrated in the stream drainages. The soils listed are not generally considered to be expansive, have a generally low to moderate erosion potential, and are generally considered suitable for wastewater disposal using conventional septic systems.

Subsidence

Differential settlement, resulting in the compaction of loose, less cohesive soils, may be caused by earthquakes and could occur in the City's SUDP/SOI. The most likely areas are those in



Legend

Merced City Limit

Proposed Sphere of Influence (SOI)

Soils

- 2HB, Hopeton clay, 0 to 8 percent slopes
- 3HA, Hopeton clay loam, 0 to 3 percent slopes
- 3HB, Hopeton clay loam, 3 to 8 percent slopes
- 4HB, Hopeton gravelly clay loam, 0 to 8 percent slopes
- AaA, Alamo clay, 0 to 1 percent slopes
- AcA, Anderson gravelly soils, channeled, 0 to 3 percent slopes
- BaA, Bear Creek clay loam, 0 to 3 percent slopes
- BcA, Bear Creek loam, 0 to 3 percent slopes
- BdA, Bear Creek soils, 0 to 3 percent slopes
- BkA, Burchell silt loam, slightly saline-alkali, 0 to 1 percent slopes
- BnA, Burchell silty clay loam, 0 to 1 percent slopes
- BpA, Burchell silty clay loam, slightly saline-alkali, 0 to 1 percen slopes
- BrA, Burchell silty clay loam, moderately saline-alkali, 0 to 1 percent slopes
- CgB, Corning gravelly loam, 0 to 8 percent slopes
- CkB, Corning gravelly sandy loam, 0 to 8 percent slopes
- GfA, Greenfield sandy loam, deep over hardpan, 0 to 3 percent slopes
- HtA, Honcut silt loam, 0 to 1 percent slopes
- HuA, Honcut silt loam, deep over hardpan, 0 to 1 percent slopes
- HwA, Honcut silty clay loam, 0 to 1 percent slopes
- HxA, Honcut silty clay loam, deep over hardpan, 0 to 1 percent slope
- KaB, Keyes gravelly clay loam, 0 to 8 percent slopes
- LaA, Landlow clay, 0 to 1 percent slopes
- LbA, Landlow clay, slightly saline-alkali, 0 to 1 percent slopes
- LeA, Landlow silty clay loam, 0 to 1 percent slopes
- LfA, Landlow silty clay loam, slightly saline-alkali, 0 to 1 percent slopes
- LgA, Lewis clay, slightly saline-alkali, 0 to 1 percent slopes
- LhA, Lewis clay, moderately saline-alkali, 0 to 1 percent slopes
- LoA, Lewis silty clay loam, slightly saline-alkali, 0 to 1 percent slopes
- LpA, Lewis silty clay loam, moderately saline-alkali, 0 to 1 percent slopes
- LrA, Lewis silty clay loam, strongly saline-alkali, 0 to 1 percent slopes
- MfA, Marguerite silty clay loam, 0 to 1 percent slopes
- MgA, Marguerite silty clay loam, deep over hardpan, 0 to 1 percent slopes
- MrA, Montpellier coarse sandy loam, 0 to 3 percent slopes
- MrB, Montpellier coarse sandy loam, 3 to 8 percent slopes
- PhB, Pentz clay loam, 0 to 8 percent slopes
- PhD, Pentz clay loam, 8 to 30 percent slopes
- PkD, Pentz gravelly loam, 8 to 30 percent slopes
- PmD, Pentz loam, 8 to 30 percent slopes
- PnB, Peters clay, 0 to 8 percent slopes
- PwA, Porterville clay, o to 3 percent slopes
- RaA, Raynor clay, 0 to 3 percent slopes
- RaB, Raynor clay, 3 to 8 percent slopes
- RbA, Raynor cobbly clay, 0 to 3 percent slopes
- RbB, Raynor cobbly clay, 3 to 8 percent slopes
- RdA, Redding gravelly loam, poorly drained variant, 0 to 3 percent slopes
- ReB, Redding gravelly loam, 0 to 8 percent slopes
- ReD, Redding gravelly loam, 8 to 30 percent slopes
- RgA, Rocklin loam, 0 to 3 percent slopes
- RgB, Rocklin loam, 3 to 8 percent slopes
- RkB2, Rocklin sandy loam, 3 to 8 percent slopes, eroded
- RsA, Ryer clay loam, 0 to 2 percent slopes
- RsB, Ryer clay loam, 3 to 8 percent slopes
- RtA, Ryer silt loam, 0 to 3 percent slopes
- SbA, San Joaquin loam, 0 to 3 percent slopes
- SbB, San Joaquin loam, 3 to 8 percent slopes
- ScA, San Joaquin sandy loam, 0 to 3 percent slopes
- ScB, San Joaquin sandy loam, 3 to 8 percent slopes
- SdA, San Joaquin-Alamo complex, 0 to 3 percent slopes
- Tg, Terrace escarpments
- W, Water
- WhB, Whitney fine sandy loam, 3 to 8 percent slopes
- WmB2, Whiney and Rocklin soils, 3 to 8 percent slopes, eroded
- WnA, Wyman clay loam, deep over hardpan, 0 to 1 percent slopes
- WoA, Wyman clay loam, 0 to 3 percent slopes
- WrA, Wyman loam, 0 to 3 percent slopes
- YaA, Yokohl clay, 0 to 3 percent slopes
- YbA, Yokohl clay loam, 0 to 3 percent slopes
- YcA, Yokohl loam, 0 to 3 percent slopes

Source: USGS, 2009 / USDA, 2009 / City of Merced, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
SOILS MAP

Figure 3.6-1

Job No.: 060429

which the groundwater surface is deep (otherwise liquefaction would be more likely), the soils are loose to medium-dense, and the soil profile includes strata of loose and uniformly graded sand. The potential for ground subsidence due to earthquake motion is largely dependent on the magnitude, duration, and frequency of the earthquake waves.

Unlike tectonic or seismically stimulated subsidence which occurs suddenly, most of the various cases of subsidence happen slowly over a long period of time. The west side of the San Joaquin Valley has been recognized as the world's largest area of subsidence due to groundwater withdrawal. Until recently, the County's subsiding area has been in the vicinity of Los Banos; however, a new subsiding area has been discovered near El Nido east of the San Joaquin River. No known subsidence has occurred in the Merced planning area or has accompanied groundwater withdrawal.

Lurch Cracking and Lateral Spreading

Lurch cracking and lateral spreading are processes that result in free face failures during a seismic event. No significant free face failures were observed within the SUDP/SOI and the potential for lurch cracking and lateral spreading is, therefore, very low in the SUDP/SOI in its current condition.

Seismic Settlement

Due to the moderate- to well-drained and generally consolidated nature of the geologic materials within the SUDP/SOI area, the risk of seismic settlement is considered to be low.

Naturally Occurring Asbestos

Potentially naturally occurring asbestos (NOA) containing rock formations are not known to be present in the San Joaquin Valley. Potentially NOA-containing rock formations do occur in the Western Sierra from which the sediments underlying the City of Merced are derived; however, the probability that materials containing NOA concentrations at or above the current regulated level of 0.25% is very low.

Volcanism

The City of Merced is located in a sedimentary basin that is well over 100 million years old, and has not been volcanically active in that time. Volcanic deposits less than 10 million years old indicative of a latent volcanic hazard are not present in the SUDP/SOI. The closest significant potential area of volcanism to the SUDP/SOI is the Mono Lakes and Mammoth areas approximately 50 miles east. Although it is likely that at some time in the future volcanism will resume in the region, it is unlikely that this will occur in the next millennia.

Regulatory Setting

FEDERAL

U.S. Uniform Building Code (UBC)

The U.S. Uniform Building Code (UBC) has design criteria for excavations and structures under static and dynamic loading conditions.

STATE

California Building Code

The California Building Code is another name for the body of regulations known as the California Code of Regulations (C.C.R.), Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988).

Published by the International Code Council, the International Building Code (IBC) is a widely adopted model building code in the United States. The California Building Code incorporates by reference the IBC with necessary California amendments. About one-third of the text within the California Building Code has been tailored for California earthquake conditions.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazards associated with fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations are conducted in order to demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong groundshaking, liquefaction, landslides, or other ground failure/hazards caused by earthquakes. This act requires the State Geologist to delineate seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site has to be conducted and appropriate mitigation measures incorporated into the project design.

California Department of Transportation

Caltrans has developed roadway design standards including those for seismic safety. Consideration of earthquake hazards in roadway design is detailed in the Highway Design Manual published by Caltrans (1995). Modifications to local highways and roads would be required to adhere to Caltrans engineering standards to minimize settlement.

Government Code Section 65302(g)

Government Code Section 65302(g) discusses the significant issues that a General Plan must address in its Safety Element. Among these issues are the potential for seismically induced surface rupture, groundshaking, ground failure, seiche, tsunami, slope instability, and subsidence. Seismic and geologic hazards must be considered in determining design and building standards, and the location of future development, in order to minimize or mitigate the risk of injury, death and property damage which could result from natural and man-made hazards.

LOCAL

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to geological/soils related impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Parks, Open Space, and Conservation and Safety Elements of the General Plan are designed to ensure that geological/soils related impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Open Space, Conservation, and Recreation Policies:

OS-5.2 Protect soil resources from the erosive forces of wind and water.

Safety Policies:

S-2.1 Reduce the potential danger from earthquake and seismic-related activity from existing buildings where necessary.

S-2.2 Encourage the improvement of all public facilities and infrastructure such as natural gas, fuel, sewer, water, electricity, and railroad lines and equipment with up-to-date seismic safety features.

S-2.3 Restrict urban development in all areas with potential ground failure characteristics.

3.6.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42
    - Strong seismic ground shaking
    - Seismic-related ground failure, including liquefaction
    - Landslides

- Result in substantial soil erosion or the loss of topsoil

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse

- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

3.6.3 IMPACTS AND MITIGATION MEASURES

Impact #3.6-1: Expose people or structures to potential substantial adverse effects from seismic hazards

Discussion/Conclusion: Merced County is divided into two major geologic provinces: the Sierra Nevada Mountains and the Central Valley. The City of Merced is located in the northeastern portion of the County, in the Central Valley geologic province. Although the City of Merced is situated in proximity to several fault groups (see Table 3.6-1), it is not identified to be located in a delineated Alquist-Priolo Earthquake Fault Zone. Isolated portions of the County may be subject to strong seismic groundshaking. These locations are primarily located to the south, east, and west of the City of Merced. The nearest faults of major historical significance are the San Andreas Fault, 58 miles to the west; the Hayward and Calaveras faults to the northwest; and the White Wolf, Garlock, and Sierra faults to the south. These seem to be the most likely to shake the City of Merced again in the future. The probability of soil liquefaction actually occurring in the County, including within the City of Merced, is considered to be a low to moderate hazard; however, detailed geotechnical engineering investigations at a site specific level would be necessary to more accurately evaluate liquefaction potential in specific areas.

Policies included in the proposed General Plan to provide for the safety of all residents from earthquake and other geologic hazards include Policies S-2.1, S-2.2 and S-2.3 which call for the City to reduce the potential danger from earthquake and seismic-related activity from existing buildings where necessary; to encourage the improvement of all public facilities and

infrastructure; and restrict urban development in all areas with potential ground failure characteristics. Implementing actions of each of these policies provide further guidance and actions for reducing seismic related hazards in the City of Merced (2.1.a, 2.1.b, 2.1.c, 2.1.d, 2.1.e, 2.1.f, 2.2.a, 2.2.b, 2.3.a and 2.3.b).

As stated above, the City will implement a variety of policies and implementing actions designed to address public health and safety issues resulting from seismic hazards. Therefore, implementation of the proposed General Plan, adherence to the Alquist-Priolo Act, and enforcement of the California Building Standards Code would result in a ***less than significant*** impact.

Mitigation Measures

No mitigation measures are required.

Impact #3.6-2: The proposed project would not result in substantial soil erosion or the loss of topsoil

Discussion/Conclusion: Erosion is a normal and inevitable geologic process whereby earth materials are loosened, worn away, decomposed or dissolved, and are removed from one place and transported to another location. Precipitation, running water, and wind are all factors that contribute to erosion. Ordinarily, erosion proceeds very slowly as to be imperceptible, but when the natural equilibrium of the environment is changed, the rate of erosion can be greatly accelerated. Accelerated erosion within an urban area can cause damage by undermining structures, blocking storm sewers and depositing silt, sand, or mud in roads and tunnels. Consequently, these erosion effects can result in a variety of aesthetic and engineering problems. Additionally, eroded materials are eventually deposited into local waterways where the carried silt remains suspended for some time, constituting a pollutant and altering the normal balance of a waterway ecosystem.

The City's topography is relatively flat, with soil conditions that exhibit minimal potential for erosion impacts. Development activities resulting from buildout of the proposed General Plan could accelerate the erosion rate through both an increase in short-term construction-related activities and an overall increase in the amount of impervious surfaces. Development in the City would be subject to local and State codes and requirements for erosion control and grading. In addition, project sites encompassing an area of one or more acres would require compliance with a NPDES permit and consequently the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

Consequently, erosion-related effects can be minimized through implementation of the policies and implementing actions provided as part of the Open Space, Conservation and Recreation Element. Policy OS-5.2 calls for the City to protect soil resources from the erosive forces of wind and water. Implementing Actions 5.2.a and 5.2.c of Policy OS-5.2 call for the City to reduce the soil erosion potential of new development, and maintain adequate vegetation along the banks of urban streams and storm water drainage channels. With implementation of the

policies and implementing actions and adherence to applicable federal, state and local regulations as noted above, this impact is considered ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.6-3: The proposed project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

Discussion/Conclusion: The Foothill and Mountain areas of the County are more likely to experience landslides than the Valley area. The City of Merced is located in the Valley area of the County and is therefore less likely to experience landslides than other areas in the County. Susceptible areas include areas where fractured and steep slopes are present or where inadequate ground cover accelerates erosion. The probability of soil liquefaction actually taking place anywhere in the City of Merced is considered to be a low hazard. Soil types in the area are not conducive to liquefaction because they are either too coarse or too high in clay content. No significant free face failures were observed within the SUDP/SOI and the potential for lurch cracking and lateral spreading is, therefore, very low in the SUDP/SOI in its current condition.

As stated above and under Impacts #3.6-1 and #3.6-2, the City will implement a variety of policies and implementing actions (policies OS-5.2 and S-2.3, and Implementing Actions 5.2.a, 5.2.b, 5.2.c, 2.3.a and 2.3.b) designed to address public health and safety issues resulting from an unstable geologic unit. Therefore, implementation of the proposed General Plan, adherence to the Alquist-Priolo Act, and enforcement of the California Building Standards Code would result in a ***less than significant*** impact.

Mitigation Measures

No mitigation measures are required.

Impact #3.6-4: The proposed project could be located on expansive soils creating substantial risks to life or property

Discussion/Conclusion: Expansive soils are those possessing clay particles that react to moisture changes by shrinking (when they dry) or swelling (when they become wet). Expansive soils can also consist of silty to sandy clay. The extent of shrinking and swelling is influenced by the environment, including the extent of wet or dry cycles, and by the amount of clay in the soil. This physical change in the soils can react unfavorably with building foundations, concrete walkways, swimming pools, roadways, and masonry walls. Soils in the area are generally moderate to deep, silty and clayey loams. Some gravely and cobbley loams are also present, primarily concentrated in the stream drainages. The soils listed are not generally considered to be expansive, have a generally low to moderate erosion potential, and are generally considered suitable for wastewater disposal using conventional septic systems.

As stated above, Policy S-2.3 calls for the City to restrict urban development in all areas with potential ground failure characteristics. Implementing Action 2.3.a of this policy says that the City will investigate the feasibility of performing an inventory of areas with generally unstable ground within the SUDP/SOI area and work with the County to restrict or prohibit their development. In the Merced planning area, most of the unstable ground are in old streams beds, near embankments, and adjacent to streams with sufficient velocities to erode the bank. This policy and the other policies noted previously under Impacts #3.6-1 through #3.6-3 are designed to address public health and safety issues resulting from an unstable geologic unit, including expansive soils. Therefore, implementation of the proposed General Plan, adherence to the Alquist-Priolo Act, and enforcement of the California Building Standards Code would result in a ***less than significant*** impact.

Mitigation Measures

No mitigation measures are required.

Impact #3.6-5: Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

According to the Geologic, Geohazards and Environmental Health Hazards Evaluation Report (Geocon Consultants, Inc.), the soils in the SUDP/SOI are not generally considered to be expansive, have a generally low to moderate erosion potential, and are generally considered suitable for wastewater disposal using conventional septic systems. The impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Regional development would increase the number of people and structures subject to geologic and soils-related risks. The policies contained in the proposed General Plan, along with compliance with federal, State and local regulations addressing building construction, run-off and erosion, reduce the potential project-level impact associated with geology and soils to a less than significant level. Development in other communities and unincorporated areas in Merced County would also be required to comply with federal, State and local regulations that are designed to protect increases in people and structures from hazards related to such issues as earthquakes, landslides and soil erosion. As a result, conformance with adopted California building codes, and other measures to protect people and structures from geologic hazards, would reduce this impact to a less than significant level. The project's incremental contribution to these impacts will be ***less than cumulatively considerable***.

3.7

HAZARDS AND HAZARDOUS MATERIALS

3.7 Hazards and Hazardous Materials

This section of the Draft EIR addresses the potential for the Merced General Plan to create hazards to the public or residents of the area through the transport, use, or disposal of hazardous materials, the exposure of persons to existing onsite hazardous materials or soil contamination, or the exposure to potential wildland fires. During the Notice of Preparation period, the Office of Emergency Services stated that the City should examine the sections of state planning law that involve potential hazards the City may face.

3.7.1 SETTING

Environmental Setting

Lists of contaminated sites within the City of Merced are available through the Regional Water Quality Control Board and the Department of Toxic Substance Control. According to information provided by these agencies, several sites located within the City are associated with leaking underground fuel tanks (LUFT) or are classified as Spills, Leaks, Investigation, and Cleanups sites (SLIC). Appendix H lists the site name, location, site type and status of the listings identified. In addition, agricultural practices and businesses such as dry cleaners, gas stations and auto-repair shops could also be areas of contamination. Railroad rights-of-way typically have surface contamination due to the lubricating oil used on the wheels and the use of herbicides to help minimize weeds within these areas.

A substance may be considered hazardous due to a number of criteria, including toxicity, ignitability, corrosivity, or reactivity. The term "hazardous material" is defined in law as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.

Once a hazardous material becomes ready for discard, it becomes a hazardous waste. A hazardous waste, for the purpose of this EIR, is any hazardous material that is abandoned, discarded, or (planned to be) recycled. In addition, hazardous wastes may occasionally be generated by actions that change the composition of previously non-hazardous materials. The same criteria (toxicity, ignitability, corrosivity, or reactivity) that render a material hazardous makes waste hazardous.

WILDLAND AND URBAN FIRE HAZARDS

Both urban and wildland fire hazard potential exists in the City of Merced and surrounding areas, creating the potential for injury, loss of life, and property damage. Urban fires primarily involve the uncontrolled burning of residential, commercial, or industrial structures due to human activities. Wildland fires affect grassland, brush or woodlands, and any structures on or near these fires. Such fires can result from either human made or natural causes.

The type and amount of fuel, topography, climate, and the availability of water for fire fighting are the primary factors influencing the degree of fire risk. Urban fires comprise the majority of fires in the City of Merced while the potential for wildland fires could increase as large blocks of

undeveloped land are annexed into the City. Most of the fires are caused by human activities involving motor vehicles, equipment, arson, and burning of debris.

As the City of Merced continues to grow and more rural lands are annexed to the City, there is the potential to exacerbate the potential for wildland fires. Proper land use planning, education, mitigation measures and investment in fire protection resources are key steps to reducing the potentially devastating effects of wildland fires and thus safeguarding the people and property of the City of Merced.

AIRPORT SAFETY

The City of Merced is impacted by the presence of two airports-Merced Regional Airport, which is on the southwest corner of the City, and Castle Airport, located approximately three miles west of the Highway 59 and Bellevue Road intersection (Figure 3.7-1). This is the former Castle Air Force Base.

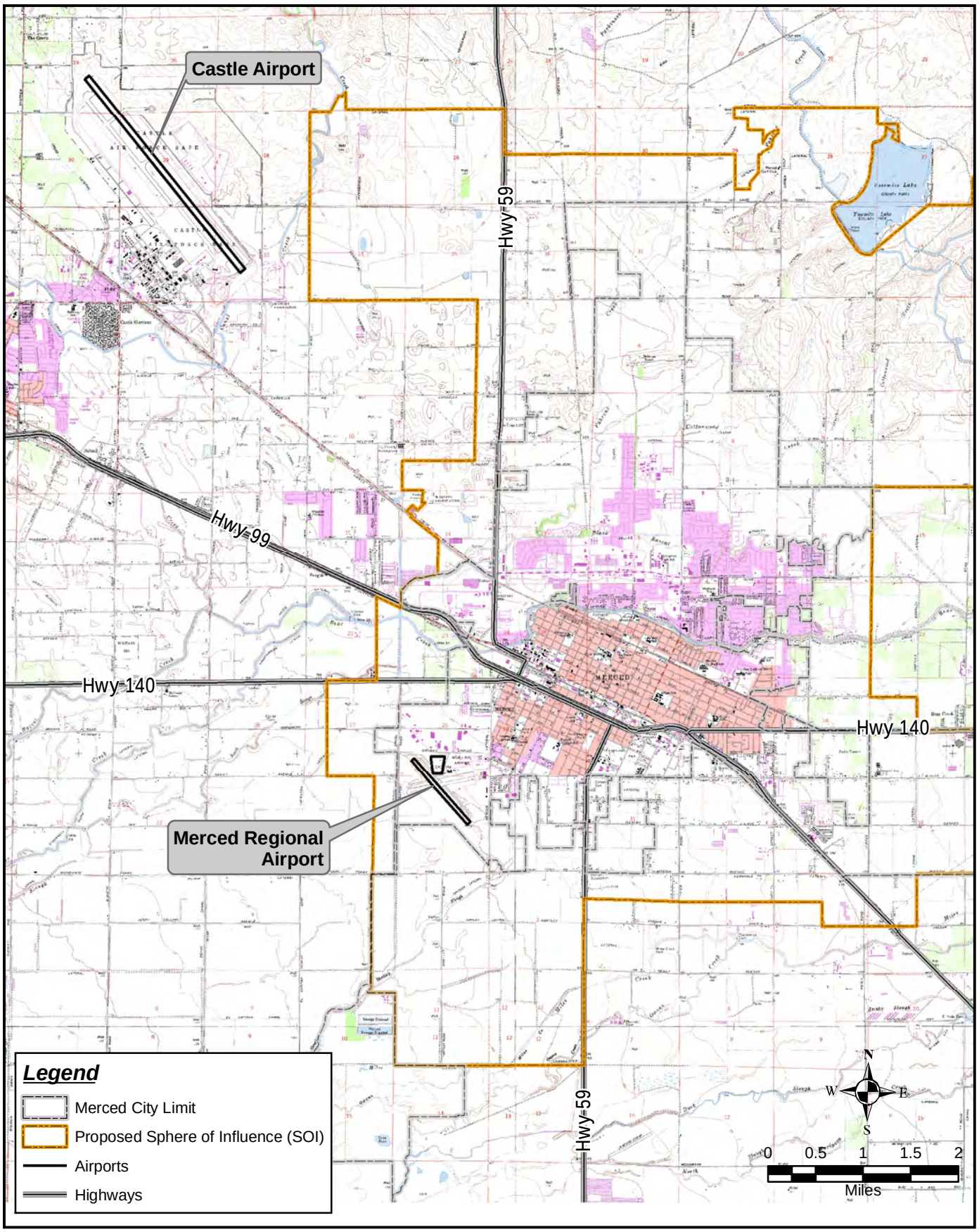
The continued operation of the Merced Regional Airport involves various hazards to both flight (physical obstructions in the airspace or land use characteristics which affect flight safety) and safety on the ground (damage due to an aircraft accident). Growth is restricted around the Regional Airport in the southwest corner of the City due to the noise and safety hazards associated with the flight path.

Castle Airport also impacts the City. Portions of the northwest part of the SUDP/SOI and the incorporated City are within Castle's safety zones (see Figure 3.7-2). The primary impact is due to noise (Zones C and D), though small areas have density restrictions (Zone B2). The military discontinued operations at Castle in 1995. One important criterion for determining the various zones is the noise factor. Military aircraft are designed solely for performance, whereas civilian aircraft have extensive design features to control noise. Now that the Castle Airport is used for civilian purposes, the approach zones for the airport are being re-evaluated, which may create opportunities for additional residential development.

Potential hazards to flight include physical obstructions and other land use characteristics that can affect flight safety, which include: visual hazards such as distracting lights, glare, and sources of smoke; electronic interference with aircraft instruments or radio communications; and uses which may attract flocks of birds. In order to safeguard an airport's long-term usability, preventing encroachment of objects into the surrounding airspace is imperative.

RAILROAD

Hazardous materials are regularly shipped on the BNSF and SP/UP Railroad lines that pass through the City. While unlikely, an incident involving the derailment of a train could result in the spillage of cargo from the train in transporting. The spillage of hazardous materials could have devastating results. The City has little to no control over the types of materials shipped via the rail lines. There is also a safety concern for pedestrians along the tracks and vehicles utilizing at-grade crossings. The design and operation of at-grade crossings allows the City some control over rail related hazards. Ensuring proper gate operation at the crossings is the most effective strategy to avoid collision and possible derailments.

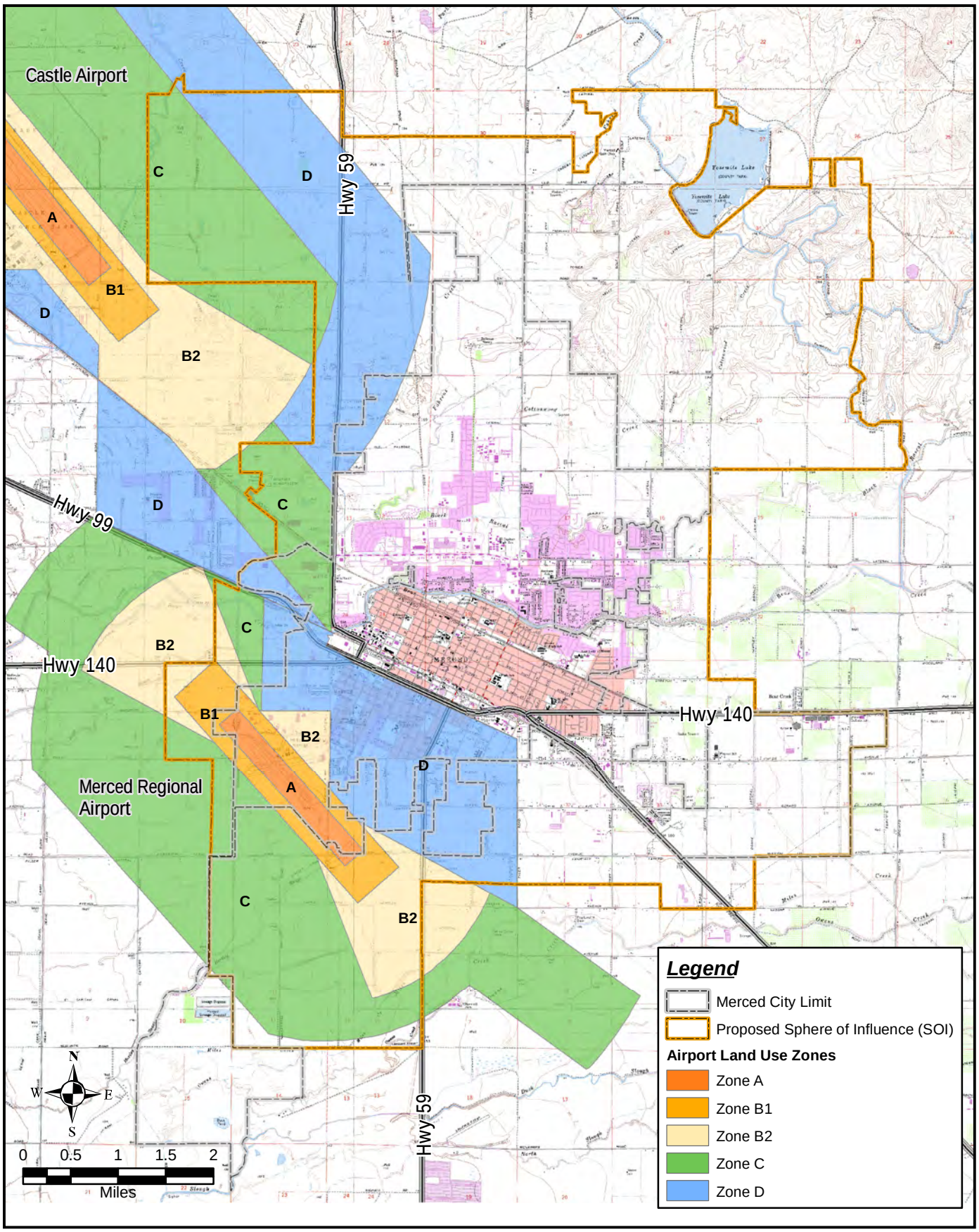


Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
AIRPORT LOCATIONS

Figure 3.7-1

Job No.: 060429



Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
AIRPORT COMPATIBILITY ZONES

Figure 3.7-2

Job No.: 060429

EMERGENCY PREPAREDNESS

Public Protection & Disaster Planning

Hospitals, ambulance companies, and fire districts provide medical emergency services. Considerable thought and planning have gone into efforts to improve responses to day-to-day emergencies and planning for a general disaster response capability.

The City's Emergency Plan and the County Hazardous Waste Management Plan both deal with detailed emergency response procedures under various conditions for hazardous materials spills. The City also works with the State Department of Health Services to establish cleanup plans and to monitor the cleanup of known hazardous waste sites within the City.

Regulatory Setting

The use of hazardous materials and disposal of hazardous waste are subject to numerous laws and regulations at all levels of government. Below is a brief overview of federal, state and local laws and regulations.

FEDERAL

Resource Conservation and Recovery Act (RCRA)

Under the Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C s/s 6901 et seq.), individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as federal RCRA requirements. The EPA must approve state programs intended to implement federal regulations. In California, the California Environmental Protection Agency (Cal EPA) and the Department of Toxic Substances Control (DTSC), a department within Cal EPA, regulate the generation, transportation, treatment, storage, and disposal of hazardous waste. The EPA approved California's RCRA program, called the Hazardous Waste Control Law (HWCL), in 1992. DTSC has primary hazardous material regulatory responsibility, but can delegate enforcement responsibilities to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of the HWCL.

The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe the management of hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in ordinary landfills. Hazardous waste generators must retain hazardous waste manifests for a minimum of three years. These manifests provide a description of the waste, its intended destination, and regulatory information about the waste. A copy of each manifest must be filed with the state. The generator must match copies of hazardous waste manifests with receipts from treatment, storage, and disposal facilities.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act and associated Superfund Amendments provide the US Environmental Protection Agency with the authority to identify hazardous sites, to require site remediation, and to recover the costs of site remediation from polluters. California has enacted similar laws intended to supplement the federal program. The DTSC is primarily responsible for implementing California's Superfund Law.

US Department of Transportation

The United States Department of Transportation (DOT) regulates transportation of hazardous materials by truck and rail. This department also establishes criteria for safe handling procedures of hazardous materials.

STATE

California Code of Regulations, Title 22, §66261.20-24

Soils having concentrations of contaminants higher than certain acceptable levels must be handled and disposed of as hazardous waste when excavated. The California Code of Regulations, Title 22, §66261.20-24 contains technical descriptions of characteristics that would cause a soil to be classified as a hazardous waste.

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act)

The Business Plan Act requires that any business that handles hazardous materials prepare a business plan, which must include the following:

- Details, including floor plans, of the facility and business conducted at the site.
- An inventory of hazardous materials that are handled or stored on site.
- An emergency response plan.
- A safety and emergency response training program for new employees with annual refresher courses.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)

In January 1996, the Cal EPA adopted regulations implementing the Unified Program. The program has six elements: hazardous waste generators and hazardous waste on-site treatment; underground storage tanks; aboveground storage tanks; hazardous materials release response plans and inventories; risk management and prevention programs; and Fire Code hazardous materials management plans and inventories. The plan is implemented at the local level. The local agency that is responsible for the implementation of the Unified Program is called the Certified Unified Program Agency (CUPA), and the Merced County Environmental Health Division is designated the CUPA.

California Vehicle Code § 32000

Common carriers are licensed by the California Highway Patrol (CHP), pursuant to California Vehicle Code § 32000. This section requires the licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time, and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards.

California Emergency Services Act

Pursuant to the California Emergency Services Act, the state has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local governmental agencies and private persons. Response to hazardous materials incidents is one part of this plan. The plan is administered by the state Office of Emergency Services (OES). The OES coordinates the responses of other agencies, including the Cal EPA, CHP, the CDFG, the RWQCBs, the local air pollution control districts, and local agencies.

California Accidental Release Prevention Program (CalARP)

CalARP regulations became effective January 1, 1997, replacing the California Risk Management and Prevention Program. CalARP was created to prevent the accidental release of regulated substances. It covers businesses that store or handle certain volumes of regulated substances at their facilities. A list of regulated substances is found in § 2770.5 of the CalARP regulations. If a business has more than the listed threshold quantity of a substance, an accidental release prevention program must be implemented and a risk management plan may be required. The OES is responsible for implementing the provisions of CalARP.

LOCAL

Merced County Airport Land Use Compatibility Plan

In April 1999, the Merced County Airport Land Use Commission adopted the *Merced County Airport Land Use Compatibility Plan* (Merced County, 1999), which addresses what is now called the Merced Regional Airport. The Plan promotes compatibility between the airports in the County and the land uses that surround them through the establishment of compatibility zones surrounding the airports. The five zones are described as follows.

- Zone A: This zone is the Runway Protection Zone where all structures are prohibited.

- Zone B1: This zone is the Approach/Departure Zone, which runs adjacent to the runway. In this zone, educational facilities, hospitals, and aboveground storage of hazardous materials are prohibited. There is also a 0.2 unit/acre maximum density requirement for this zone.

- Zone B2: This zone is the Extended Approach/Departure Zone. In this zone, educational facilities, hospitals, and aboveground storage of hazardous materials are prohibited. There is a 1.0 unit/acre maximum density requirement for this zone.

- Zone C: This zone is the Common Traffic Pattern zone. In this zone, educational facilities, hospitals, and libraries are prohibited. There is an 8 units/acre maximum density requirement for this zone.

- Zone D: This zone is for Other Airport Environs and is the outermost zone of the airport. There are no development restrictions for this zone, with the exception of objects over 150 feet tall.

Figure 3.7-2 shows these zones in relation to the City. Castle Airport impacts the northwest part of the proposed SUDP/SOI through the establishment of Compatibility Zones "C" and "D." The far northwest corner of the plan area is designated for a Community Plan, which will ultimately contain a mix of residential and commercial uses. Zone "C" will establish a density restriction, and a number of public uses will be prohibited. The area within Zone "D" lies along Highway 59, and is designated for a mix of residential, commercial, industrial and public uses. Occasional noise events are the primary effects within this zone.

Merced County Hazardous Waste Management Plan

Merced County prepared an HWMP in 1989 in accordance with California Health and Safety Code Section 25135, et seq. The plan addresses waste reduction and on-site treatment, the siting of off-site hazardous waste facilities, transportation of hazardous wastes, cleanup of contaminated sites, and emergency response procedures. The Merced County Division of Environmental Health enforces the plan and maintains a list of known hazardous waste sites within the County that is updated continuously. The Merced City Fire Department also works with the County Division of Environmental Health to prevent the accidental release of hazardous substances by conducting inspections of hazardous materials facilities and enforcing use and storage requirements.

City of Merced Emergency Plan

The City has adopted an Emergency Plan, which is reviewed and updated annually. This plan identifies emergency evacuation routes and procedures for the City in the event that an incident occurs. The City coordinates with the Merced County Office of Emergency Services in planning for a number of potential emergency situations, such as floods, hazardous material spills, and major fires. The City also recently agreed to establish a Community Emergency Response Team (CERT) in coordination with the County OES. CERTs assist emergency responders with first aid, traffic control and clean-up.

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to Hazards and Hazardous Materials impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Transportation and Circulation, Parks, Open Space, and Conservation and the Safety Elements of the General Plan are designed to ensure that hazards and hazardous materials impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Urban Expansion Policies:

UE-1.1 Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.

Transportation and Circulation Policies:

T-1.4 Promote traffic safety for all modes of transportation.

T-2.3 Support a safe and effective public transit system.

T-3.1 Preserve the Merced Regional Airport and its protective zones from incompatible encroachment and incompatible development within the Airport Industrial Park.

Open Space, Conservation, and Recreation Policies:

OS-4.1 Preserve open space areas which are necessary to maintaining public health and safety.

Safety Policies:

S-1.1 Develop and maintain emergency preparedness procedures for the City.

S-4.1 Promote the concept of fire protection master planning with fire safety goals, missions, and supporting objectives for the community.

S-4.2 Maintain a reasonable level of accessibility and infrastructure support for fire suppression, disaster, and other emergency services.

S-5.1 Continue to protect approach areas and control zones for both existing and future runway systems through land use regulations and property acquisition where necessary.

S-5.2 Prevent the encroachment of potential hazards to flight within the Airport's airspace.

S-7.1 Prevent injuries and environmental contamination due to the uncontrolled release of hazardous materials.

S-7.2 Ensure that hazardous materials are cleaned up before a property is developed or redeveloped.

3.7.2 THRESHOLDS OF SIGNIFICANCE

A project is normally considered to have a potentially significant impact on the environment if it will:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school

- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment

- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area

- For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan

- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands

3.7.3 IMPACTS AND MITIGATION MEASURES

Impact #3.7-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

Discussion/Conclusion: The potential increase in development as a result of implementation of the 2030 General Plan could result in more hazardous materials being used, stored, transported through and discarded within the City of Merced, which would increase the potential risk associated with hazardous materials and waste. As a result, the 2030 General Plan includes policies and implementing actions that are intended to limit the impact hazardous materials could have on the population and environment.

Industrial and Commercial Uses

Potential increases in industrial and commercial use of hazardous materials would primarily be regulated by federal, State and County agencies, as discussed above, which would ensure that hazardous material use and transportation would be safely controlled. Implementing Action 1.4.c of Policy T-1.4 (Promote Traffic Safety) states that the City will promote increased traffic safety with special attention to hazards which could cause personal injury. Policies S-7.1 and S-7.2 of the Draft Safety Element call for the City to prevent injuries and environmental

contamination due to the uncontrolled release of hazardous materials and ensure that hazardous materials are cleaned up before a property is developed or redeveloped. Implementing Actions include supporting Merced County in carrying out and enforcing the Merced County Hazardous Waste Management Plan (7.1.a); continuing to update and enforce local ordinances regulating the permitted use and storage of hazardous gases, liquids, and solids (7.1.b); and continuing to make sure underground storage tanks containing hazardous materials are properly installed, used, and removed (7.1.c).

Combined with federal, State and County requirements and standards, as well as the policies contained in the 2030 General Plan, adoption and implementation of the Plan would have a ***less than significant*** impact related to industrial and commercial use of hazardous materials.

Household Use

Residential growth that may occur over the lifetime of the 2030 General Plan could result in increased use of household hazardous materials. While this use is generally limited and is not typically considered a major hazard, facilitating the proper disposal of household hazardous waste creates opportunity for residents to properly dispose of such materials rather than "pouring them down the drain." The Merced County Division of Environmental Health has a facility near the Highway 59 landfill site for disposal of hazardous household chemicals and other items, such as batteries and electronics. In addition, the division conducts a number of hazardous waste collection events each year throughout Merced County.

The availability of proper disposal facilities and the commitment of the City to community education and emergency preparedness, reduce the potential impact from improper household hazardous materials disposal to ***less than significant.***

Mitigation Measures

No mitigation measures are required.

Impact #3.7-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

Discussion/Conclusion: Due to the increase in population and non-residential land uses that would result from the implementation of the 2030 General Plan, there would be the potential for an increase in the risk of hazardous materials accidents such as spills. Although accidents involving hazardous materials cannot be completely avoided, the threat of accidents is maintained at a less than significant level by existing federal, State, County and local regulations that direct the production, use, emissions and transportation of hazardous materials. For example, the transport of hazardous materials by rail and truck is regulated by the Department of Transportation (DOT) and the California Environmental Protection Agency is responsible for implementing federal hazardous materials laws and regulations. The City's Emergency Plan also plans for response to a potential hazardous materials incident, in the event one was to occur.

Policies S-7.1 and S-7.2 of the Draft Safety Element call for the City to prevent injuries and environmental contamination due to the uncontrolled release of hazardous materials and ensure that hazardous materials are cleaned up before a property is developed or redeveloped. Implementing Actions include supporting Merced County in carrying out and enforcing the Merced County Hazardous Waste Management Plan (7.1.a); continuing to update and enforce local ordinances regulating the permitted use and storage of hazardous gases, liquids, and solids (7.1.b); and continuing to make sure underground storage tanks containing hazardous materials are properly installed, used, and removed (7.1.c).

By following federally- and State-mandated guidelines and the City's Emergency Plan for the handling of hazardous materials and by diverting hazardous materials away from populated areas, the risk associated with the potential for accidental release of hazardous materials into the environment and community would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.7-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school

Discussion/Conclusion: Schools are one of several sensitive receptors that must be taken into consideration when the City is approving new land uses or transportation routes that may accommodate the production, use, storage, or transportation of hazardous materials and/or waste. Implementation of the 2030 General Plan would result in increased population levels throughout the City and would increase the number of school-age children as well. An increase in residential development throughout the City would generate an increase in the number of students (dependent upon future household sizes and make-ups), and would increase the need to construct additional school facilities. New school sites, as required by California law, will be evaluated for their proximity and potential exposure to hazardous materials as they are proposed for development. Policy P-7.1 commits the City to work closely with the school districts on school siting. Potential school sites will be selected to minimize their exposure to a variety of hazardous conditions. School acquisition/development projects to be funded under the State School Facilities Program must also satisfy several specific requirements established under the California Education Code and California Code of Regulations. These regulations require that potential school hazards relating to soils, seismicity, hazards and hazardous materials, and flooding be addressed during the school site selection process. Compliance with these requirements will address significant impacts associated with the siting of new public schools within the City.

Policies S-7.1 and S-7.2 of the Draft Safety Element call for the City to prevent injuries and environmental contamination due to the uncontrolled release of hazardous materials and ensure that hazardous materials are cleaned up before a property is developed or redeveloped. Implementing Actions include supporting Merced County in carrying out and enforcing the Merced County Hazardous Waste Management Plan (7.1.a); continuing to update and enforce

local ordinances regulating the permitted use and storage of hazardous gases, liquids, and solids (7.1.b); and continuing to make sure underground storage tanks containing hazardous materials are properly installed, used, and removed (7.1.c). The combination of federal, State, County and local regulations and implementation of 2030 General Plan policies and implementing actions and land use patterns would ensure that the risk to schools of hazardous materials or emissions would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.7-4: Would the proposed project be located on a site, or proximate to a site, that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment

Discussion/Conclusion: According to a California Department of Toxic Substances Control EnviroStor database search, several hazardous materials sites (LUFT's and SLIC's) are located in the Merced area or near Merced (see Appendix H). However, future development as a result of adoption of the 2030 General Plan will be in compliance with regulations established by the State Department of Health Services and the Merced County HWMP, and policies and implementing actions found in the 2030 General Plan. This impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.7-5: Would the proposed project be located within an airport land use plan, or within two miles of a public airport or private airstrip, creating a safety hazard for people residing or working in the project area

Discussion/Conclusion: The Merced Regional Airport is a publicly owned, public use facility providing commercial air service and freight air cargo service. The airport is located in southwest Merced south of SR 99. In an effort to minimize potential hazards associated with the Merced Regional Airport, the 2030 General Plan proposes low-intensity land uses, such as industrial (and Industrial Reserve), as opposed to land uses such as commercial and residential that carry higher population densities, adjacent to the Runway Protection Zone (Zone A) in accordance with the Merced County Airport Land Use Compatibility Plan and Federal Aviation Administration recommendations.

Merced's Regional Airport Master Plan calls for the acquisition of property and/or approach protection easements in Zone A areas, a maximum occupancy level for commercial/industrial uses in Zones B1, B2, and C, and the retention of existing agricultural uses and the discouragement of residential land uses through density restrictions in the entire referral area (Zones A, B1, B2, and C).

Overall, the intent of the Merced Vision 2030 General Plan is to ensure that existing and future land uses function without imposing a nuisance, hazard, or unhealthy condition upon adjacent uses. Policies included as part of the 2030 General Plan that would minimize conflicts with local airports are summarized as follows. Implementing Action 1.1.c of Policy UE-1.1 (Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area) of the Draft Urban Expansion Element states that incompatible urban development shall not be approved in designated airport clear zones. Implementation Action 1.1e states that the City will "Explore techniques to preserve…aircraft noise and safety zones…from incompatible urban development."

Policy S-5.1 of the Draft Safety Element states that the City will continue to protect approach areas and control zones for both existing and future runway systems through land use regulations and property acquisition where necessary. Policy S-5.2 addresses the encroachment of potential hazards to flight within the Airport's airspace. Implementing actions include retaining existing agricultural land uses and discouraging residential land use designations within the airport referral area; limiting industrial/commercial uses to those with peak occupancy levels of 25 persons/acre or less within Zones B1, B2, and C of the airport referral area; and exploring alternatives for acquiring approach protection easements and overflight easements for properties within the airport referral area (5.1.a, 5.1.b and 5.1.c). Implementation Action 5.2.a states that the City will continue to follow Federal Aviation Regulation standards regarding the maximum height of structures and other objects within the Merced Regional Airport referral area.

Castle Airport is also a focal point for the establishment of specific approach zones. Several of these zones encroach into the proposed SUDP/SOI, as well as existing City limits. Land use restrictions established in the Merced County Airport Land Use Compatibility Plan shall be recognized and enforced. A large area west of Highway 59 is proposed to be removed from the SUDP/SOI as depicted in the Draft February 2008 Land Use Map to avoid potential conflict, but will remain in the Area of Interest (AOI). Draft plans for the two Community Plan areas affected by the Merced and Castle Airports are consistent with the Land Use Compatibility Plan.

Airport safety is also addressed in other elements of the General Plan. Implementation Action 4.1d of Policy OS-4.1 (Preserve open space areas which are necessary to maintaining public health and safety) in the Draft Open Space Element states the City will continue to discourage residential uses in Merced Regional Airport Land Use Compatibility Zones. The Transportation Element includes Policy T-3.1 to "preserve the regional airport and its protective zones from incompatible encroachment." Adherence to the policies and implementing actions contained in the 2030 General Plan will ensure airport safety is achieved for those living and working in the planning area, as well as those flying in and out of the Merced Regional Airport. This impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.7-6: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan

Discussion/Conclusion: The 2030 General Plan could result in new development and population growth, which could affect the implementation of adopted emergency response and evacuation plans during disasters. Recognizing the need to plan for adequate emergency response to protect existing and future development, the 2030 General Plan contains several policies and implementing actions which support public education and emergency preparedness, as well as funding emergency service needs in conjunction with urban growth, and planning future emergency response travel routes. Draft Safety Element Policy S-1.1 aims to develop and maintain emergency preparedness procedures for the City through Implementation Actions 1.1a through 1.1f which call for annual review of the City's existing Emergency Plan; the preparation of route capacity studies and determine evacuation procedures and routes for different types of disasters; requiring that all new annexation areas be incorporated into the City's emergency plan at the time of annexation; establishing a process whereby the City systematically encourages review of and familiarity with the most current community disaster plan by those in local government and other local residents who hold responsible positions; and continuing to adopt and respect agreements with the County and adjacent communities for mutual and automatic aid assistance. Taken together, the proposed policies and implementing actions of the 2030 General Plan would reduce the potential emergency preparedness impact to ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.7-7: Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residence are intermixed with wildlands

Discussion/Conclusion: The risk for wildland fire in the City of Merced and surrounding Planning Area is minimal. Fire and hazardous material safety for the residents of the City and for those working in fire suppression is the overall goal under Fire Protection in the Draft Safety Element. This goal is aided by Policy S-4.1 which calls for the City to promote the concept of fire protection master planning with fires safety goals, missions, and supporting objectives for the community. The Draft Safety Element also addresses fire protection with Policy S-4.2 which calls on the City to maintain a reasonable level of accessibility and infrastructure support for fire suppression, disaster, and other emergency services through implementing actions 4.2.a-4.2.e. These implementing actions include the continued enforcement of the "present nuisance abatement program regarding a height limit on weeds during the dry season in both vacant and developed lots" as well as public education through the provision of "fire prevention and disaster preparedness information through the schools, public interest groups, and other facilities and people." The Draft Open Space Element also addresses weed abatement with Implementing Action 4.1.c of Policy OS-4.1 (Preserve open space areas which are necessary to maintaining public health and safety) by means of "continue[d] enforcement of the City's weed abatement program to ensure undeveloped areas do not become fire hazards." The identified policies under

the 2030 General Plan are targeted to minimizing loss of life and property from wildland fires. The impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

As discussed above, while there would be an increase in local population and employment, the proposed General Plan would not result in a significant impact related to hazards and hazardous materials due to local, regional, State and federal regulations. Similarly, as growth occurs in the County, additional people would be exposed to the risk of hazardous materials, wastes and wildland fires. However, as would occur in Merced, regional, State and federal regulations would apply to development countywide, thereby reducing the potential for cumulative impacts associated with hazards and hazardous materials to a ***less than significant*** level.

3.8

HYDROLOGY AND WATER QUALITY

3.8 Hydrology and Water Quality

This section of the Draft EIR addresses the potential for the Merced General Plan to affect or modify the existing hydrology and water quality of the Planning Area. Two comment letters were received on the NOP from the Merced Irrigation District (MID) in which they said that they would "Upon development of new and existing land covered within the scope of the 2030 General Plan, MID will provide a detailed response in regards to the proposed projects and their impacts upon MID facilities." The second letter received was in response to the NOP regarding hydrology and water quality. The commenter wants the City to prepare a Water Element and "perform an environmental review of the potentially positive environmental effects that could be based upon such additional elements."

3.8.1 SETTING

Environmental Setting

CLIMATE

The climate of the City of Merced is hot and dry in the summer and cool and humid in the winter. The average daily temperature ranges from 47 to 76 degrees Fahrenheit. Extreme low and high temperatures of 15°F and 111°F are also known to occur. Historical average precipitation is approximately 12" per year, with the rainy season commencing in October and running through April. On average, approximately 80% of the annual precipitation occurs between November and March. The hot and dry weather of the summer months usually results in high water demands for landscape irrigation during those months.

REGIONAL TOPOGRAPHY

The project area is located in and immediately adjacent to the City of Merced. The City of Merced is situated in the San Joaquin Valley at the base of the Sierra Nevada foothills. This area contains little topographic relief (less than 1% slopes) across the entire City. Elevation in the City ranges from approximately 200 feet above mean sea level (MSL) along the southeastern portions to approximately 150 feet above MSL in the southwestern extent of the City boundary.

DRAINAGE BASIN

The City of Merced and adjacent areas slated for expansion through the Specific Urban Development Plan/Sphere of Influence (SUDP/SOI) process are located within the San Joaquin/Merced River drainage basin or "watershed." A watershed is commonly defined as the area of land that drains water, sediment, and dissolved materials to a common outlet at some point along the stream channel.

The San Joaquin Valley drainage basin extends from near the City of Stockton to the north to near the City of Fresno to the south, and from the Sierra Nevada on the east to the Coastal Ranges on the west. The basin encompasses approximately 11,000 square miles and is approximately 110 miles long and 95 miles wide. The San Joaquin River originates in the Sierra Nevada mountains and flows southwesterly to the vicinity of Mendota. It then flows

northwesterly to its mouth in the Suisun Bay. It represents the principal stream in the regional drainage basin.

Principal tributaries to the San Joaquin River include the Stanislaus, Tuolumne, and Merced rivers. There are a number of minor tributaries, most of which are ephemeral (dry during the summers), which join the San Joaquin River in an east to west orientation. The following discussion briefly describes the key surface water resources relative to the SUDP/SOI or plan area.

- **The Merced River** is located approximately eight miles north of the study area, flowing through the northeastern part of Merced County. Originating in Yosemite National Park, it drains an area of approximately 1,040 square miles along the western flank of the Sierra Nevada range. With an average flow of 969,400 acre feet, the Merced River provides a source of water for a number of water systems including the Merced Irrigation District.

- **Black Rascal Creek** located north of Santa Fe Drive and Olive Avenue, flows southwesterly through the plan area. Black Rascal Creek originates in the foothills northeast of the plan area near the boundary of Merced and Mariposa Counties.

- **Bear Creek** flows located south of Santa Fe Drive/Olive Avenue, flows in an east-west direction. Its headwaters are impounded by a reservoir approximately four miles east of the plan area. Bear Creek ultimately flows directly into the San Joaquin River.

- **Fahrens Creek** originates at approximately the 700-foot elevation northeast of the plan area and flows southwesterly to its confluence with Black Rascal Creek at a location east of Highway 59 and north of Olive Avenue.

In addition to the natural drainage features, the study area is transected by numerous man-made channels which are part of MID's extensive system of irrigation canals, levees, and ditches. The most significant is the main canal which was constructed in 1886 and interrupts flows from the upper reaches of Ellendale Creek, Parkinson Creek, and Fahrens Creek water systems. The main canal ultimately conveys a portion of these flows to Lake Yosemite, located east of the plan area.

In terms of flooding, more than half of the Merced SUDP/SOI, is located within a 100-year flood plain, as shown on the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA) (Figure 3.8-1). A 100-year flood plain is defined as an area subject to inundation from a flood event that has a statistical probability of occurring once every 100 years.

GROUNDWATER

The City of Merced is located in the 2,665 square mile Middle San Joaquin-Lower Chowchilla watershed (USGS Hydrologic Unit 18040001), which in turn is part of the San Joaquin River Groundwater Basin. The basin covers approximately 15,200 square miles. The San Joaquin River, and its larger tributaries, is the major river system in the basin. The San Joaquin River drains into the Delta, which eventually empties into San Francisco Bay.

Legend

Merced City Limit

Proposed Sphere of Influence (SOI)

FEMA Q3 Flood Zones 1996

100 Year Flood Zone

500 Year Flood Zone

FEMA DFIRM Flood Zones 2006

100 Year Flood Zone

100 Year Flood Zone - BFE's Determined

100 Year Flood Zone - BFE's Determined - Flood Depth 1 to 3 Feet

100 Year Flood Zone - Average Flood Depths Determined - Flood Depth 1 to 3 Feet

200 Year Flood Zone

N

W E

S

0 0.5 1 1.5 2

Miles

Source: NAIP, 2005 / FEMA, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
FEMA FLOOD ZONES

Figure 3.8-1

Job No.: 060429

Groundwater, which is generally supplied by runoff from the foothills and mountains, is a very significant source of domestic water for the City of Merced. The San Joaquin Valley Groundwater Basin and Merced Subbasin are described in California's Groundwater, California Department of Water Resources (DWR) Bulletin 118 (DWR Bulletin 118) originally published in 1975, and most recently updated in 2003, as follows:

- **Basin Boundaries and Hydrology -** The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

  The Merced subbasin includes lands south of the Merced River between the San Joaquin River on the west and the crystalline basement rock of the Sierra Nevada foothills on the east. The subbasin boundary on the south stretches westerly along the Madera-Merced County line (Chowchilla River) and then between the boundary of the Le Grand-Athlone Water District and the Chowchilla Water District. The boundary continues west along the northern boundaries of Chowchilla Water District and El Nido Irrigation District [I.D.]. The southern boundary then follows the western boundary of El Nido I.D. south to the northern boundary of the Sierra Water District, which is followed westerly to the San Joaquin River. Average annual precipitation is 11 to 13 inches, increasing eastward.

- **Hydrogeologic Information -** The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide. It is filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

- **Water Bearing Formations -** Geologic units in the Merced Subbasin consist of consolidated rocks and unconsolidated deposits. The consolidated rocks include the Ione Formation, the Valley Springs Formation, and the Mehrten Formation. In the eastern part of the area, the consolidated rocks generally yield small quantities of water to wells except for the Mehrten Formation, which is an important aquifer.

  The unconsolidated deposits were laid down during the Pliocene to present. From oldest to youngest, these deposits include continental deposits, lacustrine and marsh deposits, older alluvium, younger alluvium, and floodbasin deposits. The continental deposits and older alluvium are the main water-yielding units in the unconsolidated deposits. The lacustrine and marsh deposits (which include the Corcoran, or "E-" Clay), and the floodbasin deposits yield

little water to wells, and the younger alluvium in most places probably yields only moderate quantities of water to wells.

There are three ground water bodies in the area: an unconfined water body, a confined water body, and the water body in consolidated rocks. The unconfined water body occurs in the unconsolidated deposits above and east of the Corcoran Clay, which underlies the western half of the subbasin at depths ranging between about 50 and 200 feet (DWR 1981), except in the western and southern parts of the area where clay lenses occur and semi-confined conditions exist. The confined water body occurs in the unconsolidated deposits below the Corcoran Clay and extends downward to the base of fresh water. The water body in consolidated rocks occurs under both unconfined and confined conditions.

- **Restrictive Structures -** Groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. DWR (2000) data show two groundwater depressions south and southeast of the City of Merced during 1999.

- **Groundwater Level Trends -** Groundwater supplies throughout the San Joaquin Valley are being depleted with a resulting decrease in groundwater levels and availability. Changes in groundwater levels are based on annual water level measurements by DWR, MID and other entities. Water level changes are monitored by the City of Merced on a quarterly basis, through more than 120 monitoring wells.

  Within the MGWB, 34 monitoring wells with at least 30 years of history (from 1970 to present) have been selected for evaluation of available groundwater. Data shows that since 1980, average groundwater levels beneath the MGWB have declined approximately 14 feet.

- **Groundwater Storage -** The 2003 DWR Bulletin 118 indicates that the MGWB has a surface area of about 491,000 acres. Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 9.0 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 15.7 million acre-feet to a depth of 300 feet and 42.2 million af to the base of fresh water. As of 2007, the MGWB is in a state of mild declione with a cumulative decrease in storage of approximately 720,000 af from 1980 to 2007.

- **Groundwater Budget (Type B) -** Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

  Natural recharge into the subbasin is estimated to be 47,000 af. Values for artificial recharge and subsurface inflow are not determined. There is approximately 243,000 af of applied water recharge into the subbasin. Annual urban and agricultural extractions are 54,000 af and 492,000 af, respectively. Other extractions equal approximately 9,000 af. Subsurface inflow values are not determined.

From a more focused perspective, there are four recognized aquifers beneath the City of Merced and the larger SUDP/SOI area as described below.

- **The Mehrten Formation** is the oldest and thickest of the deposits and represents a significant aquifer to the SUDP/SOI area in terms of water supply. It is characterized as a consolidated clay stone, silt stone, conglomerate. Beneath the City of Merced, the Mehrten is found at a depth of approximately 300 feet. The Mehrten formation possesses a continuous layer of clay often referred to as a "300-foot clay" which is a significant geologic feature relative to water quality.

- **The confined aquifer** between the 300-foot clay in the Mehrten formation and the base of the Corcoran formation or E-clay. This formation consists of continental alluvial deposits of poorly-sorted gravel, sands, silt, and clay. Beneath the City of Merced, the continental deposits are found approximately 150 feet below the surface.

- **The intermediate aquifer** above the E-clay and below the shallow clay. Above the continental deposits lies the older alluvium which represents the most extensively developed aquifer in the study area. This deposit consists of gravel, sand, silt, and clay and is characterized as an older alluvium. The Corcoran or the E-clay component of this formation is a major confining layer that separates the older alluvium into distinct hydrostratographic units and confines the deeper alluvium and the continental deposits.

- **The shallow unconfined aquifer** consisting of alluvium flood basin deposits composed of fine sand, silt, and clay overlaying the older flood basin deposits. Groundwater in this formation can be accessed at 1 to 15 feet in depth at some locations within the SUDP/SOI area.

In terms of groundwater movement in the Merced area, groundwater generally tends to flow northeast to southwest, although groundwater pumpage creates cones of depression, and irrigation may cause a mounting effect complicating flow patterns and causing them to change over time.

Groundwater Quality

The geographic units beneath the City of Merced and the larger SUDP/SOI area are saturated with fresh water at a depth of approximately 1,200 feet. Existing water quality in the study area can generally be characterized as moderate to good. It should be noted, however, that most of the water quality samples collected in the area are from the City's deep municipal wells. The results of these water quality samples is only indicative of the water quality within the intermediate or deep aquifers in which the City of Merced draws the majority of its water for domestic applications. Groundwater in shallower aquifers in the Merced region is impacted by nitrates from wastewater disposal and agriculture, and water quality is declining.

The most significant groundwater quality issue for Merced appears to be the presence of Tetrachlorethylen (PCE), an industrial solvent associated with the dry cleaning industry. This compound has been detected in three shallow wells in the downtown area. These three well sites

have subsequently been closed and replaced with deeper wells. In addition, a well site located in an area known as the Kendall site was found to be contaminated with Tetrachlaroethleane (TCE), an industrial solvent and to a lesser extent Dibromochloropropane (DBCP), an agricultural chemical used in the control of root nematodes.

Clean-up of the Kendall site has been on-going for approximately 10 years and the process of air-stripping has been employed to reduce the level of TCE in the water to a maximum allowable level (MAL) of five parts per billion (PPB). As indicated, existing water quality in the study area can be characterized as moderate to good. However, the groundwater quality problems associated with the shallow aquifer could ultimately migrate through the restrictive clay layers, if continued pumpage from beneath these protective layers induces downward contamination migration.

Surface Water Quality

Increasing the amount of impervious surfaces within the existing Merced SUDP/SOI has resulted in higher rates of runoff during rainy periods. This runoff can be a source of surface water pollution. The construction of roadways and vehicle parking areas, in combination with the use of chemical pesticides and fertilizers, cleaning solvents, etc., may have resulted in inadvertent contamination of surface waters throughout the City of Merced urban area. Storm runoff can carry these polluting agents into natural drainage courses causing adverse effects on surface water quality.

Constituents found in urban runoff vary from storm event to storm event at a given site and from site to site within a given area. Variances can be the result of differences in rainfall intensity and occurrence, geographic features and the land use of the site, as well as vehicle traffic and percent of impervious surface. The EPA estimates that runoff from construction sites without adequate erosion control measures can contribute high loads of sediment to receiving waters.

In the Central Valley, there is a natural weather pattern of long dry periods from May to October. During this seasonal dry period, pollutants created by vehicle exhaust, vehicle and tire wear, crank case drippings, spills and atmospheric fallout accumulate on roadways and parking areas. Precipitation during the early portion of the wet season, typically beginning in November, displaces these pollutants into the storm water runoff, resulting in high pollution concentrations in the initial wet weather runoff. This early runoff with peak pollutant levels is commonly referred to as the “first flush” of a storm.

Under conditions where surface storm water discharge is not regulated, water coming from paved roadways and parking areas may contain substances such as oil, battery acid, and engine coolant. All of these can be hazardous to local flora and fauna. Pesticides and fertilizers applied to landscaping could be washed into the stream channel which could affect native plants and animals.

As a result of the scientific data documenting the polluting potential of urban runoff, a number of federal and state programs have been initiated. At present, there is a very complex regulatory

environment within which new urban development must operate. These regulatory programs are discussed below.

Regulatory Setting

FEDERAL

Regional Water Quality Control Board Permitting

The National Pollution Discharge Elimination System (NPDES) program, under Section 402(p) of the Federal Clean Water Act, is administered locally by the Central Valley Regional Water Quality Control Board on behalf of the US Environmental Protection Agency (EPA). The program is designed to reduce pollution from storm water discharge and may require a permit from parties discharging to lakes, streams and other water bodies. In the case of the proposed project, a construction activity permit would be required since construction activities associated with the project would result in the disturbance of more than five acres and movement of at least 2.9 million cubic yards of soil. The permit would require that the following measures be implemented during construction activities: eliminate or reduce non-storm water discharges to storm water systems and other waters of the nation, develop and implement a Storm Water Pollution Prevention Plan (SWPPP), and perform inspections of storm water control structures and pollution prevention measures.

Clean Water Act-Section 404

The federal Clean Water Act (CWA, 33 USC 1251-1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's water." Important applicable sections of the Act are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for any federal permit that proposes an activity which may result in a discharge to "waters of the United States" to obtain certification from the state that the discharge will comply with other provisions of the Act. The Regional Water Quality Control Board (RWQCB) provides certification.

- Section 402 establishes the NPDES, a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. This permit program is administered by the RWQCB.

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. The U.S. Army Corps of Engineers (ACOE) administers this permit program.

Wetlands and other waters of the U.S. are subject to the jurisdiction of the ACOE and EPA under Section 404 of the Clean Water Act. Wet areas that are not regulated by this Act do not have a hydrologic link to other waters of the U.S., either through surface or subsurface flow. The

ACOE has the authority to issue a permit for any discharge, fill, or dredge of wetlands on a case-by-case basis, or by a general permit. General permits are handled through a Nationwide Permit (NWP) process. These permits allow specific activities that generally create minimal environmental effects. Projects that qualify under the NWP program must fulfill several general and specific conditions under each applicable NWP. If a proposed project cannot meet the conditions of the applicable NWP, an individual permit would likely be required from the ACOE (EPA 2004).

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA), administered by the U.S. Environmental Protection Agency in coordination with the states, is the chief federal regulatory legislation regulating drinking water quality. The 104th Congress reauthorized and made significant changes to the SDWA, which had most recently been reauthorized in 1986. Major changes included establishing a drinking water state revolving loan fund to be made available to public water systems to help them comply with national primary drinking water regulations and to upgrade water treatment systems; and requirements for EPA to establish drinking water standards based on risk assessment and cost/benefit analysis.

Federal Emergency Management Agency (FEMA)

The National Flood Insurance Program is a Federal program administered by FEMA. Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted, as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years although such a flood may occur in any give year. The County is occasionally audited by the Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

Merced County Streams Project

The Merced County Streams Group Project was approved by Congress in 1970. The project was re-evaluated by the U.S. Corps of Engineers in 1980 and some construction has been completed, but the entire project currently lacks local cost-sharing commitments. The project, as currently defined, entails construction of two new detention dams (Castle on Canal Creek and Haystack Mountain on Black Rascal Creek), the enlargement and modification of the Bear Creek detention dam, and construction and modification of 32 miles of levees and channels on the Bear Creek Stream Group (Fahrens, Black Rascal, Cottonwood, and Bear Creeks, Black Rascal Slough, and El Capitan Canal). Castle Dam and a diversion structure from MID's main canal has been completed to date. Approximately 24 square miles in the Planning Area would be removed from the 100-year or more floodplain by this project.

STATE

Senate Bill 610 Water Supply Assessment

Senate Bill 610 (SB 610), passed in 2001, amended the California Water Code, to require a written water supply assessment for projects of 500 or more residential units, 500,000 square feet of retail commercial space, or 250,000 square feet of office commercial space.

Senate Bill 221 Water Supply Verification

Senate Bill 221 (SB 221), passed in 2001, amended the California Water Code, to require a written affirmative verification of sufficient water supply by a city or county for certain residential subdivisions.

California Water Code

The California Water Code establishes the foundation for acquisition and protection of water rights. These water doctrines, with some originating hundreds of years ago, remain relevant to current water law discussions to varying extents, and they have been used by the court system over the years to resolve conflicts and establish precedents.

Rights to groundwater are more complex and groundwater as a resource is generally considered in three separate classes: (1) as stream underflow, (2) as definite underground streams, and (3) as percolating waters. The first two are treated legally as surface water, and all underground water is considered percolating water unless proven otherwise.

California State Water Resources Control Board

Responsibility for administering California water rights procedures lies with the California State Water Resources Control Board (SWRCB), which also is responsible for managing and administering various federal and state water quality control programs. Procedures are provided by statute, but the board has the authority to establish rules and regulations to help it carry out its work. All board activities are governed by state water policy and are administered in accordance with policies and procedures in the California Water Code.

The SWRCB carries out its water quality protection authority through the adoption of specific Water Quality Control Plans (Basin Plans). These plans establish water quality standards for particular bodies of water. California water quality standards are composed of three parts: the designation of beneficial uses of water, water quality objectives to protect those uses, and implementation programs designed to achieve and maintain compliance with the water quality objectives.

The SWRCB adopted the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SWRCB 2005). This policy provides implementation measures for numerical criteria contained in the California Toxics Rule, promulgated in May 2000 by the U.S. EPA. When combined with the beneficial use

designations in the Basin Plan, these documents establish statewide water quality standards for toxic constituents in surface waters.

Central Valley Regional Water Quality Control Board

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the Regional Water Quality Control Boards conduct planning, permitting, and enforcement activities. The project area lies within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB).

The CVRWQCB is responsible for the protection of beneficial uses of water resources within the Central Valley region. Designation of beneficial uses defines the resources, services, and qualities of the aquatic system that are the ultimate goals of protecting and achieving high water quality. The CVRWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the Central Valley Region Water Quality Control Plan (Basin Plan) to implement plans, policies, and provisions for water quality management. Beneficial uses of surface waters are described in the Basin Plan and are designated for major surface waters and their tributaries. In addition to identification of beneficial uses, the Basin Plan also contains water quality objectives that are intended to protect the beneficial uses of the Basin. The CVRWQCB has region-wide and water body/beneficial use-specific water quality objectives.

Beneficial uses of the surface waters of the Delta include municipal, agricultural, industrial, and recreational uses, freshwater habitat, migration, spawning, wildlife habitat, and navigation. Beneficial uses for all groundwater resources in the Central Valley region include or potentially include municipal, agricultural, and industrial uses.

The CVRWQCB has set water quality objectives for all surface waters in the region concerning bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, population and community ecology, pH, salinity, sediment, settleable material, suspended material, sulfide, tastes and odors, temperature, toxicity, turbidity, and ammonia. Water quality objectives for groundwater include standards for bacteria, chemical constituents, radioactivity, tastes and odors, and toxicity.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act regulates the discharge of waste into waters of the state. The Regional Water Quality Control Board (RWQCB) administers this regulation. Water Code Section 13260 requires "any person discharging, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge." A report of waste discharge ("RWD") is an application for waste discharge requirements ("WDRs"). WDRs contain conditions imposed on a given discharge by the appropriate RWQCBs for the purpose of protecting the beneficial uses of the waters of the state. Upon receipt of a RWD, the RWQCB may issue WDRs imposing conditions on the proposed discharge, or it may waive the requirement for WDRs.

Urban Water Management Planning Act

The Urban Water Management Planning Act became part of the California water code with passage of AB 797 in 1984. The act requires every urban water supplier (providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually) to adopt and submit an urban water management plan at least once every five years to the Department of Water Resources. The most current Merced Urban Water Management Plan (UWMP) is dated December 2005, but the UWMP is in the process of being updated by the City in 2010.

AB 162 - Designation

In compliance with Assembly Bill 162 and Government Code §65302(g), jurisdictions are also required to utilize the FEMA flood insurance rate maps to determine flood hazards zones, and the NFIA maps when considering development in flood hazard areas.

LOCAL

Merced Municipal Code

The purpose of Chapter 17.48, Flood Damage Prevention, of the Merced Municipal Code, is to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas. Methods of reducing flood losses include:

A. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;

B. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

C. Controlling the alteration of natural floodplains, stream channels, and natural protective biers, which help accommodate or channel flood waters;

D. Controlling fill, grading, dredging, and other development which may increase flood damage; and

E. Preventing or regulating the construction of flood barriers, which will unnaturally divert flood waters or which may increase flood hazards in other areas.

Chapter 17.60, Water Efficient Landscaping and Irrigation, of the Merced Municipal Code is intended to enhance the environmental performance of development by promoting the percolation of storm water, conservation of water and preservation of water quality by requiring drought tolerant plant material in landscaping and the retention of existing natural vegetation.

Merced Water Supply Plan

The Merced Water Supply Plan was completed in 1995 and evaluated future water needs in the Merced area. It was projected that the City of Merced's needs could increase from 15,000 AF in 1995 to 60,000 AF by 2030. After extensive public involvement in all phases of the plan, the "groundwater recharge" alternative was selected because the Project Advisory Committee felt it was the most cost effective and environmentally sound approach. Under this Preferred Alternative, the cities will remain on groundwater (constructing new wells as needed); groundwater recharge facilities will be constructed on an annual basis with the goal of stabilizing groundwater at 1992 levels, and MID will increase the delivery of surface water to agricultural users along with installing new wells to protect against droughts.

During 1997, several agencies within the groundwater basin adopted Resolutions of Intention to adopt a Groundwater Management Plan pursuant to Water Code Section 10753 et seq. In addition, these agencies formed the Merced Area Groundwater Pool Interests (MAGPI) for the purpose of developing a basin-wide groundwater management plan to guide the management of groundwater resources in the MGWB.

The 1997 GWMP was the result of the planning effort of the City of Merced and MID on behalf of MAGPI. In June 2001, the DWR entered into an MOU to work cooperatively to promote conjunctive use of surface and groundwater projects within the MGWB.

Merced Storm Drain Master Plan

The City prepared a Storm Drain Master Plan (2002), which identified the infrastructure improvements necessary to accommodate storm water runoff at build-out of the 2015 General Plan SUDP/SOI. The City requires the construction of storm water percolation/detention basins with new development. Percolation basins are designed to collect storm water and filter it before it is absorbed into the soil and reaches groundwater tables. Detention basins are designed to temporarily collect runoff so it can be metered at acceptable rates into canals and streams which have limited capacity.

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to Hydrology and Water Quality impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Public Services and Facilities, Land Use and Parks, Open Space, and Conservation, and Safety Elements of the General Plan are designed to ensure that hydrology and water quality impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Public Services and Facilities Policies:

P-3.1 Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.

P-3.2. In cooperation with the County and the Merced Irrigation District, work to stabilize the region's aquifer.

P-4.1 Provide adequate wastewater collection, treatment and disposal capacity for existing and projected future needs.

P-4.2 Consider the use of reclaimed water to reduce non-potable water demands whenever practical.

P-5.1 Provide effective storm drainage facilities for future development.

P-5.2 Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.

Open Space, Conservation, and Recreation Policies:

OS-1.2 Preserve and enhance creeks in their natural state throughout the planning area.

OS-1.5 Preserve and enhance water quality.

OS-5.1 Promote water conservation throughout the planning area.

Safety Policies:

S-1.1 Develop and maintain emergency preparedness procedures for the City.

S-3.1 Endeavor to remove most of the existing City, and the vast majority of the SUDP/SOI, from the 100-year and 200-year floodplain.

S-3.2 Maintain essential City services in the event of flooding or dam failure.

3.8.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project is considered to have a significant impact on the environment if it will:

- Violate any water quality standards or waste discharge requirements

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site

- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff

- Otherwise substantially degrade water quality

- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map

- Place within a 100-year flood hazard area structures which would impede or redirect flood flows

- Expose people or structure to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam

- Inundation by seiche, tsunami, or mudflow

3.8.3 IMPACTS AND MITIGATION MEASURES

Impact #3.8-1: Violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality

Discussion/Conclusion: Water quality can be impacted by the discharge of soils and other pollutants often associated with urban runoff such as oil, grease, pesticides and fertilizers. Grading and construction activity can cause erosion, which can increase the sediment load of runoff. These non-point source pollutants may flow into local surface waters or seep into the groundwater table and incrementally degrade water quality. Areas designated for future development proposed under the Merced 2030 General Plan would potentially impact the quality of runoff and other pollutant loadings to receiving waters. Water quality impacts may be significantly greater during the region's rainy season.

Policies included as part of the General Plan Update that would minimize this impact include Policies P-5.1 and P-5.2 which will provide effective storm drainage facilities for future development and integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping. Implementing Action 5.1a states that the City will continue to implement, along with MID and the County, the Merced Storm Water Master Plan and the Storm Water Management Plan within the Merced SUDP/SOI. Implementing Action 5.1.b states that the City will work with MID and the County to update the Merced Storm Water Master Plan to account for changes in expected storm drainage runoff due to expanded land uses within the Merced area. Implementing Action 5.1.c requires all development to comply with the Merced Storm Water Master Plan and any subsequent updates.

In the Open Space Element, Policy OS-1.5 states, "preserve and enhance water quality." Implementing Action 1.5a calls for the utilization of storm water retention basins and other "Best Management Practices" to improve the quality of storm water discharged into the region's natural surface water system. Implementing Actions 1.5.b and 1.5.c call for the monitoring of known sources of groundwater contamination within the City and its future expansion area and ground water in areas in and around the City using septic system wastewater disposal systems. Policy OS-5.1 and Implementing Action 5.1.b promote water conservation and the preservation of water quality by requiring drought tolerant plant material in landscaping and the retention of existing natural vegetation on new development projects.

While the *Merced Vision 2030 General Plan* would allow new development that could potentially create additional urban pollutants that may end up in the surface or groundwater systems, implementation of the above policies and implementing actions will be self-mitigating and result in a ***less than significant*** impact.

Mitigation Measures

No mitigation measures are required.

Impact #3.8-2: The proposed project could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.

Discussion/Conclusion: With respect to water supply, as previously indicated, Merced is primarily dependent on groundwater sources that draw from the San Joaquin aquifer. The City has storage capacity of approximately 1.4 million gallons in four elevated storage tanks, 21 active well sites, and 14 pumping stations, which provide service to meet peak hour urban level conditions and the average daily demand plus fire flows.

The City of Merced has instituted significant water conservation measures in recent years in response to a prolonged drought period in California and the Central Valley. As a result, peak water production declined from its high of 38.3 million gallons per day (MPD) in 1984 to around 31.6 MPD in 1994. In 2007, the amount of water consumed per day had dropped to just over 21.0 MPD. This decline in peak day production has occurred despite the fact that population growth in the City has been occurring at a rapid rate.

Policies and implementation actions included as part of the proposed project that would minimize this impact through the ongoing protection of groundwater resources are summarized as follows. Policy P-3.2 of the Public Services and Facilities Element states that the City will work with the County and MID to stabilize the region's aquifer. Implementing Action 3.2.a states that the City will work closely with the State and County agencies in exploring innovative technology and procedures for water conservation and recycling. The City will work cooperatively with MID to preserve and enhance its surface water delivery system (Implementing Action 3.2.b). Implementing Action 3.2.c states that the City will explore the use of MID water resources for applications that do not require treated water to reduce demand on

the regional groundwater supplies and reduce costs of water treatment. Implementing Action 3.2.d will ensure cooperation with MID and the County in the development of groundwater recharge facilities as called for in the Merced Water Supply Plan. Policy P-4.2 calls for the City to consider the use of reclaimed water to reduce non-potable water demands whenever practical.

Regarding groundwater depletion and recharge, Merced is within the Merced Sub-basin which is, according to the California Department of Water Resources, being subject to critical conditions of overdraft. Also, a Groundwater Impacts Analysis prepared by Brown and Caldwell for the City of Merced indicates that there is groundwater overdraft in the City's service area, and that the rate of overdraft will continue to increase with future urban development. Implementation of proposed policies and implementation actions in the proposed General Plan will help to reduce this impact within Merced's Planning Area; however, it will remain a ***significant impact***.

Mitigation Measures

No mitigation measures are available to reduce this impact to less than significant.

Impact #3.8-3: The proposed project could substantially alter the existing drainage pattern of the area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or substantially increase the rate or amount of surface runoff in a manner, which would result in on- or offsite flooding.

Discussion/Conclusion: Drainage runoff from developing areas or parcels is dependent on the percent of impervious surface assigned to individual parcels or projects. New areas will see development potential under the 2030 General Plan. Urban density development will increase the amount of impervious surfaces, thereby increasing the amounts and speed of runoff. Increased runoff volumes and speeds may increase erosion or siltation and could result in localized nuisance flooding in areas without adequate drainage facilities.

Policies included as part of the proposed project that would minimize this impact are summarized as follows: The Open Space Element includes Policy OS-5.2 which calls for the City to protect soil resources from the erosive forces of wind and water. Implementing Action 5.2.a says that the City will reduce soil erosion potential of new development. Policy P-1.1 calls for the City to provide adequate public infrastructure and services to meet the needs of future development and Implementing Action 1.1.d states that the City will construct a storm water drainage system in accordance with master plans. As noted under Impact #3.8-1, Policies P-5.1 and P-5.2 will provide effective storm drainage facilities for future development and integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping. Implementing Action 5.1a says that the City will continue to implement, along with MID and the County, the Merced Storm Water Master Plan within the Merced urban area. Implementing Action 5.1.b says that the City will work with MCFCD, MID and the County to update the Merced Storm Water Master Plan to account for changes in expected storm drainage runoff due to expanded land uses within the Merced area.

Implementing Action 5.1.c requires all development to comply with the Merced Storm Drain Master Plan and any subsequent updates.

Policies S-3.1 and S-3.2 call for the City to remove most of the existing City, and the vast majority of the SUDP/SOI, from the 100-year and 200-year floodplains and maintain essential City services in the event of flooding or dam failure. Implementing Action 3.2.a says that the City will continue to build all pump station (both sewer and water) entryways at one (1) foot above the 200-year flood elevation and consider additional standards to address flooding due to dam failure. Implementing Action 3.2.b says the City will continue the "flood-proofing" of high-value or important City infrastructure, such as lift stations and signal control functions, as required by the City's Flood Damage Prevention Ordinance.

Implementation of the General Plan itself will not alter the drainage pattern of the area. It allows for the development of future projects that could result in the changes of drainage patterns that could result in erosion, siltation or flooding. All new development as a result of the General Plan Update will have to be consistent with the City's policies noted above and also with the City's Storm Drain Master Plan, the rules and regulations of MID, and any future studies/plans as a result of General Plan adoption. Further, any development must be consistent with all federal and state regulations as well. This impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.8-4: The proposed project could create or contribute runoff water which would exceed the capacity of existing stormwater drainage systems or provide substantial additional sources of polluted runoff.

Discussion/Conclusion: Flood control detention is considered the most viable option for mitigating the increase in runoff from new development areas, with the specific types and locations of these drainage facilities to be determined at the time development applications are submitted consistent with City Design Standards. Pollution associated with increased stormwater and urban runoff would affect local and regional surface and groundwater quality conditions. Unlike sewage, which is transported to a treatment facility, urban runoff flows untreated through the storm drainage system. Anything thrown, swept, or poured into the street, gutter, or a catch basin (the curbside openings that lead into the storm drainage system) flows directly into local channels and creeks. Pollutant loads can be particularly acute at the beginning of the rainy season, but can be a problem at any time due to the improper disposal of products associated with home, garden, or automotive use.

Policies included as part of the Proposed Project that would minimize this impact are summarized below. Policy P-1.1 will provide adequate public infrastructure and services to meet the needs of future development. Implementing Action 1.1.d calls for the City to construct a stormwater drainage system, water system and sewer system in accordance with master plans. Policy P-3.2 calls for the City to cooperate with the County and MID to stabilize the region's

aquifer. Implementing Action 3.2.d states that the City will cooperate with MID and the County in the development of groundwater recharge facilities as called for in the Merced Water Supply Plan.

As noted under Impact #3.8-1, Policies P-5.1 and P-5.2 will provide effective storm drainage facilities for future development and integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping. Implementing Action 5.1a says that the City will continue to implement, along with MID and the County, the Merced Storm Water Master Plan within the Merced urban area. Implementing Action 5.1.b says that the City will work with MID and the County to update the Merced Storm Water Master Plan to account for changes in expected storm drainage runoff due to expanded land uses within the Merced area. Implementing Action 5.1.c requires all development to comply with the Merced Storm Water Master Plan and any subsequent updates.

Implementation of the General Plan Update itself will not create or contribute runoff water which would exceed capacity of existing/planned systems or provide substantial additional sources of pollutants; however it allows for the development of future projects that could result in stormwater capacity being exceeded or additional sources of pollutants. Since all new development as a result of the General Plan Update will have to be consistent with numerous regulations, including the City's policies noted above, the City's Storm Drain Master Plan, City Design Standards, the rules and regulations of MID, and any future studies/plans after General Plan adoption. In addition, federal and state regulations (such as preparing a SWPPP) regarding runoff and erosion must be followed. This impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.8-5: The proposed project could place housing or other structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, or other flood hazard delineation map or place within a 100-year flood hazard area structures which could impede or redirect flood flows.

Discussion/Conclusion: A review of applicable FEMA flood maps indicates that approximately 1/2 of the City, the southern half, is located within the 100-year floodplain (see Figure 3.8-1). A good portion of the proposed SUDP/SOI is also within the 100-year floodplain and a smaller portion in the 500-year floodplain. Buildout of the proposed project could expose more people and structures to potential flooding if development occurs within or adjacent to these floodplain areas.

Policies of the General Plan Update Safety Element direct the City to limit development in hazardous areas and minimize flooding hazards. Policies S-3.1 and S-3.2 state that the City will endeavor to remove most of the existing City, and the vast majority of the SUDP/SOI, from the 100-year and 200-year floodplains and the City will maintain essential City services in the event of flooding or dam failure. Implementing Action 3.1.a states that the City will work on the

development and implementation of a funding plan to provide for the City's share of the Merced Streams Project. The City will also consider basing assessments on those areas which would benefit from removal from the 200-year flood and/or Lake Yosemite's inundation area. Implementing Action 3.2.a states that the City will continue to build all pump stations (both sewer and water) entryways at one (1) foot above the 100-year flood elevation and consider additional standards to address flooding due to dam failure. Implementing Action 3.2.b states that the City will continue the "flood-proofing" of high-value or important City infrastructure, such as lift stations and signal control functions, as required by the City's Flood Damage Prevention Ordinance. There are currently two plans that should reduce the risk of flooding within the City's Planning Area.

The State of California has adopted legislation that requires jurisdictions to prepare floodplain regulations based on the 200-year flood event. New maps identifying the 200-year event boundaries were released by the State Dept. of Water Resources on October 15, 2008. The maps do not indicate that there are any areas within City limits, or within the SUDP/SOI, that are impacted by the 200-year floodplain. The DWR plans further studies over the next four years; any changes will need to be incorporated into affected development proposals.

New development as a result of the General Plan's adoption will have to adhere to the City's Flood Damage Prevention Ordinance, Municipal Code, General Plan policies, MID rules and regulations, and the Merced Storm Water Master Plan where applicable. With adherence to the City's ordinances, master plans and General Plan policies and implementation of the following mitigation measures to comply with Government Code §65302(g), potential flood hazards will be reduced from potentially significant impact to ***less than significant.***

Mitigation Measures

No mitigation measures are required.

Impact #3.8-6: The proposed project could expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or inundation by seiche, tsunami or mudflow.

Discussion/Conclusion: In addition to flood hazards associated with 100-year flood zones, flood inundation resulting from levee or dam failure due to a variety of factors is a potential hazard for the City. Merced is presently in the inundation area of two dams, Bear Reservoir Dam and Lake Yosemite Dam (see Figure 3.8-2). Bear Reservoir Dam is located on Bear Reservoir from which Bear Creek flows into, and is approximately 20 miles east of Merced. Lake Yosemite Dam is located on Lake Yosemite which is on a tributary of the Merced River, and is in the northeast corner of the Planning Area. Both of these dams are earthen-fill which makes them more flexible and, therefore, more earthquake resistant. However, they are more likely to fail if over-topped. Dam failure can result from numerous natural or human activities, such as earthquakes, erosion, improper siting, rapidly rising flood waters, and structural and design flaws.

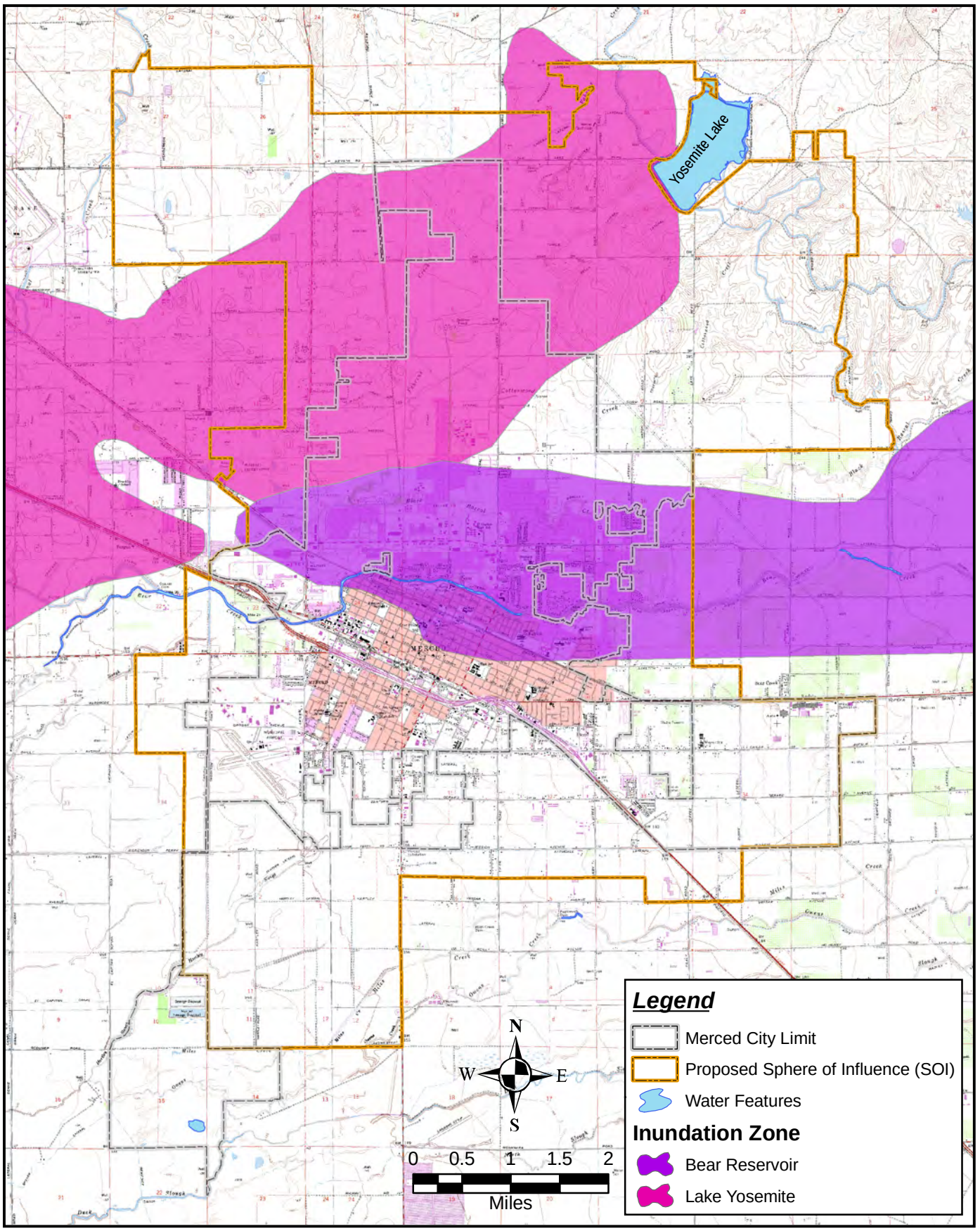
Recent flood events, including Hurricane Katrina, and more locally, levee failures in the Sacramento-San Joaquin Delta region, have brought to the forefront a heightened awareness of the dangers of levee failure. This realization has led to increased public scrutiny of new development projects that are located in floodplain areas protected by levees. Levees typically fail in one of two ways: (1) overtopping of the levee during peak flows or (2) structural failure. Structural failure can occur as a result of a variety of factors including seismic activity, erosion, damage from vegetation and rodents. Both types of levee failure can result in deep flooding within the adjacent floodplain.

In summary, there could be a minor, major, or catastrophic failure of the levee. Implementation of the proposed project would result in additional City-wide residential and non-residential land use developments that would face similar risks to those experienced by other residents in the region. Other areas of California face similar risks from natural disasters including earthquakes, mudslides, wildfires, and inundation as a result of dam failure; however, the regulatory framework developed to address these hazards and fund the necessary improvements is generally better established. Levees in Merced are owned by the Merced Irrigation District. While the City has no jurisdiction and is limited in terms of alternatives to mitigate for the identified risks, the City works closely with the district on a number of issues, including flood control, and impacts to MID facilities due to development. Levee maintenance and its associated funding mechanisms are complicated by various factors outside the City's control and beyond the scope of this project.

Policies of the General Plan Safety Element direct the City to limit development in hazardous areas and minimize flooding hazards. Policies S-3.1 and S-3.2 state that the City will endeavor to remove most of the existing City, and the vast majority of the SUDP/SOI, from the 100-year and 200-year floodplains and the City will maintain essential City services in the event of flooding or dam failure. Implementing Action 3.1.a states that the City will work on the development and implementation of a funding plan to provide for the City's share of the Merced Streams Project and consider basing assessments on those areas which would benefit from removal from the 100-year flood and/or Lake Yosemite's inundation area. Implementing Action 3.2.a states that the City will continue to build all pump stations (both sewer and water) entryways at one (1) foot above the 100-year flood elevation and consider additional standards to address flooding due to dam failure. Implementing Action 3.2.b states that the City will continue the "flood-proofing" of high-value or important City infrastructure, such as lift stations and signal control functions, as required by the City's Flood Damage Prevention Ordinance.

New development as a result of the General Plan Update's adoption will have to adhere to the City's Flood Damage Prevention Ordinance, Municipal Code, General Plan policies, MID rules and regulations, and the Merced Storm Drain Master Plan where applicable. For these reasons, the implementation of the proposed General Plan would have a ***less than significant impact*** with respect to flooding.

The proposed General Plan would allow additional development to occur in areas of dam inundation risk as noted previously. In the case of dam failure, these particular areas are subject to flooding. However, the risk of dam inundation is low since the Department of Water Resources is responsible for completing annual inspections of each dam for the purpose of



Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
INUNDATION ZONES

Figure 3.8-2

Job No.: 060429

safeguarding life and destruction of property. Since the risk of dam failure is low, the adoption of the proposed General Plan would ***not result in a significant impact***.

Seiches, or waves generated in bodies of water similar to the back-and-forth sloshing of water in a tub, could possibly occur in swimming pools and water tanks. Both Lake Yosemite and Bear Reservoir are subject to seiches in the event of an earthquake. If the seiche overtops either of the dams, failure could result. Failure of either dam would cause flooding within parts of the City. Given the distance between the lakes, and any major faults, the risk of seiche is extremely low. Neither lake has experienced a seiche since their construction, though a number of earthquakes have occurred since. This is a ***less than significant*** impact.

Merced is not at risk from tsunami due to its inland location. Finally, the Merced area is also not at risk of mudflows due to its relatively flat topography and distance from any hillsides. The proposed project will have ***no impact*** to the potential for inundation by seiche, tsunami or mudflow.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

As development proceeds within Merced and the SUDP/SOI, the amount of polluted runoff would increase, as well as the amount of stormwater, which presents a potential impact to surface and groundwater quality. A greater percentage of the population would also be exposed to the risk from flooding of the 200-year floodplain, or from dam inundation. However, project-level water quality and flooding impacts would be reduced to a less than significant level by proposed General Plan policies and existing regulations. New development within the County would also result in an increase in runoff and may locate additional population and structures within areas subject to flooding. Regional development would also be required to comply with regional, State and federal regulations addressing stormwater runoff, water quality and flooding. These regulations would reduce the potential for a cumulative hydrology and water quality impact to less than significant, so the proposed General Plan would ***not contribute to a significant cumulative impact***.

Regarding groundwater depletion and recharge, Merced is within the Merced Sub-basin which is, according to the California Department of Water Resources, being subject to critical conditions of overdraft. Also, a Groundwater Impacts Analysis prepared by Brown and Caldwell for the City of Merced indicates that there is groundwater overdraft in the City's service area, and that the rate of overdraft will continue to increase with future urban development. Implementation of mitigation measures in Section 3.8 (#3.8-5a through 3.8-5h), will help to reduce this impact within Merced's Planning Area; however, it will remain a ***significant cumulative impact***.

3.9

LAND USE AND PLANNING

3.9 Land Use and Planning

This section of the Draft EIR presents information pertaining to the land use regulations in Merced, the existing land use conditions and potential environmental impacts that the proposed General Plan would have on these uses. During the Notice of Preparation (NOP) period, comments were received regarding the City's urban expansion and existing County zoning and General Plan designations; the development assumptions from urbanization of the proposed Community Plan areas; potential annexation of the UC Merced campus into the City limits of Merced; the proposed SUDP/SOI and availability of public services and facilities; LAFCo policies regarding future SOI revisions; and the need to prepare a Municipal Service Review.

3.9.1 SETTING

Environmental Setting

The City of Merced is located approximately 104 miles southeast of Sacramento, 53 miles northwest of Fresno, and 112 miles southeast of San Francisco, in the Central Valley of California. Incorporated in 1889, the City of Merced is situated within the eastern section of Merced County and is the largest City in the County. Principal highway access to Merced is via State Highway 99, which runs through the central portion of the City in a general north/south direction. State Highways 140 and 59 also serve the City.

The topography of the community is characterized by flat land approximately 155 - 180 feet in elevation. The local climate is typical of the Central Valley. Average daily temperatures are 48 degrees in January to 95 degrees in July. The summer months are typically dry and hot and the winter months are typically cool with occasional fog. Average annual rainfall is approximately 12 inches, with January being the wettest month of the year with two inches of precipitation.

The City contains a typical mix of residential, commercial, industrial and public land uses. The City is centered around Main Street. Older development transitions into new development as one goes farther north. Significant areas in the extreme north remain undeveloped, though they have been annexed. Less new development has occurred in the south portion of the City. The South Merced Community Plan was approved in 2008, and may spur additional development in the area.

Regulatory Setting

FEDERAL

No federal regulations critical to the assessment of this impact were noted.

STATE

California Government Code Sections 65000-66037, Title 7 Planning and Land Use

These regulations provide the foundation for the organizational and regulatory structures adopted by cities and counties in the State of California. It is through this legislation that cities and counties are required to prepare, adopt and amend General Plans.

In California, a General Plan is the foundation and central feature of the local planning process. Each city and county is required to prepare, adopt, and maintain a General Plan to govern the physical development of all of the land area under its jurisdiction. The purposes that are intended to be served by a General Plan include the following important functions:

- The identification of the community's physical development goals, and goals relating to environmental, economic, and other factors.

- Policies for maintaining or improving the character of existing developed uses and for guiding the location and nature of future development in order to ensure that the community's goals are achieved.

- The consideration of all aspects of local conditions affecting physical development and change, in order to ensure that problems and opportunities are analyzed and addressed adequately within the context of local, regional, statewide, and national goals and policies.

By their nature, general plans possess great potential for environmental impacts by providing for new growth and development.

California Community Redevelopment Law

The California Community Redevelopment Law (California Government Code 33000) outlines the form and required content for a city's redevelopment plan. In accordance with the State redevelopment law, redevelopment plans set the general activities and implementation procedures used by the redevelopment agency. These include the steps the agency may undertake in pursuing the redevelopment process in a community. The plans also include a description of activities that the redevelopment agency is required to undertake. These activities are required in the redevelopment process to conform to Community Redevelopment Law. Many of the circumstances existing in a community that influence the nature and scope of the most appropriate redevelopment activities are prescribed by the redevelopment agency on behalf of the community's members and property owners.

Cortese-Knox-Hertzberg Local Government Reorganization Act

In 1963, the Knox-Nisbet Act was enacted, and created a Local Agency Formation Commission (LAFCO) in every county in the state, with the exception of San Francisco. Each LAFCO is responsible for coordinating logical and timely changes in local governmental boundaries, conducting special studies that review ways to reorganize, simplify, and streamline governmental structure, and prepare a sphere of influence for each city and special district within its county. The Commission's efforts are directed toward seeing that services are provided efficiently and economically while agricultural and open-space lands are protected.

In 2000, the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 was signed into law to reform local government reorganization law. Highlights of these revisions include, but are not limited to, streamlining and clarifying LAFCO policies and procedures; making LAFCOs neutral, independent, and balanced in representation for counties, cities, and special districts; strengthening LAFCO powers to prevent sprawl and ensure the orderly extension of

government services; enhancing communication, coordination, and procedures of LAFCOs and local governments; and enhancing opportunities for public involvement, active participation, and information regarding government decision making.

The act also expanded the LAFCOs mandate to include service reviews. A service review is a comprehensive study designed to better inform LAFCO, local agencies, and communities about the provision of municipal services. Service reviews attempt to capture and analyze information about the governance structures and efficiencies of service providers, and to identify opportunities for greater coordination and cooperation between providers. The service review is a prerequisite to a sphere of influence determination and may also lead a LAFCO to take other actions under its authority.

LOCAL

Merced County Regulations

Unincorporated land located outside the City limits of Merced but within the SUDP/SOI Area is under the jurisdiction of Merced County. Any future development taking place within this area, prior to it being annexed by the City of Merced would be subject to the provisions set forth in the Merced County General Plan and applicable provisions of the Merced County Zoning Ordinance.

Merced County General Plan

The Merced County General Plan identifies the types and intensities of uses that are permissible in relation to different land use designations. Any future development in the Planning Area that occurs on unincorporated Merced County land would be subject to the provisions of the Merced County General Plan.

Summary of Merced Vision 2015 General Plan

The *Merced Vision 2015 General Plan* (2015 General Plan) was adopted by the City Council in April 1997. The 2015 General Plan was an update, expansion, and reorganization of the 1981 General Plan. The 2015 General Plan includes the following three separate documents: *Merced Vision 2015 General Plan* Executive Summary; *Merced Vision 2015 General Plan*; and *Merced Vision 2015 General Plan* Program EIR. The 2015 General Plan is comprised of the following mandated elements: Land Use (Chapter 3), Circulation (Chapter 4), Open Space (Chapter 7), Conservation (Chapter 7), Housing (Chapter 9), Noise (Chapter 10), Safety (Chapter 11). Additional elements included in the 2015 General Plan are Urban Expansion (Chapter 2), Public Facilities (Chapter 5), Urban Design (Chapter 6), and Sustainable Development (Chapter 8).

The heart of the *Merced Vision 2015 General Plan* were the goals, policies, and implementing actions. A goal is general, overall, and ultimate purpose, aim, or end toward which the City will direct effort. A policy is a specific statement of principle or guiding action which implies clear commitment. A general direction that the City will follow in order to meet its goals by undertaking specific action programs. It is assumed that each policy statement is preceded by the phrase, “The City shall...”. An implementing action is an action, activity, or strategy carried out

in response to adopted Policy to achieve a specific Goal. The major goals of the 2015 General Plan were as follows:

- Expansion of the urban limit line (SUDP area) to accommodate expected growth
- Preservation of prime agricultural land around the City
- Continuation of the predominantly north-south growth pattern
- Expansion of the "Sphere of Influence" (ultimate urban growth boundary) to include rural residential centers east of the City and the UC campus site/Smith Trust property
- A joint City/County planning effort for the area around the future University of California campus
- Economic Development: Planning well in advance for industrial/business park uses and for the infrastructure needed to support such development
- A flexible and efficient circulation system which can accommodate all modes of transportation (private cars, public transit, bicycles, pedestrians, etc.)
- Mixed-use, transit- and pedestrian-friendly "urban villages" with direct access to commercial centers from surrounding neighborhoods
- Location of higher densities along transit corridors
- A diversity of housing types and opportunities
- Housing affordability
- "Sustainable Development" = The efficient use and management of land and other natural resources in order to conserve them for the use of present and future generations

The City's General Plan Land Use Diagram presents the proposed general distribution of the uses of land within the City of Merced and its SUDP. Reference Figure 2-3 in Chapter Two, Project Description, for the existing 2015 General Plan Land Use diagram (Figure 2-4 shows the proposed 2030 General Plan Land Use diagram). Table 3.9-1 shows the 2015 General Plan Land Use acreage of each land use designation within the City limits and SUDP.

Table 3.9-1
Existing General Plan (2015) Land Use (Acreage) within the City & SUDP

Land Use	City Limits	Existing SUDP	City Limits + Existing SUDP	% of Total
RR (Rural Residential)	15	281	296	1.4%
AG Agriculture	92	22	114	0.5%
Total Ag Res	**108**	**302**	**410**	2.0%
LD (Low Density Residential	5,545	3,186	8,731	41.8%

Land Use	City Limits	Existing SUDP	City Limits + Existing SUDP	% of Total
LMD (Low-Med. Density Res.)	853	505	1,358	6.5%
Total Single-Family Res	**6,398**	**3,691**	**10,089**	48.3%
HMD (High-Med. Density Res.	745	28	773	3.7%
HD (High Density Residential	92		92	0.4%
RMD (Residential Mobile Home	79	0	80	0.4%
Total Multi-Family	**917**	**28**	**945**	4.5%
P/G (Public/Government)	533	5	538	2.6%
CO (Commercial Office)	342	189	531	2.5%
Total Office	**875**	**194**	**1,069**	5.1%
IND (Industrial)	1,882	995	2,877	13.8%
IND-R (Industrial Reserve)		150	150	0.7%
Total Industrial	**1,882**	**1,145**	**3,027**	14.5%
BP (Business Park)	125	565	691	3.3%
BP-R (Business Park Reserve)	3	326	329	1.6%
Total Business Park	**128**	**891**	**1,019**	4.9%
CG (Commercial General)	322	258	579	2.8%
CN (Commercial Neighborhood)	190	81	270	1.3%
CT (Thoroughfare Commercial)	213	9	222	1.1%
HC (Highway Commercial)			0	0.0%
CC (Community Commercial)	487	42	529	2.5%
Total Commercial	**1,211**	**390**	**1,601**	7.7%
PK (Open Space-Park/Rec)	746	166	911	4.4%
PKY (Parkway)				0.0%
Total Open Space	**746**	**166**	**911**	4.4%
SCHOOL (School)	663	52	715	3.4%
COM-R (Commercial Reserve)	7	83	90	0.4%
RES-R (Residential Reserve)		360	360	1.7%
PARK-F (Future Park)	6	77	83	0.4%
SCHOOL-F (Future School)	6	49	54	0.3%
VR (Village Residential)	239	286	526	2.5%
SPECIFIC PLAN (Specific Plan, Master Plan)				0.0%
RESERVE (Reserve)				0.0%
Total Other	**921**	**907**	**1,828**	8.7%
Totals	**13,186**	**7,714**	**20,901**	**100%**

The following Land Use Designation descriptions define the Land Use Areas depicted on the Land Use Diagram of the 2015 General Plan. These General Plan Land Use Designations describe the extent of the uses of land within the Merced Urban Planning Area including standards of population density and building intensity (see Table 3.9-2).

RESIDENTIAL

RR (Rural Residential), [1 to 3 dwelling units per acre (du/ac)]
To provide single family homes on large lots in a semi-rural environment and as a buffer between agricultural land and other environmentally sensitive or resource areas and the City's urbanized areas.

LD (Low Density Residential), (2 to 6 du/ac)
To provide single family residential dwellings served by City services throughout the City. Primarily single-family detached housing, but options such as condominiums and zero-lot-line units can be developed.

LMD (Low-Medium Density Residential), (6 to 12 du/ac)
To provide duplexes, triplexes, four-plexes, condominiums, zero-lot-line as well as single-family detached units on appropriately sized lots.

HMD (High-Medium Density Residential), (12 to 24 du/ac)
To provide areas for multi-family development such as apartments, higher density triplex/fourplex units and condominiums.

HD (High Density Residential), (24 to 36 du/ac)
To provide for the highest multi-family residential densities typically found only in limited areas of the City.

RMH (Mobile Home Park Residential), (6 to 10 du/ac)
To provide designated areas within the City for the establishment of Mobile Home Park residential environments.

VR (Village Core Residential), (7 to 30 du/ac for a minimum average of 10 du/ac)
To provide for the development of mixed-use, medium-density urban "village" centers in the undeveloped portions of the Merced SUDP/SOI.

COMMERCIAL

CO (Commercial Professional Office)
To provide for a wide range of office commercial uses within the City. The array of relatively small-scale office activities range from professional uses (such as medical, dental, law, engineering, counseling, and architecture) to typical commercial/business office activities like real estate agencies and insurance agencies, financial institutions (banks, and savings and loans), and travel agencies.

CN (Neighborhood Commercial)
To provide sites for retail shopping areas, primarily in shopping centers, containing a wide variety of businesses including retail stores, eating and drinking establishments, commercial recreation, auto services, etc., to serve residential neighborhoods.

CV (Convenience Commercial)
To provide sites for small 1- to 5-acre centers with mini-markets, fast food restaurants, small specialty shops, video rentals, coin laundries, beauty salons, and small professional offices, to serve convenience shopping needs of the surrounding neighborhood.

RC (Regional/Community Commercial)
To provide community and regional commercial centers to serve the full depth and variety of retail goods, general merchandise, apparel, and home furnishings, with one or more major department stores as key tenants.

CT (Thoroughfare Commercial)
To accommodate auto-oriented commerce and the needs of people traveling on highways. Large recreational facilities and some "heavy commercial" uses are also common. Typical uses include motels, gas stations, truck stops, restaurants, automobile sales, auto repair shops, bowling alleys, driving ranges, skating rinks, souvenir shops, carwashes, and plant nurseries.

CG (General Commercial)
To provide areas for general commercial uses which are land-intensive commercial operations, involving some light manufacturing, repair, or wholesaling of goods. Typical activities include lumber-yards, automobile wrecking yards, farm equipment or mobile home sales, and building supplies and machine shops.

INDUSTRIAL

IND (Industrial)
This designation provides for the full range of industrial activities, including but not limited to manufacturing, food processing, trucking, packing, and recycling, as well as related office and production facilities.

BP (Business Park)
To provide areas for a mix of commercial, office, and industrial uses with shared access and parking facilities. Uses could include a wide variety of light manufacturing, warehousing, office and service business activities.

RESERVE

RES-R (Residential Reserve)
To provide areas for future urban density residential expansion within the Merced SUDP/SOI. This classification, along with the other reserve classifications described below, is to be combined with an interim use classification, such as Agriculture, which maintains existing use practices in the area but establishes expected future uses based on need.

COM-R (Commercial Reserve)
To provide areas for future commercial expansion within the Merced SUDP/SOI.

IND-R (Industrial Reserve)
To provide areas for future industrial expansion within the Merced SUDP/SOI.

BP-R (Business Park Reserve)
To provide areas for future business park expansion within the Merced SUDP/SOI.

AI (Area of Interest)
In accordance with the Merced County General Plan, this designation is applied to areas located outside the City's SUDP/SOI proximate to City territory, but not currently planned for annexation or City service, whose development may impact City planning efforts.

OTHER

P/G (Public/Government)
To provide public facilities such as schools, fire stations, police stations, public buildings (libraries, courthouse, public offices, etc.) and similar types of public uses and facilities.

OS-PK (Open Space-Park/Recreation)
To provide public and private open space for outdoor recreation both passive and active. OS-PK areas may be designated in areas containing public parks, golf courses, greens, commons, playgrounds, landscape areas and similar types of public and public open spaces.

Table 3.9-2
Standards of Population Density and Building Intensity (2015 and 2030 General Plan)

Land Use Designation	Zoning	Residential Density (Units/Gross Acre)	Average Permitted Floor Area Ratio (FAR)	Residential Average Persons/ Housing Unit	Population Person/ Acre (Range)
Residential					
Rural (RR)	P-D	1.0 to 3.0		3.02	3.0-9.1
Low Density (LD)	R-1-5, R-1-6, R-1-10, R-1-20	2.0 to 6.0		3.02	6.0-18.1
Low-Medium Density (LMD)	R-2	6.1 to 12.0		3.02	18.4 to 36.2
High-Medium Density (HMD)	R-3-1.5, R-3-2	12.1 to 24.0		3.02	36.5 to 72.5
High Density (HD)	R-4	24.1 to 36.0		3.02	72.8 to 108.7
Mobile Home Park (RMH)	R-MH	6.0 to 10.0		3.02	18.1 to 30.2
Village Residential (VR)	RP-D	7.0 to 30.0 (Average 10.0)		3.02	21.1 to 90.6

Land Use Designation	Zoning	Residential Density (Units/Gross Acre)	Average Permitted Floor Area Ratio (FAR)	Residential Average Persons/ Housing Unit	Population Person/ Acre (Range)
Commercial					
Commercial/Professional Office (CO)	C-O		0.50		
Neighborhood (CN)	C-N		0.35		
Convenience (CV)	P-D		0.35		
Regional/Community (RC)	C-C		0.35 to 6.0		
Thoroughfare (CT)	C-T		0.35		
General (CG)	C-G		0.35		
Urban Village Core (UVC)	P-D		0.35		
Business Park	P-D**		0.40		
Industrial	I-L, I-H		0.30 to 0.50		
Reserve*					
Residential	A-1-20	2.0 to 6.0*		3.02*	6.0-18.1*
Commercial	A-1-20		0.35*		
Industrial	A-1-20		0.30 to 0.50*		
Business Park	A-1-20		0.40*		
Area of Interest	A-1-20		0.10*		
Other					
Public/Government (P/G)	All				
Open Space-Park/Recreation Facility (OS-PK)	All		0.10		

*Does not apply until area is redesignated from "Reserve
** New Zoning District(s) may be created for these land uses.

Specific Plans/Master Development Plans

In 1996, the City of Merced had three adopted "Specific Plans" (Fahrens Park, Campus North, and Northeast Yosemite) and one "Master Development Plan," (Bellevue Ranch) all located in the North Merced planning area. These plans were developed as a way of master-planning large areas under consideration for development.

The Fahrens Park Specific Plan was originally adopted in 1984, includes approximately 300 acres and calls for single-family residential development, open space (including Fahrens Community Park and a flood control channel), along with a small amount of medium-density residential development. The Campus North Specific Plan was originally adopted in 1985, includes 78 acres, and, as amended, calls for single-family homes on standard and small lots, and professional office uses. The Northeast Yosemite Specific Plan was adopted in 1989, includes approximately 640 acres, and calls for mostly single- family residential development with some

duplex and multi-family development. Other uses include the new Mercy Medical Center Merced and Mercy Cancer Center, three church sites, Cruickshank Middle School, a 10-acre park site, and a small neighborhood commercial center ("The Promenade").

The Bellevue Ranch Master Development Plan was adopted in June 1995 and covers 1,365 acres. The plan calls for a great deal of single-family residential and multifamily residential development as well as a substantial amount of retail commercial and professional office development adjacent to the east-west arterials running through the site. Other uses include more elementary school sites, one high school site, nearly 200 acres of park land and open space, and two fire station sites.

Existing Zoning Summary

Zoning regulations clearly indicate the extent and type of development that can occur in the incorporated areas (hence holding capacity and buildout potential). An important distinction between the General Plan and Zoning Ordinance is that the General Plan provides guidance on the location, type, density, and timing of new growth and development over the long-term, while the Zoning Ordinance regulates uses, building height, setbacks, provisions of open space, lot sizes, and other factors related to development on individual property. The discussion of future growth must first examine the current growth potential and capacity for new growth. The General Plan and Zoning Ordinance are the two most important factors used to calculate potential growth. The General Plan and Zoning Ordinance provide guidance and requirements for an area's ultimate population and size and to what extent development is possible. The purpose of this section is to summarize existing information regarding the City of Merced Zoning Ordinance.

The Zoning Ordinance establishes 11 residential classifications, seven commercial zones, two industrial zones, four reserve zones, one public/government zone, and one open space/park zone (reference Table 3.9-2). The purpose of all zones is to translate the broad General Plan land use categories into detailed land use classifications that are applied to properties with much greater precision than the General Plan.

The Zoning Ordinance has a number of Special Districts established to provide areas for special uses which are of a transitory nature, which require special consideration by the Planning Commission and the City Council.

Redevelopment Plans

The Goal of the Redevelopment Program is to stimulate economic investment by participating in real estate-based development projects and public improvements that increase economic vitality and improve physical conditions in target redevelopment project areas for the benefit of the entire City and its residents in order to eliminate physical and economic blight as defined by the California Community Redevelopment Law (CRL), which provides the framework for carrying out redevelopment activities.

The City of Merced contains two redevelopment areas. Project Area 2 was created in 1974 and encompasses the entire downtown and the Western Industrial Park. In 1996, the Redevelopment Agency approved the Gateways Project Area, which included areas along Merced's highways. This project area was amended in 2000 to encompass a portion of the Airport Industrial Park and again in 2005 to include the majority of South Merced and areas outside of the City limits. Redevelopment activities in Merced are governed by the Agency's Board which consists of the six City Council Members and the Mayor.

Sphere of Influence

A "sphere of influence" is a boundary surrounding cities and special service districts intended to represent the ultimate area into which the city or district may expand and extend public services. The Merced County Local Agency Formation Commission (LAFCO) must approve the adoption of a sphere of influence boundary and changes to existing sphere boundaries.

The policies of LAFCO require a development plan and a plan for the extension of services to be submitted with every application for a boundary change, and that be submitted with any application for annexation. Other policies discourage the annexation of prime agricultural land when significant areas of non-prime agricultural land is already available, and encourage the development of vacant/infill areas within cities before the annexation and development of fringe areas. Additional policies encourage city annexations that reflect a planned, logical, and orderly progression of urban expansion and promote efficient delivery of urban services.

General Plan Consistency

The intent of the Merced Vision 2030 General Plan Update is to identify areas for new growth that is anticipated over the next 20 years. The Plan also establishes goals, policies and implementing actions to regulate that development. A set of guiding principles was formulated in order to direct the development of the Plan and its' implementing regulations. These guiding principles are:

- Expansion of the Sphere of Influence and City boundary with phasing of development to avoid premature conversion of agricultural land and to plan for cost-effective extension of municipal services.

- Foster compact and efficient development patterns.

- Connectivity between existing and planned urban areas. Examples include the northeast area toward UCM, the University Community, and South Merced.

- Merced as the single municipal service provider in the expanded sphere of influence.

- New development provides or pays its fair share of public services and facilities to avoid burdening existing city residents (in short, new growth pays for itself).

- Mixed-use, transit and pedestrian friendly urban villages in growth areas with direct access to commercial cores from surrounding neighborhoods.

- Commercial nodes in new growth areas to avoid the aesthetic and circulation issues associated with more common "strip commercial".

- Circulation: Recognition of the cost and importance of the arterial street system and protect capacity with access standards. Designs that encourage all modes of transportation.

- Build community quality. High community standards for Merced's services, infrastructure, and private development as a strategy for attracting business and industry and to benefit the City's residents.

- Planning well in advance for industrial/business park uses and for the infrastructure needed to support such development.

- A diversity of housing types and opportunities.

- Encouraging Sustainable and "Green" Development.

- Planning for the provision of infrastructure ahead of development.

- Maintaining Merced's high quality of life and keeping it a nice place to live.

- Encouraging new research parks and the use of new technologies.

- Protection of the Merced Regional Airport as an important community asset.

- Maintaining a quality educational environment for pre-school, K-12, and higher education.

- Maintaining our quality parks and recreation systems, including the bike path system.

- Encouraging a healthy community through improved medical facilities, air quality, parks & recreation opportunities, etc.

The intent of the 2030 General Plan update was not to replace the 2015 plan, but to update selected elements to reflect changes in state law, and new issues (such as the UC Merced campus) that arose since the 2015 plan was adopted. A significant amount of the 2015 plan was retained, including land use designations and development standards.

The *Merced Vision 2030 General Plan* contains a number of policies that apply to Land Use and Planning impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Land Use, Transportation and Circulation, Public Services and Facilities, Urban Design, Open Space, Conservation, and Recreation, Housing, and Safety Elements of the General Plan are designed to ensure that environmental impacts are minimized as development occurs.

Urban Expansion Policies:

UE-1.1 Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

UE-1.3 Control the annexation, timing, density, and location of new land uses within the City's urban expansion boundaries.

UE-1.4 Continue joint planning efforts on the UC Merced and University Community plans.

UE-1.5 Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP/SOI)/Sphere of Influence (SOI) during the planning period.

UE-1.6 Consider expansion of the City's SUDP/SOI boundary for areas within the Area of Interest when certain conditions are met.

Land Use Policies:

L-1.1 Promote balanced development which provides jobs, services and housing.

L-1.2 Encourage a diversity of building types, ownership, prices, designs, and site plans for residential areas throughout the City.

L-1.3 Encourage a diversity of lot sizes in residential subdivisions.

L-1.4 Conserve residential areas that are threatened by blighting influences.

L-1.5 Protect existing neighborhoods from incompatible developments.

L-1.6 Continue to pursue quality single-family and higher density residential development.

L-1.7 Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.

L-1.8 Create livable and identifiable residential neighborhoods.

L-1.9 Ensure connectivity between existing and planned urban areas.

L-2.1 Encourage further development of appropriate commercial and industrial uses throughout the City.

L-2.2 Locate new or expanded industrial, research & development, technology, and business parks in appropriate areas.

L-2.3 Promote the retention and expansion of existing industrial and commercial businesses.

L-2.4 Provide a range of services adjacent to and within industrial areas to reduce auto trips.

L-2.5 Maintain attractive industrial areas and business parks.

L-2.6 Provide neighborhood commercial centers in proportion to residential development in the City.

L-2.7 Locate and design new commercial development to provide good access from adjacent neighborhoods and reduce congestion on major streets.

L-2.8 Encourage a mixture of uses and activities and reinvestment that will maintain the vitality of the downtown area.

L-2.9 Identify locations and develop standards for campus-type research and development parks.

L-2.10 Encourage well-planned freeway-oriented developments

L-3.1 Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.

L-3.2 Encourage infill development and a compact urban form.

L-3.3 Promote site designs that encourage walking, cycling, and transit use.

L-3.4 Build identity, character, and enhanced community design in the South Merced Community Plan area.

L-3.5 Develop a Transit-Oriented Development Overlay Zone adjacent to the planned High Speed Rail Transit Station in Downtown Merced.

L-3.6 Require Community Plans for large new development areas within the City's SUDP/SOI prior to development.

L-3.7 Implement policies and principles to conform to the intent of the San Joaquin Valley Regional Blueprint.

Transportation and Circulation Policies:

T-1.1 Design streets consistent with circulation function, affected land uses, and all modes of transportation.

T-1.3 Design major roads to maximize efficiency and accessibility.

T-1.7 Minimize street system impacts on residential neighborhoods and other sensitive land uses.

T-2.1 Provide for and maintain a major transitway along "M" Street and possibly along the Bellevue Road/Merced-Atwater Expressway and Campus Parkway corridors.

T-2.6 Maintain and expand the community's existing bicycle circulation system.

T-2.8 Improve planning for pedestrians.

T-2.9 Ensure that new development provides the facilities and programs that improve the effectiveness of Transportation Control Measures and Congestion Management Programs.

T-3.1 Preserve the Merced Regional Airport and its protective zones from incompatible encroachment and incompatible development within the Airport Industrial Park.

T-3.2 Promote and encourage the orderly and timely development of commercial and general aviation facilities.

T-3.4 Reduce rail system impacts on circulation within the urban area.

T-3.6 Retain and expand as needed rail facilities serving industrial development.

Public Services and Facilities Policies:

P-1.1 Provide adequate public infrastructure and services to meet the needs of future development.

P-1.2 Utilize existing infrastructure and public service capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of infrastructure and services where necessary.

P-3.1 Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.

P-4.1 Provide adequate wastewater collection, treatment and disposal capacity for existing and projected future needs.

P-5.1 Provide effective storm drainage facilities for future development.

P-5.2 Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.

P-7.1 Cooperate with Merced Area School Districts to provide elementary, intermediate and high school sites that are centrally located to the populations they serve and adequate to serve community growth.

Urban Design Policies:

UD-1.2 Distribute and design Urban Villages to promote convenient vehicular, pedestrian, and transit access.

UD-1.3 Promote and facilitate Core Commercial design principles in

UD-1.1 Apply Urban Village design principles to new development in the City's new growth areas.

UD-1.4 Promote and facilitate Urban Village residential area design principles.

UD-1.5 Design and develop public and quasi-public buildings and uses utilizing Urban Village principles.

Open Space, Conservation, and Recreation Policies:

OS-1.2 Preserve and enhance creeks in their natural state throughout the planning area.

OS-1.4 Improve and expand the City's urban forest.

OS-2.1 Protect agricultural areas outside the City's SUDP/SOI from urban impacts.

OS-3.1 Provide high-quality park and open space facilities to serve the needs of a growing population.

OS-3.4 Develop a diverse and integrated system of park facilities throughout Merced.

OS-4.1 Preserve open space areas which are necessary to maintaining public health and safety.

Housing Policies:

H-1.1 Support increased densities in residential areas.

Noise Policies:

N-1.1 Minimize the impacts of aircraft noise.

N-1.5 Coordinate planning efforts so that noise-sensitive land uses are not located near major noise sources.

Safety Policies:

S-2.3 Restrict urban development in all areas with potential ground failure characteristics.

S-5.1 Continue to protect approach areas and control zones for both existing and future runway systems through land use regulations and property acquisition where necessary.

Specific Urban Development Plan

The SUDP/SOI boundary is recognized as the City's ultimate growth boundary over the life of the General Plan. Merced County policy states that all land within the SUDP/SOI is planned for eventual development through a mixture of urban and urban-related uses. The City of Merced's General Plan builds on the County SUDP policies to provide a long term growth strategy for Merced's future expansion. Merced's revised SUDP/SOI boundary is proposed to be co-terminus with the Sphere of Influence.

Additional local regulations are described under the Environmental Setting portion of this section.

3.9.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project is normally considered to have a significant impact on the environment if it will:

- Physically divide an established community
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect
- Conflict with any applicable habitat conservation plan or natural community conservation plan

3.9.3 IMPACTS AND MITIGATION MEASURES

Impact #3.9-1: Physically divide an established community

Discussion/Conclusion: As shown in Table 3.9-3, the 2030 General Plan establishes 21 land use designations that encompass 33,463 acres, which is 62 percent larger (12,865 acres) than the SUDP in the existing 2015 General Plan, but almost the same size as the 1997 Sphere of Influence (33,700 acres). The SUDP and SOI boundaries have been combined into one boundary in the proposed General Plan. The largest land use is Low Density Residential (8,771 acres or 26 percent of the SUDP/SOI).

Table 3.9-3
Merced Planned Land Use Summary
(2015 General Plan SUDP vs. 2030 General Plan SUDP/SOI)

Land Use Classification	2015 GP SUDP		2030 GP SUDP/SOI		Percent Change
	Acres	Percent of Total	Acres	Percent of Total	
RR (Rural Residential)	296	1.44	2,301	6.88	677
AG (Agriculture)	114	0.55	114	0.34	0
Total Agricultural Residential	*410*	*1.99*	*2,415*	*7.22*	*489*
LD (Low-Density Residential)	8,497	41.25	8,771	26.21	3
LMD (Low-Medium Density)	1130	5.49	1,177	3.52	4
Total Single-Family Residential	*9,627*	*46.74*	*9,948*	*29.73*	*3*
HMD (High-Medium Density)	807	3.92	833	2.49	3
HD (High Density Residential)	92	0.45	116	0.35	26
RMH (Residential Mobile Home)	80	0.39	80	0.24	0
Total Multi-Family	*979*	*4.75*	*1,029*	*3.08*	*5*
P/G (Public/Government)	538	2.61	578	1.73	7
CO (Commercial Office)	474	2.30	474	1.42	0
Total Office	*1,012*	*4.91*	*1,052*	*3.14*	*4*
IND (Industrial)	2,877	13.97	2,877	8.60	0
IND-R (Industrial Reserve)	150	0.73	1,223	3.65	715
Total Industrial	*3,027*	*14.70*	*4,100*	*12.25*	*35*
BP (Business Park)	582	2.83	659	1.97	13
BP-R (Business Park Reserve)	88	0.43	88	0.26	0
Total Business Park	*670*	*3.25*	*747*	*2.23*	*11*
CG (General Commercial)	494	2.40	494	1.48	0
CN (Neighborhood Commercial)	252	1.22	275	0.82	9
CT (Thoroughfare Commercial)	505	2.45	679	2.03	34
RC (Regional/Community)	518	2.51	518	1.55	0
Total Commercial	*1,769*	*8.59*	*1,966*	*5.88*	*11*
OS-PK (Open Space/Park)	954	4.63	1,107	3.31	16
Total Open Space	*954*	4.63	*1,107*	*3.31*	*16*
Total School	*746*	*3.62*	*1,740*	*5.20*	*133*
Total Other Lands	*1,404*	*6.82*	*1,244*	*3.72*	*-11*
Community Plan Areas	*0*	*0.00*	*8,115*	*24.25*	*N/A*
TOTAL SOI/SUDP AREA	**20,598**	**100.00**	**33,463**	**100.00**	**62**

Note: Open Space Inventory for the 2030 SOI/SUDP includes arterial street rights-of-way

Source: Figures 2-3 & 2- -Land Use Diagram as calculated by Quad Knopf, Inc.

A number of plans and policies are related to the 2030 General Plan Update. These include, but are not limited to, the City's Zoning Ordinance, the Merced County General Plan, the Merced County Zoning Ordinance, Specific Plans/Master Development Plans, redevelopment project

areas, the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (LAFCO), the Merced County Regional Transportation Plan (RTP), the Regional Transportation Improvement Program (RTIP), Merced Public Facilities Financing Plan, the State Transportation Improvement Program (STIP), the Merced County Airport Land Use Compatibility Plan, the Merced Regional Airport Master Plan, the San Joaquin Valley Air Quality Attainment Plan (AQAP), and the Air Quality Guidelines for General Plans.

The 2030 General Plan includes planning for infrastructure elements (utilities and roadways) to improve the quality of life for City residents and to support an additional 74,000 residents by 2030. These elements will widen some roadways, improve existing infrastructure, and improve flood control facilities. However, no major new roads or infrastructure corridors are proposed in the developed portions of the community that would create a physical barrier or division between existing neighborhoods.

The 2030 General Plan Draft Urban Expansion Element includes the following goals: a compact urban form; preservation of agriculturally significant areas; and efficient and phased urban expansion. These goals will help prevent urban sprawl and land use conflicts, and will ensure compatibility and community continuity throughout the City. Policies and implementing actions are included as part of the proposed project to encourage development of cohesive neighborhood patterns and consequently, would minimize this impact. The 2030 General Plan provides a number of policies and implementing actions designed to protect the desired elements of the community (i.e., history, character, etc.) while also providing for future growth.

Applicable policies of the Draft Urban Expansion Element with regard to this impact include Policy UE-1.1 which states that the City is to designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area. Policy UE-1.2 calls for the City to foster compact and efficient development patterns to maintain a compact urban form, and Policy UE-1.3 states that the City will control the annexation, timing, density, and location of new land uses within the City's urban expansion boundaries. Policy UE-1.4 calls for the City to continue joint planning efforts on the UC Merced and University Community plans. Policy L-1.9 of the Land Use Element calls for the City to ensure connectivity between existing and planned urban areas and Policy LU-3.2 calls for the City to encourage infill development and a compact urban form.

Applicable implementing actions of the policies above include encouraging development on infill sites by amending the Zoning and Subdivision Ordinances to better accommodate such requests (1.2.a). Implementing Action 1.2.c states that the City will continue to limit the expansion of City utilities to only those within an established urban expansion boundary. Implementing Action 1.2.d states that the City will promote higher residential densities within the Merced urban area. The City will continue to require that all new urban development and annexations be contiguous to existing urban areas and have reasonable access to public services and facilities (1.3.a). The City should adequately plan for public improvements/services to support designated land uses for all areas as they become suitable for development and/or proposed for annexation (Implementing Action 1.3.b). With Implementing Action 1.3.c, the City shall encourage phasing of new development.

Generally, new development as a result of the 2030 General Plan would represent a continuation of the existing urban area of the City and would not result in the physical division of the existing community. New guiding principles have been added to the 2030 plan for preparation of Community Plans which require connectivity with existing and planned urban uses. With the implementation of the policies and implementing actions noted above, this impact is considered ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.9-2: Conflict with any applicable land use plan, policy, or regulation

Discussion/Conclusion: Per State law, the General Plan is the primary planning document of the community and the blueprint for future growth. The 2030 General Plan would supersede the 1997 General Plan once adopted. Upon approval and implementation of the 2030 General Plan, other City documents, like the Zoning Ordinance, Subdivision Ordinance, or infrastructure master plans may need to be updated to ensure consistency.

To address this, Implementing Action 1.2.a of Policy P-1.2 of the proposed Public Services and Facilities Element calls for the City to develop plans which establish priorities to address existing inadequacies in the City's infrastructure system and to periodically review and update them. Implementing Action 1.2.a of Policy UE-1.2 states that the City will encourage development on infill sites by amending the Zoning and Subdivision Ordinances to better accommodate such requests. Implementing Action 1.3.a of Policy P-1.3 states that the City should require new development to provide or pay for its fair share of public facility and infrastructure improvements to assure that maintenance of City service levels is adequate. Implementing Action 3.1.b of Policy P-3.1 call for the City to update the Water Master Plan and Urban Water Management Plan for the SOI and expanded SUDP/SOI area.

Implementing Action 3.2.a of Policy T-3.2 states that the City will implement the Merced Regional Airport Master Plan and update it as necessary. This will ensure that new development is consistent with the Airport Master Plan. Also, see discussion in Impact #3.7-5 regarding the Merced County Airport Land Use Compatibility Plan.

The proposed General Plan land use designations beyond the existing SOI are not consistent with the existing Merced County General Plan land use designations; however, this inconsistency already exists since the adopted General Plan has urban uses for areas which the County has designated for non-urban uses. This inconsistency is typical, since more intensive urban uses are generally encouraged within cities. As a result, the proposed General Plan would not create a new significant impact that does not already exist. Please see Section 3.2, Agricultural and Forest Resources, of this EIR for a discussion of the potential impacts related to conflicts between existing County agricultural designations and the proposed General Plan.

Much of the area designated Rural Residential (RR) in the County General Plan on the east side of Merced is proposed as RR in the expanded SUDP/SOI. The exception is the Bellevue

Corridor which is a major route to UC Merced. See General Plan Section 3.7.1 for a discussion of the planning process for the Bellevue Corridor Community Plan. The RR designation in the 2030 Plan allows for 1 to 3 units with annexation and urban services. This is consistent with the County General Plan which permits up to 3 units when sewer and water are available.

Development of the General Plan will ultimately involve expansion to the City's SUDP/SOI and annexations. The City must comply with LAFCO policies and procedures for final approval of the SOI. A part of LAFCO policy is the General Plan's attention to phasing. This is an important part of Chapter 2, Urban Expansion. The Land Use Element includes policies designed to reduce the demand of annexations, such as encouraging in-fill development and a compact urban form (Policy L-3.2), and controlling the annexation, timing, density, and location of new land uses within the City's urban expansion boundaries (Policy UE-1.3). The City will promote the annexation of developed areas within the City's SUDP/SOI during the planning period (Policy UE-1.5). Policy UE-1.4 calls for the City to continue joint planning efforts on the UC Merced and University Community plans.

Implementation of the policies and implementing actions in the 2030 General Plan and the LAFCO process would result in ***less than significant*** land use impacts related to conflicts with other plans, policies and regulations applicable in the Merced area.

Mitigation Measures

No mitigation measures are required.

Impact #3.9-3: Conflict with any applicable habitat conservation plan or natural community conservation plan.

Discussion/Conclusion: No Habitat Conservation Plans or Natural Community Conservation Plans have been adopted encompassing the Merced Planning Area, and ***no impact*** would therefore occur as a result of implementing the proposed 2030 General Plan.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

As the primary planning document for the City of Merced, the proposed General Plan would have a less than significant impact in relation to potential conflicts with other applicable plans, policies and regulations, including the County's General Plan and LAFCO's SOI. Since the proposed General Plan would not have a significant impact on these regional land use plans and policies, the proposed General Plan would ***not result in a significant cumulative impact***.

3.10

MINERAL RESOURCES

3.10 Mineral Resources

This section of the Draft EIR describes the regulatory framework and existing conditions related to mineral resources in and around Merced, and the potential mineral resources impacts of the proposed General Plan.

3.10.1 SETTING

Environmental Setting

The City of Merced does not contain any mineral resources that require managed production, according to the State Mining and Geology Board. Based on observed site conditions and review of geological maps for the area, economic deposits of precious or base metals are not expected to underlie the Merced SUDP/SOI. According to the California Geological Survey, Aggregate Availability in California - Map Sheet 52, Updated 2006, and minor aggregate production occurs west and north of the City of Merced, but economic deposits of aggregate minerals are not mined within the immediate vicinity of the SUDP/SOI. Commercial deposits of oil and gas are not known to occur within the SUDP/SOI or vicinity.

According to the Merced County General Plan Background Report (June 21, 2007), very few traditional hard rock mines exist in the county. The County's mineral resources are almost all sand and gravel mining operations. Approximately 38 square miles of Merced County, in 10 aggregate resource areas (ARA), have been classified by the California Division of Mines and Geology for aggregate. The 10 identified resource areas contain an estimated 1.18 billion tons of concrete resources with approximately 574 million tons in Western Merced County and approximately 605 million tons in Eastern Merced County. Based on available production data and population projections, the Division of Mines and Geology estimated that 144 million tons of aggregate would be needed satisfy the projected demand for construction aggregate in the county through the year 2049. The available supply of aggregate in Merced County substantially exceeds the current and projected demand.

Regulatory Setting

FEDERAL

There are no specific federal regulations applicable to mineral resources.

STATE

Surface Mining and Reclamation Act

The California Surface Mining and Reclamation Act of 1975 (SMARA) was enacted in response to land use conflicts between urban growth and essential mineral production. SMARA (Public Resources Code § 2710 et seq.; subsequently amended) is the primary regulation for onshore surface mining in the State. SMARA mandated that aggregate resources throughout the State be identified, mapped, and classified by the State geologist so that local governments could make

land use decisions in light of the presence of aggregate resources and the need to preserve access to those resources. Local jurisdictions are required to enact specific plan procedures to guide mineral conservation and extraction at particular sites, and to incorporate mineral resource management policies into their general plans. The Division of Mines and Geology has prepared Mineral Land Classification Maps for aggregate resources. The Mineral Land Classification Maps designate four different types of resource sensitivities. The four sensitivity types are:

- MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood for their presence exists.

- MRZ-2: Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood for their presence exists.

- MRZ-3: Areas containing mineral deposits the significance of which cannot be evaluated from available data.

- MRZ-4: Areas where available information is inadequate for assignment of any other MRZ zone.

LOCAL

General Plan Consistency

The City of *Merced Vision 2030 General Plan*, existing or proposed, does not contain policies relative to mineral resources.

3.10.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project is normally considered to have a potentially significant impact on the environment if it will:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state

- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan

3.10.3 IMPACTS AND MITIGATION MEASURES

Impact #3.10-1: The proposed project could adversely affect the availability of a known mineral resource of value to the region and/or residents of the state

Discussion/Conclusion: Based on observed site conditions and review of geological maps for the area, economic deposits of precious or base metals are not known to occur in the Merced SUDP/SOI. According to the California Geological Survey, Aggregate Availability in California

- Map Sheet 52, Updated 2006 minor aggregate production occurs west and north of the City of Merced, but economic deposits of aggregate minerals are not mined within the immediate vicinity of the SUDP/SOI. The City of Merced will not be impacted by dust or noise based on the community's distance from mining operations. Therefore implementation of the proposed General Plan would have ***no impact*** on the availability of mineral resources or impact current of future mining operations.

Mitigation Measures

No mitigation measures are required.

Impact #3.10-2: The proposed project could adversely affect the availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan

Discussion/Conclusion: No Mineral Resource Zones or mineral resource recovery sites exist within the City of Merced or in the area designated for future expansion of the City (the SUDP/SOI). As a result the General Plan does not identify location of resource sectors, nor are policies for management of mineral resources identified. Implementation of the proposed General Plan would not adversely affect the availability of locally-important mineral resource recovery sites delineated on a local general plan, specific plan or other land use plan. Therefore, there is ***no impact***.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

The County's mineral resources are almost all sand and gravel mining operations. Approximately 38 square miles of Merced County, in 10 aggregate resource areas, have been classified by the California Division of Mines and Geology for aggregate. Development in these areas could preclude potential future mining by rendering this resource inaccessible or by establishing urban uses incompatible with mining operations. However, the vast majority of the County's potential mineral deposits are expected to remain available for potential mining into the foreseeable future, should site-specific evaluations determine them to be significant and economic. For these reasons, the loss of mineral resources as a result of development in the County would be a ***less than significant cumulative impact.***

3.11
NOISE

3.11 Noise

The purpose of this section is to describe the existing and the future noise environments within the City of Merced. This section provides an assessment of long term noise impacts associated with traffic, railroad operations, aircraft operations, commercial/light industrial uses and other non-transportation noise sources. Based upon the analysis, mitigation measures associated with the buildout of the proposed General Plan are provided where a potentially significant impact has been identified. The mitigation measures generally take the form of the proposed goals, policies and implementation measures.

3.11.1 SETTING

Environmental Setting

The City of Merced is located approximately 100 miles southeast of Sacramento, 55 miles northwest of Fresno, and 150 miles southeast of San Francisco, in the Central Valley of California. Incorporated in 1889, the City of Merced is situated within the eastern section of Merced County and is the largest City in the County. Principal highway access to Merced is via State Highway 99, which runs through the central portion of the City in a general north/south direction. State Highways 140 and 59 also serve the City.

The City contains a typical mix of residential, commercial, industrial and public land uses. The City is centered around Main Street. Older development transitions into new development as one goes farther north. Significant areas in the extreme north remain undeveloped, though they have been annexed. Less new development has occurred in the south portion of the City.

ACOUSTIC TERMINOLOGY

Noise is often defined as unwanted sound, and its perception can be characterized as a subjective reaction to a physical phenomenon. Researchers have grappled for many years with the problem of translating objective measurements of sound into directly correlated measures of public reaction to noise. The descriptors of community noise in current use are the results of these efforts, and represent simplified, practical measurement tools to gauge community response. Table 3.11-1 provides examples of maximum or continuous noise levels associated with common noise sources.

Table 3.11-1
Typical A-Weighted Maximum Sound Levels of Common Noise Sources

dB (Sound Pressure Level)	Source (with distance)
130	Threshold of pain
120	Jet aircraft take-off at 100 feet
110	Riveting machine at operators position
100	Shot-gun at 200 feet
90	Bulldozer at 50 feet

dB (Sound Pressure Level)	Source (with distance)
80	Diesel locomotive at 300 feet
70	Commercial jet aircraft interior during flight
60	Normal conversation speech at 5-10 feet
50	Open office background level
40	Background level within a residence
30	soft whisper at 2 feet
20	Interior of recording studio

Source: j.c. brennan and associates, Inc., 2007

A common statistical tool to measure the ambient noise level is the average sound level (Leq), which is the sound level corresponding to a steady-state A-weighted sound level in decibels (dB) containing the same total energy as a time-varying signal over a given time period (usually one hour). The Leq, or average sound level, is the foundation for determining composite noise descriptors such as Ldn and CNEL (see below), and shows very good correlation with community response to noise. For an explanation of these terms, see Table 3.11-2 "Acoustical Terminology."

Table 3.11-2
Acoustical Terminology

Term	Definition
Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period

Term	Definition
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches

Source: j.c. brennan and associates, Inc., 2007

Two composite noise descriptors commonly used are: Ldn and CNEL. The Ldn (Day-Night Average Level) is based upon the average hourly Leq over a 24-hour day, with a +10 decibel weighting applied to nighttime (10:00 p.m. to 7:00 a.m.) Leq values. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were subjectively twice as loud as daytime exposures. The CNEL (Community Noise Equivalent Level), like Ldn, is based upon the weighted average hourly Leq over a 24-hour day, except that an additional +4.77 decibel penalty is applied to evening (7:00 p.m. to 10:00 p.m.) hourly Leq values.

The CNEL was developed for the California Airport Noise Regulations, and is normally applied to airport/aircraft noise assessment. The Ldn descriptor is a simplification of the CNEL concept, but the two will usually agree, for a given situation, within 1 dB. Like the Leq, these descriptors are also averages and tend to disguise short-term variations in the noise environment. Because they presume increased evening or nighttime sensitivity, these descriptors are best applied as criteria for land uses where nighttime noise exposures are critical to the acceptability of the noise environment, such as residential developments.

The State Office of Planning and Research Noise Element Guidelines require that major noise sources be identified and quantified by preparing generalized noise contours for current and projected conditions. Noise measurements and modeling are used to develop these contours. Significant noise sources include traffic on major roadways and highways, railroad operations, airports, representative industrial activities and fixed noise sources.

Noise modeling techniques use source-specific data, including average levels of activity, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Modeling methods have been developed for a number of environmental noise sources such as roadways, railroad line operations and industrial plants. Such methods produce reliable results so long as data inputs and assumptions are valid.

The modeling methods used in this report closely follow recommendations made by the State Office of Noise Control, and were supplemented, where appropriate, by field-measured noise levels to account for local conditions. The noise exposure contours are based upon annual average conditions. Because local topography, vegetation or intervening structures may significantly affect noise exposure at a particular location, the noise contours should not be considered site-specific.

As described earlier, the CNEL and Ldn are 24-hour average noise level descriptors, which assume that individuals are more sensitive to noise occurring during the evening and nighttime hours. The CNEL and Ldn descriptors have been found to provide good correlation to the potential for annoyance from transportation-related noise sources (ie: roadways, airports and, to a lesser extent, railroad operations). However, these descriptions do not provide a good correlation to the potential for annoyance from non-transportation or stationary noise sources, such as industrial and commercial operations, because many times stationary noise sources operate sporadically or for short durations. Examples of these types of noise sources include loading docks, special event concerts, pressure relief valves or alarms, which tend to be short duration noise events. When applying an Ldn or CNEL descriptors, the noise levels associated with these types of short term operations will be averaged over a 24-hour period, underscoring the potential for annoyance.

The State of California "Model Community Noise Control Ordinance" suggests that an exterior hourly L50/Leq noise level of 55 dBA should be used for evaluating stationary noise source impacts during the daytime period (7 am - 10 pm) and 45 dBA during the nighttime period (10 pm - 7 am), within "suburban" areas. The hourly Leq, or hourly average noise level, has been found to provide good correlation to noise sources which operate for a short duration.

ROADWAY NOISE LEVELS

The Federal Highway Administration's (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop Ldn (24-hour average) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly Leq values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict Ldn values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Traffic data representing annual average traffic volumes for existing conditions were obtained from Caltrans and the project traffic consultant. Day/night traffic distribution for Highway 99,

State Route 59, and State Route 140 were based upon continuous hourly noise measurement data collected for those roadways. Truck mix data were also based upon Caltrans and j.c. brennan & associates, Inc. file data. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing traffic volumes in terms of the Ldn metric. Distances from the centerlines of selected roadways to the 60 and 65 dB Ldn contours are summarized in Table 3.11-3. Continuous noise measurement data is shown in Appendix B of Appendix I.

In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. The distances reported in Table 3.11-3 are generally considered to be conservative estimates of noise exposure along roadways in the City of Merced.

The effects of factors such as roadway curvature, and grade, can be determined from site-specific traffic noise measurements. The noise measurement results can be compared to the FHWA model results by entering the observed traffic volumes, speed and distance as inputs to the FHWA model. The differences between the measured and predicted noise levels can be used to adjust the FHWA model and more precisely determine the locations of the traffic noise contours.

Table 3.11-3
Existing Traffic Noise Levels

Roadway	Segment	Ldn at 100 feet	Distances[1] to Ldn Contours		
			70 dB	65 dB	60 dB
SR 59	16th to Olive	67 dB	66	142	306
SR 59	Olive to Yosemite	69 dB	89	192	415
SR 59	Yosemite to Cardella	67 dB	62	133	287
SR 59	Cardella to Bellevue	66 dB	51	109	235
SR 59	Bellevue to Old Lake	65 dB	45	98	211
SR 59	Old Lake to Castle Farms	65 dB	45	98	211
SR 59	Roduner to Mission	63 dB	36	78	169
SR 59	Mission to Gerard	64 dB	39	83	180
SR 59	Gerard to Childs	66 dB	52	113	243
SR 59	Childs to SR 99	64 dB	40	86	185
SR 59	SR 99 to 16th Street	65 dB	49	106	229
SR 59	Castle Farms Rd to Oakdale Rd	61 dB	25	54	116
SR 99	Franklin to Thornton	79 dB	416	897	1933
SR 99	Thornton to V Street	79 dB	369	795	1712
SR 99	V Street to R Street	79 dB	369	795	1712
SR 99	R Street to MLK JR	78 dB	360	775	1670
SR 99	MLK JR to G Street	79 dB	373	804	1732
SR 99	G Street to SR 140	79 dB	425	915	1970
SR 99	SR 140 to Childs	79 dB	414	892	1922
SR 99	Childs to Gerard	79 dB	396	853	1837
SR 99	Gerard to Mission	78 dB	357	770	1659

Roadway	Segment	Ldn at 100 feet	Distances[1] to Ldn Contours		
			70 dB	65 dB	60 dB
SR 99	Mission to Mariposa	78 dB	357	770	1659
SR 99	Castle Xpway to Franklin	79 dB	422	910	1960
SR 140	Tina to Thornton	72 dB	132	285	614
SR 140	Thornton to V Street	64 dB	37	80	173
SR 140	G Street to Parsons/Gardner	67 dB	64	138	296
SR 140	Parsons/Gardner to Campus Parkway	67 dB	64	138	298
13th Street	V Street to R Street	58 dB	16	34	74
13th Street	R Street to M Street	56 dB	11	25	53
13th Street	M Street to MLK JR	58 dB	16	35	75
13th Street	MLK JR to G Street	58 dB	17	37	79
13th Street	G Street to B Street	57 dB	13	28	61
14th Street	V Street to R Street	58 dB	16	34	73
14th Street	R Street to M Street	57 dB	13	28	60
14th Street	M Street to MLK JR	48 dB	4	8	16
16th Street	SR 99 to V Street	63 dB	33	72	155
16th Street	V Street to R Street	63 dB	36	79	169
16th Street	R Street to M Street	63 dB	32	69	149
16th Street	M Street to G Street	61 dB	23	51	109
16th Street	G Street to SR 99	59 dB	19	41	88
Bellevue Road	SR 59 to R Street	62 dB	30	64	137
Bellevue Road	R Street to M Street	62 dB	29	63	135
Bellevue Road	M Street to G Street	62 dB	29	63	135
Bellevue Road	G Street to Parsons/Gardner	63 dB	33	71	153
Bellevue Road	Parsons/Gardner to Campus Parkway	60 dB	22	48	104
Bellevue Road	SR 59 to Thornton	60 dB	23	49	106
Bellevue Road	Thornton to Castle Xpway	60 dB	23	49	106
Cardella Road	R Street to M Street	57 dB	13	28	61
Cardella Road	M Street to G Street	58 dB	16	35	75
Childs Avenue	West Ave to SR 59	58 dB	15	33	71
Childs Avenue	SR 59 to Tyler	57 dB	13	27	58
Childs Avenue	Tyler to SR 99	58 dB	16	34	73
Childs Avenue	SR 99 to Coffee	61 dB	25	53	114
Childs Avenue	Coffee to Campus Parkway	58 dB	16	34	73
Childs Avenue	Campus Parkway to Tower	55 dB	10	21	46
Dickenson Ferry	Thorton to West Ave	53 dB	7	15	32
Dickenson Ferry	West Ave to SR 59	53 dB	7	15	32
Dickenson Ferry	Grove to Thornton	53 dB	7	15	32
G Street	Mission to Childs	58 dB	16	34	73
G Street	Childs to SR 99	63 dB	34	74	160
G Street	SR 99 to Bear Creek	63 dB	35	76	164
G Street	Bear Creek to Olive	65 dB	48	104	225

Roadway	Segment	Ldn at 100 feet	Distances[1] to Ldn Contours		
			70 dB	65 dB	60 dB
G Street	Olive to Yosemite	66 dB	53	114	245
G Street	Yosemite to Cardella	63 dB	33	71	154
G Street	Cardella to Bellevue	63 dB	32	69	149
G Street	Bellevue to Old Lake	59 dB	20	42	91
G Street	Old Lake to Snelling	59 dB	20	42	91
Gerard Avenue	M Street to SR 59	53 dB	7	16	34
Gerard Avenue	SR 59 to Tyler	53 dB	7	16	34
Gerard Avenue	Parsons/Gardner to Coffee	60 dB	21	45	97
Gerard Avenue	Coffee to Campus Parkway	46 dB	2	5	11
Gerard Avenue	Campus Parkway to Tower	46 dB	2	5	11
M Street	Mission to Childs	56 dB	12	26	57
M Street	Childs to SR 99	59 dB	19	41	87
M Street	SR 99 to Bear Creek	63 dB	34	72	156
M Street	Bear Creek to Olive	63 dB	34	74	159
M Street	Olive to Yosemite	64 dB	42	90	194
M Street	Yosemite to Cardella	61 dB	25	54	116
Mission Avenue	SR 59 to Tyler	52 dB	7	14	31
Mission Avenue	Tyler to Henry	51 dB	5	11	24
Mission Avenue	Henry to SR99	53 dB	7	15	33
Mission Avenue	Coffee to Tower	48 dB	3	7	15
North Bear Creek	SR 99 to Campus Parkway	56 dB	12	26	57
North Bear Creek	R Street to M Street	58 dB	16	34	72
North Bear Creek	M Street to G Street	59 dB	18	40	86
North Bear Creek	G Street to Parsons/Gardner	59 dB	19	41	89
North Bear Creek	Parsons/Gardner to McKee	54 dB	8	17	37
Old Lake Road	Parsons/Gardner to Lake	45 dB	2	5	10
Olive Avenue	SR 99 to Campus Parkway	66 dB	56	121	260
Olive Avenue	R Street to M Street	66 dB	54	116	251
Olive Avenue	M Street to G Street	66 dB	51	110	238
Olive Avenue	G Street to Parsons/Gardner	64 dB	39	83	179
Olive Avenue	Parsons/Gardner to Campus Parkway	60 dB	21	45	98
Parsons	Coffee to Gerard	51 dB	5	11	24
Parsons/Gardner	Childs to SR 140	60 dB	20	44	94
Parsons/Gardner	SR 140 to Bear Creek	60 dB	23	49	105
Parsons/Gardner	Bear Creek to Olive	56 dB	12	26	55
Parsons/Gardner	Olive to Yosemite	57 dB	14	30	66
Parsons/Gardner	Yosemite to Cardella	52 dB	6	13	28
R Street	Gerard to Childs	47 dB	3	6	13
R Street	Childs to SR 99	60 dB	22	47	101
R Street	SR 99 to Bear Creek	62 dB	27	59	126
R Street	Bear Creek to Olive	62 dB	31	67	145

Roadway	Segment	Ldn at 100 feet	Distances[1] to Ldn Contours		
			70 dB	65 dB	60 dB
R Street	Olive to Yosemite	64 dB	39	83	179
Santa Fe Ave	SR 59 to Franklin	66 dB	54	116	250
Thornton Avenue	Mission to SR140	56 dB	11	24	51
Yosemite Ave	SR 59 to Campus Parkway	62 dB	29	63	136
Yosemite Ave	R Street to M Street	63 dB	35	75	163
Yosemite Ave	M Street to G Street	65 dB	49	105	227
Yosemite Ave	G Street to Parsons/Gardner	64 dB	41	88	190
Yosemite Ave	Parsons/Gardner to Campus Parkway	61 dB	26	55	119

Notes: [1]Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: j.c. brennan & associates, Inc., 2007

RAILROAD NOISE LEVELS

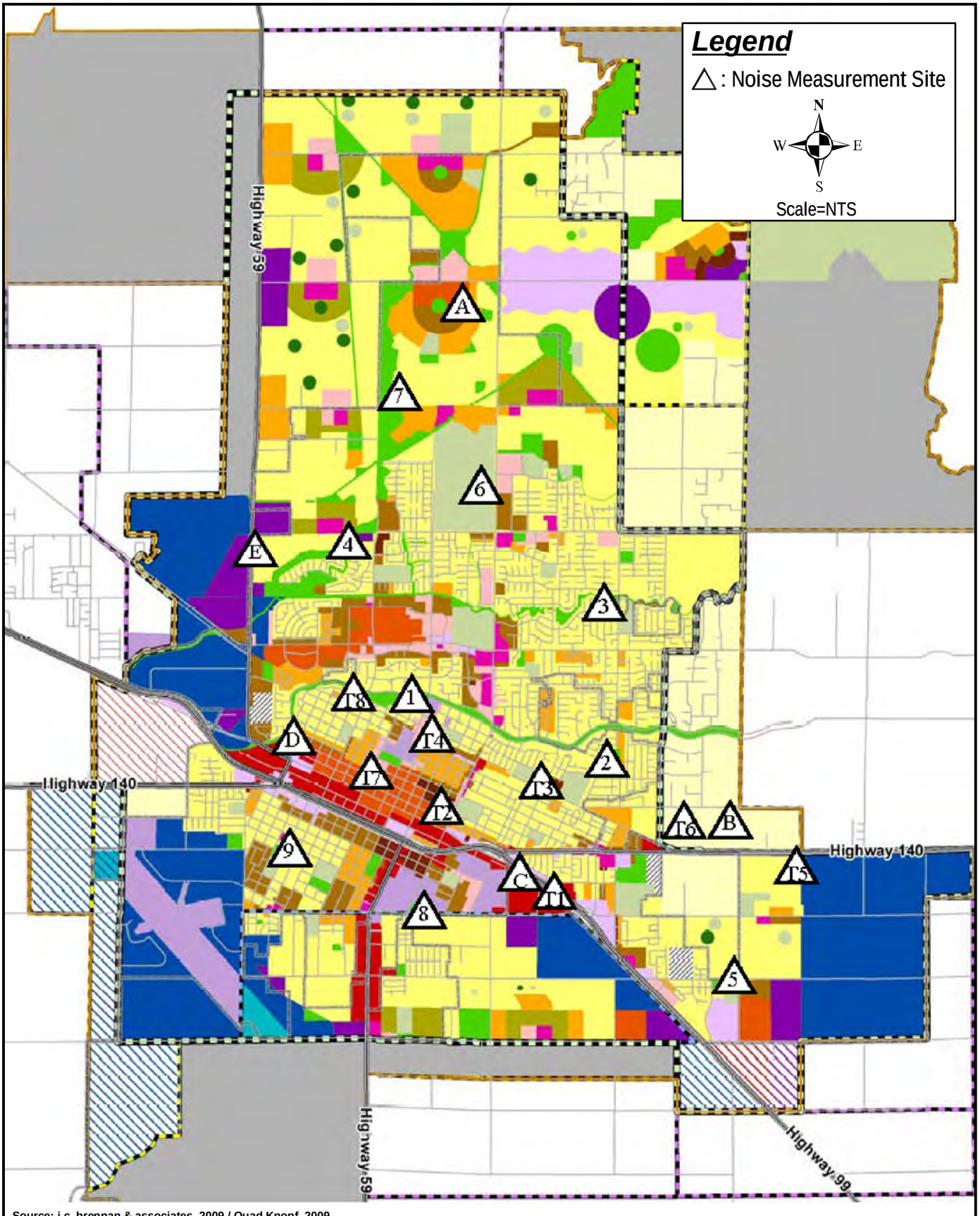
Railroad activity in the City of Merced General Plan Study Area occurs along the Union Pacific Railroad (UPRR) and Burlington Northern/Santa Fe (BNSF) railroad tracks. The UPRR mainline track generally runs parallel to the State Route 99 outside of the downtown area. Within the downtown area of Merced, the Union Pacific Railroad (UPRR) runs parallel and directly between 16th Street and 15th Street. The Burlington Northern Santa Fe Railroad generally runs parallel to Santa Fe Avenue until reaching the intersection of Highway Ca-140. At which point the tracks redirect easterly and follow Highway 140/Yosemite Parkway towards Planada.

In order to quantify existing train usage, j.c. brennan & associates, Inc., conducted continuous noise level monitoring at three location within the General Plan area. The purpose of the noise level measurements was to determine typical sound exposure levels (SEL) for railroad line operations in the General Plan area, accounting for the effects of travel speed, warning horns and other factors which may affect noise generation. In addition, the noise measurement equipment was programmed to identify individual train events, so that the typical number of train operations could be determined. Locations of continuous noise monitoring sites are shown on Figure 3.11-1. Table 3.11-4 shows a summary of the continuous noise measurement results for the UPRR and BNSF railroad lines. Figure 3.11-2, Figure 3.11-3 and Figure 3.11-4 show the results of the continuous railroad noise measurements.

Table 3.11-4
Railroad Noise Measurement Results

Measurement Location	Railroad Track	Grade Crossing /Warning Horn	Trains Events Per Day	Distance to CL	Average SEL
Site B	BNSF	No	26	110’	100 dB
Site C	UPRR	No	16	114’	103 dB
Site D	UPRR	Yes	16	46’	108 dB

Source: j.c. brennan & associates, Inc., 2007



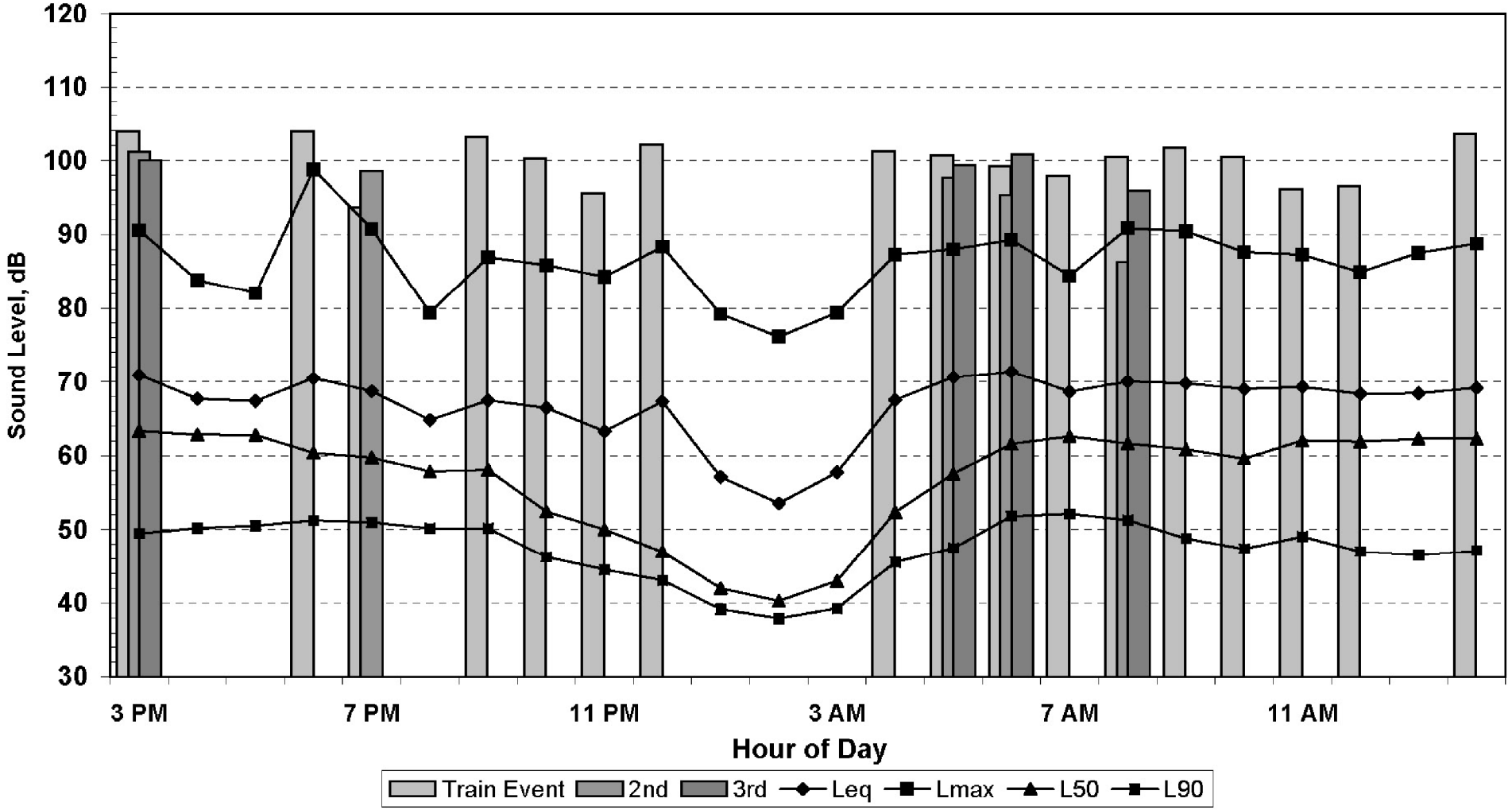
Source: j.c. brennan & associates, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
NOISE MEASUREMENT SITE LOCATIONS

Figure 3.11-1

Job No.: 060429



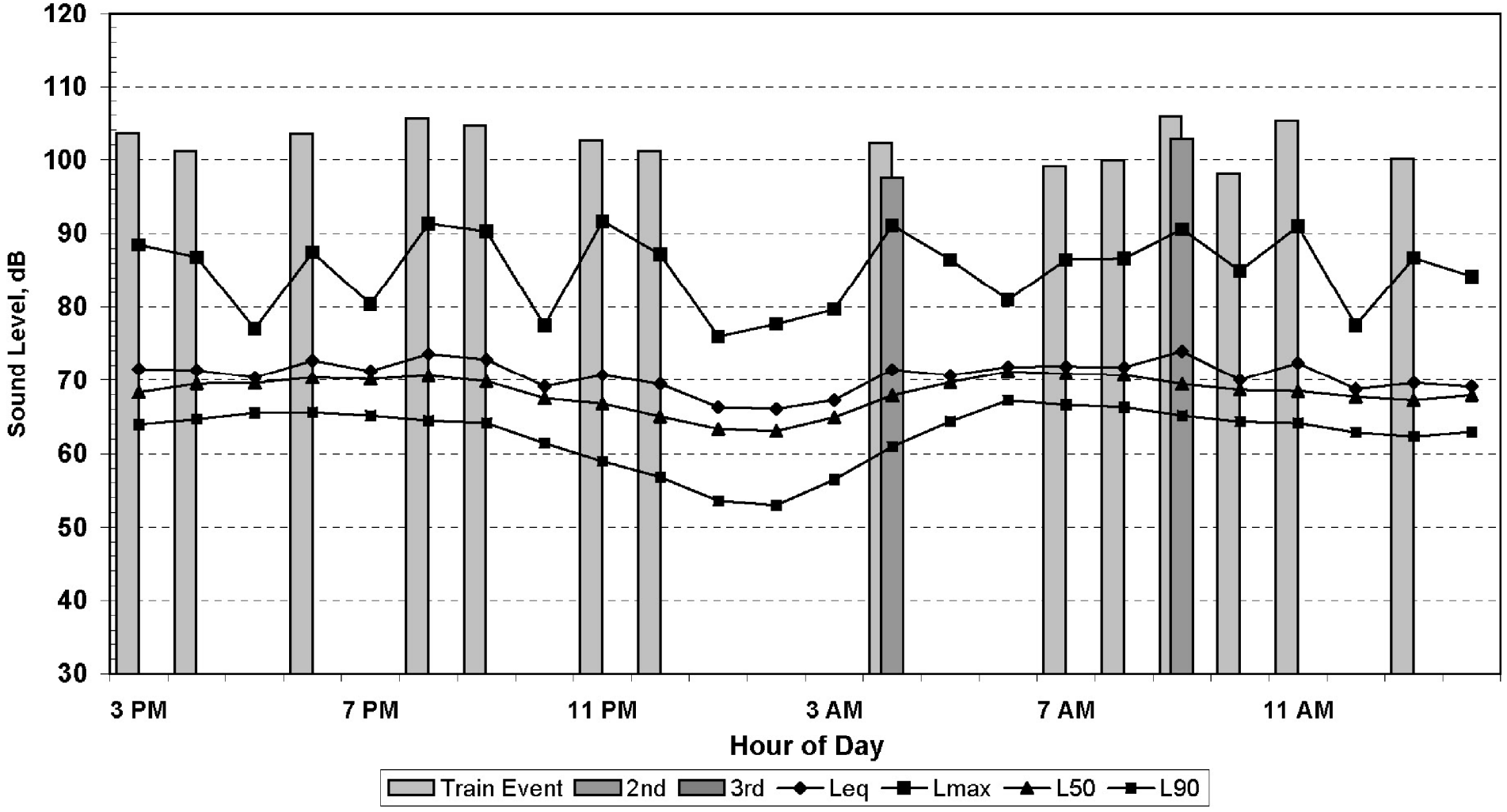
Source: j.c. brennan & associates, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
CONTINUOUS MEASURED RAILROAD AND HOURLY NOISE LEVELS - SITE B
JUNE 11-12, 2007

Figure 3.11-2

Job No.: 060429



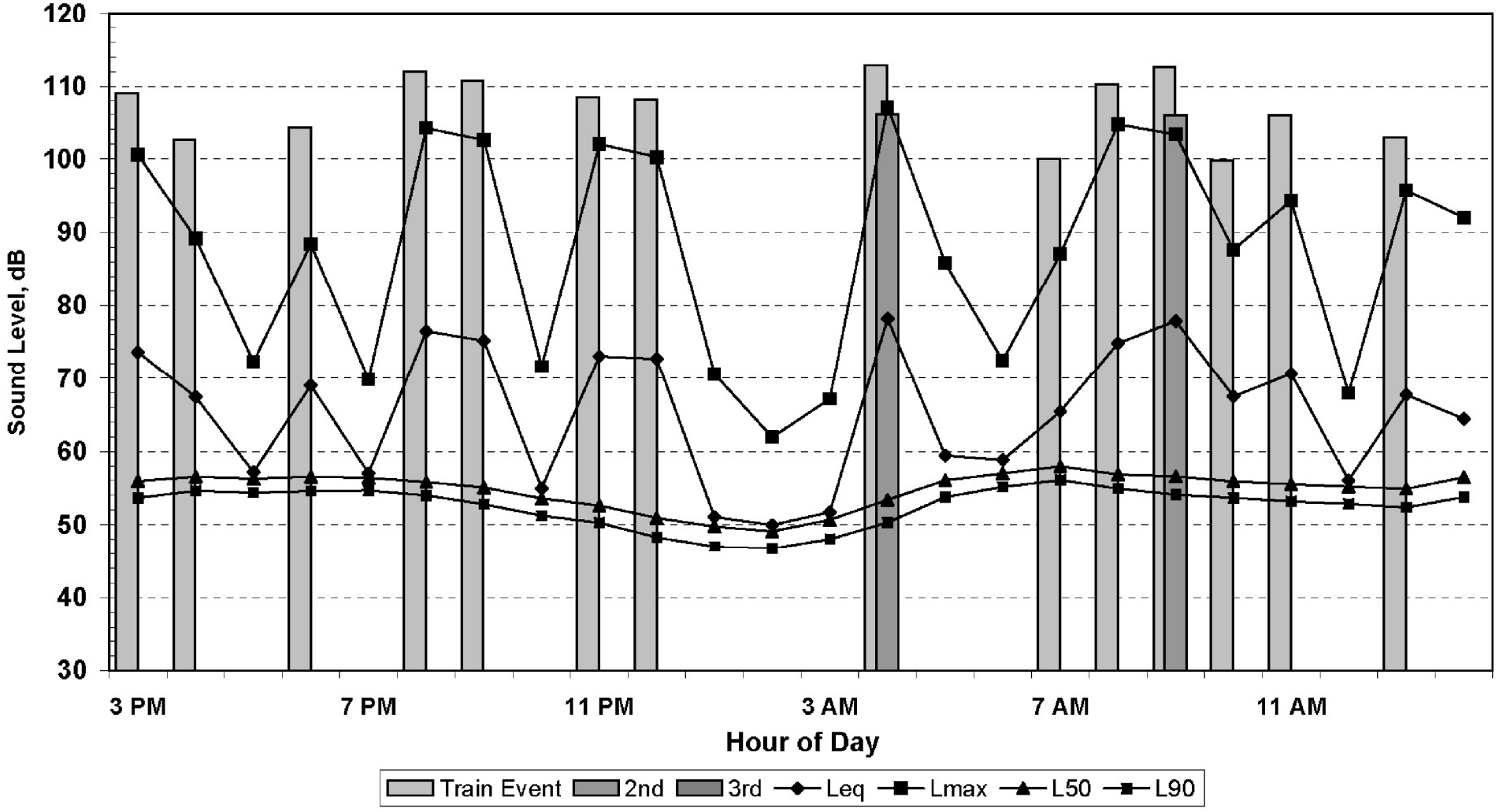
Source: j.c. brennan & associates, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CONTINUOUS MEASURED RAILROAD AND HOURLY NOISE LEVELS - SITE C
JUNE 11-12, 2007

Figure 3.11-3

Job No.: 060429



Source: j.c. brennan & associates, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CONTINUOUS MEASURED RAILROAD AND HOURLY NOISE LEVELS - SITE D
JUNE 11-12, 2007

Figure 3.11-4

Job No.: 060429

Noise measurement equipment consisted of Larson Davis Laboratories (LDL) Model 820 and Model 824 precision integrating sound level meter equipped with a LDL ½" microphone. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

Based upon the noise level measurements shown in Table 3.11-4, the average SEL for train operations along the UPRR line is 103 dB at 100 feet, with approximately 16 train events occurring per day. The average SEL for train operations along the BNSF railroad line is 101 dB, with approximately 26 train events occurring per day. Train operations for each railroad line are assumed to be equally and randomly distributed throughout the daytime and nighttime hours.

To determine the distances to the Ldn railroad contours, it is necessary to calculate the Ldn for typical train operations. This was done using the SEL values and above-described number and distribution of daily freight train operations for each railroad line. The Ldn may be calculated as follows:

Ldn = SEL + 10 log Neq - 49.4 dB, where:

SEL is the mean Sound Exposure Level of the event, Neq is the sum of the number of daytime events (7 a.m. to 10 p.m.) per day, plus ten times the number of nighttime events (10 p.m. to 7 a.m.) per day, and 49.4 is ten times the logarithm of the number of seconds per day. Based upon the above-described noise level data, number of operations and methods of calculation, the Ldn value for railroad line operations have been calculated, and the distances to the Ldn noise level contours are shown in Table 3.11-5.

Table 3.11-5
Approximate Distances to the Railroad Noise Contours without Horn Use

Ldn at 100 feet	Distance to Ldn Contour		
	60 dB	65 dB	70 dB
UPPR line			
72.6 dB	700 feet	325 feet	151 feet
BNSF line			
72.0 dB	635 feet	295 feet	137 feet

Source: j.c. brennan & associates, Inc., 2007

In addition j.c. brennan & associates, Inc. conducted short-term noise measurements of train operations at eight locations throughout the City. The intent of the short-term noise monitoring was to determine the effects of railroad grade-crossings and the use of warning horns on environments in the vicinity of railroad tracks. Short-term noise monitoring was conducted for the UPRR line at: the End of Brantley St, 16th and "G" St., and 16th and "M" Street. Noise measurements of the BNSF railroad line were conducted at: Santa Fe and Glenn Ave, The Amtrak Station, end of Baker Dr., off SR 140 near Santa Fe, and "R" Street. Union Pacific Railroad sound exposure levels (SEL) within the City ranged from 101 dB to 103 dB, with maximum noise levels ranging from 92 dB to 96 dB Lmax at a distance of 100 feet. Burlington Northern Santa Fe Railroad sound exposure levels (SEL) within the City ranged from 100 dB to 108 dB, with maximum noise levels ranging from 89 dB to 103 dB Lmax at a distance of 100

feet. Grade crossings and the use of warning horns was found to raise noise levels associated with train operations 5 dB to 10 dB.

AVIATION NOISE LEVELS

In the vicinity of the City of Merced there are currently two public airports in operation: Castle Airport, and Merced Regional Airport. The Merced Regional Airport is owned and operated by the City of Merced. Ownership of Castle Airport was turned over from the US Military to the Castle Joint Powers Authority (CJPA). The CJPA was disbanded a number of years ago and Merced County has overtaken operation of the Castle Airport. Additionally, there are a number of privately owned and operated airfields in the area surrounding the City of Merced.

Noise Impacts and contours associated with Castle Airport and Merced Regional Airport are addressed in the *Merced County Airport Land Use Compatibility Plan*, adopted by the Airport Land Use Commission on April 15, 1999.

Merced Regional Airport

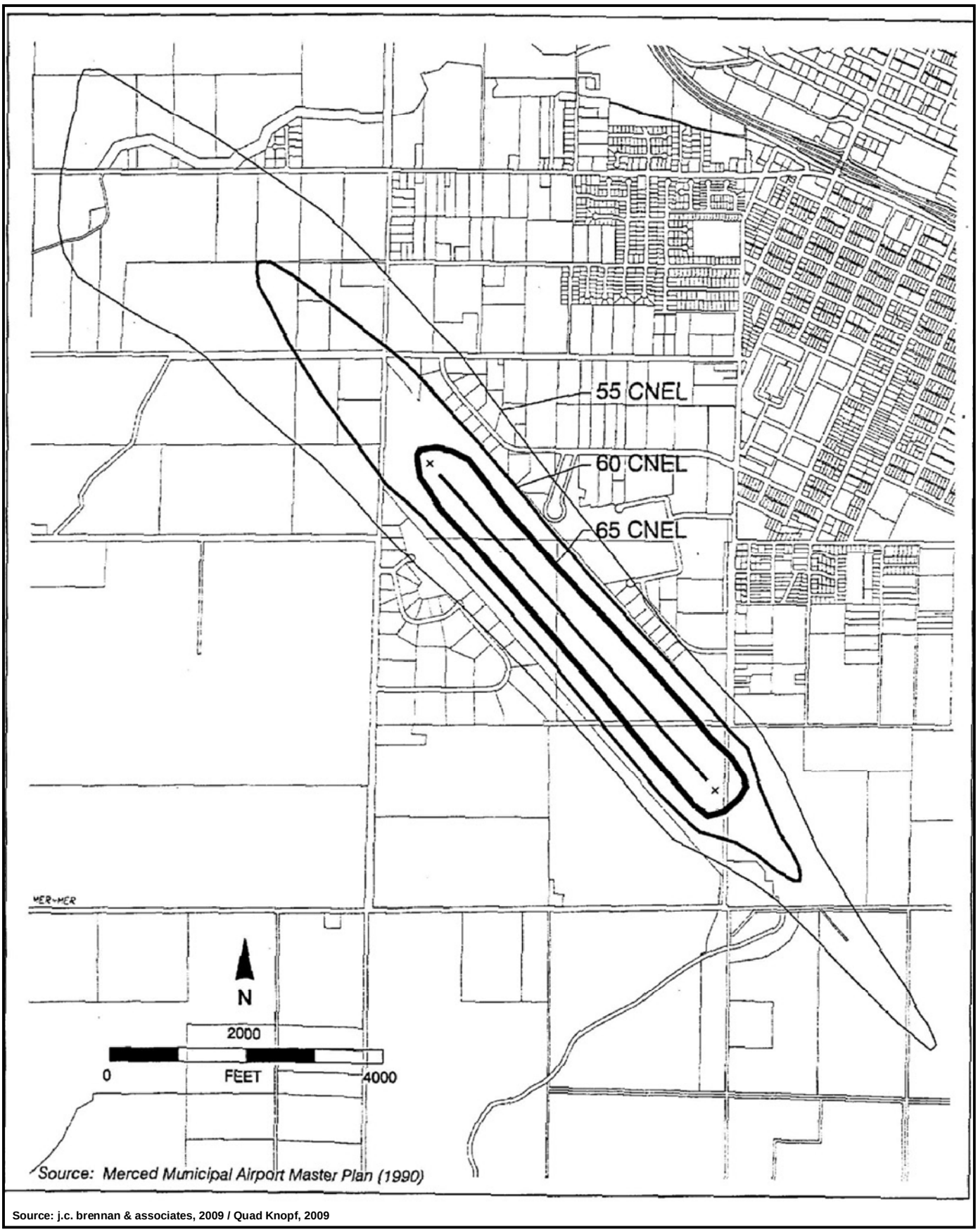
The Merced Regional Airport/Macready Field is located 2 miles southwest of the center of the City of Merced. This airport has a single runway with a heading of 12/30, at an elevation of 157 feet above sea level. The airport is open 24 hours per day, and has multiple instrument and GPS approaches in addition to a lighted runway for night operations. Merced Regional Airport is a Commercial Non-Primary Hub with scheduled daily flights. In addition, the airport primarily serves single-engine fixed wing aircraft used for general aviation purposes. Twin engine, business jet, and turbo prop aircraft also frequent the airport. On an annual average basis, there are approximately 229 operations per day, with the majority of aircraft using the northwest approach (Runway 30). Further information and analysis for this airport can be found in the above referenced ALUCP. Figure 3.11-5 shows the Merced Regional Airport noise impact area..

Castle Airport

Castle Airport is located approximately 6 miles northwest of the City of Merced. Prior to October 1995, Castle Airport was operated for more than fifty years by the military. The Airport consists of a single runway with a heading of 13/31. The airport is open 24 hours per day, and has a lighted runway for night operations. Aircraft that primarily use the airport are single-engine fixed-wing general aviation aircraft. Twin-engine aircraft, business jets, and commercial jet airplanes also utilize the airport. On an annual average basis, there are approximately 579 operations per day, with the majority of aircraft using the southeast approach (Runway 31). Further information and analysis for this airport can be found in the above referenced ALUCP. Figure 3.11-6 show the Castle Airport noise impact area.

Other Aviation Activity

Other general aviation activities can be expected to occur in the vicinity of the City of Merced. The Mercy Medical Center Merced owns and operates a Bell 407 helicopter for emergency airlift services, which is operated as needed 24 hours a day. Other general aviation may be associated with agricultural, forestry, recreational or other private operation.



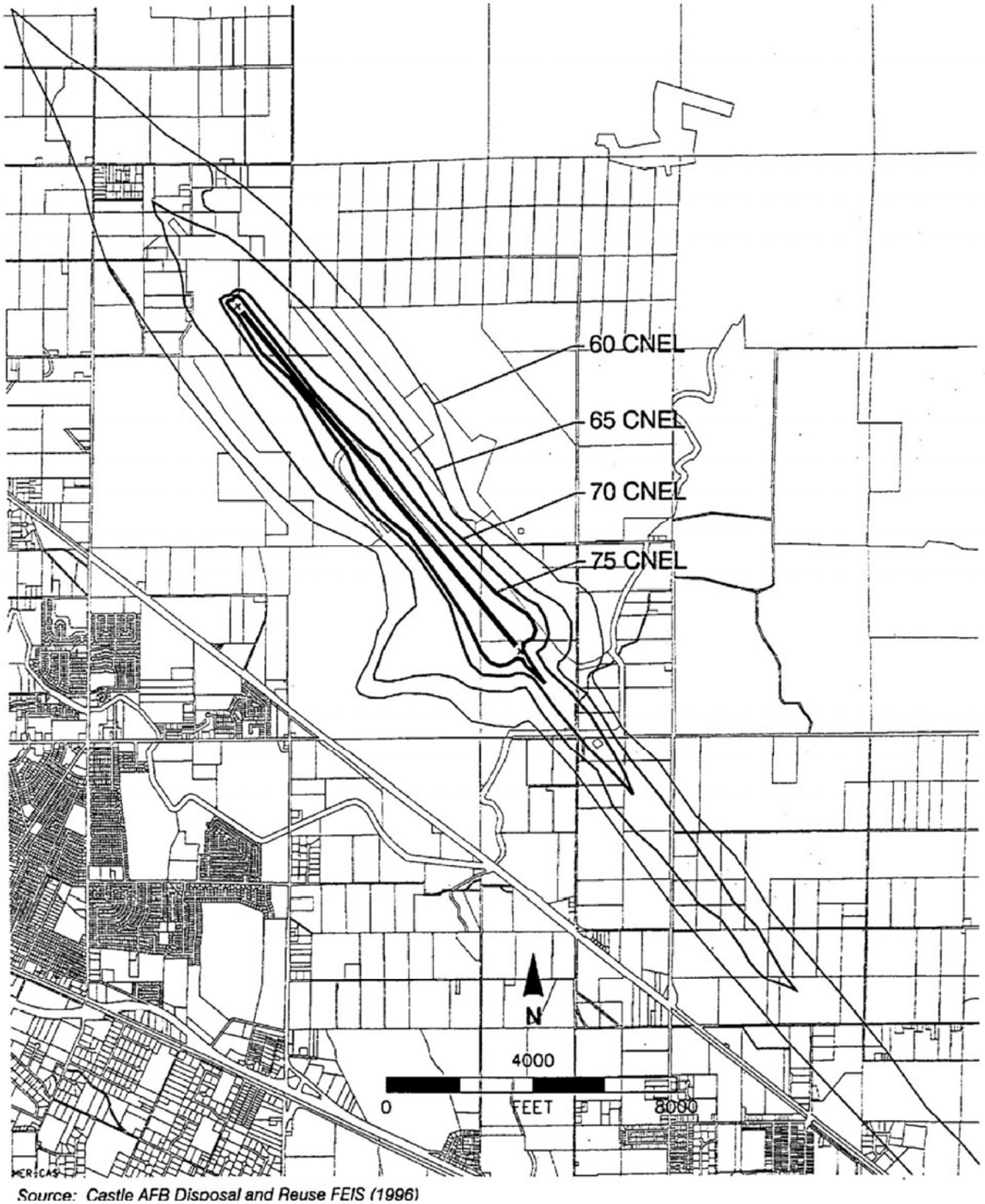
Source: j.c. brennan & associates, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
MERCED REGIONAL AIRPORT NOISE CONTOURS

Figure 3.11-5

Job No.: 060429



Source: Castle AFB Disposal and Reuse FEIS (1996)

Source: j.c. brennan & associates, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CASTLE AIRPORT NOISE CONTOURS

Figure 3.11-6

Job No.: 060429

FIXED NOISE SOURCES

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1) To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2) To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified music and voice

The types of uses which may typically produce the noise sources described above, include, but are not limited to: wood processing facilities, pump stations, industrial facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, special events such as concerts, and athletic fields.

The City of Merced has three primary areas where industrial noise sources exist. The primary industrial noise generating areas are located along the western, southwestern and southeastern

City boundaries. The following descriptions are intended to be representative of the relative noise impacts of such uses and to identify individual noise sources needing consideration during the environmental review process of developments in their vicinity. Pepsi-Cola Metropolitan Bottling and Distribution Facility, Werner Corporation, McLane Pacific Grocery Distribution, and Quebecor World (now known as Quad/Graphic) have been identified as primary industrial noise generators located within the City of Merced in 2007.

Pepsi-Cola Bottling Facility

Pepsi-Cola operates a bottling, production, and distribution facility at the corner of West Avenue and Eagle Street. Noise sources associated with the facility include air compressors, cooling towers and evaporator equipment located at the north side of the facility, and on-site truck circulation along the southern and western property boundaries. Liquid carbon dioxide is delivered generally once per week, causing 15-20 minutes of elevated noise levels along the eastern portion of the facility. The facility is operated continuously year-round, 24 hours a day. Noise measurements were conducted outside the northern property line, adjacent to the facilities cooling towers. The cooling towers generated an average noise level of 69.8 dB Leq and a maximum noise level of 70.8 dB Lmax, at a distance of 50 feet.

Werner Corporation

The Werner Corporation is located west of the Grogan Avenue and West Avenue intersection. The facility manufactures, assembles, and distributes fiberglass, wood, and metal climbing equipment such as ladders and scaffolding. Hours of operation are 6:00 a.m. to 11:15 p.m. seven days a week. Noise sources include manufacturing equipment located inside the building, audible through bay doors at the northwestern facade, and on-site truck operations. Werner Co. receives and dispatches approximately ten semi tractor-trailers per day. j.c. brennan & associates file data indicates that slowly moving trucks may produce maximum noise levels of 71-74 dB at 100 feet, and idling trucks generate approximately 62-63 dB at 100 feet. Noise measurements of manufacturing operations ranged from 71 dB to 75 dB Lmax 110 feet north of the facility.

McLane Pacific

McLane Pacific operates a 250,000 square foot food service/grocery processing and distribution facility located at the northwest corner of Childs Ave and Kibby Rd. Hours of operation are 24 hours a day, Sunday through Saturday. Primary noise sources associated with the facility include rooftop cooling towers, refrigeration equipment, loading dock activities, and on-site truck circulation. Due to the nature of the product, the majority of trailers are outfitted with diesel powered refrigeration units and may remain idling at the facility for extended periods of time. Mclane Pacific dispatches between 30 and 35 trucks per day and receives 45 to 60 trucks per day. Noise measurements conducted east of the McLane Pacific facility ranged from 56 dB to 63 dB Leq, and 72 dB to 77 dB Lmax approximately 450 feet from the primary noise sources.

Quebecor World (now known as Quad/Graphic)

Quebecor World Incorporated (now known as Quad/Graphic) operates a 500,000 square foot digital media production, printing, and distribution facility located northwest of Cooper Avenue

and Highway 59 in Merced, California. A representative for the facility was not available for comment during our survey, and therefore operational statistics are unknown. Daytime noise levels associated with the facility were at or below the ambient noise environment in the vicinity, which was primarily comprised of transportation noise on Highway 59 and Santa Fe Boulevard. Nighttime noise measurements of the Quebecor World facility resulted in noise levels of 64 dB Leq, and 68 dB Lmax at a distance of 650 feet.

Aggregate Batch Plants

There are three aggregate/rock processing facilities in the vicinity of Merced: Builders Concrete, Boulders Unlimited, and Central Valley Concrete/Trucking. Central Valley Concrete processes batches of concrete and supplies sand and gravel throughout Merced and many neighboring counties. The main plant is located at the Highway 59 and Buena Vista Ave intersection, with a secondary plant located in southern Merced on Brantley Street. Operations at the facility are dependent on type of material, demand from contractors, and number of internal CVC jobs in operation. Typical hours of operation are 6:00 a.m. to 4:00 p.m., four to five days per week. Approximately 30-40 trucks of concrete are produced per day; however, when demand peaks production can accommodate 120 trucks per day.

Builders Concrete located northwest of the City limits operates in a similar manner to Central Valley Concrete. Hours of operation are typically 5:00 a.m. to 3:00 p.m. but may vary considerable to meet demand. Builders Concrete operates locally in the Merced area with a fleet of 10-22 trucks making multiple trips when required. At a distance of 280 feet from the center of the batch plant the average noise level was 59 dB Leq, with a maximum noise level of 63 dB Lmax.

Boulders Unlimited, located at the Highway 59 and Yosemite Avenue intersection, batches concrete and supplies sand, gravel, boulders, and landscaping materials. Hours of operation are 7:30 am to 5:30 pm, five days per week. Boulders Unlimited also provides crane, and general trucking services which are dispatched from the facility.

Merced County Fairgrounds

The Merced County Fairgrounds are located on Martin Luther King Junior Way, between East 11th street and Childs Avenue, in the City of Merced. There are a variety of potential noise sources associated with fairground operations including parking lot noise, amplified speech/music, amusement/carnival rides, livestock, concerts, and the Merced Speedway. The majority of these activities are limited to one week of operation during the Merced County Fair. Off-season use of the fairgrounds is generally associated with the Merced Flea Market, held weekly year-round, private facilities rentals, and the Merced Speedway.

Merced Speedway. Merced Speedway is a 3/8th of a mile dirt oval located on the northwestern portion of the Merced County Fairgrounds. The speedway can accommodate 3,250 guests in grandstand seating and an additional 1,750 in bleacher seating. Racing series' range from super modified, high output classes to small sport compacts. The Merced Speedway track schedule shows the pit areas opening at 4 pm, racing beginning at 7 pm, and awards/standings closing

between 9:30 pm and 10:00 pm. Racing events occur Saturdays and some Sundays from March through October.

In order to evaluate noise levels associated with the Merced Speedway, j.c. brennan & associates, Inc. conducted short-term noise level measurements at the Fairgrounds. Short-term measurements were conducted at three locations at the speedway. Continuous noise level measurements were conducted at a nearby residential receiver, located adjacent to the speedway along East 11th Street. Table 3.11-6 summarizes the results of the noise monitoring. Noise measurement locations are shown on Figure 3.11-7.

Nightly Concert Series. The Merced County Fair hosts a nightly concert series during the Merced County Fair. Nightly concerts are held at a temporary outdoor theater located in the western portion of the fairgrounds. The outdoor theater is arranged with a main seating area for 2,000 attendees surrounded by bleacher seating for an additional 3,000 guests. Performances at the outdoor theater ranged from contemporary/pop styles to country, and alternative rock music. The performance stage was approximately 72 feet by 40 feet, and was outfitted with four JBL Vertec line array speaker cabinets and four sub woofers per side. Noise levels associated with concerts and musical events such as these can vary considerably depending on several factors: crowd size, type of music, operational levels of the sound system, and the duration of the event. During the July 17, 2007 visit to the Merced County Fair, j.c. brennan & associates, Inc. performed short-term noise measurements at five locations at the outdoor theater. Table 3.11-6 shows the results of noise monitoring for the concert series.

Table 3.11-6
Existing Merced County Fair Noise Measurement Results - July 17, 2007

Site	Location	Time	Measured Noise Level, dBA		
			Leq	L50	Lmax
1	145 West 11th Street, 800' from Speedway Center	Continuous Monitoring – 6:00 pm to 10:00 pm	61.2	57.9	85.7
			63.0	60.7	75.4
			66.4	61.6	91.1
			64.0	60.5	88.7
			65.3	61.8	82.6
Speedway – Short Term					
2	105' South of Track Center Line, 350' to Center of Oval	7:11 pm	90.0	82.0	99.6
2	105' South of Track Center Line, 350' to Center of Oval	7:22 pm	90.4	86.3	98.8
3	Center of Speedway Oval	7:29 pm	88.9	81.7	99.3
4	300' North of Speedway Center, Crowd Cheering & Announcer over PA	7:48 pm	69.1	69.1	71.2
4	300' Northeast of Speedway Center,	7:53 pm	86.5	80.6	96.3
Concert Series – Short Term					
5	Center of Main Seating Area, 100' South of Center Stage	9:08 pm	86.8	86.0	97.6

Site	Location	Time	Measured Noise Level, dBA		
			Leq	L50	Lmax
6	200' South of Center Stage	9:27 pm	85.3	84.8	88.9
7	100' West of Center Stage	9:35 pm	93.0	80.8	92.7
8	100' North of Center Stage	9:39 pm	75.2	74.2	80.0
9	100' West of Center Stage	9:42 pm	86.0	85.5	90.7

Source: j.c. brennan & associates, Inc., 2007

COMMUNITY NOISE SURVEY

A community noise survey was also conducted in 2007 to describe existing noise levels in noise-sensitive areas within the General Plan study area so that noise level performance standards may be developed to maintain an acceptable noise environment. Noise monitoring sites were selected to be representative of typical residential, commercial or recreational areas within the City.

Three sets of short-term noise measurements were conducted at nine locations on July 11, 2007 through July 13, 2007. In addition, five continuous 24-hour noise monitoring sites were also established throughout the City of Merced to record day-night statistical noise level trends. The data collected included the hourly average (Leq), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 3.11-7 and Table 3.11-8. Figure 3.11-1 shows the locations of the noise monitoring sites. A comprehensive listing and graphical representation of the continuous noise measurement data is provided in Appendix B of Appendix I of this EIR.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters equipped with a LDL ½" microphone. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

Table 3.11-7
Existing Continuous 24-Hour Ambient Noise Monitoring Results - July 11-12, 2007

Site	Location	Average Measured Hourly Noise Levels, dBA								
		Ldn (dBA)	Daytime (7:00 am - 10:00 pm)				Nighttime (10:00 pm – 7:00 am)			
			Leq	Lmax	L50	L90	Leq	Lmax	L50	L90
A	West of the Gilmore Ct. and Beckman Way intersection.	54.0	47.5	67.8	42.4	38.7	47.7	62.1	43.5	38.6
B	State Route 140 near Santa Fe Avenue.	73.7	68.9	87.6	61.2	49.5	66.9	84.2	49.6	43.9
C	South of State Route 99 near the Childs Avenue over-crossing.	76.4	71.7	86.0	69.3	64.5	69.7	83.1	66.6	59.2
D	West of the 16th Street, V Street intersection.	77.3	71.9	90.7	56.1	54.0	70.7	82.1	52.6	50.1

Site	Location	Average Measured Hourly Noise Levels, dBA								
		Ldn (dBA)	Daytime (7:00 am - 10:00 pm)				Nighttime (10:00 pm – 7:00 am)			
			Leq	Lmax	L50	L90	Leq	Lmax	L50	L90
E	Southwest of the State Route 59, Yosemite Avenue Intersection.	70.4	67.0	81.5	62.4	50.6	63.2	79.5	52.3	43.6

Source: j.c. brennan & associates, Inc., 2007

Table 3.11-8
Existing Short-Term Community Noise Monitoring Results

Site	Location	Date	Time[1]	Measured Sound Level, dB			
				Leq	Lmax	L50	L90
1	Applegate Community Park – Near Entrance	July 11, 2007	7:37 pm	59.0	74.1	55.1	52.8
		July 12,2007	1:48 am	45.2	51.1	44.6	43.3
		July 12, 2007	1:31 pm	54.7	68.2	51.7	48.5
2	Entrance to Ada Givens Park	July 11, 2007	8:45 pm	54.4	64.3	52.6	48.8
		July 12,2007	12:12 am	44.6	51.8	44.5	43.5
		July 12, 2007	10:36 am	51.9	68.6	45.1	43.1
3	Nottingham @ Rahilly Park	July 11, 2007	9:24 pm	46.3	56.7	45.0	43.5
		July 12,2007	12:31 am	40.1	51.6	39.8	38.2
		July 12, 2007	11:00 am	44.8	58.8	42.5	40.0
4	Donna and Tres Logos (Open Space Area)	July 11, 2007	8:07 pm	49.3	61.6	48.6	46.3
		July 12,2007	1:28 am	40.3	48.0	39.9	39.1
		July 12, 2007	3:02 pm	44.6	54.2	44.1	42.5
5	60’ NW of Coffee and Gerard	July 11, 2007	7:36 pm	51.2	69.5	46.3	43.3
		July 11,2007	11:32 pm	48.2	55.4	48.6	45.8
		July 12, 2007	9:51 am	54.8	74.1	48.8	45.7
6	Merced Community College	July 11, 2007	8:43 pm	55.4	65.9	52.4	44.7
		July 12,2007	12:52 am	39.2	46.4	38.8	38.1
		July 12, 2007	11:26 am	59.1	71.5	55.7	48.8
7	Cardella Road and Freemark Avenue	July 11, 2007	9:02 pm	42.8	61.8	42.0	39.9
		July 12,2007	1:08 am	40.3	48.0	39.9	39.1
		July 12, 2007	3:24 pm	41.5	62.7	38.5	36.5
8	“G” Street and Childs Avenue	July 11, 2007	7:56 pm	60.1	70.3	56.3	51.6
		July 12,2007	2:08 am	59.3	77.1	50.2	47.2
		July 12, 2007	2:07 pm	58.7	71.1	62.2	55.5

Site	Location	Date	Time[1]	Measured Sound Level, dB			
				Leq	Lmax	L50	L90
9	"S" Street and 6th Street	July 11, 2007	8:19 pm	53.5	63.3	51.8	49.6
		July 12,2007	2:26 am	48.5	53.3	48.1	46.0
		July 12, 2007	2:28 pm	58.7	65.9	58.1	55.3
10	Kibby and E. Childs Avenue	July 11, 2007	7:20 pm	62.1	74.4	57.9	55.0
		July 11,2007	11:49 pm	56.3	72.2	50.7	48.8
		July 12, 2007	10:13 am	63.0	77.1	52.4	49.1
1 - All Community Noise Measurement Sites have a test duration of 10:00 minutes.							

Source: j.c. brennan & associates, Inc., 2007

The results of the community noise survey shown in Table 3.11-7 and 3.11-8 are indicative of the major noise sources, such as SR 99, Highway 59, Highway 140, Union Pacific Railroad, Burlington Northern Santa Fe Railroad, and some industrial uses which are located in close proximity to noise-sensitive receivers such as residential uses. Measured noise levels within most areas of Merced are consistent with typical urban and suburban communities. Recently developed residential areas within the City of Merced are generally located away from major noise sources, or have included noise mitigation in the project designs, so as to reduce overall noise levels at the developments.

Regulatory Setting

FEDERAL

HUD Noise Abatement and Control

The Federal Department of Housing and Urban Development (HUD) standards (24 CFR Part 51, subpart B) define the 65 Ldn dBA as an acceptable outdoor noise level for residential uses. If outdoor noise levels exceed 75 dBA Ldn, the interior noise level in residential homes could exceed 45 dBA, however, with proper insulation and other construction techniques, the interior noise level can be reduced to the 45 dBA level.

Federal Highway Administration

The Federal Highway Administration (FHWA) requires abatement of highway traffic noise for highway projects through the Code of Federal Regulations (23 CFR Part 772).

Federal Transit Administration and Federal Railroad Administration

The Federal Transit Administration (FTA) and Federal Railroad Administration (FRA) each recommend thorough noise and vibration assessments for any mass transit or high-speed railroad projects that would pass by residential areas.

STATE

The California Department of Health Services has developed guidelines for acceptable community noise levels, which are frequently adopted by local agencies. Selected relevant noise levels are as follows:

- CNEL below 60- normally acceptable for low-density residential use.
- CNEL of 55 to 70 dBA-conditionally acceptable for low-density residential use.
- CNEL below 65-normally acceptable for high-density residential, transient lodging, churches, educational and medical facilities.
- CNEL below 70 dBA-normally acceptable for playgrounds, neighborhood parks.

"Normally acceptable" is defined as satisfactory for the specified land use, assuming that normal conventional construction is used in buildings. "Conditionally acceptable" may require some additional noise attenuation or study. Under most of these land use categories, overlapping ranges of acceptability and unacceptability are presented, leaving some ambiguity in areas where noise levels fall in within the overlapping range.

The State of California additionally regulates the noise emission levels of licensed motor vehicles traveling on public thoroughfares, sets noise emission limits for certain off-road vehicles and watercraft, and sets required sound levels for light rail transit vehicle's warning signals. The extensive State regulations pertaining to worker noise exposure are for the most part only applicable to the construction phase of any project.

California requires each local jurisdiction to perform noise studies and implement a noise element as part of its general plan. The Governor's Office of Planning and Research (in conjunction with the California Department of Health Services) has published guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The Department of Health guidelines indicate that residential land uses and other noise-sensitive uses would generally be acceptable without special noise insulation requirements in areas where exterior ambient noise levels do not exceed approximately 60 dBA (day-night noise levels, Ldn or CNEL). Residential uses in areas with Ldn between 60 and 65 dBA would generally be acceptable with noise reduction measures or insulation, and residential uses should generally be discouraged in areas where noise levels are above 65 dBA Ldn.

LOCAL

The existing City of Merced General Plan Noise Element is based upon recommendations by the California State Office of Noise Control as contained in the *Guidelines for the Preparation and Content of Noise Elements of the General Plan.*

The criteria in the Noise Element are established for determining potential noise conflicts between various land uses, and noise sources. The standards for all noise sources are based upon



Legend

△: Noise Measurement Site

N
W E
S

Scale=NTS

Source: j.c. brennan & associates, 2009 / Quad Knopf, 2009

Quad Knopf

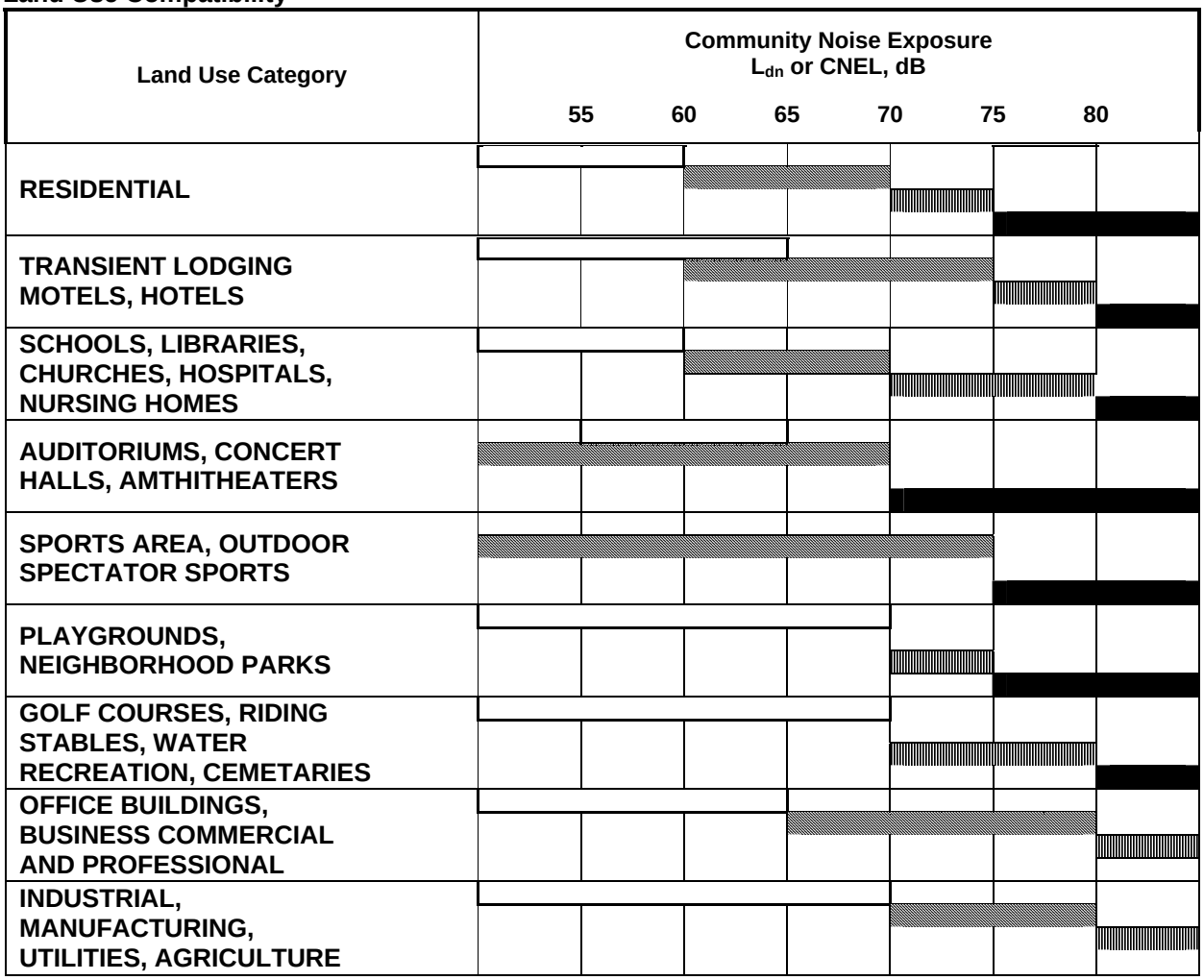
MERCED VISION 2030 GENERAL PLAN EIR
FAIRGROUNDS SPEEDWAY CONFIGURATION/MEASUREMENT SITES

Figure 3.11-7

Job No.: 060429

the CNEL/Ldn descriptor. Table 3.11-9 shows the land use compatibility chart contained in the existing City of Merced Noise Element.

Table 3.11-9
Land Use Compatibility



NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise requirements

NORMALLY UNACCEPTABLE

New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.

CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE

New construction or development clearly should not be undertaken.

Source: Adapted from the State of California General Plan Guidelines, 1990. Office of Planning and Research. Suggested CNEL/Ldn metrics for evaluating land use noise compatibility.

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to noise impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Land Use, Transportation and Circulation, Open Space, Conservation, and Recreation, and Noise Elements of the General Plan are designed to ensure that noise impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Land Use Policies:

L-2.2 Locate new or expanded industrial, research & development, technology, and business parks in appropriate areas.

Transportation and Circulation Policies:

T-1.7 Minimize street system impacts on residential neighborhoods and other sensitive land uses.

Open Space, Conservation, and Recreation Policies:

OS-4.1 Preserve open space areas which are necessary to maintaining public health and safety.

Noise Policies:

N-1.1 Minimize the impacts of aircraft noise.

N-1.2 Reduce surface vehicle noise.

N-1.3 Reduce equipment noise levels.

N-1.4 Reduce noise levels at the receiver where noise reduction at the source is not possible.

N-1.5 Coordinate planning efforts so that noise-sensitive land uses are not located near major noise sources.

N-1.6 Mitigate all significant noise impacts as a condition of project approval for sensitive land uses.

3.11.2 THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. For the purposes of this analysis, a 4 dB increase is considered a significant increase in noise levels.

- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the Plan Area to excessive noise levels

- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the Plan Area to excessive noise levels

3.11.3 IMPACTS AND MITIGATION MEASURES

Impact #3.11-1: Buildout of the General Plan may contribute to increased traffic noise levels, and an exceedance of the City's noise standards and resulting in potential noise impacts to new sensitive receptors.

Discussion/Conclusion: To describe future noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD108) was used. Direct inputs to the model included traffic volumes provided by Fehr & Peers traffic engineers. The FHWA model is the analytical method currently favored for highway traffic noise prediction by most state and local agencies, including the California Department of Transportation (Caltrans).

The FHWA model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, 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 Leq values for free-flowing traffic conditions. To predict Ldn/CNEL values, it is necessary to determine the day/night distribution of traffic and adjust the traffic volume input data to yield an equivalent hourly traffic volume. Table 3.11-10 shows the results of the traffic noise analysis for the existing and future buildout of the General Plan.

Table 3.11-10
Existing and Predicted General Plan Build Out Traffic Noise Levels
Merced General Plan – City of Merced, California

Roadway	Segment	Distance[1]	Traffic Noise Levels (dBA, Ldn)			Distance[1] to Ldn Contours Existing			Distance[1] to Ldn Contours General Plan Build Out		
			Existing	General Plan Build Out	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
SR 59	16th to Olive	100’	67.3	70.4	3.1	66	142	306	106	227	490
SR 59	Olive to Yosemite	100’	69.3	73.2	**4.0**	89	192	415	164	353	761
SR 59	Yosemite to Cardella	100’	66.9	72.6	**5.7**	62	133	287	148	320	688
SR 59	Cardella to Bellevue	100’	65.6	73.1	**7.5**	51	109	235	160	345	743
SR 59	Bellevue to Old Lake	100’	64.9	73.9	**9.0**	45	98	211	182	392	844
SR 59	Old Lake to Castle Farms	100’	64.9	71.9	**7.1**	45	98	211	134	289	623
SR 59	Roduner to Mission	100’	63.4	68.7	**5.3**	36	78	169	82	177	381
SR 59	Mission to Gerard	100’	63.8	68.5	**4.7**	39	83	180	80	172	370
SR 59	Gerard to Childs	100’	65.8	69.7	3.9	52	113	243	96	206	445
SR 59	Childs to SR 99	100’	64.0	66.5	2.5	40	86	185	59	127	273
SR 59	SR 99 to 16th Street	100’	65.4	67.0	1.6	49	106	229	63	136	292
SR 59	Castle Farms Rd to Oakdale Rd	100’	61.0	69.8	**8.8**	25	54	116	97	208	448
SR 99	Franklin to Thornton	100’	79.3	81.0	1.7	416	897	1933	542	1167	2515
SR 99	Thornton to V Street	100’	78.5	80.4	1.9	369	795	1712	492	1059	2282
SR 99	V Street to R Street	100’	78.5	80.3	1.8	369	795	1712	485	1046	2253
SR 99	R Street to MLK JR	100’	78.3	80.5	2.2	360	775	1670	504	1085	2338
SR 99	MLK JR to G Street	100’	78.6	80.5	2.0	373	804	1732	505	1088	2343
SR 99	G Street to SR 140	100’	79.4	81.5	2.1	425	915	1970	585	1261	2717
SR 99	SR 140 to Childs	100’	79.3	81.7	2.5	414	892	1922	607	1307	2815
SR 99	Childs to Gerard	100’	79.0	81.3	2.3	396	853	1837	563	1213	2613
SR 99	Gerard to Mission	100’	78.3	80.9	2.6	357	770	1659	531	1144	2465
SR 99	Mission to Mariposa	100’	78.3	80.3	2.0	357	770	1659	483	1041	2243
SR 99	Castle Xpway to Franklin	100’	79.4	81.0	1.6	422	910	1960	543	1169	2519
SR 140	Tina to Thornton	100’	71.8	73.8	2.0	132	285	614	179	385	829
SR 140	Thornton to V Street	100’	63.6	64.5	0.9	37	80	173	43	92	199
SR 140	G Street to Parsons/Gardner	100’	67.1	72.3	5.2	64	138	296	143	307	662

Roadway	Segment	Distance[1]	Traffic Noise Levels (dBA, Ldn)			Distance[1] to Ldn Contours Existing			Distance[1] to Ldn Contours General Plan Build Out		
			Existing	General Plan Build Out	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
SR 140	Parsons/Gardner to Campus Parkway	100'	67.1	69.6	2.5	64	138	298	94	202	435
13th Street	V Street to R Street	100'	58.0	60.5	2.5	16	34	74	23	50	109
13th Street	R Street to M Street	100'	55.9	59.5	3.6	11	25	53	20	43	92
13th Street	M Street to MLK JR	100'	58.2	61.7	3.5	16	35	75	28	60	129
13th Street	MLK JR to G Street	100'	58.5	59.4	0.9	17	37	79	20	42	91
13th Street	G Street to B Street	100'	56.8	61.0	**4.2**	13	28	61	25	54	116
14th Street	V Street to R Street	100'	57.9	60.0	2.1	16	34	73	22	47	100
14th Street	R Street to M Street	100'	56.7	61.4	**4.7**	13	28	60	27	57	124
14th Street	M Street to MLK JR	100'	48.2	61.6	**13.4**	4	8	16	28	59	128
16th Street	SR 99 to V Street	100'	62.8	64.3	1.5	33	72	155	42	90	195
16th Street	V Street to R Street	100'	63.4	64.4	0.9	36	79	169	42	91	196
16th Street	R Street to M Street	100'	62.6	63.6	1.0	32	69	149	38	81	175
16th Street	M Street to G Street	100'	60.6	64.0	3.4	23	51	109	40	85	184
16th Street	G Street to SR 99	100'	59.1	63.4	**4.2**	19	41	88	36	78	168
Bellevue Road	SR 59 to R Street	100'	62.1	72.2	**10.2**	30	64	137	141	303	654
Bellevue Road	R Street to M Street	100'	61.9	72.0	**10.1**	29	63	135	136	293	630
Bellevue Road	M Street to G Street	100'	61.9	72.2	**10.2**	29	63	135	139	300	647
Bellevue Road	G Street to Parsons/Gardner	100'	62.8	71.8	**9.0**	33	71	153	132	284	612
Bellevue Road	Parsons/Gardner to Campus Parkway	100'	60.2	71.6	**11.3**	22	48	104	127	274	590
Bellevue Road	SR 59 to Thornton	100'	60.4	72.0	**11.6**	23	49	106	136	293	631
Bellevue Road	Thornton to Castle Xpway	100'	60.4	73.3	**12.9**	23	49	106	165	356	768
Campus Parkway	SR 99/Mission to Childs	100'	--	67.8	--	--	--	--	71	153	330
Campus Parkway	Childs to SR 140	100'	--	65.2	--	--	--	--	48	104	223
Campus Parkway	SR 140 to Olive	100'	--	64.8	--	--	--	--	45	98	210
Campus Parkway	Olive to Yosemite	100'	--	65.1	--	--	--	--	47	101	218

Roadway	Segment	Distance[1]	Traffic Noise Levels (dBA, Ldn)			Distance[1] to Ldn Contours Existing			Distance[1] to Ldn Contours General Plan Build Out		
			Existing	General Plan Build Out	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
Campus Parkway	Yosemite to Cardella	100'	--	65.3	--	--	--	--	49	105	226
Campus Parkway	Cardella to Bellevue	100'	--	65.1	--	--	--	--	47	102	220
Cardella Road	SR 59 to R Street	100'		64.8	--	--	--	--	45	97	209
Cardella Road	R Street to M Street	100'	56.8	65.3	**8.5**	13	28	61	48	104	224
Cardella Road	M Street to G Street	100'	58.1	65.0	**6.9**	16	35	75	47	100	217
Cardella Road	G Street to Parsons/Gardner	100'	--	65.0	--	--	--	--	47	100	216
Cardella Road	Parsons/Gardner to Campus Parkway	100'	--	64.9	--	--	--	--	46	99	212
Childs Avenue	West Ave to SR 59	100'	57.7	59.8	2.1	15	33	71	21	45	97
Childs Avenue	SR 59 to Tyler	100'	56.5	64.2	**7.7**	13	27	58	41	88	190
Childs Avenue	Tyler to SR 99	100'	58.0	66.5	**8.5**	16	34	73	58	125	270
Childs Avenue	SR 99 to Coffee	100'	60.9	66.1	**5.2**	25	53	114	55	119	255
Childs Avenue	Coffee to Campus Parkway	100'	58.0	64.8	**6.9**	16	34	73	45	98	210
Childs Avenue	East of Campus Parkway to Tower	100'	55.0	62.7	**7.7**	10	21	46	32	70	150
Dickenson Ferry	Thorton to West Ave	100'	52.6	64.5	**12.0**	7	15	32	43	93	201
Dickenson Ferry	West Ave to SR 59	100'	52.6	65.3	**12.8**	7	15	32	49	105	227
Dickenson Ferry	Grove to Thornton	100'	52.6	61.0	**8.4**	7	15	32	25	54	116
G Street	Mission to Childs	100'	57.9	60.6	2.7	16	34	73	24	51	110
G Street	Childs to SR 99	100'	63.1	65.1	2.0	34	74	160	47	101	218
G Street	SR 99 to Bear Creek	100'	63.2	64.9	1.7	35	76	164	46	98	212
G Street	Bear Creek to Olive	100'	65.3	66.5	1.2	48	104	225	58	125	269
G Street	Olive to Yosemite	100'	65.8	67.5	1.6	53	114	245	68	146	315
G Street	Yosemite to Cardella	100'	62.8	68.8	**6.0**	33	71	154	84	180	388
G Street	Cardella to Bellevue	100'	62.6	69.4	**6.8**	32	69	149	91	196	423
G Street	Bellevue to Old Lake	100'	59.4	70.2	**10.9**	20	42	91	103	223	480
G Street	Old Lake to Snelling	100'	59.4	68.7	**9.4**	20	42	91	82	177	381
Gerard Avenue	M Street to SR 59	100'	53.0	61.0	**8.0**	7	16	34	25	54	117
Gerard Avenue	SR 59 to Tyler	100'	53.0	59.6	**6.6**	7	16	34	20	44	94
Gerard Avenue	Tyler to Henry	100'	--	56.4	--	--	--	--	12	27	58

Roadway	Segment	Distance[1]	Traffic Noise Levels (dBA, Ldn)			Distance[1] to Ldn Contours Existing			Distance[1] to Ldn Contours General Plan Build Out		
			Existing	General Plan Build Out	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
Gerard Avenue	Parsons/Gardner to Coffee	100'	59.8	65.1	**5.4**	21	45	97	47	102	220
Gerard Avenue	Coffee to Campus Parkway	100'	45.8	65.0	**19.2**	2	5	11	46	100	215
Gerard Avenue	East of Campus Parkway to Tower	100'	45.8	58.3	**12.5**	2	5	11	16	36	76
M Street	Mission to Childs	100'	56.3	60.9	**4.6**	12	26	57	25	53	114
M Street	Childs to SR 99	100'	59.1	61.6	2.5	19	41	87	28	59	128
M Street	SR 99 to Bear Creek	100'	62.9	63.9	1.0	34	72	156	39	84	181
M Street	Bear Creek to Olive	100'	63.0	64.6	1.6	34	74	159	44	94	202
M Street	Olive to Yosemite	100'	64.3	67.3	3.0	42	90	194	66	142	307
M Street	Yosemite to Cardella	100'	61.0	66.7	**5.7**	25	54	116	60	129	278
M Street	Cardella to Bellevue	100'	--	62.3	--	--	--	--	30	66	141
M Street	Bellevue to Old Lake	100'	--	61.9	--	--	--	--	29	62	134
M Street	Old Lake to	100'	--		--	--	--	--	--	--	--
Mission Avenue	SR 59 to Tyler	100'	52.3	65.2	**12.9**	7	14	31	48	103	222
Mission Avenue	Tyler to Henry	100'	50.7	65.1	**14.3**	5	11	24	47	101	218
Mission Avenue	Henry to SR99	100'	52.8	67.8	**15.0**	7	15	33	71	154	331
Mission Avenue	Coffee to Tower	100'	47.6	52.5	**5.0**	3	7	15	7	15	32
North Bear Creek	SR 99 to Campus Parkway	100'	56.3	61.4	**5.1**	12	26	57	27	58	125
North Bear Creek	R Street to M Street	100'	57.9	61.4	3.5	16	34	72	27	58	124
North Bear Creek	M Street to G Street	100'	59.0	61.5	2.5	18	40	86	27	58	126
North Bear Creek	G Street to Parsons/Gardner	100'	59.2	61.7	2.5	19	41	89	28	60	130
North Bear Creek	Parsons/Gardner to McKee	100'	53.6	57.8	**4.3**	8	17	37	15	33	72
Old Lake Road	SR 59 to R Street	100'	--	63.0	--	--	--	--	34	73	158
Old Lake Road	R Street to M Street	100'	--	62.3	--	--	--	--	31	66	142
Old Lake Road	M Street to G Street	100'	--	62.1	--	--	--	--	30	64	138
Old Lake Road	G Street to Parsons/Gardner	100'	--	59.1	--	--	--	--	19	41	88

Roadway	Segment	Distance[1]	Traffic Noise Levels (dBA, Ldn)			Distance[1] to Ldn Contours Existing			Distance[1] to Ldn Contours General Plan Build Out		
			Existing	General Plan Build Out	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
Old Lake Road	Parsons/Gardner to Lake	100'	45.1	55.6	**10.5**	2	5	10	11	24	51
Olive Avenue	SR 99 to Campus Parkway	100'	66.2	67.8	1.5	56	121	260	71	153	329
Olive Avenue	R Street to M Street	100'	66.0	67.3	1.3	54	116	251	66	142	305
Olive Avenue	M Street to G Street	100'	65.6	67.7	2.0	51	110	238	70	151	325
Olive Avenue	G Street to Parsons/Gardner	100'	63.8	66.6	2.8	39	83	179	59	127	274
Olive Avenue	Parsons/Gardner to Campus Parkway	100'	59.9	63.4	3.5	21	45	98	36	78	168
Parsons	Coffee to Gerard	100'	50.7	62.8	**12.1**	5	11	24	33	71	154
Parsons	Gerard to Childs	100'	--	64.1	--	--	--		40	87	187
Parsons/Gardner	Childs to SR 140	100'	59.6	64.9	**5.3**	20	44	94	46	98	212
Parsons/Gardner	SR 140 to Bear Creek	100'	60.3	65.3	**4.9**	23	49	105	48	104	224
Parsons/Gardner	Bear Creek to Olive	100'	56.1	64.5	**8.3**	12	26	55	43	92	198
Parsons/Gardner	Olive to Yosemite	100'	57.3	65.2	**7.9**	14	30	66	48	103	221
Parsons/Gardner	Yosemite to Cardella	100'	51.8	65.0	**13.3**	6	13	28	47	100	216
Parsons/Gardner	Cardella to Bellevue	100'	--	64.6	--	--	--	--	44	95	204
Parsons/Gardner	Bellevue to Old Lake	100'	--	62.2	--	--	--	--	30	65	140
Parsons/Gardner	Old Lake to	100'	--	59.6	--	--	--	--	20	44	95
R Street	Gerard to Childs	100'	46.8	60.1	**13.4**	3	6	13	22	47	102
R Street	Childs to SR 99	100'	60.1	62.1	2.1	22	47	101	30	65	139
R Street	SR 99 to Bear Creek	100'	61.5	62.8	1.3	27	59	126	33	72	154
R Street	Bear Creek to Olive	100'	62.4	64.1	1.7	31	67	145	40	87	187
R Street	Olive to Yosemite	100'	63.8	67.5	**3.7**	39	83	179	68	147	317
R Street	Yosemite to Cardella	100'	--	66.6	--	--	--	--	59	127	274
R Street	Cardella to Bellevue	100'	--	66.6	--	--	--	--	59	128	276
R Street	Bellevue to Old Lake	100'	--	66.5	--	--	--	--	59	127	273
R Street	Old Lake to	100'	--	61.1	--	--	--	--	26	55	119
Santa Fe Ave	SR 59 to Franklin	100'	66.0	67.7	1.7	54	116	250	70	151	325
Thornton Avenue	Mission to SR140	100'	55.6	65.0	**9.4**	11	24	51	46	100	215
Tyler Road	Childs to Mission	100'	--	59.7	--	--	--	--	21	44	96
West Road	Hwy 140 to	100'	--	57.3	--	--	--	--	14	31	67

Roadway	Segment	Distance[1]	Traffic Noise Levels (dBA, Ldn)			Distance[1] to Ldn Contours Existing			Distance[1] to Ldn Contours General Plan Build Out		
			Existing	General Plan Build Out	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
West Road	V Street to Childs	100’	--	60.5	--	--	--	--	23	50	108
West Road	Childs to Gerard	100’	--	59.0	--	--	--	--	19	40	86
West Road	Gerard to Mission	100’	--	58.8	--	--	--	--	18	39	84
West Road	South of Mission to	100’	--	60.1	--	--	--	--	22	47	102
Yosemite Ave	SR 59 to Campus Parkway	100’	62.0	65.3	3.3	29	63	136	49	105	226
Yosemite Ave	R Street to M Street	100’	63.2	67.0	3.8	35	75	163	63	136	292
Yosemite Ave	M Street to G Street	100’	65.3	68.3	2.9	49	105	227	77	165	356
Yosemite Ave	G Street to Parsons/Gardner	100’	64.2	68.3	**4.1**	41	88	190	77	166	357
Yosemite Ave	Parsons/Gardner to Campus Parkway	100’	61.2	67.1	**5.9**	26	55	119	64	138	297

[1]Distances are measured in feet from the centerline of the roadway.
Bold indicates a relative change of approximately 4 dB or higher.

The General Plan Noise Element has developed Implementing Actions and criteria for mitigating traffic noise levels at new developments within the City through the following implementation actions:

1.2.a Continue to discourage truck traffic and through traffic in residential areas in Merced.

1.2.c New development of noise-sensitive land uses may not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table N-3, unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to the levels specified in Table N-3.

1.2.d Noise created by new transportation noise sources shall be mitigated to the extent feasible so as not to exceed the levels specified in Table N-3 at outdoor activity areas or interior spaces of existing noise-sensitive land uses.

1.2.e It is anticipated that roadway improvement projects will be needed to accommodate build-out of the General Plan. Therefore, existing noise-sensitive uses may be exposed to increased noise levels due to roadway improvement projects as a result of increased roadway capacity, increases in travel speeds, etc. It may not be practical to reduce increased traffic noise levels consistent with those contained Table N-3. Therefore, as an alternative, the following criteria may be used for roadway improvement projects:

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in noise levels due to roadway improvement projects should be mitigated to the extent feasible; and,

- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in noise levels due to roadway improvement projects should be mitigated to the extent feasible; and,

- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB L_{dn} increase in noise levels due to roadway improvement projects should be mitigated to the extent feasible.

1.4.a Require new residential projects to meet acceptable noise level standards as follows:

- A maximum of 45 dB Ldn/CNEL for interior noise level for residential projects.

- A maximum of 65 dB Ldn/CNEL for exterior noise level for residential projects proximate to major road way and railroad corridors. For other arterial, collector and local streets a maximum of 60 dB Ldn/CNEL exterior noise with a maximum of 65 dB Ldn/CNEL when all the best available noise-reduction techniques have been exhausted without achieving 60 dB, and the strict application of such a maximum becomes a hindrance to development needed or typical for an area.

- For Railroad operations the standard shall be 65 dB L_{dn}/CNEL or less for exterior noise level using a practical application of the best-available noise reduction measures. An exterior noise level of up to 70 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with Table N-3.

1.5.f As feasible, require noise barriers and/or increased setbacks between heavy circulation corridors and noise-sensitive land uses (see Figures 10.2a and 10.2b).

1.6.a Where noise mitigation measures are required to achieve the standards of Tables N-1 and N-3, the emphasis of such measures should be placed upon site planning and project design. The use of noise barriers should be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

These, and several more policies and implementing actions in the General Plan, reduce the noise impacts within and surrounding the planning area. This impact is ***less than significant.***

Mitigation Measures

No mitigation measures are required.

Impact #3.11-2: Buildout of the General Plan may contribute to increased traffic noise levels, and a significant increase in overall traffic noise levels at existing sensitive receptors.

Discussion/Conclusion: Table 3.11-10 indicates that numerous roadway segments will experience a significant increase in traffic noise levels above what they currently experience. For this analysis, an increase of 4 dB Ldn or more due to the project, is considered to be a significant increase in traffic noise levels. This is due to both the buildout of the General Plan and buildout of the area outside of the City of Merced General Plan Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI). Some implementation actions such as Implementation Action 1.2.a which discourages truck traffic and through traffic in residential areas will assist in providing some mitigation. In addition, Implementation Action 1.2.e which addresses mitigation for roadway improvement projects will also assist in providing some mitigation of increased roadway traffic noise. However, in many cases the increase in roadway noise levels at existing noise sensitive uses is expected to occur. This is a ***potentially significant*** impact.

Mitigation Measures

No mitigation measures are available. This impact is ***significant and unavoidable.***

Impact #3.11-3: Buildout of the General Plan will result in construction activities which will contribute to the overall ambient noise environment.

Discussion/Conclusion: Noise from construction activities would add to the noise environment in the immediate project vicinity. Activities involved in typical construction would generate

maximum noise levels, as indicated in Table 3.11-11, ranging from 80 to 89 dB Lmax at a distance of 50 feet.

Table 3.11-11
Noise Levels of Typical Construction Equipment

Equipment Type	Typical Equipment Level (dBA)- 50 ft from Source
Air Compressor	81
Backhoe	85
Concrete Pump	82
Concrete Breaker	82
Truck Crane	88
Dozer	87
Generator	78
Loader	84
Paver	88
Pneumatic Tools	85
Water Pump	76
Power Hand Saw	78
Shovel	82
Trucks	88

Source: Bolt, Beranek and Newman, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, U.S. EPA, 1971.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A significant project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration, and would likely occur primarily during daytime hours.

The Merced General Plan Noise Element provides policies and implementing actions for reducing equipment noise levels. Implementing Actions 1.3.a, and 1.3.b provide for restrictions on hours of construction activities and noise control on equipment.

1.3.a Limit operating hours for noisy construction equipment used in the City of Merced.

1.3.b Review City functions (e.g. construction, refuse collection, street sweeping, tree trimming) to insure that noise generated by equipment has been reduced to the lowest practicable level.

This impact is ***less than significant***

Mitigation Measures

No mitigation measures are required.

Impact #3.11-4: Proposed General Plan Buildout will result in construction activities which could contribute to vibration levels at building facades.

Discussion/Conclusion: The City of Merced General Plan does not include standards for evaluating vibration levels associated construction activities. Certain types of construction activities, such as pile driving and large compacting equipment may produce noise and vibration levels which may be excessive and/or result in damage to structures. Table 3.11-12 shows the potential vibration levels associated with construction activities. This is a ***potentially significant*** impact.

Table 3.11-12
Vibration Levels for Varying Construction Equipment

Type of Equipment	Peak Particle Velocity @ 25 feet	Approximate Velocity Level @ 25 feet
Large Bulldozer	0.089 (inches/second)	87 (VdB)
Loaded Trucks	0.076 (inches/second)	86 (VdB)
Small Bulldozer	0.003 (inches/second)	58 (VdB)
Auger/drill Rigs	0.089 (inches/second)	87 (VdB)
Jackhammer	0.035 (inches/second)	79 (VdB)
Vibratory Hammer	0.070 (inches/second)	85 (VdB)
Vibratory Compactor/roller	0.210 (inches/second)	94 (VdB)

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006

Mitigation Measures

Implementation of the following mitigation measures will reduce the impact to ***less than significant.***

Mitigation Measure #3.11-4:

Table 3.11-13 provides criteria for evaluating construction vibration impacts. If construction activities include the use of pile drivers or large vibratory compactors, an analysis of potential vibration impacts should be conducted. The vibration impacts should not exceed a peak particle velocity of 0.1 inches/second.

Table 3.11-13
Effects of Vibration on People and Buildings

Peak Particle Velocity inches/second	*Peak Particle Velocity mm/second*	*Human Reaction*	*Effect on Buildings*
0-.006	*0.15*	*Imperceptible by people*	*Vibrations unlikely to cause damage of any type*
.006-.02	*0.5*	*Range of Threshold of perception*	*Vibrations unlikely to cause damage of any type*
.08	*2.0*	*Vibrations clearly perceptible*	*Recommended upper level of which ruins and ancient monuments should be subjected*

Peak Particle Velocity inches/second	Peak Particle Velocity mm/second	Human Reaction	Effect on Buildings
0.1	*2.54*	*Level at which continuous vibrations begin to annoy people*	*Virtually no risk of architectural damage to normal buildings*
0.2	*5.0*	*Vibrations annoying to people in buildings*	*Threshold at which there is a risk of architectural damage to normal dwellings*
1.0	*25.4*		*Architectural Damage*
2.0	*50.4*		*Structural Damage to Residential Buildings*
6.0	*151.0*		*Structural Damage to Commercial Buildings*

Source: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans 1976.

Effectiveness of Mitigation Measure:

Implementation of Mitigation Measure #3.11-4 will reduce this impact to a ***less than significant*** level**.**

Impact #3.11-5: Proposed General Plan Buildout could expose new noise-sensitive receptors to railroad noise levels.

Discussion/Conclusion: New development of residential or other noise-sensitive uses could occur adjacent to the Union Pacific Railroad (UPRR) and Burlington Northern/Santa Fe (BNSF) railroad tracks. The locations of the UPRR mainline track generally runs parallel to the State Route 99 outside of the downtown area. Within the downtown area of Merced, the Union Pacific Railroad (UPRR) runs parallel and directly between 16th Street and 15th Street. The location of the Burlington Northern Santa Fe Railroad generally runs parallel to Santa Fe Avenue until reaching the intersection of Highway CA-140. At which point the tracks redirect easterly and follow Highway 140/Yosemite Parkway towards Planada.

Railroad noise levels are described in Tables 3.11-4 and 3.11-5 of this document. Updated information on future railroad operations have not been available from the railroads. The City of Merced General Plan Noise Element has developed Implementing Actions and criteria for mitigating traffic noise levels at new developments within the City. Specifically, the Implementation Actions discussed under Impact #3.11-1 above address the noise level criteria and implementation measures within the proposed Noise Element. This impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.11-6: The Proposed General Plan Buildout may include stationary noise sources such as automotive and truck repair facilities, tire installation centers, car washes, loading docks, corporation yards, parks, and play fields may create noise levels in excess of the City standards.

Discussion/Conclusion: New development of residential or other noise-sensitive uses could encroach upon existing stationary noise sources. In addition, new stationary noise sources could encroach upon existing noise-sensitive land uses. The City of Merced General Plan Noise Element has developed Implementing Actions and criteria for mitigating stationary noise source levels within the City. Specifically, Implementation Actions 1.5.a, 1.5.b, 1.5.c and 1.5.d address the noise level criteria and implementation measures within the proposed Noise Element. This impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.11-7: Proposed General Plan Buildout could expose new noise sensitive receptors to aircraft operations noise levels.

Discussion/Conclusion: New development of residential or other noise-sensitive uses could be located within the environs of Castle Airport, and Merced Regional Airport. The Merced Regional Airport is owned and operated by the City of Merced. Ownership of Castle Airport was turned over from the US Military to the Castle Joint Powers Authority (CJPA). The CJPA was disbanded a number of years ago and Merced County took over operations of the Castle Airport. Additionally, there are a number of privately owned and operated airfields in the area surrounding the City of Merced.

Noise Impacts and contours associated with Castle Airport and Merced Regional Airport are addressed in the *Merced County Airport Land Use Compatibility Plan*, adopted by the Airport Land Use Commission on April 15, 1999.

The City of Merced General Plan Noise Element has developed Implementing Actions and criteria for mitigating aircraft operations noise impacts at new development. Specifically, Implementation Actions 1.5.d, 1.6.a and 1.6.b address the noise level criteria and implementation measures within the proposed Noise Element. This impact is ***less than significant.***

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Increased urban development is accompanied by increased noise. The proposed General Plan contains an update to the Noise Element which has several specific development policies and standards to minimize and mitigate noise impacts. Uses that generate noise and construction

noise are time restricted to minimize impacts to adjacent land uses and have performance standards for noise levels at property lines. Based on the implementation of these policies, build-out of the proposed General Plan would result in a ***less than significant cumulative impact***.

3.12

POPULATION AND HOUSING

3.12 Population and Housing

This section of the Draft EIR describes the existing population, housing and employment characteristics of the City of Merced and Merced County. The potential changes to population and housing characteristics that could result from the proposed plan are discussed, including impacts from new housing that would be generated by the proposed plan. Population growth, housing demand, and employment are considered in the DEIR only to the extent they would result in physical changes to the environment. During the Notice of Preparation (NOP) period, one comment was made at the scoping meeting that population projection estimates should be based on "realistic" growth projections.

3.12.1 SETTING

Environmental Setting

The City of Merced is located approximately 104 miles southeast of Sacramento, 53 miles northwest of Fresno, and 112 miles southeast of San Francisco, in the Central Valley of California. Incorporated in 1889, the City of Merced is situated within the eastern section of Merced County and is the largest City in the County. Principal highway access to Merced is via State Highway 99, which runs through the central portion of the City in a general east/west direction although it runs through much of the State in a north/south direction. State Highways 140 and 59 also serve the City.

The topography of the community is characterized by flat land approximately 155 - 180 feet in elevation. The local climate is typical of the Central Valley. Average daily temperatures are 48 degrees in January to 95 degrees in July. The summer months are typically dry and hot and the winter months are typically cool with occasional fog. Average annual rainfall is approximately 12 inches, with January being the wettest month of the year with two inches of precipitation.

POPULATION TRENDS

Since incorporation, the City has grown to an estimated population of 80,985 in 2010, according to the Department of Finance. In 1980, the population of the City of Merced was 36,499, and by 1990 the population had increased to 56,216 (Table 3.12-1). This was an increase of approximately 54 percent, which was much higher than both Merced County's and California's increase in population for the same time period. From 1990 to 2000, the City's population increased 13.7 percent to total 63,893. Merced County and California's population increase from 1990 to 2000 was higher at 18.0 percent and 13.8 percent respectively.

Table 3.12-1
Population Growth
Merced, Merced County and California, 1980-2000

	1980 Population	1990 Population	Percent Change 1980 to 1990	2000 Population	Percent Change 1990 to 2000
Merced	36,499	56,216	54.0%	63,893	13.7%
Merced County	134,560	178,403	32.6%	210,554	18.0%
California	23,668,862	29,760,021	25.7%	33,871,648	13.8%

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

Table 3.12-2 shows Population Estimates and Projections for the City of Merced and Merced County for the years 2000 to 2030. MCAG estimates 89,400 persons in the City of Merced and 307,300 persons in Merced County by 2015. By 2020, the City of Merced is projected to have a population of 97,700 persons and Merced County is projected to have a population of 340,800 persons. By 2030, the City's projected population is 116,800 persons and the County's projected population is 417,200 persons. It is worth noting that the projected population within the City of Merced SUDP/SOI, as proposed by the General Plan, would be approximately 155,000 in 2030.

Table 3.12-2
Population Estimates and Projections, 2000-2030
City of Merced and Merced County

	2000	2010	2015	2020	2025	2030
Merced	63,893	80,985[1]	89,400	97,700	106,800	116,800
Merced County	210,554	258,495[1]	307,300	340,800	377,400	417,200

Source: Merced County Association of Governments, 2004

HOUSEHOLD SIZE

Table 3.12-3 shows the City of Merced and Merced County's Total Occupied Households, Population in Households, and Average Household Size for 1990, 2000 and 2010 for the City of Merced and Merced County. In 1990, the City of Merced's Average Household Size was 3.03 while the County's Average Household Size was 3.17. Average Household Size in 2000 was 3.06 persons per household for the City of Merced and 3.25 persons per household for the County, showing a slight growth in household size for the general area. The City's average household size decreased to 3.00 persons per household in 2010, compared to 3.18 persons per household for the County.

Table 3.12-3
Average Household Size
Merced and Merced County, 1990-2008

Year	Number of Occupied Households	Population in Households	Average Household Size
City of Merced			
1990	18,154	55,350	3.03
2000	20,435	62,523	3.06
2010[1]	28,106	79,615	3.00
Merced County			
1990	55,331	175,172	3.17
2000	63,815	207,699	3.25
2010[1]	85,259	253,162	3.18

[1] Department of Finance, E-5 City/County Population and Housing Estimates, 1/1/2010

Source: U.S. Census Bureau

AGE CHARACTERISTICS

Age group changes in the local population provide indicators to future housing needs. Table 3.12-4 compares age group changes from 1990 to 2006 for the City of Merced. (2006 is the last year this data is available for the City.) The percentage of children under 10 years of age decreased from 21.8 percent of the population in 1990 to 19.4 percent of the population in 2000. The 10 to 19 age group increased from 15.7 percent of the population in 1990 to 19.0 percent of

the population in 2000. The 20 to 34 age group decreased from 26.7 percent of the population in 1990 to 21.6 percent in 2000. The 35 to 54 age group increased from 20.6 percent of the population in 1990 to 24.4 percent in 2000. The 55 and over age group increased slightly from 15.1 percent in 1990 to 15.7 percent in 2000. The most significant changes (by 2 or more percentage points) were in the age ranges of 25 to 34 (reduced by 4.5 percentage points) and 45 to 54 which increased by 3.2 percentage points. The primary age group for purchasing homes is the 30 to 45-age group, which overall has decreased slightly since 1990; however, the demand for both renter and owner-occupied housing is expected to increase throughout the planning period.

Table 3.12-4
Age Distribution, 1990-2006

Merced	1990		2000		2006	
	Population	Percent	Population	Percent	Population	Percent
Under 5 Years	6,319	11.2	5,860	9.2	5,678	7.7
5 to 9	5,984	10.6	6,487	10.2	5,761	7.8
10 to 14	4,588	8.2	6,187	9.7	6,249	8.5
15 to 19	4,231	7.5	5,917	9.3	7,575	10.3
20 to 24	4,706	8.4	4,967	7.8	7,269	9.9
25 to 34	10,270	18.3	8,845	13.8	11,402	15.5
35 to 44	7,289	13.0	8,682	13.6	9,639	13.1
45 to 54	4,286	7.6	6,908	10.8	7,407	10.1
55 to 59	1,875	3.3	2,241	3.5	3,153	4.3
60 to 64	1,611	2.9	1,778	2.8	2,763	3.8
65 to 74	2,944	5.2	3,106	4.9	3,487	4.7
75 to 84	1,596	2.8	2,117	3.3	2,059	2.8
85 and Over	517	0.9	798	1.2	1,225	1.7
Total	**56,216**	**100.0**	**63,893**	**100.0**	**73,667**	**100.0**

Source: U.S. Census Bureau

EMPLOYMENT

One of the factors that can contribute to an increase in demand for housing and population is expansion of the employment base. The 2000 Census classified 22,567 civilian and non-civilian persons in the City of Merced labor force. Table 3.12-5 shows 2000 Employment by Industry for the City of Merced and Merced County. In the City of Merced, the "Educational, Health and Social Services" industry employed the most people at 25.3 percent. The second largest employment industry was the "Retail Trade" industry, which had 11.1 percent of the total employed persons in the City. The County's Employment by Industry is similar to that of the City's with the exception of the "Agricultural, Forestry, Fishing and Hunting and Mining" industry, which captured 12.5 percent of the total employed persons 16 years and over compared to the City's 5.3 percent.

Employment at UC Merced was approximately 400 faculty and staff in the opening year (2004-05), this number is anticipated to grow to about 2,079 by 2014-15, and at full development the University would employ about 6,600 faculty and staff.

In addition to the direct jobs on the campus, the operation of UC Merced would result in the creation of new indirect and induced jobs in the regional economy. Indirect jobs are those that would be created when the University purchases goods and services from businesses in the region, and induced jobs are those that are created or sustained when those employed in University direct or indirect jobs spend a portion of their wages on the purchase of goods and services in the region.

According to the UC Merced Long Range Development Plan (LRDP) Draft EIR, the campus (at full development) would result in about 6,000 indirect and induced jobs in the regional economy. The number of indirect and induced jobs was approximately 2,600 in 2005-06, and is projected to be 4,000 in 2025-26. About 32 percent of these jobs would be, as expected, in wholesale and retail trade sectors, about 37 percent in services, about 11 percent in construction, and the balance distributed among other sectors (EPS, 2000).

Table 3.12-5
Employment by Industry
Merced and Merced County, 2000

Industry	City of Merced		Merced County	
	Number	Percent	Number	Percent
Employed Persons 16 years and Over	22,267	100.0	75,321	100.0
Agriculture, Forestry, Fishing and Hunting, and Mining	1,173	5.3	9,378	12.5
Construction	1,272	5.7	5,081	6.7
Manufacturing	2,387	10.7	9,781	13.0
Wholesale Trade	691	3.1	3,383	4.5
Retail Trade	2,466	11.1	8,071	10.7
Transportation and Warehousing, and Utilities Information	923	4.1	3,620	4.8
Finance, Insurance, Real Estate, and Rental and Leasing	954	4.3	2,533	3.4
Professional, Scientific, Management, Administrative, and Waste Management Services	1,859	8.3	4,547	6.0
Educational, Health and Social Services	5,624	25.3	15,296	20.3
Arts, Entertainment, Recreation, Accommodation, and Food Services	1,695	7.6	5,158	6.8
Other Services (Except Public Administration)	989	4.4	3,241	4.3
Public Administration	1,323	5.9	3,198	4.2

Source: 2000 U.S. Census

Regulatory Setting

FEDERAL

There are no specific federal or state regulations applicable to population and housing.

STATE

State Housing Law (Government Code § 65583)

State law requires that each city and county prepare and regularly update a Housing Element of their General Plan. The Housing Element is required to include an assessment of housing needs

and an inventory of resources and constraints relevant to meeting those needs. Housing elements are revised according to specific requirements of the State of California. The City's Housing Element was scheduled to be updated and submitted to the State Department of Housing and Community Development (HCD) in August 2009, which was completed. The City subsequently received comments from HCD and City staff is in the process of doing revisions. The new Housing Element should be adopted by the end of 2010.

LOCAL

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to the increase in population and new housing development that will result from the City's growth. The specific policies contained in the Urban Expansion, Land Use, Transportation and Circulation, Public Services and Facilities, Urban Design, Sustainable Development, and Housing Elements are directed at ensuring that growth occurs in an orderly, planned fashion, and that essential public services will be provided in a timely and efficient manner:

Urban Expansion Policies:

UE-1.1 Designate areas for new urban development that recognize the physical characteristics and environmental constraints of the planning area.

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

UE-1.3 Control the annexation, timing, density, and location of new land uses within the City's urban expansion boundaries.

UE-1.4 Continue joint planning efforts on the UC Merced and University Community plans.

UE-1.5 Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) during the planning period.

UE-1.6 Consider expansion of the City's SUDP/SOI boundary for areas within the Area of Interest when certain conditions are met.

Land Use Policies:

L-1.1 Promote balanced development which provides jobs, services and housing.

L-1.2 Encourage a diversity of building types, ownership, prices, designs, and site plans for residential areas throughout the City.

L-1.3 Encourage a diversity of lot sizes in residential subdivisions.

L-1.4 Conserve residential areas that are threatened by blighting influences.

L-1.5 Protect existing neighborhoods from incompatible developments.

L-1.6 Continue to pursue quality single-family and higher density residential development.

L-1.7 Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.

L-1.8 Create livable and identifiable residential neighborhoods.

L-1.9 Ensure connectivity between existing and planned urban areas.

L-2.6 Provide neighborhood commercial centers in proportion to residential development in the City.

L-2.7 Locate and design new commercial development to provide good access from adjacent neighborhoods and reduce congestion on major streets.

L-2.8 Encourage a mixture of uses and activities and reinvestment that will maintain the vitality of the downtown area.

L-3.1 Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.

L-3.2 Encourage infill development and a compact urban form.

L-3.3 Promote site designs that encourage walking, cycling, and transit use.

L-3.5 Develop a Transit-Oriented Development Overlay Zone adjacent to the planned High Speed Rail Transit Station in Downtown Merced.

L-3.6 Require Community Plans for large new development areas within the City's SUDP/SOI prior to development.

L-3.7 Implement policies and principles to conform to the intent of the San Joaquin Valley Regional Blueprint.

Transportation and Circulation Policies:

T-1.7 Minimize street system impacts on residential neighborhoods and other sensitive land uses.

T-2.7 Maintain a pedestrian-friendly environment.

T-2.8 Improve planning for pedestrians.

Public Services and Facilities Policies:

P-1.1 Provide adequate public infrastructure and municipal services to meet the needs of future development.

P-1.2 Utilize existing infrastructure and public service capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of municipal infrastructure and services where necessary.

P-3.1 Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.

P-4.1 Provide adequate wastewater collection, treatment and disposal capacity for existing and projected future needs.

P-5.1 Provide effective storm drainage facilities for future development.

P-7.1 Cooperate with Merced area school districts to provide elementary, intermediate and high school sites that are centrally located to the populations they serve and adequate to serve community growth.

Urban Design Policies:

UD-1.1 Apply Urban Village design principles to new development in the City's new growth areas.

UD-1.2 Distribute and design Urban Villages to promote convenient vehicular, pedestrian, and transit access.

UD-1.4 Promote and facilitate Urban Village residential area design principles.

Sustainable Development Policies:

SD-1.3 Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment.

SD-3.2 Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

Housing Policies: (from the 2004 Housing Element)

H-1.1 Support increased densities in residential areas.

H-1.2 Review design standards to support affordable housing.

H-1.3 Develop and implement an Affordable Housing Ordinance.

H-1.5 Provide priority review and permitting for affordable housing projects.

H-1.6 Support the construction of second units.

H-1.7 Pursue State and Federal funds for new housing construction.

H-1.8 Support housing to meet special needs.

H-2.1 Continue the City's Housing Rehabilitation Loan Program.

H-2.2 Promote preventative maintenance and energy conservation in older housing units.

H-2.3 Pursue State and Federal funds to support conservation and rehabilitation.

H-2.4 Retain existing subsidized lower-income units.

H-3.2 Work with the Housing Authority to continue and expand Section 8 Programs.

3.12.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, the proposed project is considered to have a potentially significant impact on the environment if it will:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)

- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere

- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere

3.12.3 IMPACTS AND MITIGATION MEASURES

Impact #3.12-1: Induce substantial population growth in an area, either directly or indirectly

Discussion/Conclusion: Regional and statewide growth pressures will cause the City of Merced to continue to grow into the future. Between the years 2000 and 2010 the City of Merced saw a population increase of approximately 27 percent or 2.7 percent average annual growth. The City of Merced experienced a much higher population growth rate over the last ten years then it did between 1990 and 2000, when the City experienced a 13.6 increase in population, or 1.4 percent average annual growth. The Merced County Association of Governments predicts the population of the City is expected to grow at an approximate rate of 2 percent per year until 2030 with a population at that time of 116,800 persons.

This growth would occur even without adoption of the 2030 General Plan, since the existing 2015 General Plan allows for growth within the City limits and the Sphere of Influence. Table 2-1 summarizes the total acreage of new development that is proposed under the 2030 General Plan. While the City uses a three percent growth rate for planning purposes, the actual growth rate would depend on a variety of factors including demographic, economic and market conditions that could cause growth to occur at a faster or slower rate than three percent.

The addition of future Community/Specific Plan (i.e., University Community and Castle Farms Community Plan Areas, etc.) areas as a result of the proposed General Plan's adoption will directly induce population growth in the City which could result in substantial population growth and potentially significant impacts if infrastructure can't keep pace with new development. Additionally, the Sewer and Water Master Plan updates will plan for development of these and other new growth areas and will result in expanded/upgraded facilities which could also be considered growth inducing.

The 2030 General Plan includes numerous policies that would accommodate growth in a planned and ordered fashion, focusing the highest intensities of development within existing urban areas. The Urban Design Element's (Chapter 6) expressed purpose is to guide the future character of the City, as reflected in the use and appearance of new development and redevelopment, towards a more efficient, compact form in order to conserve land resources and create a more traditional neighborhood environment conducive to pedestrian activity. Policies UD-1.1 through UD-1.5 gives direction to new development, ensuring that it results in neighborhoods that are walkable, amenable to multiple modes of transport, and reduce impacts on the environment.

The Urban Expansion Element (Chapter 2) serves to define the limits for extending City services and infrastructure so as to accommodate new development in an efficient manner anticipated within the time frame of the General Plan while conserving the natural environment surrounding the City. Policy UE-1.3 addresses control over the annexation, timing, density and location of new land uses within the City. Policy UE-1.2 promotes compact and efficient development.

The proposed General Plan specifies that growth is to be managed so as to maintain the unique qualities and character of the City, with new development required to meet important community goals for design, open space and enhancement of the City's physical diversity, visual qualities and small-town characteristics. The Policies and Standards in the Land Use Element (Chapter 3) establishes land use goals and policies for the manner in which all new development will occur and existing uses and resources will be preserved within and surrounding the City of Merced. The Land Use Element is intended to reinforce the current quality of life within the City. Policy L-1.1 requires balanced development, so that housing, jobs and services remain in equilibrium. Policies L-1.2 and L-1.3 promote diversity in all sectors of development. The location and design of new industrial and commercial development is regulated by policies L-1.9, 2.1, 2.6, 2.7, 2.9 and 2.10. In order to reduce the impact of new development on the environment, Policies L-3.1, 3.2 and 3.3 establish a compact, walkable urban form.

The policies and standards in the Housing Element encourage the maintenance and construction of housing for all income groups and those individuals with special housing needs. Policies in the Element call for the City to support increased densities in residential areas and to construct second units (Policies H-1.1 and H-1.6). Additional policies support affordable housing, pursuing funds for new housing construction, and the conservation and rehabilitation of the existing housing stock (Policies H-1.2, H-1.3, 1.5, H-1.7, H-1.8, H-2.1, H-2.2, H-2.3 and H-2.4).

Since the 2030 General Plan includes policies and standards to regulate future growth that would be allowed under the Plan in an orderly and planned manner, the 2030 General Plan would not result in substantial unexpected population growth or growth for which inadequate planning has

occurred either directly or indirectly. The implementation of the Merced 2030 General Plan would result in a ***less than significant*** impact to inducing substantial population growth in the area, either directly or indirectly.

Mitigation Measures

No mitigation measures are required.

Impact #3.12-2: Displace a substantial number of people or existing housing, necessitating the construction of replacement housing elsewhere

Discussion/Conclusion: The implementation of the Merced 2030 General Plan would create no significant impacts related to the displacement of existing housing or population. The majority of development permitted by the General Plan would either occur in infill locations, on undeveloped parcels, or on parcels that can be subdivided rather than through large scale redevelopment of already developed land and buildings. As a result, implementation of the Merced 2030 General Plan would result in a ***less than significant*** impact to the displacement of a substantial number of existing housing units or people.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

This analysis examines the population projections for cities near Merced, as shown in Table 3.12-6. According to these estimates, the City of Merced has grown at a comparable annual rate to Merced County from 2000 to 2010. The City is also expected to maintain its relative size within the County and its proportion of the County population is not expected to change significantly between 2010 and 2030.

Significant cumulative impacts to population and housing could occur as a result of implementation of the project; however, the proposed General Plan includes policies and standards designed to limit leap-frog development and provide for an orderly transition from rural to urban land uses. Therefore, ***no cumulative impact*** to population and housing is anticipated.

Table 3.12-6
Population Growth County-Wide, 2000-2010

Jurisdiction	2000		2010		Avg. Annual Increase
	Population	% of County	Population	% of County	
Merced	63,893	30.35%	80,985	31.33%	2.67%
Atwater	23,113	10.98%	27,775	10.74%	2.02%
Dos Palos	4,385	2.08%	5,041	1.95%	1.50%
Gustine	4,698	2.23%	5,250	2.03%	1.17%
Livingston	10,473	4.97%	14,051	5.43%	3.08%

Jurisdiction	2000		2010		Avg. Annual Increase
	Population	% of County	Population	% of County	
Los Banos	25,869	12.29%	36,421	14.09%	4.08%
Unincorporated	78,123	37.10%	88,992	34.43%	1.39%
County Total	**210,554**	**100%**	**258,495**	**100%**	**2.28%**

Source: California Department of Finance, Demographic Research Unit, 2010
(http://www.dof.ca.gov/HTML/DEMOGRAP/repndat.asp)

3.13

RECREATION

3.13 Recreation

This section of the Draft EIR focuses on recreational facilities in Merced. A description of existing facilities is given, as well as an analysis of the potential project-related impacts related to future demand for recreational facilities. During the NOP period, no comments were received regarding recreation.

3.13.1 SETTING

Environmental Setting

The City of Merced has a well developed network of parks and recreation facilities. The City of Merced has historically used the standard of five acres of City park land for every thousand residents. In addition to the five acres of City park land per thousand people, the parks and open space system is supplemented by school grounds, church grounds, Lake Yosemite and other similar facilities. These supplemental recreation opportunities are not included in the standard.

According to the 2004 Park and Open Space Master Plan, the City has acquired park land, as well as providing other recreational opportunities, using the five acres per 1,000 population standard for almost 30 years. In 2004, the overall ratio was 4.98 acres per 1,000 population.

In terms of developed parks, approximately 328 +/- acres have been developed into usable parks and open space as of 2010, up from 311 acres in 2004. See Table 3.13-1 for an inventory of City park land and Figure 3.13-1 for a map of existing and proposed parks in the Merced area.

Table 3.13-1
Merced City Park Land Inventory by Type (2010)

Summary	No.	Improved Acres
Total Community Parks	3	83.6
Total Neighborhood Parks	7	63.8
Total Mini-Parks	10	4.2
Total Linear Parks	4	120.4
Total Other Park/Rec. Sites	5	56.6
Total	**24**	**328.6**

According to the Park and Open Space Master Plan, parks in Merced are classified as follows.

- **Mini-Parks**, tot lots and children's playgrounds are all small, single purpose play lots designed primarily for small children usage. Due to their size, the facilities are usually limited to a small open grass area, a children's playground and a small picnic area.

- **Neighborhood Parks** are a combination playground and park, designed primarily for non supervised, non-organized recreation activities. They are generally small in size (about 5 acres) and serve an area of approximately one-half mile radius. Typically, facilities found in a neighborhood park include a children's playground, picnic areas, trails, open grass areas for

passive use, outdoor basketball courts and multi-use sport fields for soccer, softball, and baseball. Optimum size is between three and seven acres.

- **Community Parks** are planned primarily to provide active and structured recreation opportunities. In general, community park facilities are designed for organized activities and sports, although individual and family activities are also encouraged. Community parks serve a much larger area and offer more facilities. As a result, they require more in terms of support facilities such as parking, restrooms, and covered play areas. Community parks usually have sport fields or similar facilities as the central focus of the park. Their service area is roughly a one to two mile radius. Optimum size is between 15 and 20 acres.

- **School Parks** are park facilities, usually neighborhood park facilities that are developed adjacent to or on school grounds.

- **Special Use Areas** are miscellaneous public recreation areas or land occupied by a specialized facility. Some of the uses falling into this classification include community centers, skate parks, community gardens, or sites occupied by buildings.

- **Urban Plazas** are small parks, usually passive, that provide an opportunity for the public to gather in urban locations. Size varies, but urban plazas are typically small and primarily hard surfaces.

- **Athletic Parks** are sites where sports fields are the central focus. Facilities may consist of baseball, softball and soccer fields. Supplemental activities may include tennis, volleyball, playgrounds, and picnic areas.

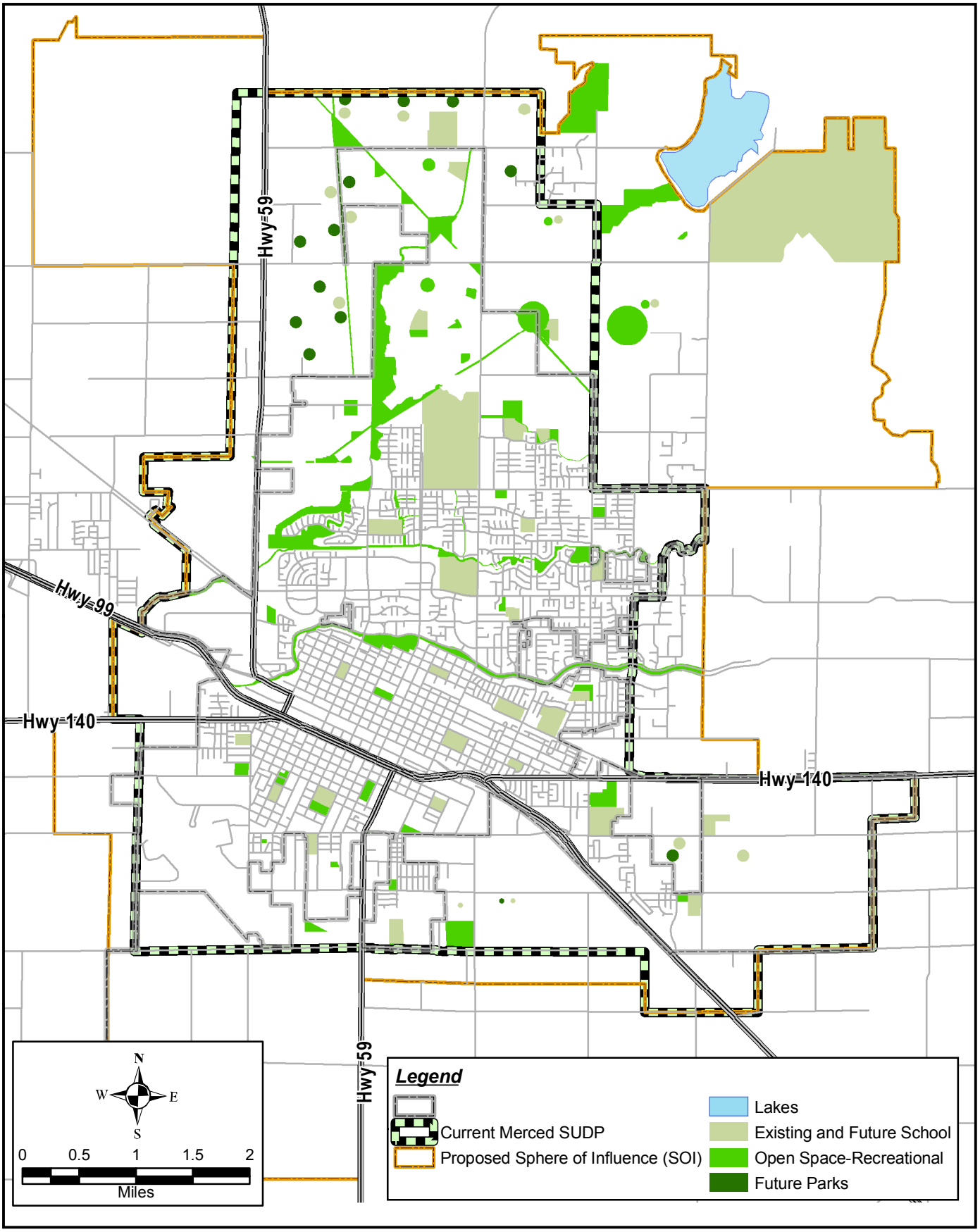
- **Linear Parks** are open spaces or developed landscaped areas that follow linear corridors such as creek corridors, canals, trail corridors, abandoned railroad right-of-ways, canals, and other elongated features. This type of park usually contains pedestrian/bicycle trails, landscaped areas, viewpoints and seating areas. Neighborhood park facilities may be incorporated when space is available.

SCHOOLS AND PARKS

School facilities act as a supplement to the park system in Merced. They provide virtually the same active recreation facilities and opportunities as a typical City park; however, passive recreation facilities are usually limited at school recreation sites. The City of Merced and local school districts have worked closely in the past to share facilities and programs. The City and school districts have promoted development and design of combined facilities, incorporating active and passive recreation opportunities. Ada Givens and Burbank School/Parks are examples of combined facility planning.

EXISTING RECREATIONAL RESOURCES

The Merced park system consists of both active and passive recreational areas, including a variety of park types, as well as an extensive off-street bicycle path system. The City of Merced



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MERCED VISION 2030 GENERAL PLAN EIR
PARKS AND OPEN SPACE

Figure 3.13-1

Job No.: 060429

has approximately 187 acres of active parkland, more than 120 acres of linear parkland encompassing the stream corridors where the bike paths are located, and more than 56 acres of undeveloped parkland. The bike trail system is contained in four creek corridors, and currently totals 13 miles. Expansions to this system are planned, and funding is in place for some of them. In Merced, the inventory of recreation facilities such as sports fields used by the public is relatively low, and the City itself provides only a few facilities. The City owns one gymnasium, except the McCombs Youth Center, which is operated by the Boys and Girls Club. The City relies heavily on the local school districts for athletic fields and gymnasiums. The following facilities are available for public use in Merced:

- 23 youth softball/baseball fields (3 lighted);
- 5 adult softball fields (all lighted);
- 13 soccer fields (does not include open turf areas); and
- 6 tennis courts; and
- 5,450 s.f. of pool space.

Other recreational sites in the planning area owned by public agencies include the Merced County Fairgrounds (owned by the State of California), Courthouse Park, and Flanagan Park, (the latter now owned by the City of Merced). Lake Yosemite, also owned by Merced County, is located to the northeast of the planning area and is adjacent to the U.C. Merced campus. A full list of the City of Merced Parks can be found in Table 3.13-2.

Table 3.13-2
Merced City Park Land Inventory

	Acres	Facilities						
		RB	PG	PS	S	BF	BB	RR
Regional Parks:								
Applegate Park	32.37	X	X	X			X	X
Youth Sports Complex	12.34					X		X
Community Parks:								
Fahrens Park	47.62		X				X	X
Joe Herb Park	26.74		X	X		X		X
McNamara Park	8.70	X	X		X		X	X
Neighborhood Parks:								
Ada Givens Park	10.00		X	X	X			X
Bob Carpenter Park	5.99							
Burbank Park	3.28		X					
Davenport Park	7.5							
Gilbert Macias Park	4.91			X			X	X
Rahilly Park	28.91		X	X				X
Roland D. Brooks Jr. Park	4.00							
Stephan Gray Park	2.50							
Stephen Leonard Park	2.70	X	X		X		X	X
Mini Parks:								
12th and G St.	0.19		X					
11th and H St.	0.17		X					
8th and V St.	0.89		X					

	Acres	Facilities						
		RB	PG	PS	S	BF	BB	RR
Dennis Chavez Park	0.28		X					
William Lloyd Garrison Park	1.02							
Diego Rivera Park	0.25		X					
Love Veasley Park	0.17		X					
Harriet Tubman Park	0.45		X					
Charles Richard Drew Park	0.52		X					
Circle Drive Park	0.26		X					
Linear Parks:								
Sante Fe	15.60		X					
Black Rascal Creek	22.00		X					
Bear Creek	8.00							
RB=Recreation Building S=Pool PG= Playground BF=Ballfields PS=Picnic Shelter RR=Rest Room BB-Basketball								

Source: City of Merced Parks and Community Services Department, 2007

Recreational Programs

A variety of programs for youth, adults and seniors are organized through the City of Merced Parks and Community Services Department, including swimming lessons, leisure classes, youth services and after school programs, senior activities, and youth and adult sports.

Bike Paths

The City of Merced has an extensive City bikeway system and has recently added a number of new lanes and routes. North-South additions include "G" Street, "R" Street, and "V" Street. East-West additions include Childs Avenue, 13th Street, East Main Street, and Yosemite Avenue. Bicyclists can follow these routes to nearly any area within and surrounding the City. The Bicycle Transportation Plan is shown on Figure 4.9 of the Merced Vision 2030 General Plan document.

Existing bike paths include, but are not limited to the Class 1 bike paths along existing waterways such as Bear Creek and Black Rascal Creek. Each of these bike paths extends from McKee Road (east) to Highway 59 (west). The system will also be extended to complete a larger loop sub-route along Fahrens Creek, to Lake Yosemite and down Lake Road (extended) to Black Rascal Creek. Ultimately, this could allow the system to be extended to provide regional bicycle access to the UC campus. Class I bikeways will also extend along powerline easements and the old Yosemite Valley Railroad corridor that criss-cross the northern growth area.

Grounds & Maintenance

In addition to the parks and bike paths, the Public Works Department also maintains an extensive amount of medians, parkways, and public City grounds. These areas include but are not limited to, Civic Center, Senior/Community Center, Downtown, Olive Ave Medians and more totaling over 35 acres of land.

Private Facilities

The City of Merced also has a number or private or commercial recreational facilities such as racquet ball courts, swimming pools, church-operated facilities, gyms and fitness clubs, and nearby golf courses, which contribute to overall recreational opportunities for the City's residents.

Merced County

Merced County offers thousands of acres of federal, state and recreation facilities to accommodate many types of outdoor leisure activities ranging from sightseeing to boating, picnicking and camping. These facilities provide both economic and open space benefits to county residents. These lands represent a unique assortment of facilities that provide recreational opportunities to both residents and visitors.

There are eight federally-managed parks and recreation areas in Merced County offering a wide range of activities. There are nine state-managed areas in the County. Merced County operates 11 parks and recreation areas, including Courthouse Park in central Merced and Lake Yosemite Park, located four miles north of Merced.

Regulatory Setting

FEDERAL

There are no specific federal regulations applicable to recreation.

STATE

Quimby Act

Cities and counties have been authorized since the passage of the 1975 Quimby Act (California Government Code §66477) to pass ordinances requiring that developers set aside land, donate conservation easements, or pay fees for park improvements. Revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities. The amount of the fee is limited by statute and must be based upon the policies and standards contained in an adopted general or specific plan. The City has a parkland/dedication in-lieu fee, and has also adopted a development impact fee for community parks and Class 1 bike paths.

LOCAL

Park and Open Space Master Plan

The City updated and adopted the Park and Open Space Master Plan in 2004. The 2004 Merced Park and Open Space Master Plan contains an assessment of park, open space, and facility needs; recommendations and policies for the acquisition and development of future park sites as well as improvements to existing parks and facilities; recommendations on organization, operations, and maintenance to manage the park and recreation programs in the City; and a list of projects and

actions necessary to implement the Master Plan, identifies project priorities, and potential funding sources. Standards identified in the Master Plan indicate that the City will need approximately 180 acres of additional parkland for the projected 2030 population of 116,800. The City park system will need to provide for other types of recreational facilities, such as gymnasiums and swimming pools, as part of its development.

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to recreation impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Land Use, Transportation and Circulation, Public Services and Facilities, and the Open Space, Conservation, and Recreation Elements of the General Plan are designed to ensure that recreation impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Land Use Policies:

L-1.8 Create livable and identifiable residential neighborhoods.

Transportation and Circulation:

T-2.6 Maintain and expand the community's existing bicycle circulation system.

Public Services and Facilities Policies:

P-1.3 Require new development to provide or pay for its fair share of public facility and infrastructure improvements.

P-5.2 Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.

P-8.1 The City will support the cultural and health related needs of the community by incorporating such facilities and services in development and redevelopment proposals.

P-8.2 The City shall promote consolidation of complementary or support services to avoid duplication of programs.

Open Space, Conservation, and Recreation Policies:

OS-1.2 Preserve and enhance creeks in their natural state throughout the planning area.

OS-3.1 Provide high-quality park and open space facilities to serve the needs of a growing population.

OS-3.2 Maintain and expand the City's Bikeway and Trail System.

OS-3.3 Maintain the City's existing high-quality open space facilities.

OS-3.4 Develop a diverse and integrated system of park facilities throughout Merced.

3.13.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment if it will:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment

3.13.3 IMPACTS AND MITIGATION MEASURES

Impact #3.13-1: Increase the use of existing neighborhood and regional parks or other recreational facilities or require the construction or expansion of recreational facilities.

Discussion/Conclusion: New development under the proposed General Plan has the potential to increase the demand for parks and recreational facilities. The Plan Update includes a policy of providing five acres of parkland for every new 1,000 residents (Policy OS-3.1, Implementing Action 3.1.a), as allowed under the Quimby Act. Based on the expected 2030 population of approximately 116,800 persons, there would be a need to provide a total of 180 acres of additional parkland to maintain this policy. Without additional park acreage, there could be an increase in the use of existing neighborhood and regional parks or other recreational facilities, which could hasten the deterioration of the existing facilities.

The General Plan includes policies and implementing actions to ensure that the City's parkland goal is met and existing facilities are not negatively impacted by future growth. Policy OS-3.1 calls for the City to provide high quality park and open space facilities to serve the needs of a growing population. With Implementing Action 3.1.a, the City will continue efforts to acquire new park sites within future growth areas in advance of development to meet the recreation open space needs of an expanding population. With Implementing Action 3.1.b, the City will consider density bonuses for development proposals which offer extra park land dedications. The City will continue to implement the Park and Open Space Master Plan (Implementing Action 3.1.c). When feasible, the City will continue to encourage joint use agreements with the local school districts to combine the design and use of park and school facilities (Implementing Action 3.1.d). The City will continue to use the Park Dedication Ordinance to develop the City's park system (Implementing Action 3.1.e) as well as the impact fee ordinance and policy (Implementing Action P-1.3a).

The City will maintain its existing high quality open space facilities and design park facilities so that a high level of maintenance can occur with minimum effort (Policy OS-3.3, Implementing

Action 3.3.a). The City will develop a diverse and integrated system of park facilities throughout Merced (Policy OS-3.4). With Implementing Actions 3.4.a and 3.4.b, community parks should be distributed throughout the City and neighborhood parks and village greens are to be located within villages. With Implementing Action 3.4.c, greenways should be designed to connect various park sites, schools and other public places with paths exclusively for pedestrians and bicyclists. Implementing Action 3.4.d calls for the City to cooperate with the County and MID to evaluate the Lake Yosemite regional park to identify how it might adequately meet the needs of the City of Merced and the new growth areas in the region including the U.C. Merced campus.

The General Plan Update includes additional policies and implementing actions to expand the City's bikeway and trail system and provide open space for public health and safety (Policies OS-3.2 and OS-4.1).

Implementation of the policies proposed in the General Plan, adherence to the guidelines and standards in the Merced Park and Open Space Master Plan, collection of fees for development of new parks, and mitigation measures would ensure that increased demand associated with an increase in population would not significantly accelerate the deterioration of existing park areas or recreational facilities. Therefore, this impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.13-2: Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Discussion/Conclusion: Future development assumed under the 2030 General Plan could result in a total population of 116,800 residents. However, these new residents are anticipated as part of the General Plan and policies have been created to accommodate this increase in population. Based on park standards set in the proposed General Plan and Park and Open Space Master Plan, the proposed General Plan would require approximately 180 additional acres of parkland. These needs would be met through implementation of the proposed General Plan policies. For example, Policy OS-3.1, Implementing Action 3.1.a, states that five acres of parkland should be provided per 1,000 residents. The acquisition of additional park land and open space will continue as development occurs through use of the City's Park Dedication Ordinance, the required dedication of creekside open space, the payment of Park In-Lieu fees, and the Public Facilities Financing Plan (impact fee). The expansion, planning, development, and use of joint facilities are additional means to provide recreational opportunities and to offset needs of park and recreational facilities. The policies set forth in the 2030 General Plan are designed to ensure that future development within the Planning Area would not create a need for construction or expansion of recreational facilities beyond what was anticipated in the General Plan. Therefore, this impact would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

A cumulative impact or effect results when two or more individual effects are combined together, which when taken together are considerable. For the 2030 General Plan, the effects of buildout of the General Plan and the increase in population is considered the "project." In terms of the provision of parks and recreation services and facilities, the effects of buildout of the plan on existing park facilities are already evaluated in Impacts #3.13-1 and #3.13-2. There are no other projects that, when combined together (within the SUDP/SOI), along with the project, would compound or increase environmental effects on park facilities. Therefore, the cumulative impacts of the project are addressed in Impacts #3.13-1 and #3.13-2 and would ***not result in a significant cumulative impact.***

3.14

PUBLIC SERVICES

3.14 Public Services

This section of the Draft EIR presents information on existing public services in Merced, including police and fire protection, schools and libraries, and describes the potential effects of the proposed General Plan related to the provision of these services. Parks and recreation are discussed in Section 3.13, Recreation. One comment letter was received regarding public services. The commenter commented on "fire safety protection and the timing of the construction of public fire safety protection infrastructure to an operational level, so that the necessary fire station infrastructure, equipment, and staffing is identified and clearly stated in specific terms as implementation measures and standard Conditions of Approval for annexation and subdivision agreements and as mitigation measures."

3.14.1 SETTING

Environmental Setting

POLICE

Police protection for the entire City is provided by the City of Merced Police Department. The Police Department employs a combination of sworn officers, non-sworn officer positions (clerical, etc.) and unpaid volunteers (V.I.P.S). The 1995 service criteria used for planning future police facilities was approximately 1.32 sworn officers per 1,000 population. In 2010, the Merced Police Department had 111 sworn officers. Based on a population of 80,985, this ratio exceeds the standard of one (1) officer per 1,000 citizens.

Merced is divided into three police districts, each with its own police facility and officers. District 1 serves the area north of Bear Creek from the north station on Loughborough Drive. District 2 serves the area between Highway 99 to the south and Bear Creek to the north from the central station at M and 22nd Streets. District 3 serves the area south of Highway 99 from the south station in McNamara Park.

The primary reason for having the three districts is to place police officers closer to the neighborhoods and citizens they serve. The Police Department is of the opinion that this "community policing concept" will be successful in combating increases of crime as the City continues to expand. Citizen councils have been established in each district to meet with area commanders and develop strategies for combating crime in their neighborhoods. To augment police department efforts, Neighborhood Watch Programs are established throughout the City and have been highly successful.

The Merced Police Department provides patrol and crime prevention services as well as operation of a SWAT and Tactical Negotiations Team, Bomb Squad, Domestic Violence Response Team, K-9 Units, Bicycle Patrol, Mounted Patrol, and providing identification and fingerprinting services.

The unincorporated component of the General Plan area slated for urban expansion through the Specific Urban Development Plan/Sphere of Influence process is currently under the jurisdiction

of the Merced County Sheriff's Department. The Sheriff's Department is located at 700 West 22nd Street in Merced. The Sheriff's Department presently employs approximately 80 plus sworn deputies to provide police protection for the unincorporated portions of the county, with at least six deputies and a sergeant on duty at any one time.

The Merced Sheriff's Department provides patrol and crime prevention services as well as maintaining the county jail, operation of a SWAT team, and providing identification and fingerprinting services.

Merced County Sheriff's Department operates the Merced County Correctional facilities which houses jail in-mates living in the County. The County also provides court services (including probation, etc.), which supports the local law enforcement efforts of both the Merced County Sheriff's Department and the Merced City Police Department.

FIRE PROTECTION

The City of Merced Fire Department provides fire protection, rescue, and emergency medical services from five fire stations throughout the urban area. The City central fire station is located in the downtown area. There is a station on East 21st Street near Yosemite Park Way, a station north of the Merced Mall on Loughborough Drive, a station on Parsons, and another at the Regional Airport.

Fire Department personnel are typically assigned on a three-platoon work schedule, which provides the City coverage 24 hours a day, seven days a week. The Department equipment includes first-line engine companies (carry and pump water), ladder companies, reserve engines and ladder trucks, airport emergency vehicles and other miscellaneous vehicles.

Merced's fire protection system operates according to a central station concept. Under this concept, a central station can respond to calls from within its own service area or district, and can provide back-up response to other districts as well. From 1990 to 2010, response activity doubled.

The Fire Department provides around-the-clock coverage with a full-time staff upwards of 54 Line Personnel (15 Captains, 18 Engineers, 21 Firefighters) three Battalion Chiefs, two Division Chiefs, one Chief, and two Secretaries. The Fire Department is a paid only career department (no Volunteers, Reserves, or PCFS). Equipment includes five Frontline Engines, two Reserve Engines, Frontline Truck, Reserve Truck, Reserve Squad, Aircraft Crash / Fire Engine, California State Office of Emergency Services (OES) Engine, Rescue Trailer, Public Education Trailer, HAZMAT Decon Trailer, Rescue Boat, two Fire Prevention Vehicles, four Administrative Vehicles, and two Support Vehicles. The Fire Department also has one training tower.

The Insurance Services Office (ISO) defines fire protection services on a scale of 1 to 10, with 1 representing the best level of protection and 10 indicating no protection at all. The City of Merced's 2010 rating, Class 2, is considered to be well above average, despite manning levels

below national averages. This rating helps keep the costs of fire insurance premiums low for City businesses.

The City's Fire Department Master Facilities Plan is used in the planning of stations that will provide protection within a primary service area. The Department has a goal of maintaining a response time of four to six minutes for the first crew to arrive at a fire or medical emergency within an assigned district. This goal was chosen on the basis of proven factors affecting property damage and, more importantly, life.

The City of Merced Fire Department has a mutual aid agreement with the Atwater and County Fire Departments. This agreement enables the different jurisdictions to request aid from another when necessary.

The Merced County Fire Department (MCFD) provides fire protection, rescue, and emergency medical services to all unincorporated areas of the County. Additional fire and medical service personnel are provided through contract with the California Department of Forestry (CDF). The nearest Merced County Fire Department station at 3360 North McKee Road is responsible for the unincorporated areas surrounding the City. The McKee Road station is staffed 24-hours per day by either a fire captain or a fire apparatus engineer and augmented with 15 volunteer personnel. The McKee Road response area is approximately 150 square miles and response times vary. The goal for this area is an arrival response time of 10 minutes.

The Merced County Fire Department has an ISO rating of 5 within a 5-mile radius of the station where there are fire hydrants, and a rating of 8 in this same area where there are no hydrants. Areas farther than 5 miles from the station have an ISO rating of 9.

SCHOOLS

Public schools are operated by school districts, which are autonomous governmental agencies separate from the City. They have their own elected officials and source of funding. There has been a long tradition of support and cooperation between the school districts and the community of Merced. The City coordinates with the school districts on the locations of future school sites, the collection of developer impact fees, and joint activities and facilities (i.e. school parks).

Primary and Secondary Education

The public school system in Merced is served by four districts, which include elementary schools, middle (junior high) schools, and high schools.

1. Merced City School District (elementary and middle schools);

2. Merced Union High School District (MUHSD); and

3. Weaver Union School District (serving a small area in the southeastern part of the City with elementary schools).

4. McSwain Union Elementary School District (serving a small area in the southwestern part of the City with an elementary school).

As the City grows, new schools will need to be built to serve Merced's growing population. Student generation rates vary with each school district and are subject to change based on the latest impact fee justification studies prepared by the school districts. Examples of the most recent student generation rates from the Merced City School District and Merced Union High School District in 2010 are shown below in Table 3.14-1.

Table 3.14-1
Student Generation Rates in Merced City School District and Merced Union High School District (2010)

Unit Type	Elementary (k-6)	Middle (7-8)	High School (9-12)
Single-Family Detached	0.352	0.105	0.227
Multi-Family	0.459	0.100	0.109

In 1986, the California Legislature passed legislation (Government Code Section 53080 and 65995) authorizing local school districts to levy fees on new development at a rate authorized by the State as a method for partially financing the expansion and construction of school facilities made necessary by new growth.

The School Facilities Law of 1986 limited the amount of any fee or other requirement imposed on a development project for the mitigation of impacts on school facilities. Although the law appeared to prohibit denial of a project on the basis of inadequacy of school facilities, three subsequent court decisions held that this prohibition applied only to administrative land use approvals (such as tentative maps, use permits, and building permits), not to legislative land use approvals (such as general plan amendments and rezoning). These court decisions became known as the Mira-Hart-Murietta trilogy. In reliance on these decisions, many cities and counties required payment of school fees in excess of the statutory limits as a condition to granting approval of general plan amendments, specific plans, rezoning, and other legislative approvals.

Proposition 1A/Senate Bill (SB) 50 (Chapter 407, Statutes of 1998) was a school construction measure that was approved by the voters on the November 3, 1998 ballot. It authorized the expenditure of State general obligation bonds totaling $9.2 billion through 2002, primarily for the modernization and rehabilitation of older school facilities and the construction of new school facilities related to new growth. Of the $9.2 billion, $2.5 billion was targeted for higher education facilities and the remaining $6.7 billion was targeted for K-12 facilities, throughout the state.

SB 50 overturned the Mira-Hart-Murietta cases by expressly prohibiting local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any "legislative or adjudicative act . . . involving . . . the planning, use, or development of real property" (Government Code 65996(b)). In other words, the regulations also explicitly prohibit local agencies from imposing school impact fees in excess of those provided by the statute in connection with approval of a project. Additionally, a local agency cannot require participation in a Mello-Roos for school facilities; however, the statutory fee is reduced by the amount of any voluntary participation in a Mello-Roos.

Proposition 1A/SB 50 has resulted in full State preemption of school mitigation. Satisfaction of the statutory requirements by a developer is deemed to be "full and complete mitigation" in compliance with the California Environmental Quality Act. The law does identify certain circumstances under which the statutory fee can be exceeded. These include preparation and adoption of a "needs analysis," eligibility for State funding, and satisfaction of two of four requirements identified in the law including year-round enrollment, general obligation bond measure on the ballot over the last four years that received 50 percent plus one of the votes cast, 20 percent of the classes in portable classrooms, or specified outstanding debt.

Assuming a district can meet the test for exceeding the statutory fee, the law establishes ultimate fee caps of 50 percent of costs where the State makes a 50 percent match, or 100 percent of costs where the State match is unavailable. All fees are levied at the time the building permit is issued. District certification of payment of the applicable fee is required before the City or County can issue the building permit.

Higher Education

Merced College, a California Community College, provides Merced County residents with opportunities for educational development, cultural enrichment, and personal growth. The College's strong program of academic courses, combined with a wide variety of vocational programs, allows the College to serve the needs of a diverse student population. Two-year Associate in Arts or Sciences degrees, as well as Certificates of Completion in selected vocational areas are available along with other programs designed to transfer to four-year colleges and universities.

The main campus covers over 270 acres and is located north of Yosemite Avenue between M and G Streets. A satellite campus is located in Los Banos to serve the west side of the county. Main campus facilities include classrooms and laboratories, a theater, art gallery, gymnasium, swimming pool, football stadium, tennis courts, library, and agricultural area.

UC Merced is the 10th campus in the University of California system. UC Merced is diverse, growing, and committed to those ideals that serve the state, nation and world through education, research and public services. UC Merced is a student centered research university that opened in September 2005 alongside Lake Yosemite. As the University continues to grow the list of majors, minors and graduate programs expand. The student body is projected to consist of approximately 3,500 as of Fall 2010, with over 75 clubs and organizations.

LIBRARIES

Libraries in Merced County are provided by the Merced County Library System, which has one main library in Merced and 15 branch libraries throughout the County.

The main library is located next to the Merced County Courthouse at 21st and O Streets. Merced College's Lesher Library also provides library service within the City of Merced. It should be noted that non-Merced College students are prohibited from checking books out of the library, but may use the resources on-site. UC Merced Library also provides library services to the City of Merced.

In January 1994, budget constraints resulted in the Library operations being reduced to a minimal level. Beginning that year library services in Merced County were scaled back and funding, programs, hours, and staff were reduced or terminated. In early 1997, the City and County adopted a property tax sharing agreement in which the County would receive a share of the tax increment from the City of Merced's Redevelopment Project Area 2 specifically for library purposes. While this agreement is currently in place, the County library system still lacks the funding necessary to provide adequate circulation and staffing for existing libraries. Compared to a State average library-spending rate of $20.65 per capita, Merced County's per-capita expenditure in 1998 was $4.03.

Efforts continue to fund restoration of hours and staffing. As of the fiscal year 2006-2007, the Library began implementing a five year plan to restore professional infrastructure of the County Library System and hours of Operation at the Main Library in Merced as well as the four larger branches (Atwater, Gustine, Livingston, and Los Banos).

HEALTH SERVICES

The citizens of Merced enjoy good health care provided by Merced's hospital, surgical and diagnostic centers, urgent care facilities, convalescent facilities, as well as many private physicians.

Mercy Medical Center—Community Campus (formerly known as Merced Community Medical Center) was located near 13th and D Streets and served the citizens of Merced County for nearly 120 years, first as a public hospital, and later operated by Catholic Healthcare West under a long-term lease with the County. This acute care facility offered a full-range of in-patient and out-patient services. This facility has been replaced as of May 2010 with the new Mercy Medical Center Merced below. Limited outpatient and urgent care services remain at the site. Outpatient services are also offered at the Mercy Medical Center—Dominican Campus at M and W. 27th Streets.

The Mercy Medical Center Merced is a new facility located in North Merced at G Street and Mercy Avenue that opened in May 2010. Construction of the project will ultimately include three phases. Phase 1, which was completed in May 2010, includes a 8-story 264,000 square foot acute care tower with 218 beds, a 4-story 80,000 square foot medical office building and central plant. The medical office building is connected to the hospital tower by a one-story circulation spine. Surface parking is provided for patients, staff and visitors.

Phase 2 will include a 6 to 7 story acute care tower, a 3-story 60,000 square foot medical office building and central plant expansion. The medical office building will be connected to the hospital by a one-story circulation spine. The area and number of floors of the tower will be determined after a detailed capacity analysis. Surface parking will be provided for patients, staff and visitors. This phase will increase capacity to approximately 362 beds. Phase 2 estimated date of completion is 2018.

Phase 3 will include a 5 to 6 story acute care tower, a 3 story 60,000 square foot medical office building, central plant expansion and a 4 story parking structure for approximately 370 cars.

Surface parking for patients, staff and visitors is provided on both parcels. This phase will increase capacity to approximately 450 beds. Phase 3 estimated date of completion is 2023.

GOVERNMENT FACILITIES

The City of Merced owns and operates several civic facilities to serve the needs of its citizens. The Merced Civic Center, opened in 1988 and located at 18th and N, houses most City departments, and hosts public meetings of the City Council and other City boards and commissions, art exhibitions, and other civic activities. The City also operates the Transpo Center, the Senior and Community Center, the Merced Regional Airport, the City Corporation Yard, the Ralph H. Shannon and Merced Center Parcades, and other City-owned parking lots.

The City of Merced, as the County seat, contains many County- and State-owned government facilities. Chief among these facilities are the County Administration Building at M and 21st, the historic Merced County Courthouse and other justice facilities at 21st/22nd and N, and the Merced County Fairgrounds at Martin Luther King and Childs.

Many public services are provided by federal and State agencies at facilities such as the Main Post Office, Department of Motor Vehicles, and Social Security Office. There are also quasi-public uses, such as churches and non-commercial private schools.

Regulatory Setting

FEDERAL

There are no specific federal regulations applicable to public services.

STATE

Assembly Bill 2926 School Development Fees

Assembly Bill 2926 (AB 2926), passed into law January 1987, allows school districts to levy three different levels of development fees directly on new residential, commercial, and industrial development (Government Code § 65995).

- Level 1 fees are the base statutory fees. As of January 27, 2010, Level 1 fees are $2.97 per square foot for new residential development and $0.47 per square foot of chargeable, covered and enclosed floor space for new commercial/industrial development. These amounts currently represent the maximum that can currently be legally imposed upon new development projects by a school district unless the district qualifies for a higher level of funding (Education Code § 17620-17621).

- Level 2 fees allow the school district to impose developer fees above the statutory levels, up to 50% of certain costs under designated circumstances. The state would match the 50% funding if funds are available.

- Level 3 fees apply if the state runs out of bond funds after 2006, allowing the school district to impose 100% of the cost of the school facility or mitigation minus any local dedicated school moneys.

Districts set their own fees within this limit based on a nexus study establishing their funding requirements. Since Proposition 1A was passed by the voters and SB 50 was passed by the State Legislature in 1996, payment of these school development fees is deemed to constitute full, complete, and adequate mitigation of project impacts on school facilities. Further, state law prohibits a local agency from either denying approval of a land-use project because of inadequate school facilities or imposing school impact mitigation measures other than designated fees. The California Legislature has found and declared that the mitigation of the impacts of land-use approvals on the need for school facilities[1] are matters of statewide concern. For this reason, the Legislature has occupied the subject matter of requirements related to school facilities levied or imposed in connection with, or made a condition of, any land-use approval, and the mitigation of the impacts of land-use approvals on the need for school facilities, to the exclusion of all other measures, whether financial or non-financial.

In addition, the payment or satisfaction of a fee, charge, or other requirement levied or imposed pursuant to Education Code Section 17620, in the amount specified in Government Code Section 65995 and, if applicable, any amounts specified in Sections 65995.5 or 65995.7, is deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property on the provision of adequate school facilities.[1] In fact, a state or local agency may not deny or refuse to approve a legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property on the basis of a person's refusal to provide school facilities mitigation that exceeds the amounts authorized pursuant to Government Code Section 65995 or pursuant to Sections 65995.5 or 65995.7, as applicable.[2]

Accordingly, mitigation on the need for school facilities in land-use approvals is limited by the California Legislature to the payment of mitigation fees under Government Code Sections 65995, 65995.5, or 65995.7, as applicable, and the payment of such fees is deemed to be full and complete mitigation of the impacts of any local agency action involving the planning, use, or development of real property.

While current state law limits the consideration by cities and counties of school facilities issues in the land use approval process, local governments still have the power to use the General Plan and zoning to reserve and designate areas for schools. For example, California Government Code Section 65302 mandates that General Plans include a Land Use Element that designates the proposed general distribution, location, and extent of various land uses, including educational facilities. The *Merced Vision 2030 General Plan* accomplishes this through a set of policies and by designating "floating school" sites throughout the planning area. These future school sites are

[1] "School facilities" is defined as any school-related consideration relating to a school district's ability to accommodate enrollment [Government Code §65995(e)].
[2] Government Code §65995(h).
[3] Government Code §65995(i).

referenced in this way because the actual location of school sites is determined at a later stage in the planning and development of the City (e.g., during annexation or subdivision platting).

LOCAL

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to public services impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Land Use, Transportation and Circulation, Public Services and Facilities, Urban Design, Open Space, Conservation, and Recreation, Housing and Safety Elements of the General Plan are designed to ensure that public services impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Urban Expansion Policies:

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

UE-1.5 Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) during the planning period.

Land Use Policies:

L-1.7 Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.

L-1.9 Ensure connectivity between existing and planned urban areas.

L-2.7 Locate and design new commercial development to provide good access from adjacent neighborhoods and reduce congestion on major streets.

L-3.1 Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.

L-3.2 Encourage infill development and a compact urban form.

L-3.3 Promote site designs that encourage walking, cycling, and transit use.

Transportation and Circulation Policies:

T-2.1 Provide for and maintain a major transitway along "M" Street and possibly along the Bellevue Road/Merced-Atwater Expressway and Campus Parkway corridors.

T-2.9 Ensure that new development provides the facilities and programs that improve the effectiveness of Transportation Control Measures and Congestion Management Programs.

Public Services and Facilities Policies:

P-1.1 Provide adequate public infrastructure and municipal services to meet the needs of future development.

P-1.2 Utilize existing infrastructure and public service capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of municipal infrastructure and services where necessary.

P-1.3 Require new development to provide or pay for its fair share of public facility and infrastructure improvements.

P-2.1 Maintain and enhance public protection facilities, equipment, and personnel to the maximum extent feasible within the resource constraints of the City to serve the City's needs.

P-3.1 Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.

P-3.2. In cooperation with the County and the Merced Irrigation District, work to stabilize the region's aquifer.

P-4.1 Provide adequate wastewater collection, treatment and disposal capacity for existing and projected future needs.

P-4.2 Consider the use of reclaimed water to reduce non-potable water demands whenever practical.

P-5.1 Provide effective storm drainage facilities for future development.

P-5.2 Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.

P-6.1 Establish programs to recover recyclable materials and energy from solid wastes generated within the City.

P-6.2 Minimize the potential impacts of waste collection, transportation and disposal facilities upon the residents of Merced.

P-7.1 Cooperate with Merced area school districts to provide elementary, intermediate and high school sites that are centrally located to the populations they serve and adequate to serve community growth.

P-7.2 Support higher educational opportunities.

P-8.1 The City will support the cultural and health related needs of the community by incorporating such facilities and services in development and redevelopment proposals.

P-8.2 The City will promote consolidation of complementary or support services to avoid duplication of programs.

P-8.3 Work with others to study innovative ways of delivering library services at the neighborhood level to promote community education and provide a focus for community activity and cultural development.

Urban Design Policies:

UD-1.1 Apply Transit-Ready Development or Urban Village design principles to new development in the City's new growth areas.

UD-1.2 Distribute and design Urban Villages to promote convenient vehicular, pedestrian, and transit access.

UD-1.3 Promote and facilitate Core Commercial design principles in Village commercial areas.

UD-1.4 Promote and facilitate Urban Village residential area design principles**.**

UD-1.5 Design and develop public and quasi-public buildings and uses utilizing Transit-Ready Development or Urban Village principles.

Open Space, Conservation, and Recreation Policies:

OS-1.2 Preserve and enhance creeks in their natural state throughout the planning area.

OS-1.4 Improve and expand the City's urban forest.

OS-3.1 Provide high-quality park and open space facilities to serve the needs of a growing population.

OS-3.4 Develop a diverse and integrated system of park facilities throughout Merced.

OS-4.1 Preserve open space areas which are necessary to maintaining public health and safety.

Housing Policies:

H-1.8 Support housing to meet special needs.

Safety Policies:

S-1.1 Develop and maintain emergency preparedness procedures for the City.

S-3.2 Maintain essential City services in the event of flooding or dam failure.

S-4.2 Maintain a reasonable level of accessibility and infrastructure support for fire suppression, disaster, and other emergency services.

S-6.1 Provide superior community-based police services within the resource constraints of the City.

S-6.2 Provide services and personnel necessary to maintain community order and public safety.

3.14.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services including fire protection, police protection, schools, parks, and other public facilities (potential parks and recreation impacts are discussed in Section 3.13).

3.14.3 IMPACTS AND MITIGATION MEASURES

Impact #3.14-1: Result in a substantial adverse physical impact to the continued provision of law enforcement services in the City

Discussion/Conclusion: Growth allowed under the General Plan would result in a potential population increase of approximately 36,200 additional residents by 2030 (General Plan buildout). Therefore, implementation of the proposed General Plan would result in an increased need for police service. The City would continue to provide police services within the City limits, which would eventually expand to include lands annexed from the SUDP/SOI in preparation for development.

Current staffing levels are adequate to meet existing needs. Using the service criteria of 1.32 sworn officers per 1,000 population, which exceeds the typical standard of one sworn officer per 1,000 population, the City would need an additional 91 officers to meet the needs of new development. To support the additional officers, supplementary support staff, equipment and increased facility space will also be needed.

Implementing Action 1.3.c of Policy P-1.3, states that all new development shall contribute its fair share of the cost of on-site and off-site public infrastructure and services as appropriate. This could include installation of public facilities, payment of impact fees, and participation in a public facilities financing program. These have been adopted by the City to provide for development of city-wide public facilities along with use of a Community Facilities District to help offset costs of annual operations caused by new growth.

The proposed General Plan includes Policy P-2.1, which will maintain sufficient public protection facilities, equipment, and personnel to the maximum extent feasible within the resource constraints of the City to serve the City's needs. Applicable Implementing Actions of this policy include 2.1.a which states that the City will periodically review existing and potential station facilities, equipment and manpower in light of protection service needs, and 2.1.b in which the City will determine that new development is adequately served by fire and police protection services.

Policies S-6.1 and S-6.2 of the proposed Safety Element call for the City to provide superior community-based police services within the resource constraints of the City and provide services and personnel necessary to maintain community order and public safety. Implementing Action 6.1.c of Policy S-6.1 states that the City will locate future police facilities to enhance the "community policing" concept through the expansion of existing or the addition of new police service districts as the City grows. Implementing Actions 6.2.a and 6.2.b of Policy S-6.2 call for the City to maintain a police force sufficiently staffed and deployed to ensure quick response times to emergency calls and encourage approaches to crime prevention to be designed into new buildings and subdivisions.

As stated above, the City will continue to implement a variety of policies and implementation actions designed to ensure that new development projects plan and finance future required protection services, and that the City maintains sufficient public protection facilities, equipment, and personnel to serve the City's needs. Therefore, implementation of the proposed General Plan would result in a ***less than significant*** impact.

Mitigation Measures

No mitigation measures are required.

Impact #3.14-2: Result in a substantial adverse physical impact to the continued provision of fire protection services in the City

Discussion/Conclusion: The City has a Fire Department Master Facilities Plan used in the planning of stations. The Department has a goal of maintaining a response time of four to six minutes for the first crew to arrive at a fire or medical emergency within an assigned district. This goal was chosen on the basis of proven factors affecting property damage and, more importantly, life. As the City continues to grow in population and area, the fire protection system will have to change if it is to maintain this response time standard. This would require two existing stations to be relocated and five new facilities with personnel and equipment to be added to the system.

If new development occurs pursuant to the proposed General Plan, there would be increased demand for fire and emergency medical protection. Additional staff, equipment and facilities would be required to ensure adequate levels of service and maintain, or exceed, current response times. The actual location of new and expanded facilities will depend on the pattern of growth that occurs in the City limits and proposed SUDP/SOI, which is not known at this time.

However, fire and emergency response facilities would be allowed in most proposed General Plan land use designations.

Recognizing that there would be an increased demand for fire and emergency medical response, the General Plan includes several policies to support the activities of the Merced Fire Department and other service providers. For example, Policy P-2.1 states that the City will maintain sufficient public protection facilities, equipment, and personnel to the maximum extent feasible within the resource constraints of the City to serve the City's needs. Applicable Implementing Actions of this policy include 2.1.a which states that the City will periodically review existing and potential station facilities, equipment and manpower in light of protection service needs, and 2.1.b in which the City will determine that new development is adequately served by fire and police protection services. Implementing Action 2.1.c states that fire station sites should be selected based on the distribution of land uses and population projected when the area is fully developed. Implementing Action 2.1.d provides guidelines for siting new firehouse facilities. Guidelines include fire stations being located on streets close to and leading into major or secondary thoroughfares; fire stations being near the center of their primary service area; convenient to high value areas of commercial or industrial districts; stations being located away from other uses which may be sensitive to the noise impacts of frequent alarms; and residential service areas, fire stations should be located in or near those sections which have the highest density.

Implementing Actions 2.1.e, 2.1.f and 2.1.h of Policy P-2.1 call for the City to maintain an adequate and reliable water system, support the "central station concept," and assure that new development utilizes modern public protection concepts in their design and development.

Policy S-4.1 of the proposed Safety Element states that the City will promote the concept of fire protection master planning with fire safety goals, missions, and supporting objectives for the community. Policy S-4.2 calls for the City to maintain a reasonable level of accessibility and infrastructure support for fire suppression, disaster, and other emergency services. Implementing Action 4.1.a of Policy S-4.1 states that the City will provide additional fire station locations as expansion of the City occurs in order to maintain a response objective of 4 to 6 minutes citywide, at least 90 percent of the time.

As stated above, the City will continue to implement a variety of policies and implementation actions designed to ensure that new development projects plan and finance future required fire protection services and facilities. Financing mechanisms include impact fees and annexation into the Services Community Facilities District. New development will also be subject to the Building Code and the Fire Code with regard to building construction and related items such as the care of vacant lots and the storage of flammable liquids. Therefore, implementation of the proposed project would result in a ***less than significant*** impact.

Mitigation Measures

No mitigation measures are required.

Impact #3.14-3: Result in a substantial adverse physical impact to the continued provision of school services in the City

Discussion/Conclusion: Implementation of the proposed General Plan is projected to increase the population by approximately 36,200 new residents by the year 2030. This increased population will result in increased student generation and the need for additional Merced elementary, junior high and high school facilities. Student generation rates are shown in Table 3.14-1. Consequently, new facilities and personnel will be required in order to provide adequate service for future growth. Although school districts have plans for the construction of new facilities, the continued provision of adequate funding sources (i.e., developer impact fees, etc.) and the dedication of future school sites will be necessary to ensure continued development of future school facilities.

Policies and implementation actions included as part of the proposed General Plan that address additional school services are summarized below. Policies P-7.1 and P-7.2 of the proposed Public Services and Facilities Element state that the City will cooperate with the area school districts to provide school sites that are centrally located to the populations they serve and adequate to serve community growth, and support higher educational opportunities. Implementing Action 7.1.b of Policy P-7.1 states that the City will assist, support, collaborate and cooperate with the school districts in planning for and providing of educational services and facilities to meet the needs of current and future students. Implementing Action 7.1.c states that schools should generally be located within neighborhoods near open space amenities in urban village areas, schools should be located adjacent to Village Core Residential (higher density) areas. Implementing Action 7.1.f requires the City to designate specific school site locations on the Land Use Diagram as needs and sites are identified and ensure their compatibility with adjacent development. The City will cooperate with the school districts to ensure that school facility impact fees are collected in accordance with State law (Implementing Action 7.1.i). The City will also work with the school districts to obtain adequate funding for infrastructure improvements on and adjacent to school sites (Implementing Action 7.1.j).

Implementing Actions 7.2.a and 7.2.b of Policy P-7.2 call for the City to work with Merced College and UC Merced to ensure adequate facilities and grounds and community infrastructure are available to meet future student needs.

On the General Plan Land Use Diagram, future school sites have been indicated, but only reflect a general location based on projected needs. Construction of school facilities is provided for through a combination of state and local sources. Local sources rely heavily on the imposition of school impact fees on new construction.

Payment of statutory fees under SB 50 is deemed to be full and complete mitigation of impacts for any legislative or judicative act, or both involving, but not limited to, the planning use or development of real property. Therefore, implementation of the proposed project would have ***no impact.***

Mitigation Measures

No mitigation measures are required.

Impact #3.14-4: Result in a substantial increase in the demand for other public services and facilities

Discussion/Conclusion:

Libraries

Increased growth in the City of Merced, surrounding areas and throughout the County of Merced, can be expected to increase demands on library services. The City had a limited role in the provision of this service in the past and there are currently no plans for the City to become a library service provider. The Plan does, however, contemplate public facilities that could be linked with the County's library system to facilitate the provision of neighborhood level service within the City of Merced.

Increased growth in the City of Merced, surrounding areas, and throughout the County of Merced can be expected to increase demands on library services. The General Plan intends that the County library system provide neighborhood-level service within the City of Merced.

Policy P-8.3 of the proposed Public Services and Facilities Element calls for the City to work with others to study innovative ways of delivering library services at the neighborhood level to promote community education and provide a focus for community activity and cultural development. Implementing Actions of this policy include exploring ways to incorporate "information access" into public facilities and buildings; working with the County to defining an efficient means of maintaining and delivering library services; exploring cooperative library facility development with local school districts and secondary education institutions; and exploring the expansion of the City's telecommunications resources to encompass access to City documents and other resources (Implementing Actions 8.3.a and 8.3.b).

Implementation of the policies noted above in the Draft General Plan will result in a ***less than significant*** impact to library service in Merced.

Government and Health Service Facilities

General governmental services and facilities (Merced Civic Center, Transpo Center, Community Center, Merced Regional Airport, City Corporation Yard, etc.) will need to expand in response to future growth trends in the region. Facility development will be part of the on-going capital facility management strategy for governmental entities throughout the region. The General Plan provides some designated lands for public facility development. Other entities will use the plans policies for siting facilities in response to service demands.

Expanded health service facilities will be required as a general response to regional growth. Merced, as a regional health service center, will grow with respect to the extent of services which can be provided to local residents. Planning policy accommodates the expansion of health service facilities, both public and private.

Policy P-8.1 of the Draft Public Services Element states that the City will support the cultural and health related needs of the community by incorporating such facilities and services in

development and redevelopment proposals. Policy P-8.2 states that the City shall promote consolidation of complimentary or support services to avoid duplication of programs. Implementing Actions 8.1.a and 8.1.c encourage a range of health related facilities in Merced to meet the needs of the growing and aging population including rehabilitation centers, walk-in medical centers, and full service hospitals; and examining the needs for developing youth services programs and facilities. Implementing Action 8.1.b encouraged the continued operation of a multi-cultural and performing arts program and facilities..

Population growth will increase the demand on governmental and medical services and facilities in Merced throughout the planning period. Implementation of the policies noted in this section from the Draft General Plan will result in a ***less than significant*** impact to these public facilities.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Future regional growth would result in increased demand for police and fire services and facilities throughout the County; however, since Merced would provide for additional police and fire services and facilities within its own boundaries to address the potential impacts of development within it's boundaries, implementation of the proposed General Plan would not contribute to a countywide cumulative impact related to police and fire services.

Future regional growth would result in increased demand for additional school facilities within the Merced school districts. While the majority of the demand for schools would result from growth within the City of Merced, as is addressed above, there will be demand for new school facilities outside of the Merced City limits. However, as with the proposed General Plan program-level analysis, it is unknown exactly where these school facility expansions would occur to support the cumulative increase in population, though they would occur within urbanized areas where there is a concentration of population. As specific school expansion or improvement projects are identified, additional project-specific, second-tier environmental analysis would be completed. As a result, a significant cumulative impact associated with schools would not occur. Payment of fees for construction of new facilities under SB50 is deemed to be full and complete mitigation of development-related impacts on schools.

Future regional growth would result in increased demand for library facilities throughout the County. As a result, the Merced County Library system would probably need to expand library facilities to meet the increased demand. It is unknown exactly where these library facility expansions would occur to support the cumulative increase in population, though they would most likely occur within urbanized areas where there is a concentration of population. As specific library expansion or improvement projects are identified, additional project-specific, second-tier environmental analysis would be completed.

Future regional growth would result in increased demand for other public services and facilities throughout the County. As a result, the County of Merced would probably need to expand these

services and facilities to meet the increased demand. It is unknown exactly where these facility expansions would occur to support the cumulative increase in population, though they would occur within urbanized areas where there is a concentration of population. As specific public services and facilities expansion or improvement projects are identified, additional project-specific, second-tier environmental analysis would be completed. As a result, a significant cumulative impact associated with other public services and facilities would not occur.

3.15

TRANSPORTATION/TRAFFIC

3.15 Transportation/Traffic

This section of the Draft EIR describes transportation and circulation conditions in the proposed General Plan SUDP/SOI and identifies impacts associated with implementation of the proposed General Plan. The City of Merced General Plan Update Traffic Analysis (Fehr and Peers, May 9, 2009) was used as a basis for this section of the Draft EIR. The traffic analysis was prepared to investigate anticipated traffic conditions with implementation of the proposed General Plan. The analysis focuses on the projected roadway and intersection operations at buildout of the *Merced Vision 2030 General Plan* and investigates the adequacy of the proposed Circulation Plan, primarily as it pertains to vehicle traffic on the planned roadways and intersections. Traffic count data and a summary of the traffic impact modeling are presented in Appendix K.

During the Notice of Preparation (NOP) period, comments were received from the Merced County Public Works Department and the California Public Utilities Commission (Rail Safety) regarding the City's urban expansion and generation of increased traffic resulting from implementation of the proposed General Plan.

Implementation of the proposed *Merced Vision 2030 General Plan* will generate increased traffic that will affect circulation conditions on the local and regional roadway network. The General Plan Circulation Element includes a broad range of policies for managing and optimizing the function of the transportation system to accommodate this additional traffic and the proposed Circulation Plan included in the Circulation Element identifies the location of the physical circulation system planned throughout the City. The Circulation Plan is presented in Figure 3.15-1.

3.15.1 SETTING

Environmental Setting

CURRENT REGIONAL ACCESS

Three routes currently provide regional access for the City of Merced (Figure 3.15-2). State Route 99 is an important north/ south highway connecting the major cities of the Central Valley although Route 99 runs east/west through the City of Merced. It is a four to six lane facility extending from Interstate 5 near Bakersfield at its southern end to Interstate 5 near Redding at its northern end. It passes through a number of Valley communities, including Bakersfield, Tulare, Fresno, Merced, Modesto, Lodi, Stockton, and Sacramento. State Route 99 serves as the primary farm-to-market route for the transportation of agricultural products, as a major commuter route within many of the cities it serves, and as a popular route for recreational traffic. SR 99 is also a major freight corridor, with trucks comprising up to 21 percent of total traffic on a typical weekday.

State Route 59 is a north/south facility extending from Route 152 south of El Nido to Snelling north of Merced. It enters Merced from the south via Martin Luther King Jr. Way (South J Street), crosses the City via Route 99, and continues northward on its own Highway 59 corridor. This route primarily serves local and truck traffic.

State Route 140 is an east/west facility connecting I-5 and Yosemite National Park. It is a two-lane road serving local traffic and a high volume of recreational traffic. It enters the City from the west at the intersection of 13th and V Streets, crosses the City via Route 99, and continues eastward on its Route 140/Yosemite Park Way corridor.

G Street and Santa Fe Drive play more limited regional roles by connecting Merced with the nearby communities of Snelling and Atwater respectively.

EXPANDED REGIONAL ACCESS

As a part of the *Merced 2030* General Plan process, the City is proposing adoption of a circulation plan of major streets (arterials) and two expressways (Atwater/Merced Expressway and Campus Parkway) for prospective growth areas. That system has been subsequently modified and expanded in concept over time. An interchange was constructed in 2008 at Mission Avenue/Highway 99 that will connect with Campus Parkway. The completion of Campus Parkway depends on the timing of build-out of UC Merced, and will be phased in over the next 10 to 20 years as traffic conditions warrant.

MAJOR ROAD SYSTEM

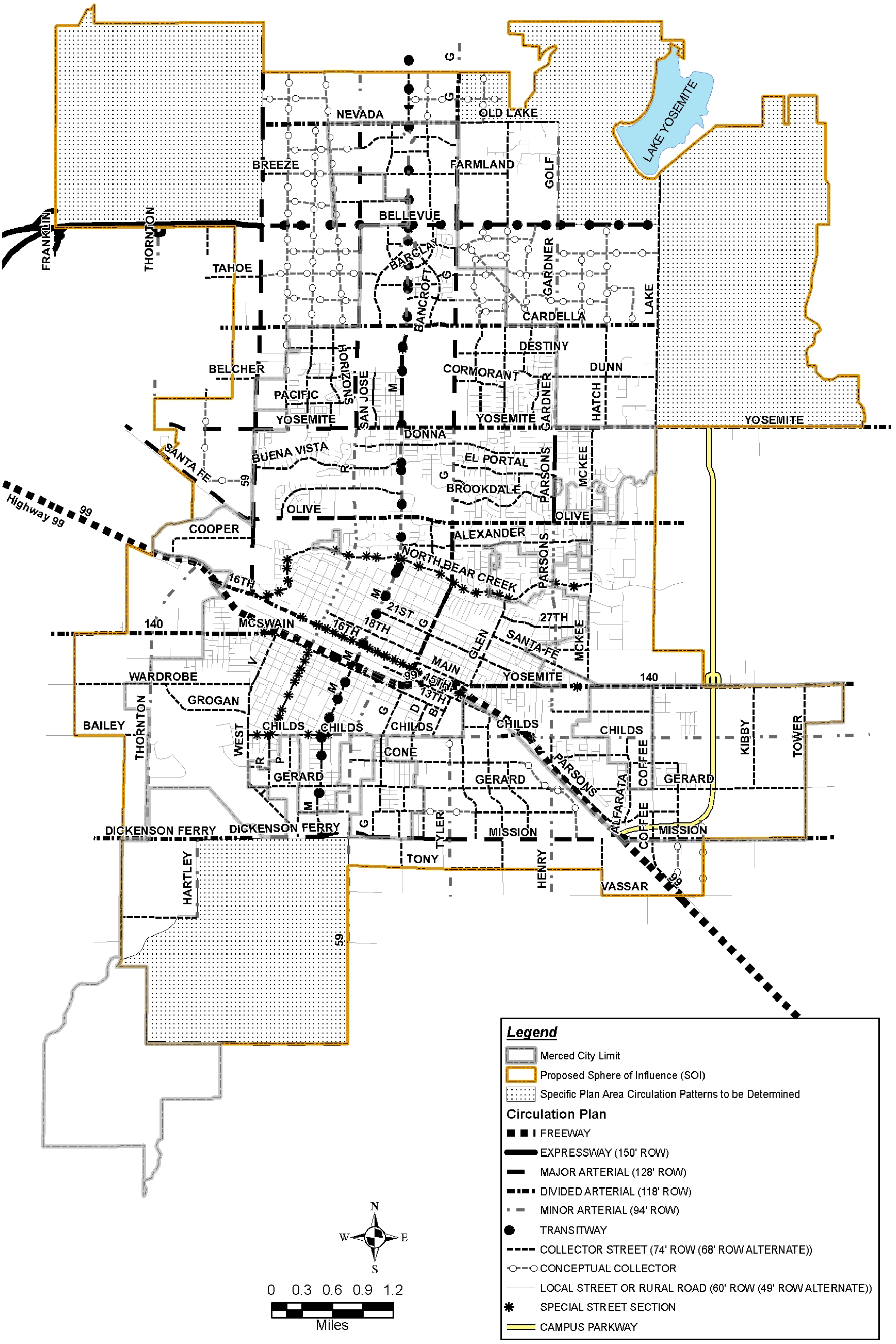
The City has had a one-mile grid system of major north-south roadways identified for many years (Highway 59, R Street, G Street, and Parsons/Gardner Avenue are all one mile apart). This existing system will be extended and expanded to the north and south to serve Merced's new growth areas.

The circulation system concept for projected new growth areas to the north of Merced provides for one-mile grids formed by major arterial and arterial roadways. The north-south major arterials in the City's primary growth area would distribute traffic throughout the community. East-west arterials would carry traffic to a convenient north-south major arterial or expressway for ultimate distribution to the downtown, other more distant community destinations, or to Highway 99 (Figure 3.15-3). Major east-west roadways include Olive Avenue, Yosemite Avenue, Cardella Road, and Bellevue Road.

TRANSIT SYSTEM

The City of Merced is served by a local public bus system, inter-regional private bus companies, and private taxi-cabs, as well as rail and air passenger services. The public bus system, created in 1974, served the community as the Merced Transit System (MTS)/City Shuttle for more than two decades. Its primary goal over time remained to serve senior citizens, low-income people and the disabled, even as the system expanded. Originally created solely as a demand responsive Dial-A-Ride operation, the service extended as time passed to include a number of fixed routes within the City.

In 1996, this system merged with other transit systems within the County to form "The Bus"-Merced County Transit. The consolidated system includes the City Shuttle plus the former Merced County MARTS and the Los Banos system. "The Bus" operates on 16 fixed routes and

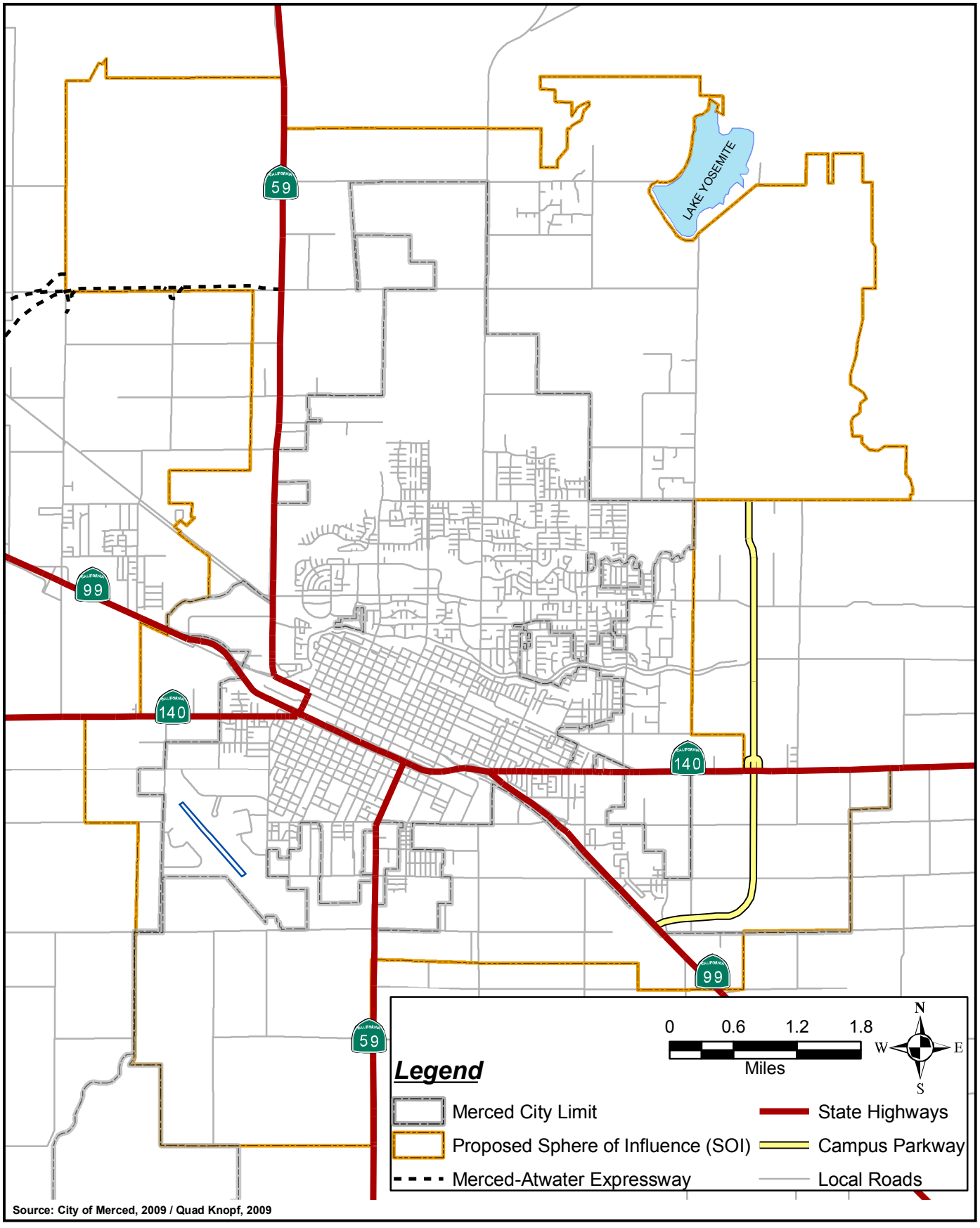


Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
CIRCULATION MAP

Figure 3.15-1

Job No.: 060429



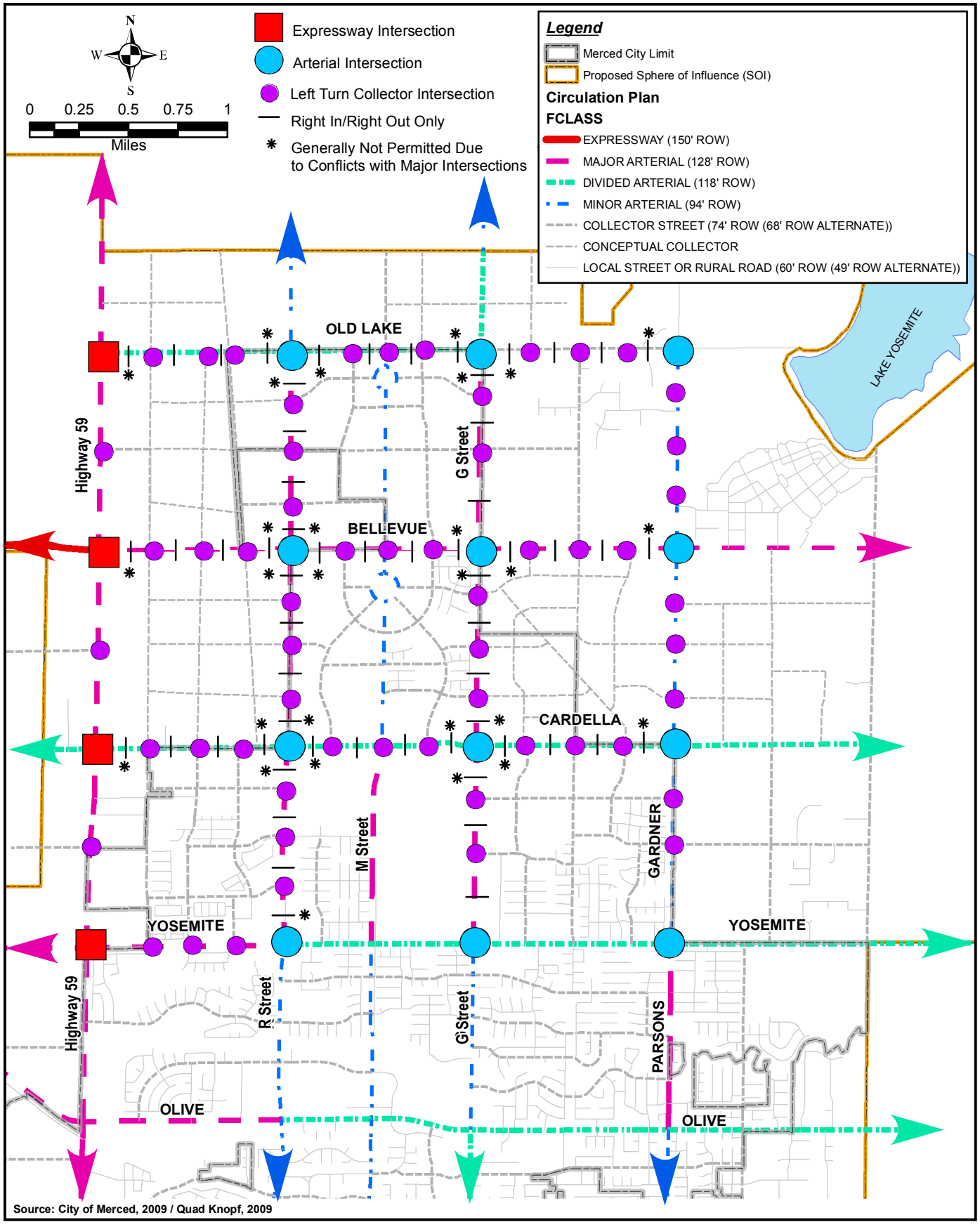
Source: City of Merced, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
REGIONAL ROUTES

Figure 3.15-2

Job No.: 060429



Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
NORTH MERCED STREET GRID

Figure 3.15-3

Job No.: 060429

also provides demand responsive service. Weekday and Saturday service is provided. The Bus also contracts with UC Merced to run a student shuttle service known as "Cat Tracks."

The intent of the combined operations has been to retain as much as possible previous local service options to City transit riders, while reducing overall system costs and enhancing regional transit opportunities for all riders.

Transit routes within the City connect downtown Merced, adjacent neighborhoods, and major trip generators such as the Merced Civic Center, hospitals, shopping areas, and many local schools including Merced College (Figures 3.15-4a, 4b, 4c and 4d). Rural destinations throughout the County are also served. In addition, the service continues to provide Dial-A-Ride for seniors and disabled individuals.

Through MCAG, the City continues to contribute its representative portion of funds necessary for the operation of the expanded, regional system. These funds help to maintain the existing system as well as provide for new equipment such as communications gear, bus shelters, and replacement vehicles.

A public bus system is expected to remain the most cost-effective method of public transportation for the community in the foreseeable future. A key factor is the amount of assistance contributed by other levels of government to help operate and maintain the system.

Transitways

The City of Merced has maintained a strong north-south growth pattern for many years, consistent with its proposed expansion areas. This pattern has contributed to a relative clustering of major destinations in proximity to "M" Street (Figure 3.15-5). This M Street "core" has been formally designated a "Transitway" or "Transit Corridor." This corridor is a logical location for centralized bus service to run along or closely parallel to "M" Street throughout the entire north-south length of the City.

In this location, public transit would be able to provide convenient access to nearly all major Merced destinations. A pattern of intersecting bus routes could tie the entire community into an efficient public transit system.

The pattern of major destinations in proximity to this central transit corridor has been continued through the City's proposed North Merced growth area. As Bellevue Ranch is built-out, additional major commercial sites will be constructed along the M Street corridor.

Bellevue Road has also been designated as a Transit Corridor in the City's Circulation Plan (Figure 3.15-1). The area near the intersection of M Street and Bellevue Road, the location of proposed future major commercial and office park sites, would also be the central transfer point between these two transit corridors.

Ultimately, Bellevue Road offers the opportunity for direct public transit access eastward to UC Merced. The opportunity should also be studied regionally for extending such a transitway westward to provide a tie-in to the prospective regional employment site at the Castle Airport.

PRIVATE TRANSPORTATION

The future of private transit operators (taxis, vanpools, etc.) is difficult to predict because of the volatile nature of the business in recent years. Future service levels of intercity transit will be influenced by changing market forces and state and federal government regulations.

Demand for service to and from the Merced area can be expected to increase. With increasing demands brought about by efforts to improve air quality and congestion, the private intercity operations in Merced County and the San Joaquin Valley could be expanded. It should be noted that if the private sector is unable to respond to this commuter demand, some of the demand could shift to the public sector.

SOCIAL SERVICE

The City of Merced partners with several agencies, public and private, to provide social service transportation. Demand response service is available for senior citizens and disabled citizens residing within the community through the Consolidated Transit System of Merced County. Special fare discounts are typically provided for seniors and disabled persons.

RAIL SERVICE

Passenger Service

There are two railroad companies that operate through Merced County and the City of Merced. Both the Union Pacific Railroad (UPRR) and Burlington Northern/Santa Fe (BNSF) railroad provide freight service to Merced, while the BNSF provides Amtrak passenger service.

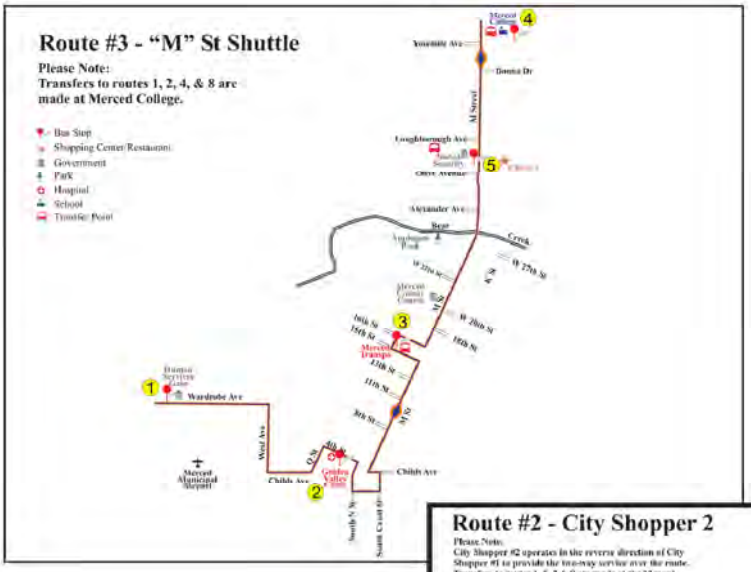
The UPRR rail line parallels 16th Street through much of the City. The BNSF line runs primarily along segments of Santa Fe Avenue (Figure 3.15-6). The Amtrak passenger station is located at 24th and K Streets.

The Amtrak San Joaquins have been serving Merced since 1974. These trains provide direct passenger service from Oakland and Sacramento to Bakersfield, with a bus feeder route running to southern California. Provision of direct rail service to Los Angeles remains both a local and State objective as a primary way for improving service and increasing ridership.

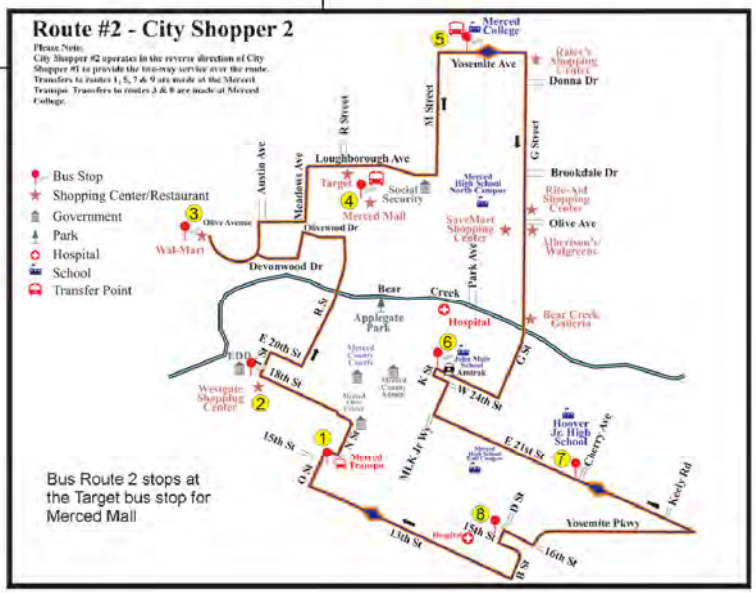
Much attention was focused in the past on possible rerouting of Amtrak onto the UPRR tracks. In anticipation of this possibility, local jurisdictions renovated the old Southern Pacific Rail Depot at 16th and N Streets, as part of an expanded Transpo Center complex completed in 1990.

Shifted State priorities make it unlikely that Amtrak will be rerouted in the foreseeable future. Nonetheless, the Transpo Center does serve as the center for all other land-based area





Note: Transit Routes Are Subject to Change



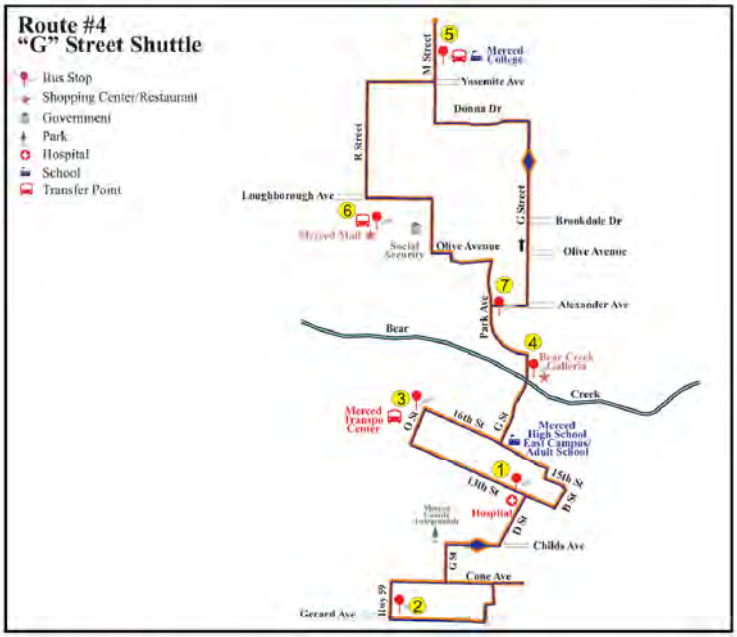
Source: City of Merced, 2009 / Quad Knopf, 2009

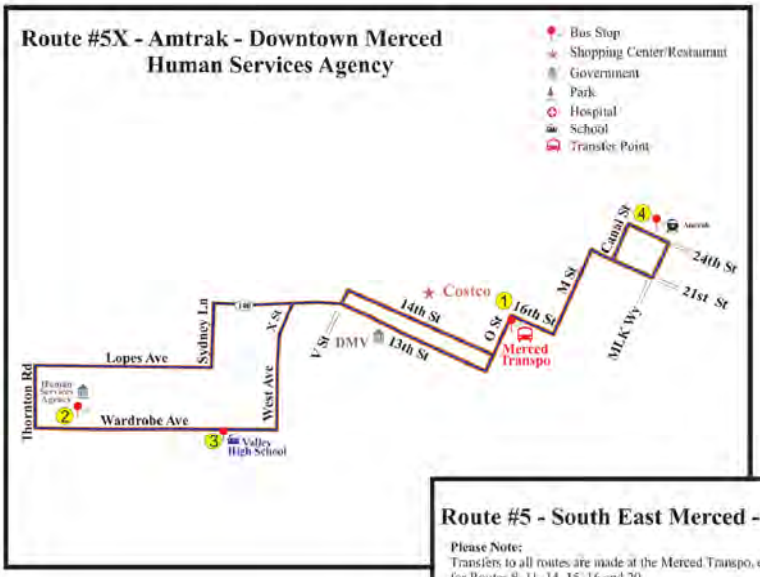
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MERCED VISION 2030 GENERAL PLAN EIR
BUS ROUTES

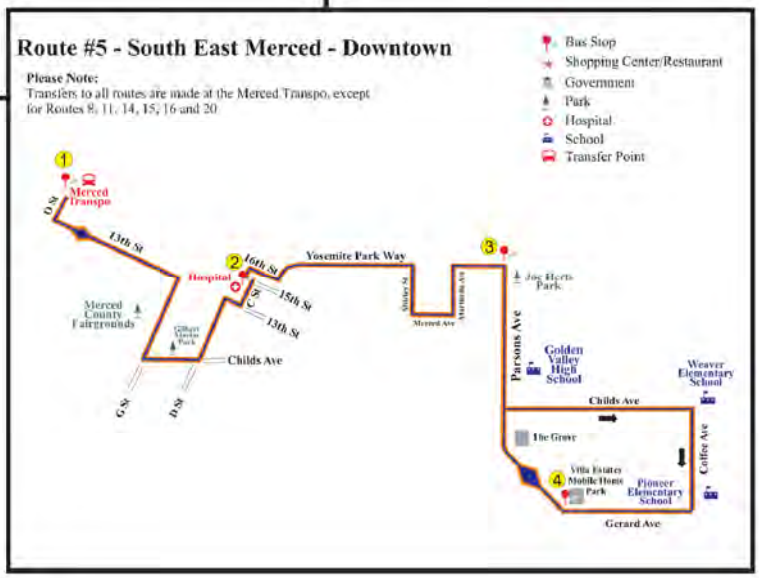
Figure 3.15-4a

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Note: Transit Routes Are Subject to Change



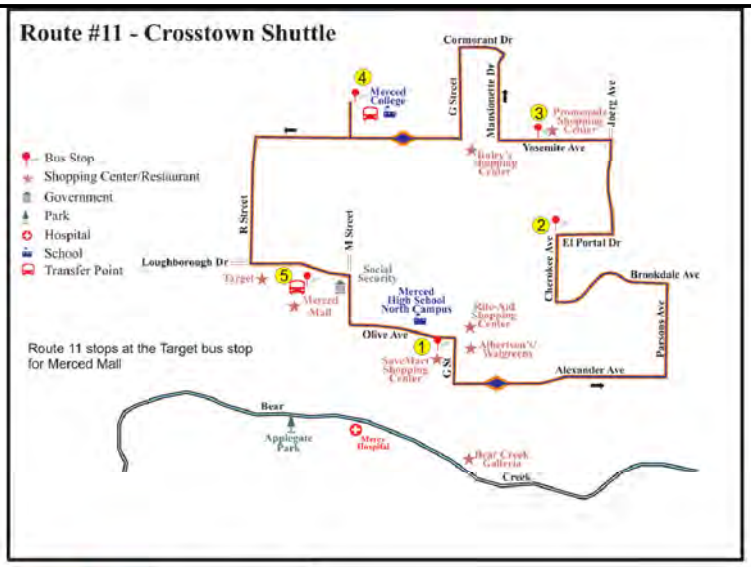
Source: City of Merced, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
BUS ROUTES

Figure 3.15-4b

Job No.: 060429





Note: Transit Routes Are Subject to Change



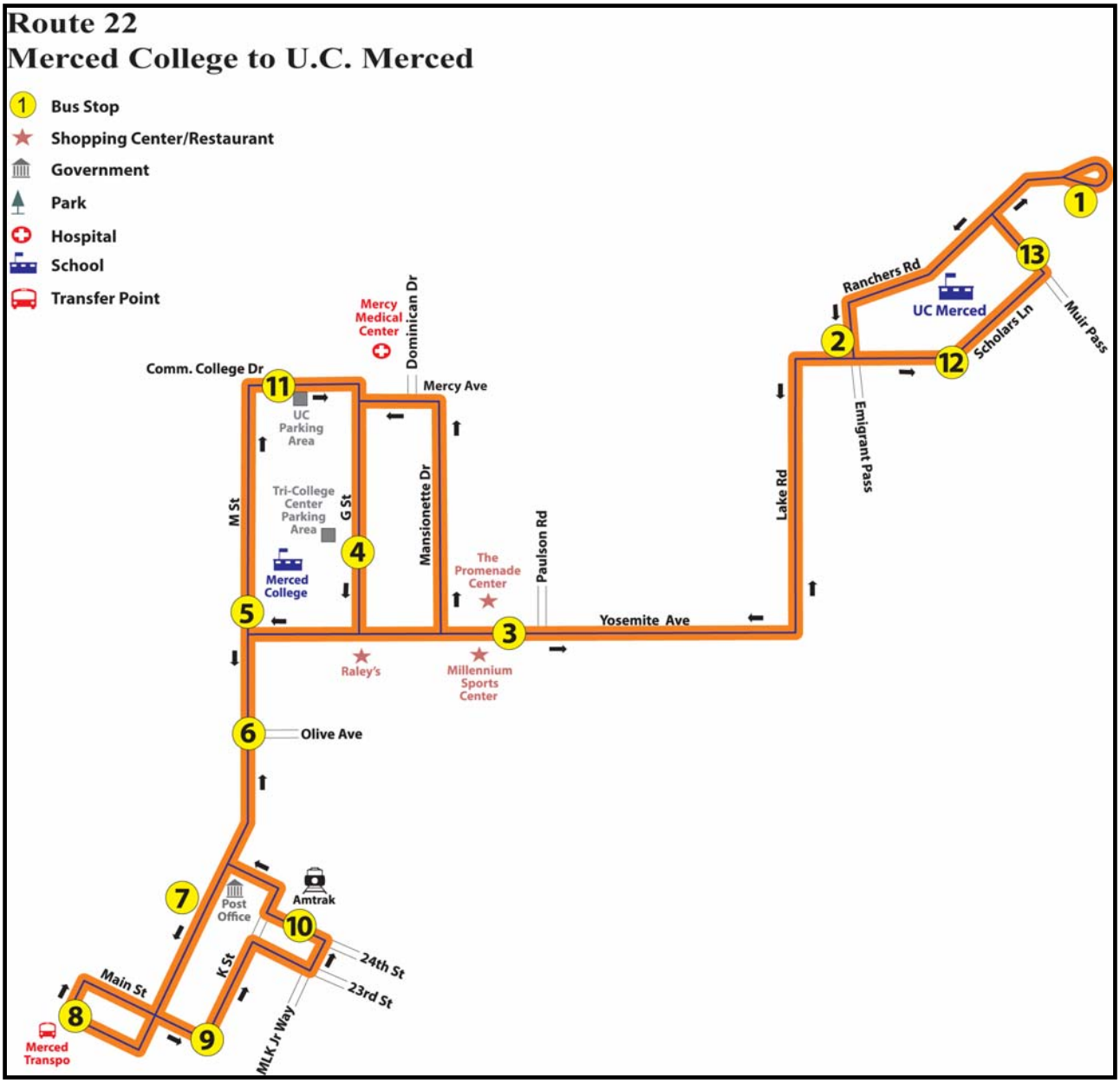
Source: City of Merced, 2009 / Quad Knopf, 2009

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MERCED VISION 2030 GENERAL PLAN EIR
BUS ROUTES

Figure 3.15-4c

Job No.: 060429



Note: Transit Routes Are Subject to Change

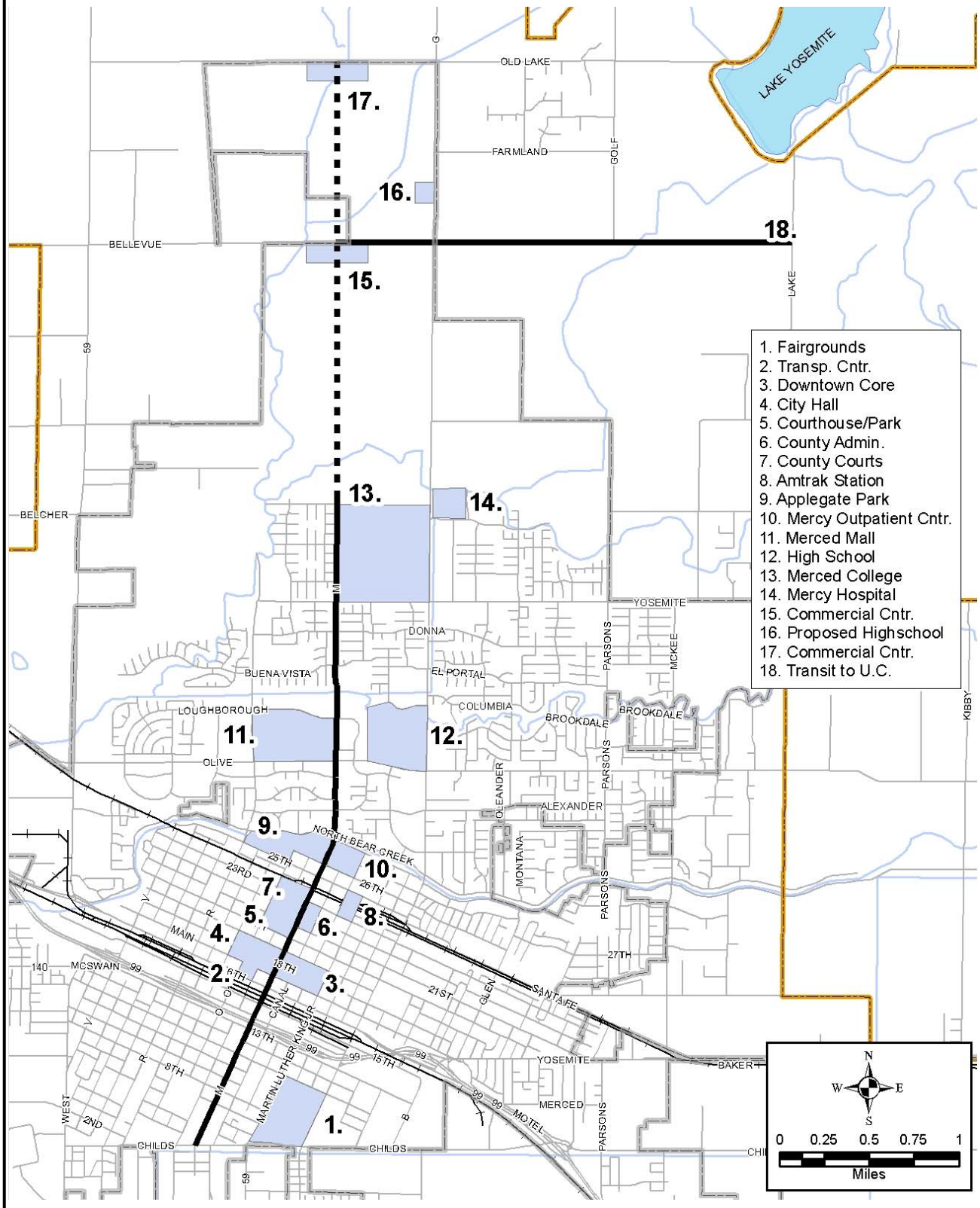
Source: City of Merced, 2010 / Quad Knopf, 2010

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MERCED VISION 2030 GENERAL PLAN EIR
BUS ROUTES

Figure 3.15-4d

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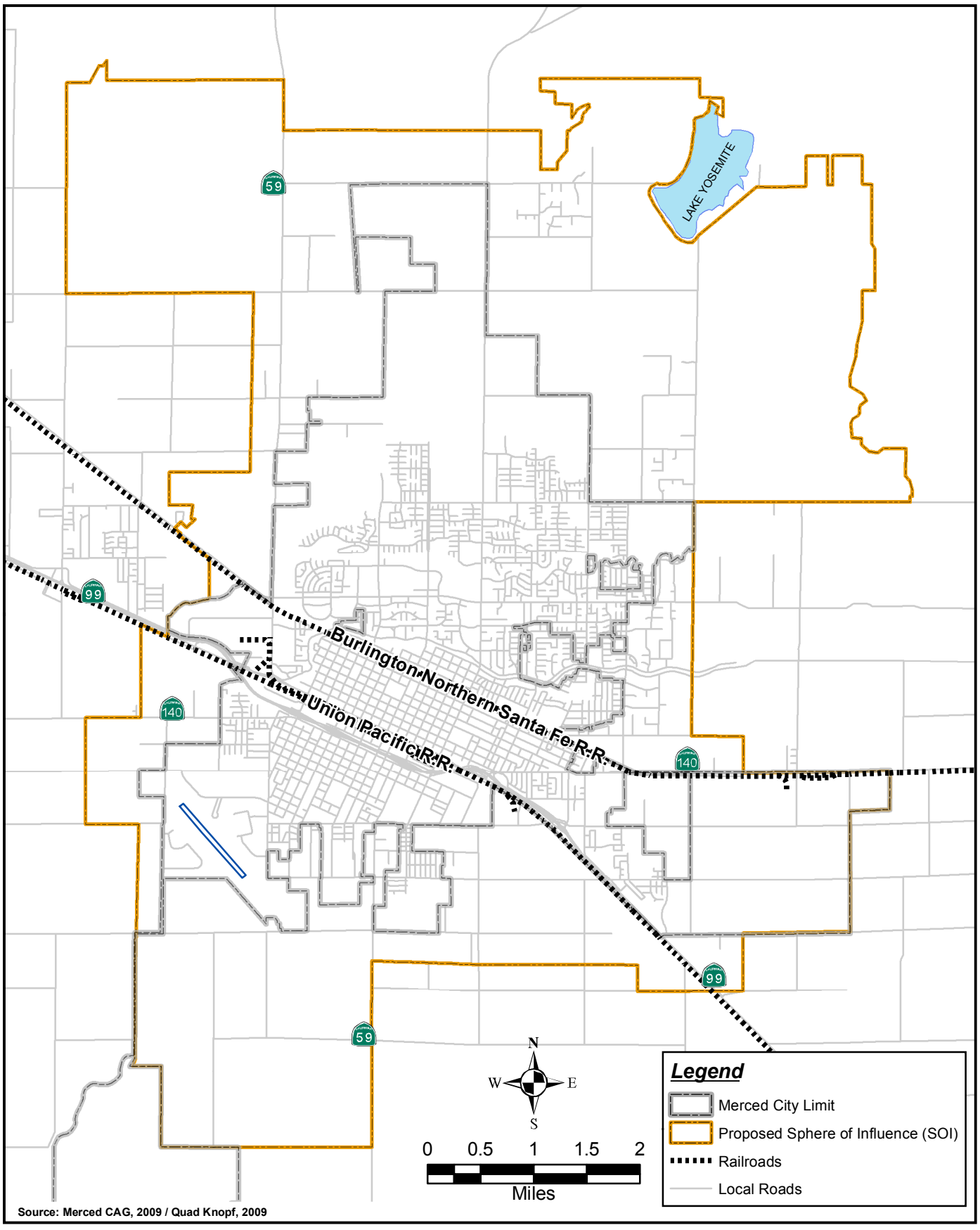


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MERCED VISION 2030 GENERAL PLAN EIR
M STREET TRANSITWAY

Figure 3.15-5

Job No.: 060429



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MERCED VISION 2030 GENERAL PLAN EIR
RAILROADS

Figure 3.15-6

Job No.: 060429

transportation, including private bus lines and taxi-cabs, as well as the central transfer point for public bus service.

High Speed Rail

An additional regional issue is proposed high speed rail service between San Diego and San Francisco, passing through the Central Valley. In 1996, the California Intercity High Speed Rail Commission selected a Highway 99 route rather than an Interstate 5 route due to the larger number of people and communities which could be served along Highway 99. The preferred route has been selected and would locate a station in Downtown Merced. Stops are anticipated in Bakersfield, Tulare, Fresno, and Merced before the trains continue over SR 152 into the Bay Area. A 2nd line to Sacramento will be added in future phases.

The project was approved by California voters on November 4, 2008 with the passage of Proposition 1A authorizing $9.95 billion for the project. The California High-Speed Rail Authority (CHSRA) is currently tasked with completing final planning, design, and environmental efforts. Construction efforts are anticipated to begin as early as 2011.

BICYCLE/TRAIL SYSTEM

Bicycles

Bicycles are an important mode of transportation in the community. Merced has both a favorable climate and terrain to encourage the use of bicycles for both recreation and transportation functions. As bicycle use increases, adequate facilities should be provided to furnish direct routes of access between destinations while minimizing conflicts with automobiles.

Bicycle routes are categorized by the degree in which they separate bicycle movement from vehicular movement. There are two major types of bikeways: (1) off-street bikeways, and (2) on-street bikeways.

Based on the State Department of Transportation classification system, off-street bikeways should be Class I (Bike Paths or Bike Trails) whenever possible. Class I bike paths provide a completely separated right-of-way designated for the exclusive use of bicycles and pedestrians, with cross flows by motorists minimized. In Merced, Class I bike paths generally take advantage of creekside locations and other non-street facilities, such as canals or railroad corridors. Although the off-street bikeways provide extensive recreational opportunities, another primary focus is on safe and efficient transportation linking major land uses and connecting with on-street bikeways at strategic locations.

On-street bikeways are intended to be Class II (Bike Lanes) whenever possible. Class II bike lanes provide a restricted right-of-way on the street for the exclusive or semi-exclusive use of bicycles. Through travel by motor vehicles or pedestrians is prohibited, but cross flows by pedestrians and motorists are permitted. The on-street bikeway system may use Class III (Bike Route) designations occasionally where Class II bike lanes are not feasible.

Class III bike routes provide a right-of-way generally designated by signs and shared with pedestrians or motorists. Class III bike routes, to be avoided if possible, are used only to connect or continue Class I or II facilities for short distances. On-street bikeways should utilize existing or proposed major streets that provide the quickest, shortest, and safest route to take for bicyclists.

Bicycle Circulation Plan

The City of Merced has a significant number of existing and proposed Class I off-road bicycle/ pedestrian trail systems. Much of this system is located along existing waterways (Bear, Black Rascal, Cottonwood, and Fahrens Creeks). Details of the existing and planned system are presented in the Merced Bicycle Plan, adopted in 2008 (Figure 3.15-7).

As proposed, the current Class I system will ultimately be extended to form one complete loop sub-route along Bear/ Black Rascal Creeks, between McKee Road and Highway 59. The system will also be extended to complete a larger loop sub-route along Fahrens Creek, to Lake Yosemite and down Lake Road to Black Rascal Creek. Ultimately, this could allow the system to be extended to provide regional bicycle access to the UC campus. Class I bikeways could also extend along power line easements and the old Yosemite Valley Railroad corridor that criss-cross the northern growth area.

The Merced Bicycle Plan, adopted in 2008, also identifies regional bicycle connections to provide bicycle mobility though the region. Area bicycle planning has, to a major degree, focused on development of an off-street trail system along the region's existing creeks. Because these creeks are located in central and north Merced, the off-street system has developed there. The Merced Bicycle Plan identifies a number of Class II and III facilities to be constructed as new development occurs throughout the City.

PEDESTRIAN CIRCULATION

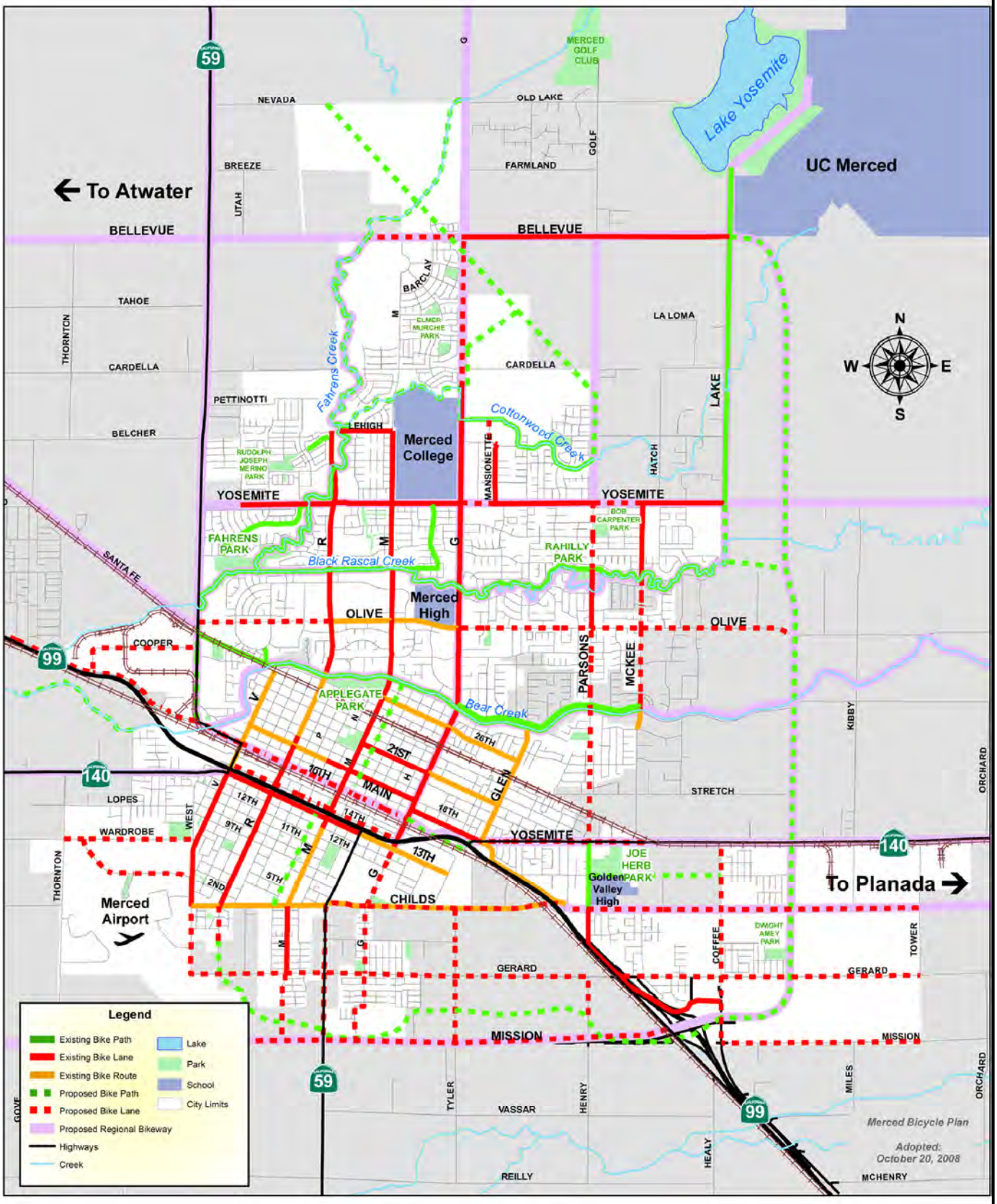
Pedestrian-ways should provide safe and convenient movement to major pedestrian destinations. The needs of school children and the problems of the disabled are of special importance. Care must be taken where development is phased or non-contiguous to provide adequate and safe pedestrian facilities at all times.

Both sidewalks and separate paths can be provided for pedestrian movement. As with bicycles, separate public easements or rights-of-way provide unique opportunities for pedestrian circulation. City street design standards require that sidewalks be installed on all new roadways and the City has made significant efforts over the years to add sidewalks to older roadways (previously developed in the County) that lack sidewalks.

AIR SERVICE

Merced Regional Airport

Merced Regional Airport is a publicly owned, public use facility. It is a basic transport airport, providing commercial air service, general aviation, and freight air cargo service. Runway length



Source: Merced CAG, 2009 / Quad Knopf, 2009

Quad Knopf

MERCED VISION 2030 GENERAL PLAN EIR
BICYCLE ROUTES

Figure 3.15-7

Job No.: 060429

is approximately 5,900 feet, capable of handling jet aircraft. Available hangar space in 2010 was approximately 100,000 square feet.

In 2009, Great Lakes Aviation (in conjunction with United Airlines) provided two daily flights to Ontario airport in Southern California. In 2010, the Ontario service was discontinued and three daily flights to Las Vegas, Nevada were added. Connections are available from Las Vegas to other areas. The airport is the only "regionally significant" airport in the County according to criteria used by the Civil Aeronautics Board.

The Great Lakes Aviation service as well as its predecessors is subsidized by the federal government under the Essential Air Service (EAS) Program. EAS was designed to provide smaller communities access to the national air transportation system by subsidizing airline service should it be necessary.

EAS was established after air service was deregulated in the late 1970's. It was originally approved through 1988. The subsidy would expire on August 31, 2010 and at this time it is not known whether EAS would be renewed. If not, Merced would need to obtain alternative funding or seek other solutions in order to maintain this air service. The City's current intent is to keep its regional airport operating.

Castle Airport

The closure of Castle Air Force Base (CAFB) was completed in 1995. The closure impacted the surrounding economy, including reductions in population and employment in Merced. The County of Merced now operates the renamed Castle Airport.

In recent years, Castle Airport has served businesses specializing in training foreign pilots. Activity related to these schools makes up the majority of the air traffic at Castle. In early 2007, the control tower was reopened to handle increased training traffic.

EXISTING TRAFFIC VOLUME

The Merced County Association of Governments employs the *Florida Department of Transportation Quality/Level of Service Handbook*, 2002, in defining level of service (LOS) as a qualitative measure describing operational characteristics within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Table 3.15-1 presents daily roadway segment level of service thresholds by roadway type and LOS characteristics for unsignalized and signalized intersections. Based on the Transportation Research Board *Highway Capacity Manual*, 2000, (HCM), Level of Service Characteristics for Unsignalized Intersections and Level of Service Characteristics for Signalized Intersections are presented in Tables 3.15-2 and 3.15-3, respectively.

Transportation Research Board *Highway Capacity Manual*, 2000, (HCM), are presented in Tables 3.15-2 and 3.15-3, respectively.

Table 3.15-1
Daily Roadway Segment Level of Service Thresholds by Roadway Type

Type of Roadway	LOS A Threshold	LOS B Threshold	LOS C Threshold	LOS D Threshold	LOS E Threshold
4 Lane Freeway	25,900	42,600	57,800	68,400	76,000
6 Lane Freeway	40,000	65,800	89,200	105,600	117,400
8 Lane Freeway	54,000	89,000	120,600	142,800	158,800
10 Lane Freeway	68,000	112,000	152,200	180,200	200,200
2 Lane Expressway	-	-	16,800	23,200	24,400
4 Lane Expressway	-	3,000	27,800	36,000	37,800
6 Lane Expressway	-	5,900	38,900	48,900	51,300
8 Lane Expressway	-	9,600	60,600	73500	77,100
2 Lane Highway	2,300	7,600	14,200	20,000	27,400
4 Lane Highway	20,500	33,200	48,000	62,200	70,600
2 Lane County Road	-	-	7,700	15,000	16,100
4 Lane County Road	-	-	18,000	32,200	34,000
2 Lane Arterial	-	-	11,600	16,000	16,800
4 Lane Arterial	-	4,100	26,800	33,700	35,400
6 Lane Arterial	-	6,600	41,800	50,700	53,200
2 Lane Collector	-	-	4,800	10,300	13,200
4 Lane Collector	-	-	11,300	22,200	26,400

Source: *City of Merced, Fehr & Peers, Florida Department of Transportation Quality/Level of Service Handbook, 2002.*

Table 3.15-2
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Little or no delay.	0-10
B	Short delays.	>10-15
C	Average delays.	>15-25
D	Long delays.	>25-35
E	Very long delays.	>35-50
F	Extremely long delays.	>50

Reference: *Highway Capacity Manual*, Transportation Research Board

Table 3.15-3
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Extremely favorable progression. Most vehicles arrive during green phase. Many vehicles do not stop.	$\leq$10
B	Good progression.	>10-20
C	Fair progression. Significant number of vehicles stopped. Some queues do not clear.	>20-35
D	Noticeable congestion. Many vehicles stop. Individual cycle failures are noticeable. Queues often do not clear.	>35-55

Level of Service	Description	Average Vehicle Delay (seconds)
E	Poor progression. Individual cycle failures are frequent. Queues frequently do not clear.	>55-80
F	Poor progression. Oversaturation. Many individual cycle failures and queues not cleared.	>80

Reference: *Highway Capacity Manual*, Transportation Research Board

Traffic volumes and LOS on key roadway segments are shown in Table 3.15-4 for existing, no project and General Plan Buildout conditions.

Table 3.15-4
Merced SUDP/SOI Arterial Street System
Traffic Volume & Level of Service – Existing, No Project, and 2030

Roadway/Segment	Existing Conditions			No Project Conditions			General Plan Buildout Conditions		
	Number of Lanes	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]
NORTH/SOUTH ARTERIALS:									
Thornton Avenue									
Mission to SR 140	2	3,800	C+	4	18,490	C+	4	33,140	D
Belcher to Bellevue	2	--	C+	2	5,750	C+	2	14,190	D
North SR 59									
16th to Olive	2	21,740	**F**	4	42,100	**F**	6	44,040	D
Olive to Yosemite	2	19,300	**F**	4	26,060	C+	6	48,030	D
Yosemite to Cardella	2	8,100	C+	2	10,440	C+	4	30,030	D
Cardella to Bellevue	2	6,000	C+	2	10,450	C+	4	33,690	D
Bellevue to Old Lake	2	5,090	C+	2	12,920	D	6	40,790	C
Old Lake to Castle Farms	2	5,090	C+	2	15,980	D	6	44,990	D
Castle Farms to Oakdale Road	2	5,090	C+	2	15,980	D	6	38,520	**C**
"R" Street									
Mission to Childs	2	500	C+	2	1,220	C+	2	10,850	**E**
Childs to SR 99	2	10,750	**E**	2	12,410	**E**	2	17,260	**F**
SR 99 to Bear Creek	4	19,100	C+	4	24,140	C+	4	25,800	C+
Bear Creek to Olive	4	23,370	C+	4	29,990	D	4	34,380	**E**
Olive to Yosemite	4	18,380	C+	4	40,610	**F**	4	43,480	**F**
Yosemite to Cardella	n/a	n/a	n/a	4	32,910	D	6	34,900	C+
Cardella to Bellevue	n/a	n/a	n/a	4	27,940	D	6	35,290	C+
Bellevue to Old Lake	n/a	n/a	n/a	4	26,630	C+	6	34,740	C+
Old Lake to Area of Influence boundary	n/a	n/a	n/a	2	600	C+	2	9,990	C+
"M" Street									
Mission to Childs	2	4,500	C+	2	7,130	D	2	12,890	**E**
Childs to SR 99	2	8,600	D	2	11,440	**E**	2	15,190	**F**
SR 99 to Bear Creek	4	20,440	C+	4	25,580	C+	4	25,560	C+
Bear Creek to Olive	4	21,140	C+	4	28,080	D	4	30,250	D
Olive to Yosemite	4	20,710	C+	4	38,490	**F**	4	41,350	**F**

Roadway/Segment	Existing Conditions			No Project Conditions			General Plan Buildout Conditions		
	Number of Lanes	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]
Yosemite to Cardella	4	9,600	C+	4	31,640	D	4	35,710	**E**
Cardella to Bellevue	n/a	n/a	n/a	2	11,660	**E**	4	12,920	C+
Bellevue to Old Lake	n/a	n/a	n/a	2	10,020	D	4	11,910	C+
Martin Luther King Jr. Way/South SR 59									
Roduner to Mission	2	8,900	C+	4	24,850	C+	4	30,160	D
Mission to Gerard	2	9,800	C+	4	24,770	C+	4	28,970	D
Gerard to Childs	2	15,430	D	4	32,640	D	4	38,100	**F**
Childs to SR 99	4	16,300	C+	4	22,180	C+	4	29,260	D
SR 99 to 16th	4	17,200	C+	4	19,360	C+	4	24,740	C+
"G" Street									
Mission to Childs	2	6,500	D	2	8,400	D	2	12,110	**E**
Childs to SR 99	2	21,300	**F**	2	26,560	**F**	2	33,890	**F**
SR 99 to Bear Creek	4	22,060	C+	4	27,840	D	4	32,520	D
Bear Creek to Olive	4	25,950	C+	4	30,860	D	4	33,990	**E**
Olive to Yosemite	4	22,182	C+	4	28,840	D	4	32,330	D
Yosemite to Cardella	2	6,650	C+	4	23,310	C+	4	26,680	C+
Cardella to Bellevue	2	6,350	C+	4	26,690	C+	4	30,380	D
Bellevue to Old Lake	2	3,020	C+	4	24,090	C+	6	36,750	C+
Old Lake to Snelling	2	3,020	C+	2	14,130	D	4	26,020	C
Parsons Avenue/Gardner Road									
Campus Parkway/Coffee to Gerard	2	620	C+	2	1,020	C+	2	14,390	**F**
Gerard to Childs	2	6,240	D	2	7,450	D	2	16,760	**F**
Childs to SR 140	2	9,600	D	4	31,260	D	4	32,420	D
SR 140 to Bear Creek (part of this segment is incomplete)	2	11,300	**E**	4	32,450	D	4	35,320	**E**
Bear Creek to Olive	2	4,330	C+	4	26,730	C+	4	29,380	D
Olive to Yosemite	2	5,600	D	4	25,750	C+	6	34,590	C+
Yosemite to Cardella	2	1,580	C+	4	19,070	C+	4	33,410	D
Cardella to Bellevue	n/a	n/a	n/a	4	6,410	C+	4	30,580	D
Bellevue to Old Lake	n/a	n/a	n/a	2	3,180	C+	4	17,350	C+
Old Lake to Golf Club	n/a	n/a	n/a	n/a	n/a	n/a	2	9,670	D
McKee Road (Collector)									
Hwy 140/Santa Fe to Bear Creek	2	5,700	D	2	9,580	D	2	13,840	**F**
Bear Creek to Olive	2	8,250	D	2	13,000	**E**	2	16,130	**F**
Olive to Yosemite	2	5,250	D	2	10,590	**E**	2	13,200	**E**
Campus Parkway									
SR 99/Mission to Childs	n/a	n/a	n/a	4	20,840	C+	6	46,200	D
Childs to SR 140	n/a	n/a	n/a	4	25,170	C+	4	35,110	D
SR 140 to Olive	n/a	n/a	n/a	4	28,910	D	4	32,060	D
Olive to Yosemite	n/a	n/a	n/a	4	28,400	D	4	33,950	D

Roadway/Segment	Existing Conditions			No Project Conditions			General Plan Buildout Conditions		
	Number of Lanes	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]
Yosemite to Cardella	n/a	n/a	n/a	4	32,080	D	4	35,720	D
Cardella to Bellevue	n/a	n/a	n/a	4	30,850	D	4	34,350	D
Tyler Road									
Childs to Mission	n/a	n/a	n/a	2	1,600	C+	2	9,830	D
EAST/WEST ARTERIALS									
Old Lake Road									
SR 59 to "R" St.	n/a	n/a	n/a	2	9,320	C+	4	20,840	C+
"R" St. to "M" St.	n/a	n/a	n/a	2	6,280	C+	4	17,890	C
"M" St. to "G" St.	n/a	n/a	n/a	2	7,220	C+	4	17,040	C
"G" St. to Parsons/ Gardner	2	1,700	C+	2	1,700	C+	2	8,630	D
Parsons/Gardner to Lake	2	340	C+	2	340	C+	2	3,830	C+
Bellevue Road									
Atwater/Merced Expy to Thornton	2	3,800	C+				8	55,380	C+
Thornton to SR 59	2	3,800	C+				8	74,340	D
SR 59 to "R" St.	2	5,630	D	6	29,980	C+	6	58,400	**F**
"R" St. to "M" St.	2	5,460	D	6	32,350	C+	6	55,310	**F**
"M" St. to "G" St.	2	5,460	D	6	33,760	C+	6	57,470	**F**
"G" St. to Parsons/Gardner	2	6,620	D	6	39,360	C+	6	52,950	**E**
Parsons/Gardner to Campus Pkwy	2	3,700	C+	6	27,610	C+	6	50,120	D
Cardella Road									
SR 59 to "R" St.	n/a	n/a	n/a	4	23,360	C+	4	31,840	D
"R" St. to "M" St.	2	5,000	C+	4	28,710	D	6	35,340	C+
"M" St. to "G" St.	2	6,800	C+	4	25,370	C+	4	33,520	D
"G" St. to Parsons/Gardner	n/a	n/a	n/a	4	26,950	D	4	33,430	D
Parsons/Gardner to Campus Pkwy	n/a	n/a	n/a	4	28,590	D	4	32,590	D
Yosemite Avenue									
SR 59 to "R" St.	4	12,160	C+	4	11,670	C+	4	26,130	C+
"R" St. to "M" St.	4	15,940	C+	4	27,170	D	4	38,430	**F**
"M" St. to "G" St.	4	19,720	C+	4	28,600	D	4	38,770	**F**
"G" St. to Parsons/ Gardner	2	15,100	D	4	24,710	C+	4	38,990	**F**
Parsons/Gardner to Campus Pkwy	2	7,550	D	4	20,280	C+	4	29,600	D

Roadway/Segment	Existing Conditions			No Project Conditions			General Plan Buildout Conditions		
	Number of Lanes	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]
Olive Avenue									
West of Hwy 59 (Santa Fe Ave)	4	22,800	C+	4	27,620	D	6	33,880	C
SR 59 to "R" St.	6	32,250	C+	6	40,650	C+	6	45,830	D
"R" St. to "M" St.	6	30,560	C+	6	36,780	C+	6	41,060	C+
"M" St. to "G" St.	6	28,210	C+	6	38,100	C+	6	45,030	D
"G" St. to Parsons/Gardner	4	18,500	C+	4	29,880	D	4	34,970	**E**
Parsons/Gardner to Lake	2	7,460	C+	2	14,110	D	2	16,770	**E**
North Bear Creek Drive									
SR 59 to "R" St.	2	4,490	C+	2	10,200	D	2	14,620	**F**
"R" St. to "M" St.	2	6,480	D	2	10,710	**E**	2	14,530	**F**
"M" St. to "G" St.	2	8,360	D	2	11,280	**E**	2	14,840	**F**
"G" St. to Parsons/ Gardner	2	8,780	D	2	12,960	**E**	2	15,510	**F**
Parsons/Gardner to Lake	2	2,400	C+	2	3,990	C+	2	6,400	D
SR 140									
Tina to Thornton	2	10,900	C+	2	13,800	C+	2	19,240	D
Thornton to "V" St.	2	10,200	C+	2	12,920	C+	4	18,020	C+
"G" St. to Parsons	4	10,400	C+	4	19,120	C+	4	34,720	**E**
Parsons to Campus Pkwy	2	7,550	C+	2	9,560	C+	2	13,330	D
16th Street									
SR 99 to "V" St.	4	20,210	C+	4	25,830	C+	4	28,590	D
"V" St. to "R" St.	4	23,200	C+	4	27,430	D	4	28,830	D
"R" St. to "M" St.	4	19,140	C+	4	19,760	C+	4	24,340	C+
"M" St. to "G" St.	4	11,950	C+	4	19,250	C+	4	26,250	C+
"G" St. to SR 99	4	8,630	C+	4	20,420	C+	4	22,840	C+
SR 99									
Atwater/Merced Expy to Franklin	4	66,000	D	4	71,050	**E**	6	96,210	D
Franklin to 16th	4	66,000	D	4	71,690	**E**	6	97,920	D
16th to "V" St.	4	53,000	C+	4	64,190	D	6	87,770	C+
"V" St. to "R" St.	4	53,000	C+	4	63,360	D	6	93,930	D
"R" St. to Martin Luther King	4	42,500	C+	4	61,490	D	6	66,820	C+
Martin Luther King to "G" St.	4	55,000	C+	4	65,440	D	6	83,050	C+
"G" St. to SR 140	4	55,000	C+	4	63,560	D	6	89,060	C+
SR 140 to Childs	4	42,500	C+	4	65,490	D	6	76,980	C+
Childs to Gerard	4	42,500	C+	4	60,890	D	6	66,820	C+
Gerard to Mission	4	66,000	D	4	53,890	D	6	97,920	D
Mission to Mariposa	4	55,000	C+	4	58,080	D	6	84,680	C+

Roadway/Segment	Existing Conditions			No Project Conditions			General Plan Buildout Conditions		
	Number of Lanes	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]
14th Street									
"V" St. to "R" St.	3	6,550	C+	3	9,110	C+	3	10,600	C+
"R" St. to "M" St.	2	4,900	D	2	10,530	C+	2	14,490	D
"M" St. to Martin Luther King	2	700	C+	2	9,570	C+	2	15,220	D
13th Street									
"V" St. to "R" St.	3	6,680	C+	3	11,850	C+	3	11,930	C+
"R" St. to "M" St.	2	4,070	C+	2	8,870	C+	2	9,360	C+
"M" St. to Martin Luther King	2	6,900	D	2	13,460	D	2	15,400	D
Martin Luther King to "G" St.	2	7,400	D	2	7,940	D	2	9,100	D
"G" St. to "B" St.	2	5,000	D	2	8,790	D	2	13,150	**E**
Childs Avenue									
West Ave to SR 59	2	6,260	D	2	7,700	D	2	10,090	D
SR 59 to Tyler	2	4,700	C+	4	13,750	C+	4	27,520	D
Tyler to SR 99	2	6,610	C+	4	29,730	D	4	46,600	**F**
SR 99 to Parsons/Gardner	2	11,770	**E**	4	32,660	D	4	41,870	**F**
Parsons/Gardner to Coffee	2	6,600	D	4	8,640	C+	4	24,590	C+
Coffee to Campus Pkwy	2	4,420	D	4	11,530	C+	4	32,120	D
Campus Pkwy to Tower	2	3,300	D	2	6,370	C+	4	19,390	C+
Gerard Avenue (Collector)									
M to SR 59	2	1,400	C+	2	2,750	C+	2	12,580	**E**
SR 59 to Tyler	2	1,300	C+	2	4,200	C+	2	8,810	D
Tyler to Henry	2	850	C+	2	2,100	C+	2	4,600	C+
Parsons/Gardner to Coffee	2	2,720	C+	2	13,430	**F**	2	18,650	**F**
Coffee to Campus Pkwy	2	2,480	C+	2	6,230	C+	2	35,230	**F**
Campus Pkwy to Tower	2	1,000	C+	2	3,480	C+	2	7,640	D
Dickenson Ferry/Mission Avenue									
Gove to Thornton	2	1,900	C+	2	6,340	C+	2	13,200	D
Thornton to West Ave	2	1,900	C+	4	17,340	C+	4	29,980	D
West Ave to SR 59	2	1,900	C+	4	17,770	C+	6	35,950	C+
SR 59 to Tyler	2	1,800	C+	4	16,150	C+	6	34,870	C+
Tyler to Henry	2	1,250	C+	4	14,350	C+	6	33,800	C+
Henry to SR 99	4	2,020	C+	4	15,630	C+	6	63,350	**F**
SR 99 to Coffee (Future Campus Parkway)	2	890	C+	4	20,840	C+	6	46,200	**D**
Coffee to Tower	2	600	C+	2	640	C+	4	1,890	C+

Roadway/Segment	Existing Conditions			No Project Conditions			General Plan Buildout Conditions		
	Number of Lanes	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]	Planned Number of Lanes[3]	Traffic Volume[1]	LOS[2]

NOTES: *(1) Traffic Volume is measured in ADT's (Average Daily Trips).*
(2) "C+" indicates Level-of-Service (LOS) "C+" or better, including LOS A and B.
(3) The number of lanes shown is the number of lanes planned in the Circulation Element; additional travel lanes, or provision of additional turn lanes at intersections may be needed to provide acceptable roadway operations with the planned level of development.

EXISTING ROADWAY OPERATIONS DEFICIENCIES

Existing Conditions Road Segment Analyses

The results of the existing-conditions road segment analyses are summarized above in Table 3.15-4. As indicated in the table, the following road segments currently operate at substandard levels of service (LOS shown in bold type):

- North SR 59 - 16th to Olive
- North SR 59 – Olive to Yosemite
- "R" Street - Childs to SR 99
- "G" Street - Childs to SR 99
- Parsons Avenue/Gardner Road - SR 140 to Bear Creek (This roadway is incomplete with gaps remaining to be constructed)
- Childs Avenue - SR 99 to Parsons

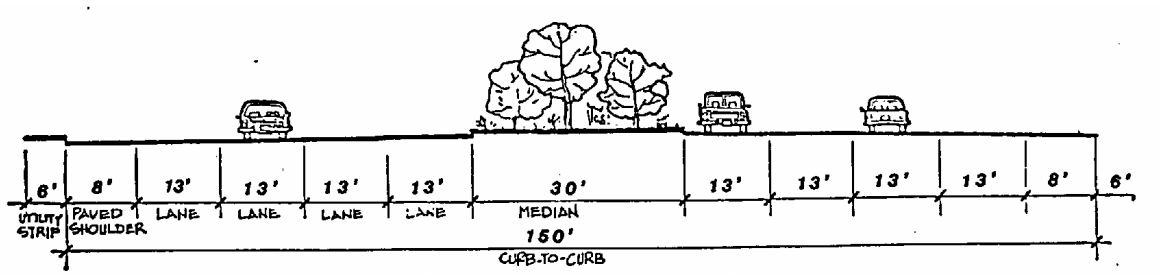
The Land Use and Circulation Map designates roadways as state highways (including freeways), expressways, major arterials, divided arterials, minor arterials, transitways or collectors. Streets not designated on the map would be considered minor collectors or local roads. The various City street cross sections are illustrated in Figure 3.15-8 through 3.15-13.

The proposed Circulation Map generally maintains the existing grid layout of roadways with alternating arterials and collectors at quarter-mile and half-mile spacing.

Table 3.15-4 presents the planned number of lanes, and the existing number of lanes for the City of Merced arterial street system. It should be noted that in some cases where the existing number of lanes equals the planned number of lanes, or the planned number of lanes to be added results in Level of Service E or F at General Plan buildout, physical constraints exist that preclude road widening to achieve Level of Service D or better in accordance with General Plan policy. Although additional travel lanes may not be possible along these corridors, additional improvements such as constructing sidewalks, curb and gutter, or bicycle facilities may be possible.

Figure 3.15-8

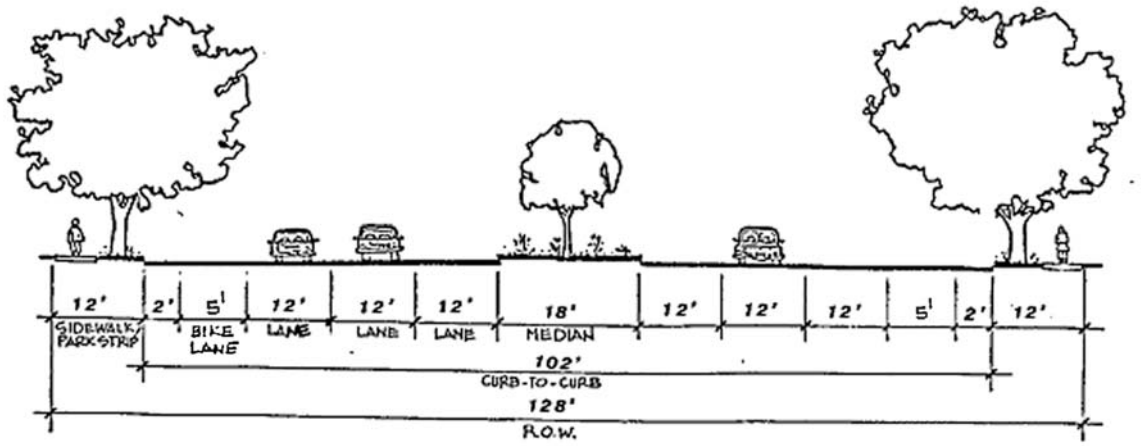
EXPRESSWAY CROSS-SECTION



8-Lane Expressway

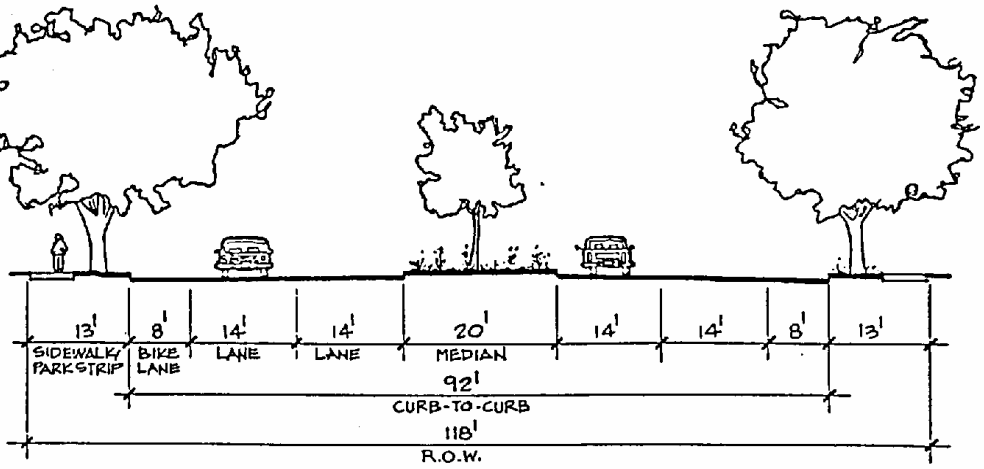
Figure 3.15-9

MAJOR ARTERIAL/ARTERIAL CROSS-SECTIONS

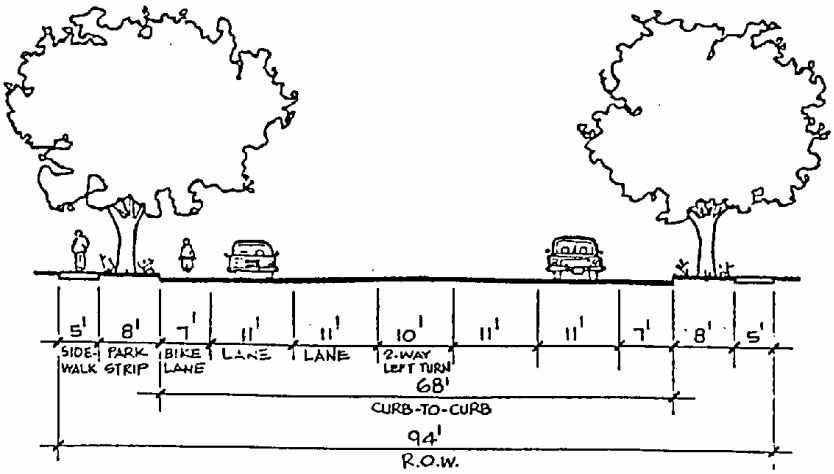


Major Arterial/Arterial

Figure 3.15-10
DIVIDED/MINOR ARTERIAL CROSS-SECTIONS



Divided Arterial



Minor Arterial

Figure 3.15-11

TRANSITWAY CROSS-SECTION ("TRANSIT-ONLY PORTIONS")

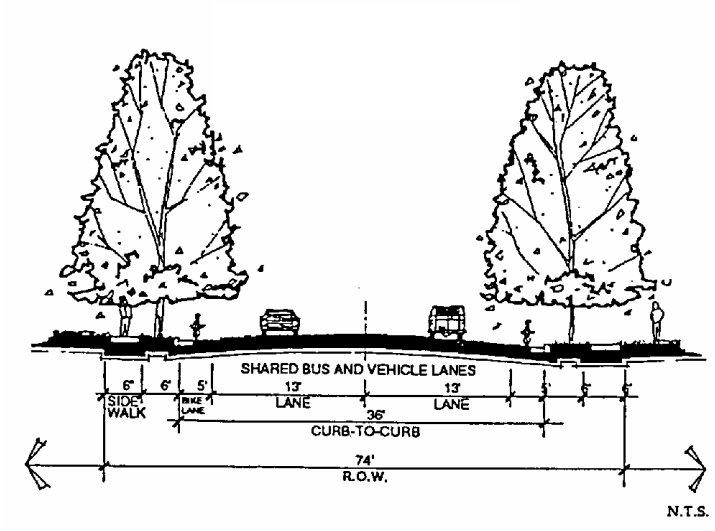
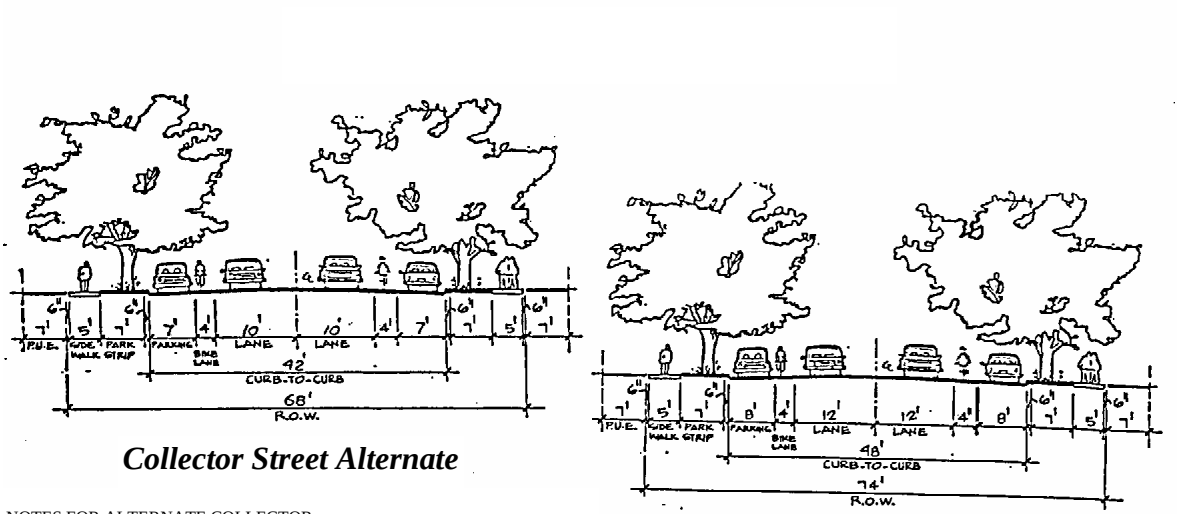


Figure 3.15-12

COLLECTOR STREET CROSS-SECTIONS



Collector Street Alternate

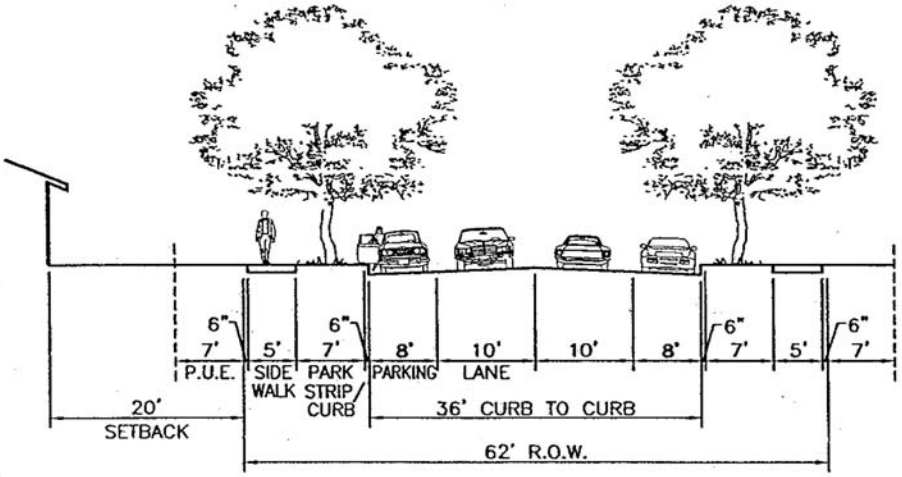
Collector

NOTES FOR ALTERNATE COLLECTOR:

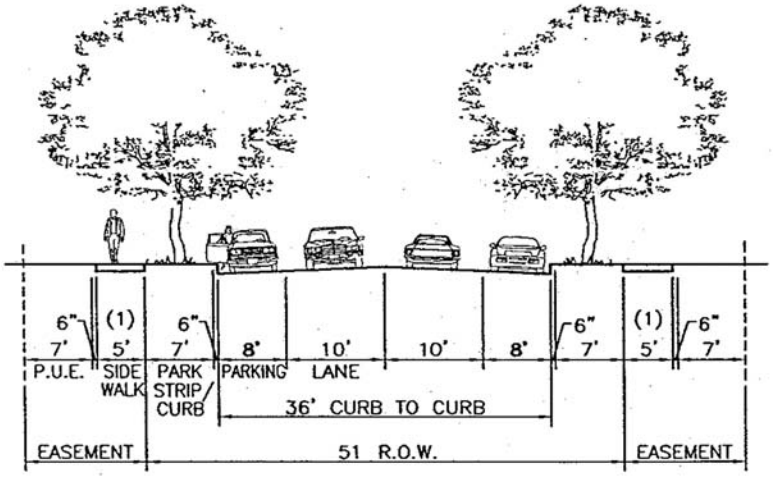
1) 68 feet of right-of-way may be permitted where supported by a traffic analysis to assure that the narrower street would not be overloaded. Analysis would include trip generation and distribution based on existing and future land use and circulation system. Additional width may be necessary at intersection where analysis shows need for turn lane(s).
2) Fronting lots would be permitted on collectors where a traffic analysis shows daily traffic volumes will not exceed 1,500 vehicles under ultimate conditions.
3) On-street parking may be deleted if adequate, convenient off-street parking is provided in a subdivision design.
4) A subdivision design with deletion of on-street bike lanes may be permitted if adequate, convenient Class I bikepath is available.

Figure 3.15-13

LOCAL STREET CROSS-SECTIONS



LOCAL STREET



LOCAL STREET ALTERNATE

(1) SIDEWALK IS WITHIN THE EASEMENT

NOTES:

1. THE LOCAL STREET ALTERNATE PLACES THE SIDEWALK IN AN EASEMENT.
2. ON-STREET PARKING MAY BE DELETED ON LOCAL AND CUL-DE-SAC STREETS IF ADEQUATE CONVENIENT OFF-STREET PARKING IS PROVIDED IN A SUBDIVISION DESIGN.
3. 41 FOOT RIGHT-OF-WAY (28 FOOT CURB TO CURB) IS PERMITTED FOR A CUL-DE-SAC UP TO 150 FEET IN LENGTH MEASURED FROM CENTER OF BULB TO RIGHT-OF-WAY LINE OF INTERSECTING STREET.

Regulatory Setting

FEDERAL

There are no federal or state regulations applicable to transportation/traffic.

STATE

The State has adopted Level-of-Service (LOS) "C" as the LOS threshold standard for traffic operations on State highways.

LOCAL

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to Transportation/traffic impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Land Use, Sustainability and Transportation and Circulation Elements of the General Plan are designed to ensure that transportation/traffic impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Land Use Policies:

L-1.7 Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.

L-1.9 Ensure connectivity between existing and planned urban areas.

L-2.7 Locate and design new commercial development to provide good access from adjacent neighborhoods and reduce congestion on major streets.

L-3.1 Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.

L-3.3 Promote site designs that encourage walking, cycling, and transit use.

Sustainability Policies:

SD-1.3 Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment.

SD-1.4 Educate the public on the impact of individual transportation, lifestyle, and land use decisions on air quality.

Transportation and Circulation Policies:

T-1.1 Design streets consistent with circulation function, affected land uses, and all modes of transportation.

T-1.2 Coordinate circulation and transportation planning with pertinent regional, State and Federal agencies.

T-1.3 Design major roads to maximize efficiency and accessibility.

T-1.4 Promote traffic safety for all modes of transportation.

T-1.5 Minimize unnecessary travel demand on major streets and promote energy conservation.

T-1.6 Minimize adverse impacts on the environment from existing and proposed road systems.

T-1.7 Minimize street system impacts on residential neighborhoods and other sensitive land uses.

T-1.8 Use a minimum peak hour Level of Service (LOS) “D” as a design objective for all new streets in new growth areas and for most existing City streets except under special circumstances.

T-2.1 Provide for and maintain a major transitway along "M" Street and possibly along the Bellevue Road/Merced-Atwater Expressway and Campus Parkway corridors.

T-2.2 Support and enhance the use of public transit.

T-2.3 Support a safe and effective public transit system.

T-2.4 Encourage the use of bicycles.

T-2.5 Provide convenient bicycle support facilities to encourage bicycle use.

T-2.6 Maintain and expand the community’s existing bicycle circulation system.

T-2.7 Maintain a pedestrian-friendly environment.

T-2.8 Improve planning for pedestrians.

T-2.9 Ensure that new development provides the facilities and programs that improve the effectiveness of Transportation Control Measures and Congestion Management Programs.

AIR

T-3.1 Preserve the Merced Regional Airport and its protective zones from incompatible encroachment and incompatible development within the Airport Industrial Park.

T-3.2 Promote and encourage the orderly and timely development of commercial and general aviation facilities.

T-3.3 Provide adequate ground transportation systems that complement air transportation facilities.

RAIL

T-3.4 Reduce rail system impacts on circulation within the urban area.

T-3.5 Support enhanced railroad passenger service and high speed rail service for Merced.

T-3.6 Retain and expand as needed rail facilities serving industrial development.

3.15.2 THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicles trips, the volume to capacity ratio on roads, or congestion at intersections)

- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

- Result in inadequate emergency access

- Result in inadequate parking capacity

- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)

3.15.3 IMPACTS AND MITIGATION MEASURES

Impact #3.15-1: Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system and/or exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

Discussion/Conclusion: The Circulation Plan designates roadways as state highways (including freeways), expressways, major arterials, arterials, or collectors. Conceptual Collectors and selected local streets/rural roads are also shown on the Plan. The various street cross sections are illustrated in Figures 3.15-8 through 3.15-13.

Table 3.15-4 presents the planned number of lanes, and the existing number of lanes for the City of Merced arterial street system.

ANALYSIS OF PROPOSED MERCED 2030 GENERAL PLAN CONDITIONS

The study area includes the proposed planning area presented in the Circulation Plan Diagram (Figure 3.15-1). The study locations for purposes of this traffic analysis are the roadways listed in Table 3.15-4.

Daily roadway operations were analyzed for the following scenarios:

- Existing Conditions;
- No Project; and
- Year 2030 Conditions with Plan Update.

The Merced County Association of Governments (MCAG) regional travel demand model was modified to use as the tool to evaluate the impacts of the proposed General Plan on the local and regional transportation system. The MCAG model forecasts average weekday daily traffic volumes on the freeways, arterials, and major collector roads in the Merced region. Modifications were made to the model to better replicate the proposed circulation and land use plan. The General Plan buildout analysis considers roadway improvements contained in the 2007 MCAG Regional Transportation Plan (Tier 1), and roadway improvements that would be constructed to support development of the proposed land use plan (Table 3.15-5).

Table 3.15-5
Major Street Improvement Projects

Project #	Project Type	Location/Improvement Summary
1	Upgrade Arterial	Thornton from SR 140 to Mission and Yosemite to Bellevue
2	Upgrade Arterial	SR 59 from 16th to Oakdale Road
3	Upgrade Arterial	SR 59 from Childs to Roduner
4	Extend/Upgrade Arterial/Collector	R St. from Gerard to Area of Influence Boundary
5	Upgrade Arterial/Extend Transitway	M St. from Yosemite to Old Lake
6	Upgrade Arterial	M.L.K. Jr. Way from Roduner to Gerard
7	Upgrade Arterial	G St. from Yosemite to Snelling Hwy.
8	Upgrade Arterial	Parsons/Gardner from Coffee to Golf Club
9	Extend Expressway	Campus Parkway from Mission to Yosemite Avenue
10	Extend/Upgrade Arterial	Old Lake from SR 59 to Lake
11	Upgrade Arterial/Expressway	Bellevue from Campus Parkway to Atwater/ Merced Expressway
12	Extend Arterial	Tyler Road from Childs to Mission
13	Extend Arterial	Cardella from Thornton to Campus Parkway
14	Upgrade Arterial	Yosemite from Thornton to Campus Parkway
15	Upgrade Arterial	Olive Ave. West of SR 59 (Santa Fe Ave.)
16	Upgrade Arterial	SR 140 from Parsons Avenue to Tower Road

Project #	Project Type	Location/Improvement Summary
*17	Upgrade to 6 Lanes, with the potential for auxiliary lanes between major interchanges.	SR 99 through Merced
18	Modify Ramps & Complete 13th/14th 1-way Couplet	SR 99 @ Martin Luther King Jr. Way, G St., & Childs Avenue
19	Upgrade Arterial	Childs from SR 59 to Tower
20	Upgrade Arterial	Dickenson Ferry/Mission from Thornton to Tower
21	Extend Expressway	Atwater/Merced Expressway from SR 99 to Bellevue Avenue
22	Interchange	Atwater/Merced Expressway @ SR 99
23	Interchange	Atwater/Merced Expressway @ Santa Fe Drive
24	Interchange	Atwater/Merced Expressway @ Bellevue Road
* This project (which is the responsibility of the State) is currently included in the SR 99 concept plan and is listed as a Tier I project in the MCAG Regional Transportation Plan (RTP).		

The model assumes a level of development outside of the Merced SUDP/Sphere of Influence consistent with County growth projections from the California Department of Finance and with presently-adopted general plans of MCAG jurisdictions. These development forecasts are considered to be an adopted "summary of projections" for purposes of determining Cumulative impacts, as defined in Section 15130(b)(1)(B) of the CEQA Guidelines.

The forecast volumes were not used directly from the MCAG Model. Instead, forecast traffic volumes were adjusted based on the incremental change between the Base year model estimates and the Future model forecasts using the following formula:

Adjusted Forecast Volume = Base Year Count + (Model Forecast Volume – Base Year Model Volume)

This adjustment process helps minimize model error in the forecasts where the error is known (i.e. where base year counts are available).

The proposed Circulation Element states that the City shall strive to maintain LOS D or better on all streets under the jurisdiction of the City of Merced. State highways and freeways shall be subject to LOS criteria established by Caltrans. The Caltrans *Guide for the Preparation of Traffic Impact Studies*, dated December 2002, indicates that Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D. In practice, this typically is interpreted as a minimum acceptable LOS C, with LOS D being unacceptable except in urban areas where LOS C is not feasible.

EXISTING ROADWAY SEGMENT CONDITIONS

As indicated in Table 3.15-4, the following road segments currently operate at substandard levels of service:

- North SR 59 - 16th to Olive (LOS F)
- North SR 59 – Olive to Yosemite (LOS F)
- "R" Street - Childs to SR 99 (LOS E)

- "G" Street - Childs to SR 99 (LOS F)
- Parsons Avenue/Gardner Road - SR 140 to Bear Creek (LOS E) (This roadway section is incomplete with gaps remaining to be constructed, including a bridge over Bear Creek and a railroad undercrossing.)
- Childs Avenue - SR 99 to Parsons (LOS E)

PROPOSED 2030 GENERAL PLAN ROADWAY SEGMENT CONDITIONS

Generally accepted traffic engineering principles and methods were employed to analyze current traffic conditions and those expected to occur with implementation of the proposed 2030 General Plan. The traffic conditions analysis has concluded that many of the existing and planned roadways within the planning area are expected to operate at acceptable levels of service at General Plan buildout. However, the following road segments are components of the Major Street Improvement projects listed in Table 3.15-5 that, while widened with additional lanes, are still anticipated to operate at LOS E or F (a significant impact) due to projected daily trip volume increases:

1. Childs Avenue from Tyler to SR 99 (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=F

2. Childs Avenue from SR 99 to Parsons/Gardner (2 lanes to 4 lanes) Existing LOS=E /Future LOS=F

3. Dickenson Ferry Rd./Mission Ave. from West Avenue to SR 59 (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=F

4. Dickenson Ferry Rd./Mission Ave. from SR 59 to Tyler (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=E

5. Dickenson Ferry Rd./Mission Ave. from Tyler to Henry (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=E

6. Dickenson Ferry Rd./Mission Ave. from Henry to SR 99 (4 lanes to 6 lanes) Existing LOS=C+ / Future LOS=F

7. Dickenson Ferry Rd./Mission Ave. from SR 99 to Coffee (Future Campus Parkway) (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=F

8. "R" Street Extension from Yosemite to Cardella (no lanes to 4 lanes) Existing LOS=none / Future LOS=E

9. "R" Street Extension from Cardella to Bellevue (no lanes to 4 lanes) Existing LOS=none / Future LOS=E

10. "R" Street Extension from Bellevue to Old Lake (no lanes to 4 lanes) Existing LOS=none / Future LOS=E

11. "M" Street Transitway Extension from Bellevue to Old Lake (no lanes to 2 lanes) Existing LOS=none / Future LOS=E

12. Cardella Road from "R" Street to "M" Street (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=E

13. Parsons/Gardner from SR 140 to Bear Creek (2 lanes to 4 lanes) Existing LOS=E / Future LOS=E

14. Parsons/Gardner from Olive to Yosemite (2 lanes to 4 lanes) Existing LOS=D / Future LOS=E

15. Parsons/Gardner Extension from Bellevue to Old Lake (no lanes to 2 lanes) Existing LOS=none / Future LOS=F

16. Old Lake Road Extension from SR 59 to "R" Street (no lanes to 2 lanes) Existing LOS=none / Future LOS=F

17. Old Lake Road Extension from "R" Street to "M" Street (no lanes to 2 lanes) Existing LOS=none / Future LOS=F

18. Old Lake Road Extension from "M" Street to "G" Street (no lanes to 2 lanes) Existing LOS=none / Future LOS=F

19. Campus Parkway Expressway Extension from Mission to Childs (no lanes to 4 lanes) Existing LOS=none / Future LOS=F

20. Bellevue Road from Atwater/Merced Expressway to Campus Parkway (2 lanes to 6 lanes) Existing LOS=C+ or D / Future LOS=F or E

21. "G" Street from Bellevue to Old Lake (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=F

22. Yosemite from "G" Street to Parsons/Gardner (2 lanes to 4 lanes) Existing LOS=D / Future LOS=F

It should be noted that the LOS results presented in Table 3.15-4 represents a worst case scenario, as the roadway segment analysis is based on buildout of the Merced Vision 2030 General Plan, which most likely will not occur in its entirety by the year 2030, and the analysis does not consider the additional capacity that is provided at intersections for additional turn pockets (i.e. dual left-turn pockets), nor the benefits of signal timing coordination and advanced traffic signal technology that will be phased in over the life of the General Plan. However, in consideration of the projected LOS E and F status of these roadway segments, even after completion of capacity enhancing improvements, and absent funding guarantees for many of the roadway improvement projects identified in the traffic conditions analysis, and referenced in the mitigation measures below, the traffic impacts associated with build-out of the proposed Merced Vision 2030 General Plan are considered ***potentially significant.***

Mitigation Measures

Implementation of the following mitigation measures and the Goals, Policies, and Implementing Actions of the *Merced Vision 2030 General Plan* will reduce the impact of increased traffic on area roadways as the 2030 General Plan is implemented; however, absent funding guarantees for many of the roadway improvement projects identified in the traffic conditions analysis, and referenced in the mitigation measures below, the traffic impacts associated with build-out of the proposed *Merced Vision 2030 General Plan* are considered ***significant and unavoidable***.

Mitigation Measure #3.15-1a:

Table 3.15-4 indicates the recommended number of travel lanes for several of the road segments analyzed to keep traffic levels-of-service at the City's preferred LOS "D" at General Plan buildout. Implementation of the following projects will permit the City to manage its traffic volumes at Level of Service "D", or better:

1. *SR 59 from 16th to Olive (2 lanes to 6 lanes) Existing LOS=F / Future LOS=D*
2. *SR 59 from Olive to Yosemite (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D*
3. *SR 59 from Yosemite to Cardella (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*
4. *SR 59 from Cardella to Bellevue (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*
5. *SR 59 from Bellevue to Old Lake (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C*
6. *SR 59 from Old Lake to Castle Farms (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D*
7. *"R" Street from Old Lake to Area of Influence Boundary (Future Extension 0 lanes to 2 lanes) Existing LOS= none / Future LOS=C+*
8. *"M" Street from Cardella to Bellevue (Future Extension 0 lanes to 4 lanes) Existing LOS=none / Future LOS = C+*
9. *"M" Street from Bellevue to Old Lake (Future Extension 0 lanes to 4 lanes) Existing LOS=none / Future LOS = C+*
10. *Martin Luther King Jr. Way/South SR 59 from Roduner to Mission (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*
11. *Martin Luther King Jr. Way/South SR 59 from Mission to Gerard (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*

12. *"G" Street from Yosemite to Cardella (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=C+*

13. *"G" Street from Cardella to Bellevue (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*

14. *"G" Street from Bellevue to Old Lake (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D*

15. *"G" Street from Old Lake to Snelling (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=C*

16. *Parsons/Gardner from Childs to SR 140 (2 lanes to 4 lanes) Exiting LOS=D / Future LOS=D*

17. *Parsons/Gardner from Bear Creek to Olive (2 lanes to 4 lanes) Exiting LOS=C+ / Future LOS=D*

18. *Parsons/Gardner from Olive to Yosemite (2 lanes to 6 lanes) Exiting LOS=D / Future LOS=D*

19. *Parsons/Gardner from Yosemite to Cardella (2 lanes to 4 lanes) Exiting LOS=C+ / Future LOS=D*

20. *Parsons/Gardner from Cardella to Bellevue (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

21. *Parsons/Gardner from Bellevue to Old Lake (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C+*

22. *Parsons/Gardner from Old Lake to Golf Club (Future Extension 0 lanes to 2 lanes) Existing LOS= none / Future LOS=D*

23. *Campus Parkway SR 99/Mission to Childs (Future Extension 0 lanes to 6 lanes) Existing LOS= none / Future LOS=D*

24. *Campus Parkway from Childs to SR 140 (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

25. *Campus Parkway from SR 140 to Olive (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

26. *Campus Parkway from Olive to Yosemite (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

27. *Campus Parkway from Yosemite to Cardella (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

28. *Campus Parkway from Cardella to Bellevue (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

29. *Tyler Road from Childs to Mission (Future Extension 0 lanes to 2 lanes) Existing LOS= none / Future LOS=D*

30. *Old Lake Road SR 59 to "R" Street (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C+*

31. *Old Lake Road "R" Street to "M" Street (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C*

32. *Old Lake Road "M" Street to "G" Street Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C*

33. *Bellevue Road from Atwater/Merced Expressway to Thornton (2 lanes to 8 lanes Exiting LOS=C+ / Future LOS=C+*

34. *Bellevue Road from Thornton to SR 59 (2 lanes to 8 lanes Exiting LOS=C+ / Future LOS=D*

35. *Bellevue Road from Parsons/Gardner to Campus Parkway (2 lanes to 6 lanes) Exiting LOS=C+ / Future LOS=D*

36. *Cardella Road from SR 59 to "R" Street (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

37. *Cardella Road from "M" Street to "G" Street (2 lanes to 4 lanes) Existing LOS= C+ / Future LOS=D*

38. *Cardella Road from "G" Street to Parsons/Gardner (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

39. *Cardella Road from Parsons/Gardner to Campus Parkway (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=D*

40. *Yosemite Avenue from Parsons/Gardner to Campus Parkway (2 lanes to 4 lanes) Existing LOS=D / Future LOS=D*

41. *Olive Avenue West of Hwy 59 (Santa Fe Avenue) (4 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C*

42. *SR 99 from Atwater/Merced Expressway to Mariposa (4 lanes to 6 lanes through Merced) Existing LOS=C+ and D / Future LOS=C+ and D*

43. *Childs Avenue from SR 59 to Tyler (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*

44. *Childs Avenue from Parsons/Gardner to Coffee (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*

45. *Childs Avenue from Coffee to Campus Parkway (2 lanes to 4 lanes) Existing LOS=D / Future LOS=D*

46. *Childs Avenue from Campus Parkway to Tower (Future Extension 0 lanes to 4 lanes) Existing LOS= none / Future LOS=C+*

47. *Dickerson Ferry/Mission Avenue from Thornton to West Avenue (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*

48. *Dickerson Ferry/Mission Avenue from West Avenue to SR 59 (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C+*

49. *Dickerson Ferry/Mission Avenue from SR 50 to Tyler (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C+*

50. *Dickerson Ferry/Mission Avenue from SR 99 to Coffee (Future Campus Parkway)(2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=C+*

51. *Dickerson Ferry/Mission Avenue from Tyler to Henry (2 lanes to 6 lanes) Existing LOS=C+ / Future LOS=D*

52. *Dickerson Ferry/Mission Avenue from Coffee to Tower (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=C+*

53. *Thornton from Dickerson Ferry/Mission to SR 140 (2 lanes to 4 lanes) Existing LOS=C+ / Future LOS=D*

Mitigation Measure #3.15-1b:

Traffic studies should be performed to satisfy the requirements of the California Environmental Quality Act (CEQA) for all proposed General Plan Amendments which intensify development, proposed specific plans, annexations, and other projects at the discretion of the Development Services Department. Future traffic studies should generally conform to any guidelines established by the City. The studies should be performed to determine, at a minimum, opening-day impacts of proposed projects and as confirmation or revision of the General Plan. The studies should address queue lengths and (at a minimum) peak-hour traffic signals warrants in addition to LOS and provide appropriate mitigations. At the discretion of the City, a complete warrant study in accordance with the most recent edition of the California Manual on Uniform Traffic Control Devices may be required to evaluate the need for traffic signals.

Effectiveness of Mitigation Measures:

While implementation of the above mitigation measures and the Goals, Policies, and Implementing Actions of the *Merced Vision 2030 General Plan* will help reduce traffic impacts resulting from implementation of the *Merced Vision 2030 General Plan*, the traffic analysis prepared for the 2030 General Plan concludes that a significant number of roadways within the Planning Area will be operating at LOS of E or F after additional lanes are added. This conclusion, and the absence of guaranteed funding for the majority of the roadway improvement projects identified in the traffic conditions analysis makes the traffic impacts associated with build-out of the proposed *Merced Vision 2030 General Plan* ***significant and unavoidable***.

Impact #3.15-2: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks

Discussion/Conclusion: The Merced Regional Airport is a publicly owned, public use facility providing commercial air service and freight air cargo service. Castle Air Force Base (CAFB) was closed in 1995 and renamed the Castle Airport.

In an effort to minimize changes in air traffic patterns associated with the Merced Regional Airport, the 2030 General Plan proposes low-intensity land uses, such as industrial (and Industrial Reserve), as opposed to land uses such as commercial and residential that carry higher population densities, adjacent to the Runway Protection Zones (Zone A) in accordance with the Merced County Airport Land Use Compatibility Plan and Federal Aviation Administration recommendations. The proposed Castle Farms development within Castle Airport's influence area has proposed significant open space to address overflight concerns. The City of Merced General Plan contains polices to ensure that development within the City of Merced and SUDP/SOI Area are designed to minimize safety risks associated with air traffic patterns. Adherence to the policies and implementing actions contained in the 2030 General Plan will ensure safety risks associated with air traffic patterns are minimized in the vicinity of the Merced Regional Airport and the Castle Airport. This impact is considered to be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.15 -3: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

Discussion/Conclusion: Future development within the Plan area will be subject to the 2030 General Plan Circulation Plan and Circulation Element polices. Additionally, future roadways, and improvements to existing roadways, will be designed in accordance with the City's Roadway Design Standards that include street cross sections designed to create a community circulation network to move people efficiently and safely throughout the City, whether by automobile, bicycle, or foot.

Compliance with the policies of the 2030 General Plan and the City's Roadway Design Standards will ensure that there will not be a significant increase in hazards due to design features or incompatible uses as the City General Plan is implemented and this impact is considered ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.15-4: Result in Inadequate Emergency Access

Discussion/Conclusion: The 2030 General Plan Circulation Plan and Policies promote emergency vehicle access to all portions of the City and Plan Area and implementation of the 2030 General Plan will not result in inadequate emergency access. Additionally, roadway improvement standards adopted by the City of Merced provide for adequate street width and secondary access to ensure that emergency vehicles have adequate access to development throughout the Plan Area.

Compliance with the policies of the 2030 General Plan and the City's Roadway Design Standards will ensure that adequate emergency vehicle access is provided throughout the City and this impact is considered to be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.15-5: Result in Inadequate Parking Capacity

Discussion/Conclusion: Future development in the 2030 General Plan Area will be subject to parking requirement provisions of the City of Merced Zoning Ordinance. These requirements are sufficient to ensure that adequate on-site and off-site parking will be provided within the Plan Area. Compliance with the parking space requirements contained in the City of Merced Zoning Ordinance will ensure that new development provides adequate parking in the Plan Area and there will be ***no impact*** from inadequate parking capacity.

Mitigation Measures

No mitigation measures are required.

Impact #3.15-6: Conflict with Adopted Polices Supporting Alternative Transportation

Discussion/Conclusion: The 2030 General Plan includes transportation policies that provide for future transit stations/transitways and an integrated system of pedestrian and bicycle trails and implementation of the Plan will not conflict with other policies supporting all modes transportation, including bicycles, pedestrians, and public transit.. There is ***no impact***.

Mitigation Measures

No mitigation measures are required.

3.16

UTILITIES/SERVICES

3.16 Utilities/Services

This section of the Draft EIR analyzes the potential demands on Utilities and Service Systems generated by the proposed project and makes determinations of the significance of these impacts on the provider of these services.

3.16.1 SETTING

Environmental Setting

WATER SUPPLY

The Merced water system had its beginnings in the pioneer efforts of C. H. Huffman and Charles Crocker in 1868, when they established the Merced Water Company. The company was responsible for construction of Lake Yosemite. The first connections to the City of Merced in 1899 were made possible by a 16-inch line from Lake Yosemite. In 1917, the domestic water was changed to a well system and the largest capacity elevated storage tank in California was built (300,000 gallons).

In 1973, the City of Merced Water Division assumed operations from the privately owned Merced Water Company and has maintained operations ever since. The current system is composed of 21 groundwater production wells located throughout the City, approximately 284 miles of main lines, and 4 water tower tanks for storage of approximately 1.6 million gallons. Automated well operations ensure reliability and adequate system pressure, attempted to be maintained at 45 to 50 pounds per square inch (psi), at all times to satisfy customer demand; diesel-powered generators help maintain uninterrupted operations during power outage. The City is required to meet State Health pressure requirements, which call for a minimum of 20 psi at every service connection under the annual peak hour condition and maintenance of the annual average day demand plus fire flow, whichever is stricter. To keep pace with water supply demands, two new wells were added in 2006 and an additional well is presently under construction. The City of Merced Water system delivered 20.75 million gallons of drinking water per day in 2009 to approximately 20,269 residential, commercial, and industrial customer locations. The City of Merced Water Division is operated by the Public Works Department.

The City of Merced's wells have an average depth of 414 feet and range in depth from 161 feet to 800 feet. The depth of these wells would suggest that the City of Merced is primarily drawing water from a deep aquifer associated with the Mehrten geologic formation. Increasing urban demand and associated population growth, along with an increased shift by agricultural users from surface water to groundwater and prolonged drought, have resulted in declining groundwater levels due to overdraft. This condition was recognized by the City of Merced and the Merced Irrigation District (MID) in 1993, at which time the two entities began a two-year planning process to assure a safe and reliable water supply for Eastern Merced County through the year 2030.

Merced has engaged in a number of water planning forums, and actively participates in the various entities which share concerns for water supply in the area. In 1995, the *Merced Water*

Supply Plan was created, establishing goals for managing groundwater resources and for providing a continued, high quality supply of water. In 2001, the *Merced Water Supply Plan Update* was prepared. Both plans addressed the problems of water supply, which were compounded by the increasing demand for water from population growth, persistent drought, and a change by agricultural users from surface water to groundwater. These increased demands have resulted in a decrease in groundwater levels and have led to overdraft of the aquifer.

At the completion of the 1995 and 2001 plans, recommended actions to restore the aquifer were made, and a preferred alternative was identified. The preferred alternative indicated that the study area will remain on groundwater, with a goal that groundwater levels be stabilized at 1999 levels, by recharging the groundwater basin with imported surface water from the Merced River.

Further studies of the Merced Groundwater Basin were provided through the Merced Area Groundwater Pool Interests (MAGPI), formed in 1993. As a result of this research, in 1997, MAGPI published the *Merced Groundwater Management Plan*, which constitutes the City's groundwater management plan. The management plan was updated in July 2008.

Water needs within the Merced River, relative to fishery resources, were also evaluated and the study concluded that fishery resource needs within the Merced River are expected to dramatically increase. Conversely, agricultural needs are likely to decrease by 12 percent by the year 2030 in response to improved conservation practices and as the trend toward less water-intensive crops continue; however, it is anticipated that 90 percent of all permanent crops and 20 percent of field crops will be irrigated by private wells due to an increased cost in delivering surface water. This condition will place an increasing demand on the groundwater aquifers as agricultural interests' transition from surface water resources in favor of private wells.

In terms of water supply, the plan determined that if current patterns of water usage continue and no action was taken, groundwater levels would continue to decline, resulting in increasing costs and poor water quality. Concurrent with this activity, MID will increase the delivery of surface water to agricultural users along with new wells to protect against drought.

In 2005, the City adopted an Urban Water Management Plan (UWMP) as required by State law. The UWMP further describes the availability of water, and discusses water use, reclamation, and recycling activities. In addition to assessing the projected needs, the UWMP identifies a number of conservation practices which, when implemented, will relieve the pressure on groundwater supplies.

Issues that will need further study include the location and timing of construction of groundwater recharge facilities, which agency or agencies will operate and maintain these facilities, and what costs should be shared. It is indicated that by 2040, approximately 100,000 acre feet of recharge per year will be needed to maintain 1999 groundwater levels.

WASTEWATER TREATMENT

Wastewater (sanitary sewer) collection and treatment in the Merced urban area is provided by the City of Merced. The wastewater collection system handles wastewater generated by residential, commercial, and industrial uses in the City.

The City Wastewater Treatment Plant (WWTP), located in the southwest part of the City about two miles south of the airport, has been periodically expanded and upgraded to meet the needs of the City's growing population and new industry. The City's wastewater treatment facility has a capacity of 11.5 million gallons per day (mgd), with an average 2006 flow of 8.5 mgd. The City has initiated an expansion project to increase capacity to 12 mgd and upgrade to tertiary treatment with the addition of filtration and ultraviolet disinfection. Future improvements would add another 8 mgd in capacity (in increments of 4 mgd), for a total of 20 mgd. This design capacity can support a population of approximately 174,000. The collection system will also need to be expanded as development occurs.

Treated effluent is disposed of in several ways depending on the time of year. Most of the treated effluent (75% average) is discharged to Hartley Slough throughout the year. The remaining treated effluent is delivered to a land application area and the on-site City-owned wetland area south of the treatment plant.

STORM DRAINAGE

The *City of Merced Storm Drainage Master Plan* addresses the collection and disposal of surface water runoff in the City's 1997 SUDP. The study addresses both the collection and disposal of storm water. Systems of storm drain pipes and catch basins are laid out, sized, and costed in the plan to serve present and projected urban land uses. The City will need to update the 2002 Storm Drain Master Plan in order to address the proposed SUDP/SOI boundary.

It is the responsibility of the subdivider to insure that utilities, including storm water and drainage facilities, are installed in compliance with City regulations and other applicable regulations. Necessary arrangements with the utility companies or other agencies will be made for such installation, according to the specifications of the governing agency and the City (Ord. 1342 § 2 (part), 1980: prior code § 25.21(f)). The City requires the construction of storm water percolation/detention basins with new development. Percolation basins are designed to collect storm water and filter it before it is absorbed into the soil and reaches groundwater tables. Detention basins are designed to temporarily collect runoff so it can be metered at acceptable rates into canals and streams which have limited capacity. The disposal system is mainly composed of MID facilities, including water distribution canals and laterals, drains, and natural channels that traverse the area.

The City of Merced has been involved in developing a Storm Water Management Plan (SWMP) to fulfill requirements of storm water discharges from Small Municipal Separate Storm Sewer System (MS4) operators in accordance with Section 402(p) of the Federal Clean Water Act (CWA). The SWMP was developed to also comply with General Permit Number CAS000004, Water Quality Order No. 2003-0005-DWQ. The Merced Storm Water Group (MSWG) is a

coalition of municipalities consisting of the Cities of Atwater, Livingston, Merced, Merced County and the Merced Irrigation District. The SWMP will be implemented to limit, to the maximum extent practicable, the discharge of pollutants from the MSWG storm sewer system. Implementation of these control measures laid out in the SWMP is expected to result in significant reductions of pollutants discharged into receiving water bodies. The six control measures are addressed in separate sections of the SWMP.

Each control measure contains Best Management Practices (BMPs) necessary for proper storm water management. The BMPs contain specific tasks to meet the objective of that control measure. This SWMP is intended to be a living document with BMPs added and deleted as new management practices arise and management practices are found not to work. A schedule for implementing each BMP is provided at the end of each section.

SOLID WASTE

The City of Merced is served by the Highway 59 Landfill and the Highway 59 Compost Facility, located at 6040 North Highway 59, one and one-half miles north of Old Lake Road. The County of Merced is the contracting agency for landfill operations and maintenance, while the facilities are owned by the Merced County Association of Governments. The City of Merced provides services for all refuse pick-up within the City limits and franchise hauling companies collect in the unincorporated areas. In addition to these two landfill sites, there is one private disposal facility, the Flintkote County Disposal Site, at SR 59 and the Merced River. This site is restricted to concrete and earth material.

Regulatory Setting

FEDERAL

The federal Clean Water Act regulates the discharge of pollutants into surface waters. The City's waste water treatment system requires a National Pollutant Discharge Elimination System (NPDES) permit in order to discharge treated water.

STATE

Senate Bill 610 Urban Water Management Plans

SB 610 makes changes to the Urban Water Management Planning Act to require additional information in Urban Water Management Plans if groundwater is identified as a source available to the supplier. The information required includes a copy of any groundwater management plan adopted by the supplier, a copy of the adjudication order or decree for adjudicated basins, and if non-adjudicated, whether the basin has been identified as being overdrafted or projected to be overdrafted in the most current California Department of Water Resources (DWR) publication on that basin. If the basin is in overdraft, that plan must include current efforts to eliminate any long-term overdraft. A key provision in SB 610 requires that any project subject to the California Environmental Quality Act supplied with water from a public water system be provided a specified water supply assessment, except as specified in the law.

Senate Bill 221 Water Supply Verification

Senate Bill 221 (SB 221), passed in 2001, amended the California Water Code by prohibiting approval of subdivisions consisting of more than 500 dwelling units unless there is verification of sufficient water supplies for the project from the applicable water supplier(s). This requirement also applies to increases of 10 percent or more of service connections for public water systems with less than 500 service connections. The law defines criteria for determining "sufficient water supply" such as using normal, single-dry, and multiple-dry year hydrology and identifying the amount of water that the supplier can reasonably rely on to meet existing and future planned uses. Rights to extract additional groundwater, if used for the project, must be substantiated.

California Urban Water Management Planning Act

The Urban Water Management Planning Act (§10610-10656 of the California Water Code) requires that all urban water suppliers prepare urban water management plans and update them every five years.

Assembly Bill 939 California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of by transformation or land disposal, the State Legislature passed Assembly Bill 939 (AB 939), the California Integrated Waste Management Act of 1989, effective January 1990. According to AB 939, all cities and counties in California were required to divert 25% of all solid waste from landfill or transformation facilities by January 1, 1995, and 50% by January 1, 2000 through source reduction, recycling and composting, and environmentally safe transformation.

Assembly Bill 1327 (AB 1327) California Solid Waste Reuse and Recycling Access Act

The Solid Waste Reuse and Recycling Access Act of 1991 required each jurisdiction to adopt an ordinance by September 1, 1994 requiring each development project to provide an adequate storage area for collection and removal of recyclable materials.

Groundwater Management Act

The Groundwater Management Act, Assembly Bill 3030 (AB 3030), signed into law in 1992, established provisions by which local water agencies could develop and implement groundwater management plans (GMP's).

LOCAL

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to utilities and service systems impacts in conjunction with ultimate buildout of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Land Use, Public Services and Facilities, Open Space, Conservation, and Recreation, Housing and Safety Elements of the General Plan are designed to ensure that utilities and service systems impacts are

minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.* The *Merced Groundwater Management Plan* and the *Merced Water Supply Plan* also provide policy and direction aimed at ensuring that there is sufficient water available to serve the City's projected 2030 population.

Urban Expansion Policies:

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

UE-1.5 Promote annexation of developed areas within the City's Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI) during the planning period.

Land Use Policies:

L-1.9 Ensure connectivity between existing and planned urban areas.

L-3.2 Encourage infill development and a compact urban form.

Public Services and Facilities Policies:

P-1.1 Provide adequate public infrastructure and municipal services to meet the needs of future development.

P-1.2 Utilize existing infrastructure and public service capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of municipal infrastructure and services where necessary.

P-1.3 Require new development to provide or pay for its fair share of public facility and infrastructure improvements.

P-3.1 Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.

P-3.2. In cooperation with the County and the Merced Irrigation District, work to stabilize the region's aquifer.

P-4.1 Provide adequate wastewater collection, treatment and disposal capacity for existing and projected future needs.

P-4.2 Consider the use of reclaimed water to reduce non-potable water demands whenever practical.

P-5.1 Provide effective storm drainage facilities for future development.

P-5.2 Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.

P-6.1 Establish programs to recover recyclable materials and energy from solid wastes generated within the City.

P-6.2 Minimize the potential impacts of waste collection, transportation and disposal facilities upon the residents of Merced.

Open Space, Conservation, and Recreation Policies:

OS-5.1 Promote water conservation throughout the planning area.

Safety Policies:

S-2.2 Encourage the improvement of all public facilities and infrastructure such as natural gas, fuel, sewer, water, electricity, and railroad lines and equipment with up-to-date seismic safety features.

S-2.3 Restrict urban development in all areas with potential ground failure characteristics.

3.16.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board

- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

- Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed

- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments

- Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs

- Comply with federal, state, and local statutes and regulations related to solid waste

3.16.3 IMPACTS AND MITIGATION MEASURES

Impact #3.16-1: The proposed project would result in the exceedance of wastewater treatment requirements of the CVRWQCB

Discussion/Conclusion: Implementation of the proposed General Plan would be expected to result in additional growth requiring additional wastewater treatment capacity. Effluent from the City's WWTP is currently regulated by the CVRWQCB under a Discharge Permit for the City of Merced. As of 2008, the City's WWTP has a flow capacity of 11.5 mgd (and permitted capacity of 20 mgd), with an average 2008 flow of 8.5 mgd. Peak flows into the wastewater treatment plant have been measured near 20 mgd. The Merced WWTP currently discharges at several locations, including Miles Creek, the Merced Wildlife Management Area, Hartley Slough and the Land Application Area. The City plans to increase this design flow capacity through three phases to an ultimate capacity of 20 mgd of tertiary effluent. According to the EIR prepared for the WWTP expansion (ESA, August, 2006), wastewater demand in Merced is 115 gallons per day per capita. The expanded WWTP (at 20 mgd) would be able to serve a population of approximately 174,000, which is more than 12% higher than the projected 2030 population of 155,000 (Sphere of Influence est.).

The proposed General Plan includes Policy P-4.2 which calls for the City to consider the use of reclaimed water to reduce non-potable water demands whenever practical. Implementing Action 1.2.b of Policy P-1.2 says that as long as it remains cost-effective, existing facilities (such as the WWTP) should be expanded at their present location to save the cost of obtaining and constructing new facilities.

All planned WWTP improvements must continue to comply with Federal water quality, waste discharge, and total maximum daily load standards defined under the Clean Water Act and the City's Discharge Permit. The 2008 discharge permit (Order nos. 2008-0027 and 2008-0028) is for 11.5 mgd (secondary treatment) and three phases of tertiary treatment to 20 mgd. Since the City is required to comply with the CVRWQCB when expanding the WWTP to support the General Plan, implementation of the General Plan would not result in exceeding CVRWQCB wastewater treatment requirements. The impact is considered ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.16-2: The proposed project would require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

Discussion/Conclusion: Implementation of the proposed General Plan would result in additional City urban development within the proposed SUDP/SOI. This future development would result in the need for additional water supply facilities through either the construction of new facilities or through the expansion or retrofitting of existing facilities. These facilities could include water

treatment facilities, pipelines, groundwater wells, pump houses, and so forth. As water use increases, facilities that recycle used water may also be needed depending upon the needs of the public water service provider. A Water Master Plan, being prepared for 2010-11 completion after the General Plan is adopted, will provide a water system capital improvement program. The site specific impacts of these facilities cannot be determined until such time that the specific types of facilities and their specific locations are identified and undergo their own specific environmental review. All future water delivery and treatment infrastructure will require additional project-level CEQA environmental review. This may be conducted as part of the specific development project, or as a stand-alone infrastructure project. Any resulting environmental impacts will be addressed through mitigation measures identified in the relevant environmental document.

The proposed General Plan includes several policies and standards designed to address a variety of environmental impacts associated with the development of new water treatment and conveyance facilities. Policy UE-1.2 will foster compact and efficient development patterns to maintain a compact urban form. Policy OS-5.1 promotes water conservation throughout the planning area. Policies P-1.1 and P-1.2 call for the City to provide adequate public infrastructure and services to meet the needs of future development and utilize existing infrastructure and public service capacities to provide for the logical, timely and economically efficient extension of infrastructure and services where necessary. Policy P-1.3 requires new development to provide or pay for its fair share of public facility and infrastructure improvements. Policy P-3.1 will ensure that an adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth. In addition, the various water management plans by the City identify a number of Best Management Practices (BMPs), designed to reduce water waste and consumption. Implementation of these policies and practices will reduce the impact to the environment to ***less than significant***.

The City of Merced has already anticipated the need for additional wastewater treatment capacity. Plans for doubling the capacity of the current treatment plant from 10 mgd to 20 mgd have already been completed, and an EIR prepared and certified. The impacts associated with construction and operation of the treatment plant are identified in the EIR, and the mitigation measures will need to be implemented. Approval from the California State Water Resources Control Board was obtained in April of 2008. This additional capacity will exceed the anticipated waste water generation of the City's proposed 2030 population. As this project has already been approved, the impact is ***less than significant***. Extension of the collection system is analyzed in the 2002 and 2007 Wastewater Collection System Master Plan. The 2007 draft will need to be completed once the SUDP/SOI boundary is approved. Construction of the system will require project-level CEQA review.

Mitigation Measures

No mitigation measures are required.

Impact #3.16-3: The proposed project would require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

Discussion/Conclusion: Merced is located in an area with little topographical relief. This results in poor drainage and potential flooding during peak storm events. The City presently relies on a combination of natural drainage courses, MID canals and storm water retention basins to manage storm waters. Urban expansion will require development of new long-term storm water facilities in the City's urban area. The City is committed to providing overall coordination for the management of storm water within its urban limits and working cooperatively with other agencies in resolving regional storm water management issues.

Development can cause significant increases in peak flow and runoff volume. Increases in peak flow and volume can be an additional 50 percent and higher when compared to undeveloped conditions. Due to the lack of peak flow capacity in the minor waterways and channels serving the Merced SUDP/SOI, most new development areas will require additional on-site, local area, or regional flood control facilities to mitigate for potential flow increases. Increasing the capacity of most existing streams and channels is considered impractical. Because of this, flood control detention/retention is considered the most viable option for mitigating the increase in runoff from new development areas where creek capacity is limited.

Regional detention facilities can be used to provide not only flood control storage, but also storm water quality treatment and, in some circumstances, can also be used as active and passive recreation areas. Regional joint-use basins can provide better land use efficiency and provide for consolidated maintenance that can reduce overall maintenance costs. At a minimum, the basins should be used to provide flood control and storm water quality mitigation, but should also be considered for recreational uses, when appropriate.

The proposed General Plan includes a number of policies and standards and implementing actions designed to provide for an adequate storm drainage collection and disposal system in the City of Merced. Policy P-1.3 requires new development to provide or pay for its fair share of public facility and infrastructure improvements. Policies P-5.1 and P-5.2 call for the City to provide effective storm drainage facilities for future development and integrate those facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge and landscaping. Implementing Action 5.1.a of Policy P-5.1 states that the City will continue to implement the City's Storm Water Master Plan and the Storm Water Management Plan and its control measures. Implementing Action 5.1.b states that the City will work with MID and the County to update the City's Storm Water Master Plan to account for changes in expected storm drainage runoff due to expanded land uses within the Merced area. Implementing Actions 5.1.c and 5.1.d call for the City to continue to require all development to comply with the 2002 *Storm Water Master Plan* and subsequent updates and that installation of facilities necessary to provide services to development projects will be based on the full buildout scenario. Implementing Actions 5.2.a and 5.2.b of Policy P-5.2 call for the City to provide drainage channels in transportation or canal easement areas to the extent feasible and that storm water facilities be designed and constructed in accordance with the standards in the Parks and Open Space Master

Plan and Storm Water Master Plan. With implementation of the policies identified in the 2030 General Plan, and utilization of Best Management Practices from the *Storm Water Management Plan*, the impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.16-4: The proposed project would require new or expanded water supply entitlements

Discussion/Conclusion: Growing urban areas will place increased demands on the area's water supplies and increased pressure on water purveyors to provide for the reliable delivery of high-quality drinking water to homes and industry throughout the planning area. The purpose of long-range water supply studies, such as the Merced Water Supply Plan, is to identify actions required to meet future urban, agricultural, and environmental water needs. These needs can vary, depending on the eventual outcome of a multitude of fluctuating demands on the area's water resources – some outside of the control of the study's sponsoring agencies.

The Merced Water Supply Plan Update (2001) examined the availability of water within a 582,000 acre area bounded by the San Joaquin River, the Merced River, the Stanislaus County line, the Mariposa County Line, and the Chowchilla River. About half of the study area lies within MID's boundaries which include the cities of Merced, Atwater and Livingston and unincorporated lands. The 1995 report concluded that through a mixture of groundwater and surface water resources, there would be adequate supplies to meet projected needs through the year 2030. The report noted; however, that due to increased demands on groundwater sources, the area would most likely experience continued declines in groundwater levels unless a groundwater recharge program was initiated.

The goals of the 1995 plan remain the same in the 2001 plan. Those goals are as follows:

1. Manage groundwater resources
2. Provide high quality, reliable supply for cities
3. Protect and enhance economic base
4. Protect Merced ID's Merced River water rights
5. Maintain consensus on water supply plan

Based on data developed for the City of Merced, MID, and UC, Merced, and contained in the 1995 and 2001 Water Supply Plans, there is sufficient water to support urban development within the Merced urban area at General Plan buildout.

The major issues in the study area, according to the 2001 Plan, are increased population, regulatory changes, water use trends, groundwater changes and UC Merced related growth. The common solutions, according to the Plan, are: intentional recharge; drought relief wells; incentives and related system improvements; surface water conservation and automation;

agricultural capacity improvements; urban capacity improvements; urban water conservation; and urban groundwater to surface water conversion.

In 1990, the total annual water demand in the 500,000 acre MID service area amounted to 1,022,000 acre feet. This is projected to increase to 1,160,000 acre feet per year by 2040 according to the 2001 Water Supply Plan Update. This total demand over the 50-year period is 13 percent, depending on the extent of increased in-stream flow demands. While the report concludes that there are sufficient water resources to meet these demands, the increased demands on the groundwater resources from urban and agricultural pumping could result in a 1,500,000 acre foot depletion in area groundwater reserves. This would translate into a 70 foot decline in the groundwater level around the City of Merced. The impacts of this trend are:

- Additional pumping costs to urban and agricultural interests.
- Potential land subsidence in the area.
- Loss of underground reservoir capacity to support drought cycle needs.
- Possible spreading of existing groundwater pollutants.
- Potential need to establish some sort of state regulatory authority of the use of groundwater.
- Reduction in the economic vitality of the region.

According to the City's 2005 Urban Water Management Plan (UWMP), the 2005 annual water demand for the City of Merced's SUDP/SOI, during a normal year, was 30,118 acre-feet per year (afy). This calculation includes water for residential, commercial, industry, the UC Merced campus and unaccounted for water (reference Table 3-6 in the UWMP). By 2025, water demands are expected to increase by approximately 85 percent, from 30,118 afy in 2005 to 55,677 afy in 2025. A significant proportion of the water demand increase is a direct result from UC Merced growth. Impacts to water use due to any conservation measures implemented in the future are not reflected in the projected water demands.

Water conservation is a method available to reduce water demands, thereby reducing water supply needs for the City. The City implements the following BMPs, as outlined in the *Memorandum of Understanding Regarding Urban Water Conservation in California*, and listed in the City's 2005 UWMP:

- System water audits, leak detection, and repair.
- Metering with commodity rates for all new connections and retrofit of existing connections.
- Public information programs.
- School education programs.
- Conservation pricing.
- Water Conservation Coordinator
- Waste water prohibition

Several policies and implementing actions included as part of the proposed General Plan that would minimize this impact through the early identification of required infrastructure and the orderly construction and rehabilitation of the facilities needed to serve existing and planned urban areas are summarized below. For example, policies P-3.1 and P-3.2 call for the City to

ensure that an adequate water supply be provided within the City's service area, concurrent with expansion and population growth and that the City cooperates with the County and MID to stabilize the region's aquifer. Implementing Actions of Policy P-3.1 include pursuing innovative programs to reduce the demand for potable ("drinkable") water (3.1.a); update the City's Water Master Plan and Urban Water Management Plan as needed for the SUDP/SOI (3.1.b); review the current water system maintenance program and coordinate planned water main replacements with the updated Water Master Plan (3.1.c); continue to work with MID and the County to ensure that adequate water supply and distribution facilities can be developed to meet the growth of the Merced metropolitan area (3.1.d); continue to support policies and programs which prohibit the use of private wells and water systems within the City limits (3.1.e); plan and design water facilities to efficiently serve the City's urban area (3.1.f); the City shall not extend water service outside its incorporated limits (3.1.g), and the City will convert flat-rate water services to water meters in compliance with the California State Water Code Section 527.

Implementing Actions of Policy P-3.2 include working closely with the State and County agencies in exploring innovative technology and procedures for water conservation and recycling (3.2.a); working cooperatively with MID to preserve and enhance its surface water delivery system (3.2.b); exploring the use of MID water resources for applications that do not require treated water to reduce demand on the regional groundwater supplies and reduce costs of water treatment (3.2.c); cooperating with MID and the County in the development of groundwater recharge facilities (3.2.d); and obtaining, purchasing or preserving rights to open space such as transitioning agriculture lands for proposed major treatment plants, groundwater recharge and storage facilities (3.2.e).

The City of Merced must continue to work closely with the MID in order to ensure that water resources remain stable. The City of Merced is committed to a program of cooperating in the long-term management of the area's water resources and utilizing policies and programs which conserve and manage water use in such a manner as to maintain the potable quality of the City's system and reduce treatment costs on applications which do not require the use of treated water.

Implementation of the proposed General Plan policies and implementing actions noted above, the continuation of water conservation measures and BMPs, and adherence to State and local regulations will reduce the potential impact on the City's future water supply. Even though groundwater levels will decrease in the region, the proposed General Plan will not require new or expanded water entitlements which would result in a significant environmental impact. The impact is therefore ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.16-5: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Discussion/Conclusion: As discussed above under Impact #3.16-1, the WWTP is currently being upgraded to provide additional capacity. An EIR has been prepared and certified (SCH No. 2005101135), and the state Water Quality Control Board has issued an approval. As of 2008, the City's WWTP has a flow capacity of 11.5 mgd, with an average 2008 flow of 8.5 mgd. Peak flows into the wastewater treatment plant have been measured near 20 mgd. The project will take place in three phases, with the first adding 1.5 mgd to existing capacity (already completed). Subsequent phases will increase capacity to 16 mgd, and finally the full 20 mgd. The expansion will accommodate the City's planned growth and a population of 174,000, which is more than 12% higher than the projected 2030 population of 155,000 (Sphere of Influence est.).

According to the City of Merced Sewer Collection Master Plan, through the modeling process, it was determined that the existing wastewater collection system in the City does not have the capacity to handle wastewater flows from buildout of the City limits, UC Merced, Campus Community, and the SUDP/SOI. Serving all of these areas will require construction of several large trunk sewers. Building large trunk sewers to serve these areas involves long-term planning, which makes these sewers unavailable to development occurring within the next few years. The Sewer Collection Master Plan outlines solutions for serving near-term development with existing infrastructure. Areas planned for improvements/interim options include two existing trunks in north Merced; the sewer trunk along G Street serving UC Merced; the Highway 59 pump station and trunk; and two trunks currently serving South Merced, Gerard Avenue Trunk and the West Avenue Trunk.

The Sewer Master Plan also outlines long-term system needs. Due to the capacity limitations of the existing sewer system, large trunk sewers must be built to accommodate future development in the proposed SUDP/SOI. Recommended trunk sewers would be aligned along the following roads:

1) Mission/Vassar Avenue: Would service future development in South Merced and relieve peak flows in the existing Gerard Avenue trunk as necessary. Pump station would be required to serve areas north of Bear Creek (on the east side of the City). A parallel sewer along Vassar would serve buildout of the SUDP/SOI study area.

2) Cardella Road: Would serve portions of the northern part of the SUDP/SOI between Cardella and Bellevue Roads as well as UC Merced and the Campus Community. Inverts and slopes selected for to avoid a pump station at Fahren's Creek.

3) Bellevue Road: Would serve portions of the SUDP/SOI in North Merced and would terminate at the Cardella trunk.

4) Thornton Road: After collecting flows from the Cardella trunk, would extend south to the WWTP. Would collect flows from portions of the SUDP/SOI and. Includes a pump station (Thornton Pump Station) just north of Bear Creek.

Depending on the growth rate of the City, the buildout of the service area might represent a 50 year or more development horizon. As a result, the City may elect to phase all or a portion of the trunk sewers to better match capacity needs with cash flows from development.

The proposed General Plan includes a number of policies and implementing actions to provide for an adequate wastewater collection, treatment and disposal system in the City of Merced. Policy P-1.2 calls for the City to utilize existing infrastructure and capacities to the maximum extent possible and provide for the logical, timely and economically efficient extension of infrastructure. Policy P-1.3 requires new development to provide or pay for its fair share of public facility and infrastructure improvements. Policy P-4.1 calls for the City to provide adequate wastewater collection, treatment and disposal capacity for existing and projected future needs. To reduce potable water demands, the City will consider the use of reclaimed water whenever practicable (Policy P-4.2). Implementing Actions of Policy P-4.1 include maintaining and enhancing the existing wastewater system to increase its lifetime (4.1.a); developing and maintaining wastewater master plans to Merced's future expansion (4.1.b); coordinating wastewater planning activities with the County (4.1.c); and prohibiting the extension of wastewater service outside of City limits, except in unique circumstances (4.1.d). Implementing Actions of Policy P-4.2 call for the City to consider the development of reclaimed water systems, including pipelines, pump stations and storage ponds (4.2.c); consider conducting a reclaimed water market study to identify potential users (4.2.b); and consider preparing a plan for the use of reclaimed water which evaluates the facilities and costs required to serve potential users, determines required capacities of facilities, and presents an implementation plan (4.2.c).

As stated above, the City will continue to implement a variety of policies and implementation actions designed to ensure that new development projects plan and finance future required wastewater infrastructure consistent with adopted City-wide master and specific plans. Therefore, implementation of the proposed General Plan would result in a ***less than significant*** impact.

Mitigation Measures

No mitigation measures are required.

Impact #3.16-6: The proposed project would increase demand for solid waste disposal services

Discussion/Conclusion: Solid waste removal services for the plan area will be provided by the City of Merced. Waste will be hauled to the Merced County Highway 59 Landfill. The Highway 59 Landfill was expanded in 2001, and no further expansion of the facility is currently planned. The landfill permitted capacity after the expansion is 30 million cubic yards, with a maximum permitted disposal rate of 1,500 tons per day. According to the CIWMB, in 1999 the Highway 59 Landfill had approximately seven percent remaining capacity. After the expansion of the facility in 2001, as of September 1st, 2005, the Highway 59 Landfill had a remaining capacity of 28 million cubic yards or 93 percent according to the CIWMB. The proposed General Plan will result in the construction of additional residential, commercial, public and industrial uses. The recent expansion of the Highway 59 Landfill allowed this facility to increase its capacity and serve the City and the County until 2030 as an expected close date.

The proposed General Plan includes policies to establish programs to recover recyclable materials and energy from solid wastes generated within the City and to minimize the potential

impacts of waste collection, transportation and disposal facilities upon the residents of Merced (Policies P-6.1 and P-6.2). Implementing Actions of Policy P-6.1 call for the City to continue to implement source reduction and recycling programs to minimize waste at the point of manufacture or use (6.1.a); work with Merced County Regional Waster Management Authority officials in seeking federal and state funds for projects utilizing resources and material recovery processes (6.1.b); and to participate in resource and material recovery studies (6.1.c). Implementing Actions of Policy P-6.2 call for the City to site intermediate waste processing facilities and materials recycling facilities in heavy commercial or industrial areas, with access to major roadways (6.2.a); to cooperate with the Merced County Regional Waster Management Authority to implement recommendations for source reduction programs which have the least environmental and economic impacts on the City and its residents (6.2.b); and to continue to implement programs in cooperation with the County to meet solid waste diversion goals.

Policies of the proposed General Plan will help reduce the amount of solid waste generated and increase recycling efforts in the City. The landfill has available capacity to service the General Plan through buildout. The solid waste generated as a result of General Plan adoption will have a ***less than significant*** impact on solid waste services for the County of Merced.

Mitigation Measures

No mitigation measures are required.

Impact #3.16-7: Will the proposed project comply with federal, state, and local statutes and regulations related to solid waste?

Discussion/Conclusion: In compliance with AB 939, the City continues to divert solid waste from local landfills through various conservation, recycling, and composting measures, including curbside recycling programs. The City complies with all other federal, State, and local statutes and regulations related to solid waste and will continue to do so in the future.

Policies and implementation actions included as part of the proposed General Plan that address additional solid waste handling services are summarized above under Impact #3.16-6. With implementation of the above mentioned policies and implementation actions, this impact is considered ***less than significant***.

CUMULATIVE IMPACT ANALYSIS

Water Supply and Delivery

Future growth in the City and County would generate an additional demand for water. As previously described above, groundwater will be the primary source of potable water throughout the County. In 1990, the total annual water demand in the 500,000 acre MID service area amounted to 1,022,000 acre feet. This is projected to increase to 1,160,000 acre feet, within the 582,000 acre expanded study area, per year by 2040 according to the 2001 Water Supply Plan Update. This total demand over the 50-year period is 13 percent, depending on the extent of increased in-stream flow demands. While the report concludes that there are sufficient water

resources to meet these demands, the increased demands on the groundwater resources from urban and agricultural pumping could result in a 1,500,000 acre-foot depletion in area groundwater reserves. This is a ***significant cumulative*** impact to water supply and delivery.

Wastewater

Future growth would result in demand for wastewater services throughout the region; however, only growth within the City of Merced and its SOI/SUDP would result in the need for the City to construct additional wastewater facilities, resulting in additional environmental impacts. Since the proposed General Plan includes policies to tie development with the provision of utilities and to avoid creating a project-level significant impact associated with wastewater availability, the proposed General Plan would ***not contribute to a cumulative impact*** associated with the provision of wastewater service.

Stormwater

Future regional growth would result in increased demand for additional stormwater drainage infrastructure throughout the County; however, only growth within Merced's proposed SOI/SUDP would result in the need for the City to construct additional stormwater drainage infrastructure, resulting in additional environmental impacts. The above program-level analysis for the proposed General Plan concluded that due to the uncertainties about future facilities and their locations, potential impacts resulting from the construction and expansion of any required public utility facilities or infrastructure remain significant. No additional feasible mitigation is currently available given the fact that future facilities have not been designed. The cumulative impact of additional stormwater drainage infrastructure is also considered ***cumulatively significant***.

Solid Waste

Growth within Merced County would contribute to the need for adequate solid waste disposal facilities. As discussed for the project-level analysis, the Highway 59 Landfill has adequate capacity until 2030. The cumulative population growth within the County was considered when evaluating the lifespan of the facility and planning for future expansions. As a result, it can be concluded that there would be adequate capacity to support regional increases in population, and a ***significant cumulative impact would not occur***.

3.17

GREENHOUSE GAS EMISSIONS (GLOBAL CLIMATE CHANGE)

3.17 Greenhouse Gas Emissions (Global Climate Change)

This section considers the impacts of proposed new land uses within the City of Merced General Plan boundary on greenhouse gas emissions and global climate change, as well as climate change impacts to water supply. The land uses that are proposed by the 2030 General Plan that will result in increased generation of CO_2 (a principal greenhouse gas contributing to global climate change) at full build out are as follows:

Proposed additional General Plan areas outside Existing General Plan area, within the SUDP/SOI:

- Total Rural Res: 1824.56 acres;
- Total Single-Family Res: 321.04 acres;
- Total Multi-Family: 57.24 acres;
- Total Office: 39.82 acres;
- Total Industrial: 1072.34 acres;
- Total Business Park: 77.43 acres;
- Total Commercial: 196.76 acres;
- Total Open Space: 287.09 acres;
- Total Schools: 994.18 acres; and
- Total Community Plan Areas: 7955.39 acres.

Figure 2-4 shows the proposed land uses included in the 2030 General Plan Update.

Global Warming Impacts and Causes

Climate change is recognized throughout the world to be one of the most daunting and controversial subjects of our time. Human activities are altering the chemical composition of the atmosphere through the rapid buildup of climate change emissions, primarily carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons. According to scientific studies, concentrations of these gasses in the ambient atmosphere are increasing at a rate not experienced for millions of years, although there is some uncertainty about exactly how and when the earth's climate will respond to increasing concentrations of climate change emissions, observations, in conjunction with climate models, indicate detectable changes are underway.

These observed changes go beyond a global mean rise in temperature and include changes in regional temperature extremes, precipitation, soil moisture, and sea level. All of these changes could have significant adverse effects on water resources and ecological systems, as well as on human health and the economy. Implementation of precautionary and proactive measures is imperative if climate change emissions are to be reduced and communities are to adapt successfully to the adverse impacts.

Research suggests that human activities, such as the burning of fossil fuels and clearing of forests, contribute additional carbon dioxide (CO_2) and other heat trapping gas emissions into the atmosphere. Future global climate change could have widespread consequences that would affect

many of California's important resources, including its water supply. Projected effects of climate change on California include:

- Increased air pollution
- Intensified heat waves
- An expanded range of infectious diseases
- A decline in the Sierra Nevada snow pack, with resulting impacts on water supply, ecosystems and hydropower
- A range of agriculture impacts, including expanded ranges for weeds and pests, and a decrease in chill hours required by some of the state's crops
- A rise in sea level and more severe storm events increasing coastal flooding
- Increased flooding in river delta and floodplain areas
- An increase in the risk of large wildfires.

Actions to Reduce Global Warming

California has taken actions to reduce climate change emissions. The California Energy Commission has adopted energy efficiency standards for buildings and appliances that are extremely stringent. CARB has adopted vehicle climate change standards that are the first of their kind in the United States. The State's Renewable Portfolio Standard was accelerated by the Governor to require by 2010 that 20 percent of all power used in California be generated by renewable resources. The California Public Utilities Commission recently adopted a Solar Building Initiative that continues California's progressive approach to economic growth and technological innovation hand in hand with protection of public health and the environment. Executive Order S-3-05 signed by the Governor on June 1, 2005, established statewide climate change emission reduction targets as follows:

- By 2010, reduce emissions to 2000 levels;
- By 2020, reduce emissions to 1990 levels;
- By 2050, reduce emissions to 80 percent below 1990 levels.

The Governor signed Executive Order S-01-07 on January 18, 2007, establishing carbon reduction targets as follows:

- By 2020, reduce carbon intensity in California transportation fuels by at least 10 percent
- In 2006 the Legislature adopted AB 32 as California's "Global Warming Solutions Act" to begin the process of reversing the causes of global warming. (See Chapter 488 Statutes of 2006). This measure directs CARB to develop a statewide greenhouse gas (GHG) emissions

cap for 2020 and to develop and implement regulations and market mechanisms to reduce GHG emissions.

Beyond the established statewide goals on emission reductions and caps, other state and regional agencies are developing strategies for incorporating energy efficiency and climate change emissions reduction measures into the policy framework governing land use and transportation. Some local air districts have begun to incorporate climate protection objectives into their ongoing local programs.

3.17.1 SETTING

Environmental Setting

EXISTING GREENHOUSE GASES AND LINKS TO GLOBAL CLIMATE CHANGE

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect.

Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), ozone (O_3), water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for enhancing the greenhouse effect. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors [California Energy Commission. *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004.* 2006a. http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF, hereafter referred to as (California Energy Commission 2006a)].

In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (California Energy Commission 2006a). A byproduct of fossil fuel combustion is CO_2. Methane, a highly potent GHG, results from offgassing associated with agricultural practices and landfills. Processes that absorb and accumulate CO_2, often called CO_2 "sinks," include uptake by vegetation and dissolution into the ocean.

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. According to the California Energy Commission 2006a, Page 17, California is the 16th largest emitter of CO_2 in the world and produced 492 million gross metric tons of carbon dioxide equivalents in 2004. Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potentials to retain infrared radiation in

the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, CH_4 is a much more potent GHG than CO_2. As described in the General Reporting Protocol of the California Climate Action Registry (2006), one ton of CH_4 has the same contribution to the greenhouse effect as approximately 21 tons of CO_2. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (California Energy Commission 2006a).

This category was followed by the electric power sector (including both in-state and out-of-state sources) at 22.2% and the industrial sector at 20.5% (California Energy Commission 2006a).

In 2003, global emissions of carbon (i.e., only the carbon atoms within CO_2 molecules) solely from fossil fuel burning totaled an estimated 7,303 million metric tons. This translates to approximately 29,400 million tons of CO_2. This is only a portion of global CO_2 emissions because it addresses only fossil fuel burning and does not address other CO_2 sources such as burning of vegetation. CO_2 emissions in California totaled approximately 391 million tons in 2004 (California Energy Commission 2006a).

FEEDBACK MECHANISMS AND UNCERTAINTY

Many complex mechanisms interact within Earth's energy budget to establish the global average temperature. For example, a change in ocean temperature would be expected to lead to changes in the circulation of ocean currents, which, in turn would further alter ocean temperatures. There is uncertainty about how some factors could affect global climate change because they have the potential to both enhance and neutralize future climate warming. Examples of these conditions are also described below.

Direct and Indirect Effects of Aerosols

Aerosols, including particulate matter, reflect sunlight back to space. As particulate matter attainment designations are met, and fewer emissions of particulate matter occur, the cooling effect of anthropogenic aerosols would be reduced, and the greenhouse effect would be further enhanced. Similarly, aerosols act as cloud condensation nuclei, aiding in cloud formation and increasing cloud lifetime. Clouds can efficiently reflect solar radiation back to space (see discussion of the cloud effect below). As particulate matter emissions are reduced, the indirect positive effect of aerosols on clouds would be reduced, potentially further amplifying the greenhouse effect.

The Cloud Effect

As global temperature rises, the ability of the air to hold moisture increases, facilitating cloud formation. If an increase in cloud cover occurs at low or middle altitudes, resulting in clouds with greater liquid water content such as stratus or cumulus clouds, more radiation would be reflected back to space, resulting in a negative feedback mechanism, wherein the side effect of

more cloud cover resulting from global warming acts to balance further warming. If clouds form at higher altitudes in the form of cirrus clouds, however, these clouds actually allow more solar radiation to pass through than they reflect, and ultimately they act as a GHG themselves. This results in a positive feedback mechanism in which the side effect of global warming acts to enhance the warming process. This feedback mechanism, known as the "cloud effect" contributes to uncertainties associated with projecting future global climate conditions.

Other Feedback Mechanisms

As global temperature continues to rise, CH_4 gas currently trapped in permafrost, would be released into the atmosphere when areas of permafrost thaw. Thawing of permafrost attributable to global warming would be expected to accelerate and enhance global warming trends. Additionally, as the surface area of polar and sea ice continues to diminish, the Earth's albedo, or reflectivity, is also anticipated to decrease. More incoming solar radiation will likely be absorbed by the Earth rather than being reflected back to space, further enhancing the greenhouse effect. The scientific community is still studying these and other positive and negative feedback mechanisms to better understand their potential effects on global climate change.

Regulatory Setting

FEDERAL

In a 5-4 opinion issued on April 2, 2007, the United States Supreme Court concluded, in *Massachusetts, et al. v. Environmental Protection Agency*, that "greenhouse gases fit well within the Clean Air Act's definition of 'air pollutant,'" and held that "EPA has the statutory authority to regulate the emission of such gases from new motor vehicles."

In that case, petitioners (states including California and New York, several cities, and American Samoa) with the support of several environmental organizations, requested that EPA regulate greenhouse gas emissions (primarily carbon dioxide) from new vehicles under section 202(a)(1) of the Federal Clean Air Act. Based on policy considerations and a conclusion by the National Research Council (an arm of the National Academy of Sciences) that it "cannot be unequivocally established" whether a "causal linkage" existed between global warming and greenhouse gas emissions, the EPA Administrator denied the rulemaking petition.

The District of Columbia Circuit upheld the denial, holding that "the EPA Administrator properly exercised his discretion under section 202 (a)(1)" and that the Administrator's decision not to regulate was consistent with other case law which allowed such decisions to be based on policy judgments where the issues to be resolved are "on frontiers of scientific knowledge."

The Supreme Court disagreed, saying that "EPA has offered no reasoned explanation for its refusal to decide whether greenhouse gases cause or contribute to climate change." "Once EPA has responded to a petition for rulemaking," the Court said, "its reasons for action or inaction must conform to the authorizing statute" and "EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some

reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do."

The matter has been remanded, and it remains to be seen whether EPA will simply articulate a more detailed explanation for declining to regulate or begin a rulemaking process to regulate greenhouse gas emissions from motor vehicles. In the meantime, a variety of climate change-related bills have been introduced in the United States House of Representatives and Senate, that, if enacted, would likely result in additional statutory direction to EPA and other federal agencies regarding the regulation of greenhouse gases from motor vehicles and stationary sources.

In spite of the Supreme Court's recent ruling in *Massachusetts v. EPA* holding that EPA has authority to regulate greenhouse gas emissions from new motor vehicles, greenhouse gases are not currently regulated under the Federal Clean Air Act. Potential greenhouse gas legislation and/or EPA rulemaking processes could take several years to become effective. Nonetheless, at least one federal district court has held that where carbon dioxide emissions from a project could result in environmental impacts, NEPA requires analysis of those impacts [*Border Power Plant Working Group v. Department of Energy* (S.D. Cal. 2003) 260 F.Supp.2d 997].

STATE

At the time of this writing, there are no regulations setting ambient air quality emissions standards for greenhouse gases; however, it is anticipated that such will be developed in the near future in accordance with the following recently enacted California legislation and Executive Order S-3-05 as described below.

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that the California Air Resources Board (ARB) develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

Executive Order S-3-05

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (Cal EPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these

impacts. To comply with the Executive Order, the Secretary of the Cal EPA created a "Climate Act Team" (CAT). In March 2006, Cal EPA released a report on behalf of the CAT (comprised of cabinet secretaries and policy makers from Cal EPA, CEC, CARB, CPUC, CIWMB, Caltrans, the Department of Food and Agriculture, and the Governor's office). Among other things, the "CAT Report" outlined the principles of climate change science that formed the basis for the evaluation of potential climate-change related impacts that could occur in California. The report cited the International Panel on Climate Change (IPCC) and other sources to conclude that global temperatures are increasing and that human activities are contributing to the build-up of climate change pollutants. The report also summarized potential effects of climate change based on three IPCC scenarios and described potential emission reduction strategies.

Assembly Bill 32, California Global Warming Solutions Act of 2006

California has enacted Assembly Bill 32 (AB 32), effective January 1, 2007, to cap carbon dioxide emissions in an effort to address one of the sources of global warming concern. AB 32 directs the California Air Resources Board ("CARB") to require reporting and verification of current greenhouse gas emissions (defined as carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) and to estimate 1990 greenhouse gas emissions levels prior to January 1, 2008 (Health and Safety Code §§ 38530, 38550). CARB must then adopt a statewide greenhouse gas emissions limit equal to the approved 1990 emissions levels and set a reduction schedule and adopt regulatory programs to achieve the target levels by 2020. The law focuses on reducing emissions to "maximum technologically feasible and cost-effective levels" (Health and Safety Code § 38560). CARB was charged with publishing a list of early action greenhouse gas emission reduction measures by June 30, 2007, and adopting regulations to implement those early action measures by January 1, 2010, while final regulations for greenhouse gas emission limits and emission reduction measures must be adopted by January 1, 2011 and become operative by January 1, 2012 (Health and Safety Code §§ 38560.5, 38562).

CARB may establish market-based compliance mechanisms (e.g. a "cap and trade" system) allowing emitters to purchase, bank or trade greenhouse gas "allowances" from third parties and/or may adopt a declining annual aggregate emissions limitation (Health and Safety Code §§ 38505(k), 38562(c), 38570 et seq). Under extraordinary circumstances, or in cases of catastrophic events or threat of economic harm, AB 32 allows the Governor to extend deadlines for adoption of regulations mandated by AB 32 for up to one year at a time (Health and Safety Code § 38599(a)).

In a CARB presentation at a February 27, 2007 public workshop discussing initial regulatory concepts for mandatory greenhouse gas emissions reporting under AB 32, cement manufacturers, electric power generation, oil refineries, industrial/commercial combustion, oil and gas production, and landfills were listed as potential covered sources. Of note, the presentation stated that other sources may be considered for mandatory reporting.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish

a greenhouse gas emission performance standard for base load generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a base load combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

No air district in California has identified a significance threshold for GHG emissions or a methodology for analyzing air quality impacts related to greenhouse gas emissions. The state has identified 1990 emission levels as a goal through adoption of AB 32. To meet this goal, California would need to generate lower levels of GHG emissions than current levels; however, no standards have yet been adopted quantifying 1990 emission targets. It is recognized that for most projects there is no simple metric available to determine if a single project would help or hinder meeting the AB 32 emission goals. In addition, at this time AB 32 only applies to stationary source emissions. Consumption of fossil fuels in the transportation sector accounted for over 40% of the total GHG emissions in California in 2004. Current standards for reducing vehicle emissions considered under AB 1493 call for "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles," and do not provide a quantified target for GHG emissions reductions for vehicles.

Senate Bill 97

SB 97 (Chapter 185, Statutes 2007) was signed by Governor Schwarzenegger on August 24, 2007. The legislation provides partial guidance on how greenhouse gases should be addressed in certain CEQA documents. SB 97 requires the Governors Office of Planning and Research (OPR) to prepare CEQA guidelines for the mitigation of GHG emissions, including but not limited to, effects associated with transportation or energy consumption. OPR must prepare these guidelines and transmit them to the Resources Agency by July 1, 2009. The Resources Agency must then certify and adopt the guidelines by January 1, 2010. OPR and the Resources Agency are required to periodically review the guidelines to incorporate new information or criteria adopted by ARB pursuant to the Global Warming Solutions Act, scheduled for 2012.

In June 2008, OPR released a technical advisory on CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review as interim recommendations while the official OPR CEQA Guidelines were under development. In January 2009, OPR released its draft CEQA Guideline amendments and additions, which include suggested thresholds of significance and mitigation measures to address global climate change.

Assembly Bill 170

AB 170 was adopted by state lawmakers in 2003 creating Government Code Section 65302.1 which requires cities and counties in the San Joaquin Valley to amend their general plans to include data and analysis, comprehensive goals, policies and feasible implementation strategies designed to improve air quality. These amendments are due no later than one year from the due date specified for the next revisions of a jurisdiction's housing element

As required in Section 65302.1.b, cities and counties within the San Joaquin Valley must amend the general plan to include a discussion of the status of air quality and strategies to improve air quality. The elements to be amended include, but are not limited to, those elements dealing with land use, circulation, housing, conservation, and open space. Section 65302.1.c identifies four (4) areas of air quality discussion required in these amendments. These areas include: (1) a report describing local air quality conditions, attainment status, and state and federal air quality and transportation plans; (2) a summary of local, district, state, and federal policies, programs, and regulations to improve air quality; (3) a comprehensive set of goals, policies, and objectives to improve air quality; and (4) feasible implementation measures designed to achieve these goals.

Senate Bill 375

SB 375 was signed by Governor Schwarzenegger on September 30, 2008. The bill provides means to further reduce greenhouse gas (GHG) emissions from passenger vehicles and light trucks. The intent of the bill is to connect land use planning with transportation policy, resulting in more sustainable and environmentally friendly communities. The bill requires Metropolitan Planning Organizations (MPOs) to prepare a Sustainable Communities Strategy (SCS) within their Regional Transportation Plans (RTPs) which sets forth a vision for growth for the region taking into account the transportation, housing, environmental, and economic needs of the region, with the goal of reducing the number of miles traveled by personal vehicles, and thus reducing GHG emissions. Under the law, the California Air Resources Board has two years to give each of California's MPO a GHG emissions reduction target for cars and light trucks. However this target to reduce GHG from cars and light trucks can only be implemented through changes in development pattern of the MPO.

The GHG emissions reduction targets for each region are required to be established no later than September 30, 2010. Once the GHG emissions reduction targets for each region have been established, SB 375 requires the MPOs to prepare a Sustainable Communities Strategy (SCS) in their Regional Transportation Plan. While there is no deadline for adoption of the SCS, it is anticipated that the first plans would not be released until 2011, at the earliest. The SCS sets forth a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement). The SCS is meant to provide individual jurisdictions with growth strategies that, when taken together, achieve the regional GHG emissions reduction targets. However, the SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS but provides incentives for consistency for governments and developers. If the SCS is unable to achieve the regional GHG emissions reduction targets, then the MPO is required to prepare an Alternative Planning Strategy that shows how the GHG emissions reduction target could be achieved through alternative development patterns, infrastructure, and/or transportation measures.

LOCAL

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has adopted guidelines for addressing greenhouse gas impacts in its *Guidance for Valley Land Use Agencies in Addressing*

GHG impacts for New Projects Under CEQA (2009). The guidance relies on performance-based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project-specific GHG emissions on global climate change during the environmental review process. Projects implementing BPS's would be determined to have a less than cumulatively significant impact. Projects can also demonstrate compliance with the requirements of AB 32 by demonstrating that their emissions achieve a 29% reduction below "business as usual" levels.

To be determined to have a less than significant individual and cumulative impact on global climate changes, projects must be determined to have reduced or mitigated GHG emissions by 29% below "business as usual" conditions, consistent with GHG emission reduction targets established by the AB 32 Scoping Plan.

Projects meeting one of the following would have a less than significant impact on global climate change:

- Exempt from CEQA;
- Complies with an approved GHG emission reduction plan or GHG mitigation program;
- Project achieves 29% GHG reductions by using approved Best Performance Standards; and
- Project achieves AB 32 targeted 29% GHG reductions compared with "business as usual".

General Plan Consistency

The *Merced Vision 2030 General Plan* contains a number of policies that apply to global climate change impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Land Use, Transportation and Circulation, Public Services and Facilities, Urban Design, Open Space, Conservation, and Recreation, Sustainable Development and Housing Elements of the General Plan are designed to ensure that global climate change impacts are minimized as development occurs in accordance with the *Merced Vision 2030 General Plan.*

Urban Expansion Policies:

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

Land Use Policies:

L-1.7 Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.

L-2.4 Provide a range of services adjacent to and within industrial areas to reduce auto trips.

L-2.6 Provide neighborhood commercial centers in proportion to residential development in the City.

L-2.7 Locate and design new commercial development to provide good access from adjacent neighborhoods and reduce congestion on major streets.

L-3.1 Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.

L-3.2 Encourage infill development and a compact urban form.

L-3.3 Promote site designs that encourage walking, cycling, and transit use.

Transportation and Circulation Policies:

T-1.5 Minimize unnecessary travel demand on major streets and promote energy conservation.

T-1.6 Minimize adverse impacts on the environment from existing and proposed road systems.

T-2.2 Support and enhance the use of public transit.

T-2.3 Support a safe and effective public transit system.

T-2.4 Encourage the use of bicycles.

T-2.5 Provide convenient bicycle support facilities to encourage bicycle use.

T-2.6 Maintain and expand the community's existing bicycle circulation system.

T-2.7 Maintain a pedestrian-friendly environment.

T-2.8 Improve planning for pedestrians.

T-2.9 Ensure that new development provides the facilities and programs that improve the effectiveness of Transportation Control Measures and Congestion Management Programs.

T-3.5 Support enhanced railroad passenger service and high speed rail service for Merced.

T-3.6 Retain and expand as needed rail facilities serving industrial development.

Public Services and Facilities Policies:

P-4.2 Consider the use of reclaimed water to reduce non-potable water demands whenever practical.

P-6.1 Establish programs to recover recyclable materials and energy from solid wastes generated within the City.

Urban Design Policies:

UD-1.1 Apply Transit-Ready Development or Urban Village design principles to new development in the City's new growth areas.

UD-1.2 Distribute and design Urban Villages to promote convenient vehicular, pedestrian, and transit access.

UD-1.4 Promote and facilitate Urban Village residential area design principles**.**

UD-2.1 Use Urban Village design concepts in neighborhood revitalization programs.

Open Space, Conservation, and Recreation Policies:

OS-1.4 Improve and expand the City's urban forest.

OS-3.2 Maintain and expand the City's Bikeway and Trail System.

Sustainable Development Policies:

SD-1.1 Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.

SD-1.2 Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.

SD-1.3 Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment.

SD-1.4 Educate the public on the impact of individual transportation, lifestyle, and land use decisions on air quality.

SD-1.5 Provide public facilities and operations which can serve as a model for the private sector in implementation of air quality programs.

SD-3.1 Promote the use of Solar Energy technology and other Alternative Energy Resources.

SD-3.2 Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

Housing Policies (Adopted 2004):

H-1.1 Support increased densities in residential areas.

H-2.2 Promote preventative maintenance and energy conservation in older housing units.

3.17.2 THRESHOLDS OF SIGNIFICANCE

No air district in California, including the San Joaquin Valley Air Pollution Control District, has identified a significance threshold for GHG emissions or a methodology for analyzing air quality impacts related to greenhouse gas emissions. The State has identified 1990 emission levels as a goal through adoption of AB 32. To meet this goal, California would need to generate lower levels of GHG emissions than current levels. However, no standards have yet been adopted quantifying 1990 emission targets. It is recognized that for most projects there is no simple metric available to determine if a single project would help or hinder meeting the AB 32 emission goals. In addition, at this time AB 32 only applies to stationary source emissions. Consumption of fossil fuels in the transportation sector accounted for over 40% of the total GHG emissions in California in 2004. Current standards for reducing vehicle emissions considered under AB 1493 call for "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles," and do not provide a quantified target for GHG emissions reductions for vehicles.

Emitting CO_2 into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of CO_2 in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of CO_2 into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of CO_2 emitted by the project would result in any altered conditions.

Given the challenges associated with determining a project-specific significance criteria for GHG emissions when the issue must be viewed on a global scale, a quantitative significance criteria is not proposed for the Project. For this analysis, a project's incremental contribution to global climate change would be considered significant if due to the size or nature of the project it would generate a substantial increase in GHG emissions relative to existing conditions.

Appendix G of the CEQA Guidelines have identified the following significance criteria pertaining to the impact of Global Warming:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment

b) Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Under the proposed Guidelines criteria greenhouse gas emissions should be addressed if either of the above applies. Criteria a. would be applicable to the implementation of the General Plan due

to the magnitude of development resulting in a substantial increase in GHG emissions over time relative to present conditions.

3.17.3 IMPACTS AND MITIGATION MEASURES

Emissions of Greenhouse Gases from the Plan

GHG emissions associated with the Project were estimated using CO_2 emissions as a proxy for all GHG emissions. This is consistent with the current reporting protocol of the California Climate Action Registry (CCAR). Calculations of GHG emissions typically focus on CO_2 because it is the most commonly produced GHG in terms of both number of sources and volume generated, and because it is among the easiest GHGs to measure; however, it is important to note that other GHGs have a higher global warming potential than CO_2. For example, as stated previously, 1 lb of methane has an equivalent global warming potential of 21 lb of CO_2 (CalEPA. *Climate Action Team Report.* March 2006. http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF). Nonetheless, emissions of other GHGs from the Project (and from almost all GHG emissions sources) would be low relative to emissions of CO_2 and would not contribute significantly to the overall generation of GHGs from the project.

Although the CCAR provides a methodology for calculating GHG emissions, the process is designed to be applied to a single or limited number of entities or operations where detailed information on emissions sources is available (e.g., usage of electricity and natural gas, numbers and types of vehicles and equipment in a fleet, type and usage of heating and cooling systems, emissions from manufacturing processes). Information at this level of detail is not available for the Project area. For example, the ultimate GHG emissions from the approximately 486 acres of additional commercial uses in the proposed General Plan could vary substantially depending on the type and amount of office and commercial uses that are developed, the density of employees in each facility, the hours of operation for each facility, and other factors. Similarly, GHG emissions from the proposed residences could vary substantially based on numerous factors, such as the sizes of homes, the type and extent of energy efficiency measures that might be incorporated into each home's design, the type and size of appliances installed in the home, and whether solar energy facilities are included on any of the residences. Given the lack of detailed design and operational information available at this time for facilities in the Project area, the CCAR emissions inventory methodology is not appropriate for estimating GHG emissions from the project.

Additionally, it should also be noted that the emissions described above do not take into account reductions in GHG emissions resulting from implementation of AB 32. Stationary emissions sources on the project site resulting from energy usage and stationary sources that serve the project site's energy needs will be subject to emissions reductions requirements of AB 32. The extent of these reductions has not yet been quantified by ARB. At the time of project buildout, overall CO_2 emissions attributable to the Project could be substantially less than current emission assumptions might indicate. Similarly, if GHG emissions reductions for vehicles are enacted, through either the requirements of AB 1493 or AB 32 or a federal regulation, CO_2 emissions from the Project would be further reduced. If regulations proposed to comply with AB 1493

survive current legal challenges, by project buildout CO_2 emissions from vehicles associated with the project could be 20% to 30% less than under current conditions.

Impact #3.17-1: Development of the Project could potentially result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change

Discussion/Conclusion: As described above in the "Environmental Setting" discussion, the cumulative increase in GHG concentrations in the atmosphere has resulted in and will continue to result in increases in global average temperature and associated shifts in climatic and environmental conditions. Multiple adverse environmental effects are attributable to global climate change, such as sea level rise, increased incidence and intensity of severe weather events (e.g., heavy rainfall, droughts), and extirpation or extinction of plant and wildlife species. Given the significant adverse environmental effects linked to global climate change induced by GHGs, the emission of GHGs is considered a significant cumulative impact. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a); therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and individual on Earth. The challenge in assessing the significance of an individual project's contribution to global GHG emissions and associated global climate change impacts is to determine whether a project's GHG emissions—which, it can be argued, are at a micro scale relative to global emissions—result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact.

Global climate change is projected to affect water resources in California; for example, an increase in the global average temperature is projected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), and is a major source of water supply for the state. Although current forecasts vary (see, e.g., Department of Water Resources [hereafter "DWR" 2006]), this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population and California's agricultural industry. An increase in precipitation falling as rain rather than snow could also lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system.

Global climate change is expected to influence many interconnected phenomena, which will in turn affect the rate of climate change itself. Faced with this overwhelmingly complex system, scientists who model climate change must make decisions about how to simplify the phenomenon, such as assuming a fixed rate of temperature change or a certain level of aerosol production or a particular theory of cloud formation. These assumptions make the models applicable to particular aspects of the changing ecosystem, given a good guess about how the future will be. Rather than try to be predictive, the models represent possible scenarios that come with a set of presuppositions. Even when results are quantified, such quantifications are

meaningless unless viewed in the light of those presuppositions. For these reasons, a range of models must be examined when trying to assess the potential effects of climate change and the resulting analysis is most appropriately qualitative (See Intergovernmental Panel on Climate Change (IPCC) 2001). This section, therefore, provides a qualitative analysis of the impacts of global climate change as they affect water resources in California and in the project area.

When discussing global climate impacts in industrialized nations, such impacts are significantly driven by population / demand (e.g. demand for residential and commercial building arises from society's demand for the additional housing and provider of basic services). Therefore, society's increasing population is the underlying trigger to any greenhouse gas emission associated with housing construction.

In the majority of studies on greenhouse gas emissions, traffic associated with development of residential and commercial buildings due to increasing populations is considered the primary contributor to operational greenhouse gas emissions. Additionally, an increase in stationary source emissions from commercial buildings and residential homes (natural gas use, landscape maintenance equipment, etc.) is anticipated from buildout under the General Plan.

Even if it were assumed that the proposed plan's contribution to global climate change was a significant environmental impact, the impact would be considered unavoidable. Because global climate change is a global issue that can only be addressed through regional, state, national, and international cooperation, plan specific impacts are extremely difficult to determine. Until the SJVAPCD modifies regulations to address the emission of greenhouse gases, specific mitigations that would address climate change locally are speculative. As the SJVAPCD modifies its plans and policies to address global warming considerations, CEQA documents will have to consider those plans and policies when assessing projects. The air quality impact analysis in Section 3.3 and in this section include mitigation measures at the local level to reduce atmospheric greenhouse gas emissions in accordance with existing plans and policies to address global climate change. However; development under the proposed General Plan in combination with growth and development at the regional level, would result in a ***significant, cumulatively considerable and unavoidable*** impact.

Mitigation Measures

Even with the proposed policies and implementation actions in the proposed General Plan, the impact will remain ***significant, cumulatively considerable and unavoidable.*** No mitigation measures are available.

Impact #3.17-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Discussion/Conclusion: Implementation of General Plan policies designed to reduce greenhouse gas emissions to the extent practicable will ensure City of Merced General Plan consistency with applicable plans, policies or regulations adopted for the purpose of reducing the emissions of greenhouse gases. This impact is ***less than significant.***

Mitigation Measures

No mitigation measures are required.

Impact #3.17-3: Climate Change could potentially result in an impact on City of Merced water resources

Discussion/Conclusion: From a statewide perspective, global climate change could affect California's environmental resources through potential and uncertain changes related to future air temperatures and precipitation and their resulting impacts on water temperatures, reservoir operations, stream runoff, and sea levels. These changes in hydrological systems could threaten California's economy, public health, and environment. The types of potential climate effects that could occur on California's water resources include:

Water Supply. Several recent studies have shown that existing water supply systems are sensitive to climate change. Potential impacts of climate change on water supply and availability could directly and indirectly affect a wide range of institutional, economic, and societal factors. Much uncertainty remains, with respect to the overall impact of global climate change on future water supplies. For example, models that predict drier conditions (i.e.., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows (Brekke, 2004). Both projections are equally probable based on which model is chosen for the analyses (Ibid.). Much uncertainty also exists with respect to how climate change will affect future demand for water supply (DWR 2006). Still, changes in water supply are expected to occur and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows.

Surface Water Quality. Global climate change could affect surface water quality as well. Water quality is affected by several variables, including the physical characteristics of the watershed, water temperature, and runoff rate and timing. A combination of a reduction in precipitation, the shift in volume and timing of runoff flows, and the increased temperature in lakes and rivers could affect a number of natural processes that eliminate pollutants in water bodies. For example, the overall decrease in stream flows could potentially concentrate pollutants and prevent the flushing of contaminants from point sources. Still, considerable work remains to determine the potential effect of global climate change to water quality.

Groundwater. Little work has been done on the effects of climate change on specific groundwater basins, groundwater quality or groundwater recharge characteristics. Changes in rainfall and changes in the timing of the groundwater recharge season would result in changes in recharge. Warmer temperatures could increase the period where water on the ground by reducing soil freeze. Conversely, warmer temperatures could lead to higher evaporation or shorter rainfall seasons, which could mean that soil deficits would persist for longer time periods, shortening recharge seasons. Warmer, wetter winters would increase the amount of runoff available for groundwater recharge. This additional winter runoff, however, would be occurring at a time when some basins, particularly in Northern California, are being recharged at their maximum

capacity. Reductions in spring runoff and higher evapotranspiration, on the other hand, could reduce the amount of water available for recharge. However, the extent to which climate will change and the impact of that change on groundwater are both unknown. A reduced snowpack, coupled with increased rainfall, could require a change in the operating procedures for California's existing dams and conveyance facilities.

Fisheries and Aquatic Resources. In California, the timing and amounts of water released from reservoirs and diverted from streams are constrained by their effects on various native fish, especially those that are listed under the federal and state endangered species acts as threatened or endangered. Several potential hydrological changes associated with global climate change could influence the ecology of aquatic life in California and have several negative effects on cold-water fish (DWR 2006). For example, if climate change raises air temperature by just a few degrees Celsius, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp (DWR 2006). Unsuitable summer temperatures would be particularly problematic for many of the threatened and endangered fish that spend summers in cold-water streams, either as adults, juveniles, or both (DWR 2006). In short, climate change could significantly affect threatened and endangered fish in California. It could also cause non-threatened and non-endangered fish to reach the point where they become designated as such (DWR 2006).

Flood Control. It is difficult to assess implications of climate change for flood frequency, in large part because of the absence of detailed regional precipitation information from climate models and because human settlement patterns and water-management choices can substantially influence overall flood risk. Still, increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control as opposed to supply conservation. This need to manage water storage facilities to handle increased runoff could in turn lead to more frequent water shortages during high water demand periods (Brekke 2004). It is recognized that these impacts would result in increased challenges for reservoir management and balancing the competing concerns of flood protection and water supply (DWR 2006).

Sudden Climate Change. Most global climate models project that anthropogenic climate change will be a continuous and fairly gradual process through the end of this century (DWR 2006). California is expected to be able to adapt to the water supply challenges posed by climate change, even at some of the warmer and dryer projections for change. Sudden and unexpected changes in climate, however, could leave water managers unprepared and could, in extreme situations, have significant implications for California and its water supplies. For example, there is speculation that some of the recent droughts that occurred in California and the western United States could have been due, at least in part, to oscillating oceanic conditions resulting from climatic changes. The exact causes of these events are, however, unknown, and evidence suggests such events have occurred during at least the past 2,000 years (DWR 2006).

The following topics summarize current literature related to the impact of global climate change on water resources in California's Central Valley:

- **Climate Warming and Water Management Adaptation for California.** Tanaka et al. (2006) explored the ability of California's water supply system to adapt to long-term climatic and demographic changes using the California Value Integrated Network (CALVIN), a statewide economic-engineering optimization model of water supply management. The results show agricultural water users in the Central Valley are the most sensitive to climate change, particularly under the driest and warmest scenario (i.e. PCM 2100), predicting a 37% reduction of Valley agricultural water deliveries and a rise in Valley water scarcity costs by $1.7 billion. Though the results of the study are only preliminary, they suggest that California's water supply system appears "physically capable of adapting to significant changes in climate and population, albeit at a significant cost." Such adaptation would entail changes in California's groundwater storage capacity, water transfers, and adoption of new technology.

- **Potential Implications of PCM Climate Change Scenarios for Sacramento-San Joaquin River Basin Hydrology and Water Resources.** VanRheenen et al. (2004) studied the potential effects of climate change on the hydrology and water resources of the Sacramento-San Joaquin River Basin using five PCM scenarios. The study concludes that most mitigation alternatives examined satisfied only 87 to 96% of environmental targets in the Sacramento system, and less than 80% in the San Joaquin system. Therefore, system infrastructure modifications and improvements could be necessary to accommodate the volumetric and temporal shifts in flows predicted to occur with future climates in the Sacramento-San Joaquin River basins.

- **Estimated Impacts of Climate Warming on California Water Availability Under Twelve Future Climate Scenarios.** Zhu et al (in press) studied climate warming impacts on water availability derived from modeled climate and warming stream flow estimates for six index California basins and distributed statewide temperature shift and precipitations changes for 12 climate scenarios. The index basins provide broad information for spatial estimates of the overall response of California's water supply and the potential range of impacts. The results identify a statewide trend of increased winter and spring runoff and decreased summer runoff. Approximate changes in water availability are estimated for each scenario, though without operations modeling. Even most scenarios with increased precipitation result in a decrease in available water. This result is due to the inability of current storage systems to catch increased winter stream flow to offset reduced summer runoff.

- **Trends in Snowfall versus Rainfall in the Western United States.** To better understand the nature of the observed changes in snowpack and stream flow timing in the west, Knowles et al. (2006) addressed historical changes in the relative contributions of rainfall and snowfall. The study documents a regional trend toward smaller ratios of winter-total snowfall water to winter-total precipitation during the period of 1949-2004. The trends toward decreased winter-total snowfall are a response to warming across the region, with the most significant decreases occurring where winter wet-day minimum temperatures were on average warmer than -5 degrees Celsius over the study period. The authors suggest that, if warming trends continue, the snowfall fraction of precipitation is likely to continue to decline, which combined with earlier melting of the remaining accumulations of snowpack, will diminish the West's natural freshwater storage capacity. This trend could, in turn,

exacerbate tensions between flood control and storage priorities that many western reservoir managers face.

- **Climate Warming and Water Supply Management in California.** Medellin et al. (2006) use the CALVIN model under a high emissions "worst case" scenario, called a dry-warming scenario. The study found that climate change would reduce water deliveries 17% in 2050. The reduction in deliveries was not equally distributed, however, between urban and agricultural areas. Agricultural areas would see their water deliveries drop by 24% while urban areas would only see a reduction of 1%. There was also a geographic difference: urban scarcity was almost absent outside of southern California.

- **Climate Scenarios for California.** Cayan et al. (2006b) considered two GHG emissions scenarios, a medium-high and a low. The study found that California will experience a warming trend from 2000 to 2100, with temperatures rising between 1.7 and 5.8º C, depending on the model and the scenario chosen. This increase in temperature could potentially impact snowpack levels as the state experiences less snow and more rain. The results also indicate that snowpack in the Sierra Nevada could be reduced 32 to 79%, depending on the model and scenario chosen. The study does not consider the ability of California's water supply system to adapt to these potential changes.

- **Our Changing Climate - Assessing the Risks to California, California Climate Change Center 2006 Biennial Report.** In 2003, the California Energy Commission's Public Interest Energy Research (PIER) program established the California Climate Change Center (CCCC) to conduct climate change research relevant to the state. Executive Order S-3-05 called for the CalEPA to prepare biennial science reports on the potential impact of continued climate change on certain sectors of California's economy. CalEPA entrusted PIER and its CCCC to lead this effort. The climate change analysis contained in its first biennial science report is the product of a multi-institution collaboration among the California Air Resources Board, DWR, CEC, CalEPA and the Union of Concerned Scientists.

  With respect to the most severe consequences of global climate change on California's water supplies, the study concludes that major changes in water management and allocation systems could be required in order to adapt to the change. As less winter precipitation falls as snow, and more as rain, water managers would have to balance the need to construct reservoirs for water supply with the need to maintain reservoir storage for winter flood control. The assessment suggests that additional storage could be developed, but with environmental and economic costs.

- **Climate Warming and California's Water Future.** Lund et al. (2003) examined the effects of a range of climate warming estimates on the long-term performance and management of California's water system. The study estimates changes in California's water availability, including effects of forecasted changes in 2100 urban and agricultural water demands using a modified version of the CALVIN model. The main conclusions are summarized as follows:

- Methodologically, it is useful and realistic to include a wide range of hydrologic effects, changes in population and water demands, and changes in system operations in climate change studies;

- A broad range of climate warming scenarios show significant increase in wet season flows and significant decreases in spring snowmelt. The magnitude of climate change effects on water supplies is comparable to water demand increases from population growth in twenty-first century; and

- California's water system would be able to adapt to the severe population growth and climate change modeled. This adaptation would be costly, but it would not threaten the fundamental prosperity of the state, although it could have major impacts on the agricultural sector. The water management costs represent only a small proportion of California's current economy.

- Under the driest climate warming scenarios, Central Valley agricultural users could be quite vulnerable to climate change. Wetter hydrology could increase water availability for these users. The agricultural community would not be compensated for much of its loss under the dry scenario. The balance of climate change effects on agricultural yield and water use is unclear. While higher temperatures could increase evapotranspiration, longer growing seasons and higher carbon dioxide concentrations could increase crop yield.

- Population growth is expected to be more problematic than climate change in Southern California. Population growth, conveyance limits on imports, and high economic value of water in Southern California, could lead to high implementation of wastewater reuse and substantial use of seawater desalination along the coast.

- Under some wet warming climate scenarios, flooding problems could be substantial. In certain cases, major expansions of downstream floodways and alterations in floodplain land use could become desirable.

- California's water system could economically adapt to all the climate warming scenarios examined in the study. New technologies for water supply, treatment, and water use efficiency, implementation of water transfers and conjunctive use, coordinated operation of reservoirs, improved flow forecasting, and the cooperation of local regional, state and federal government can help California adapt to population growth and global climate change. Even if these strategies are implemented, however, the costs of water management are expected to be high and there is likely to be less "slack" in the system compared to current operations and expectations.

As described by the literature survey above, overall, climate change is expected to have a greater effect in Southern California. In the Sacramento Valley/Sierra Nevada area, climate change will have a greater effect on agricultural users than urban users. For example, for 2020 conditions, where optimization is allowed (i.e., using the CALVIN model), scarcity is essentially zero in the Sacramento Valley for both urban and agricultural users, and generally zero for urban users in the San Joaquin and Tulare Basins. Rather, most water scarcity will be felt by agricultural users

in Southern California, though Southern California urban users, especially Coachella urban users, will also experience some scarcity. By the year 2050, urban water scarcity will remain almost entirely absent north of the Tehachapi Mountains, although agricultural water scarcity could increase in the Sacramento Valley to about 2% (Medellin et al. 2006; see also Tanaka et al. 2006 and Lund et al. 2003 for further discussion of global climate change impacts on agricultural uses).

Based on the conclusions of current literature regarding California's ability to adapt to global climate change, it is reasonably expected that, over time, the State's water system will be modified to be able to handle the projected climate changes, even under dry and/or warm climate scenarios (DWR 2006). Although coping with climate change effects on California's water supply could come at a considerable cost, based on a thorough investigation of the issue, it is reasonably expected that statewide implementation of some, if not several, of the wide variety of adaptation measures available to the state, will likely enable California's water system to reliably meet future water demands. For example, traditional water supply reservoir operations may be used, in conjunction with other adaptive actions, to offset the impacts of global warming on water supply (Medellin et al. 2006; see also Tanaka et al. 2006 and Lund et al. 2003). Other adaptive measures include better urban and agricultural water use efficiency practices, conjunctive use of surface and ground waters, desalination, and water markets and portfolios (Medellin et al. 2006; see also Lund et al. 2003, Tanaka et al. 2006). More costly statewide adaptation measures could include construction of new reservoirs and enhancements to the state's levee system (California Energy Commission 2003). As described by Medellin et al. 2006, with adaptation to the climate, the water deliveries to urban centers are expected to decrease by only 1%, with Southern California shouldering the brunt of this decrease.

Although California could potentially experience an increased number of single-dry and multiple-dry years as a result of global climate change, based on current knowledge, it is reasonably expected that such increase would not significantly affect the reliability of the City of Merced's water supply,(due to the proposed Project's location in Central/Northern California and the reasonable expectation that California's water system can be modified to handle projected climate changes as explained above).

Because considerable uncertainty remains with respect to the overall impact of global climate change on future water supply in California, it is unknown to what degree global climate change will impact the City of Merced water supply and availability in the future. However, based on consideration of the recent regional and local climate change studies described in the literature review above, it is reasonably expected that the impacts of global climate change on the City's water supply would be ***less than significant.***

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Policies of the proposed General Plan will reduce global climate change impacts; however, buildout under the proposed General Plan will nonetheless result in a substantial amount of GHG emissions contributing to global climate change. Because it cannot be determined to a reasonable degree of certainty that buildout under the proposed General Plan will not result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change, the impacts of the proposed project on global climate change are a ***significant, unavoidable and cumulatively considerable*** impact.

CHAPTER FOUR

PROJECT ALTERNATIVES

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4.1 Introduction

The California Environmental Quality Act and the implementing CEQA Guidelines require that alternatives to the proposed project be discussed in the Environmental Impact Report (EIR). The value of such discussion is to inform public decision-makers of the differential environmental impacts which may be associated with each potential alternative, and to enable a reasoned judgment to be made as to which alternative to the proposed project may be environmentally superior. Section 15126.6 of the CEQA Guidelines provides the following description of what should be included in the alternatives discussion in an EIR:

> (a) Alternatives to the Proposed Project. An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. An EIR is not required to consider alternatives which are infeasible. The Lead Agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.
>
> (b) Purpose. Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.
>
> (c) Selection of a range of reasonable alternatives. The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Additional information explaining the choice of alternatives may be included in the administrative record. Among the factors that may be

used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts.

(d) Evaluation of Alternatives. The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

(e) "No Project" alternative.

(1) The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (see Section 15125).

(2) The "no project" analysis shall discuss the existing conditions at the time the notice of preparation is published, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

(3) A discussion of the "no project" alternative will usually proceed along one of two lines:

(A) When the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the "no project" alternative will be the continuation of the plan, policy or operation into the future. Typically this is a situation where other projects initiated under the existing plan will continue while the new plan is developed. Thus, the projected impacts of the proposed plan or alternative

plans would be compared to the impacts that would occur under the existing plan.

(B) If the project is other than a land use or regulatory plan, for example a development project on identifiable property, the "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed. In certain instances, the no project alternative means "no build" wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment.

(C) After defining the no project alternative using one of these approaches, the lead agency should proceed to analyze the impacts of the no project alternative by projecting what would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

(f) Rule of reason. The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision-making.

(1) Feasibility. Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can

reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

(2) Alternative locations.

(A) Key question. The key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.

(B) None feasible. If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR. For example, in some cases there may be no feasible alternative locations for a geothermal plant or mining project which must be in close proximity to natural resources at a given location.

(C) Limited new analysis required. Where a previous document has sufficiently analyzed a range of reasonable alternative locations and environmental impacts for projects with the same basic purpose, the lead agency should review the previous document. The EIR may rely on the previous document to help it assess the feasibility of the potential project alternatives to the extent the circumstances remain substantially the same as they relate to the alternative.

(3) An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative.

The sections of the chapter that follow present a description of the alternatives considered and an analysis of the alternatives in the context of CEQA and the CEQA Guidelines. The range of alternatives addressed includes an evaluation of the no project alternative (which is required to be addressed), a reduced project size alternative, and a concentrated growth alternative. Finally, this chapter presents an analysis of the comparative environmental superiority of the various alternatives, as required by CEQA.

4.2 Project Objectives

As stated in Chapter Two of the DEIR, the *Merced Vision 2030 General Plan* contains a comprehensive set of goals and policies that establish the planning philosophy that will direct future City growth. To achieve its purpose of providing for future population growth, the plan contains land use policies that provide adequate area for housing, employment and commercial activities. The plan also contains policies and standards for the provision of public services and infrastructure necessary to support future population growth.

Beyond the physical needs of future population growth, the plan contains design and open space provisions. These provisions provide an important element to the planning process. Future growth and development are expected to contribute to the overall well being of the community while preserving and enhancing the City's present quality of life.

From the standpoint of "sustainable growth," the *Merced Vision 2030 General Plan* contains provisions to ensure that future growth and development:

- Is directed away from concentrations of "prime" agricultural land,
- Conserves water and do not over-tax or contaminate the region's water resources,
- Preserves and protects important area wildlife habitat,
- Minimizes adverse growth related impacts on the region's air quality and greenhouse gas emissions,
- Conserves non-renewable energy resources, and
- Preserves important cultural and historic resources.

4.3 Alternatives Rejected

According to the CEQA Guidelines, two primary provisions are necessary for an adequate alternative site analysis – feasibility and location. The EIR should consider alternate project locations if a significant project impact could be avoided or substantially lessened by moving the project to an alternate site. An alternative site for the proposed project would not be feasible because the project consists of the update of the City of Merced's General Plan. The project is, by definition, located in and around the City of Merced. Since the project consists of a plan update for a specific area, an alternative location for this project is not feasible.

A discussion of an infeasible alternative site would not meet the "rule of reason" under CEQA and this alternative was eliminated from further consideration in this EIR.

4.4 Project Alternatives

The following sections present a description of the alternatives considered and an analysis of the alternatives in the context of the *CEQA Guidelines*. This EIR includes an evaluation of the following alternatives:

- **Existing General Plan (No Project) Alternative.** Under this alternative, the Merced Vision 2030 General Plan would not be adopted, and the existing Merced Vision 2015 General Plan would remain in effect.

- **Reduced Project Area Alternative.** Under this alternative, slightly less new development would be allowed in comparison with the proposed General Plan and growth would be restricted to a smaller area within the 1997 SUDP boundary. This alternative was considered feasible because the City could grow at a slower pace than expected.

- **Concentrated Growth Alternative.** Under this alternative, the total amount of new development would be similar to that allowed under the Plan Update but residential densities would be increased in and around existing developed areas, leaving more land designated as Open Space or Reserve.

These alternatives are summarized in the next section and compared with the proposed project. This chapter concludes with an analysis of the comparative environmental superiority of the various alternatives, as required by CEQA.

4.4.1 EXISTING GENERAL PLAN (NO PROJECT) ALTERNATIVE

The No Project Alternative is required under CEQA. Under the "No Project" or existing General Plan alternative, development would occur as allowed under the existing LAFCO approved SOI with the same General Plan Land Use map in effect (reference Figure 2-3). The land use designations established by the existing General Plan would accommodate a residential population ranging between 139,899 and 298,614 persons. Lands currently used or planned for longer term agricultural use would continue in that use with the associated impacts. Policies in the existing General Plan would remain the same and would not be updated to address current issues such as new flood regulations and greenhouse gas emissions.

The No Project Alternative would have the following impacts relative to adoption of the General Plan unless mitigated by other City policies/ordinances, including environmental review.

Aesthetics

Future development in Merced will change the appearance of the City under either the No Project Alternative or the proposed General Plan. Of specific concern for Merced, in terms of aesthetics, is preserving its traditional historic ambiance as well as the agricultural character around the City's edges created by the farm lands surrounding the City. The No Project Alternative contains fewer policies and actions specifically related to preserving and enhancing

community character than the proposed General Plan. The "no project" alternative would have ***greater*** impact on aesthetics.

Agriculture and Forest Resources

The No Project Alternative would designate fewer acres for urban development, compared to the proposed General Plan. While some of this area may develop with very low density residential uses, as allowed by the City and County's agricultural designations, there would be a decrease in the amount of agricultural resources lost to urban development. Under this alternative, the impacts, including cumulative impacts, would remain significant and unavoidable to agricultural resources, as the alternative would still result in the conversion of agricultural land to urban uses. Agricultural impacts under the No Project Alternative would be ***lessened*** in comparison with the proposed General Plan.

Air Quality

The No Project Alternative would result in fewer urban uses and less vehicle emissions and stationary source air emissions. Construction-related emissions would also be lessened under the No Project Alternative. Implementation of the No Project Alternative would not avoid a significant, unavoidable and cumulative air quality impact since the air basin is non-attainment for selected criteria pollutants. Although there would be less development under the existing General Plan, the existing General Plan contains fewer policies with regard to air quality improvement and reduction in greenhouse gas emissions. As a result, the No Project Alternative would result in ***similar*** air quality impacts relative to the proposed General Plan.

Biological Resources

The No Project Alternative would reduce the amount of land converted from farmland to urban development. As a result, there would be a decrease in the amount of potential habitat/foraging land lost. In addition, there would be a reduction in the potential for other sensitive biological resources to be affected by conversion of land to urbanized uses. The No Project Alternative would have ***less*** impact on biological resources.

Cultural Resources

Historic resources could be affected equally under both General Plan scenarios because the historical resources of the City are primarily located in the existing developed areas. The proposed General Plan includes policies to reduce potential impacts to cultural resources. The No Project Alternative would have a ***similar*** impact on cultural resources as the proposed General Plan.

Geology and Soils

Buildout under the existing General Plan would be less than under the proposed General Plan and would result in ***less*** impacts to geology and soils.

Hazards and Hazardous Materials

Implementation of the No Project Alternative would result in a reduction in new urban development in comparison with implementation of the Plan Update and would expose fewer people to hazards and hazardous material sources, and reduce the number of potential new hazardous materials generators. While new development under both the No Project Alternative and the proposed General Plan would be subject to General Plan policies and local, State and federal regulations that would reduce the potential for hazards and hazardous materials impacts to a less than significant level, the No Project Alternative would result in ***less*** potential impacts relative to the proposed General Plan.

Hydrology and Water Quality

Implementation of the No Project Alternative would reduce the amount of land converted from farmland to urban development, thereby reducing the amount of land subject to grading for construction; however, undeveloped land may still be cleared on a regular basis for agricultural activities, leaving bare soil open to erosion. Since agriculture consumes more water than an equivalent acreage of urban development, the No Project alternative will consume more ground and surface water than development under the proposed General Plan. In addition, agricultural uses often involve the use of herbicides or pesticides which could result in polluted runoff. The impact on hydrology and water quality would be ***similar*** to development under the proposed General Plan.

Land Use and Planning

Neither the proposed Plan Update nor the No Project Alternative would divide any existing communities, and implementation of the No Project Alternative would not differ from implementation of the proposed General Plan in this regard. Implementation of the No Project Alternative would result in land use inconsistencies, less coordination with specific project plans currently underway, and future projects would not be subject to policies proposed for inclusion in the proposed General Plan designed to improve regional planning coordination. The No Project Alternative would have ***greater*** impacts on land use and planning.

Mineral Resources

Impacts to mineral resources are not an issue within the City of Merced and implementation of the No Project Alternative would have a ***similar*** effect on this resource than implementation of the proposed General Plan.

Noise

Implementation of the No Project Alternative would generate less traffic and less traffic related noise than implementation of the proposed General Plan. Noise impacts would be ***lessened*** in comparison with the proposed General Plan.

Population and Housing

The No Project Alternative would result in a smaller buildout population (between 139,899 and 298,614 persons) than that which would occur under the proposed General Plan (between 152, 063 and 328,956 persons). Similar to the proposed General Plan, the No Project Alternative would not displace housing and population, or create new population growth beyond that which is expected or planned. Since the No Project Alternative would result in a smaller population, it would have ***less*** impact on population and housing.

Recreation

The No Project Alternative would result in a smaller population at buildout than that which would occur under the proposed General Plan, which would place a smaller demand on parks/recreation services. Although the proposed General Plan includes policies that would ensure adequate provision of parks/recreation services, resulting in a less than significant impact, implementation of the No Project Alternative would result in ***less*** potential impacts on parks/recreation than the proposed General Plan.

Public Services

Implementation of the No Project Alternative would result in a smaller population at buildout than the proposed General Plan at buildout, which would place a smaller demand on public services. Although the proposed General Plan includes a range of policies that would ensure the adequate provision of public services, resulting in a less than significant impact, the No Project Alternative would result in ***less*** potential impacts than the proposed General Plan.

Transportation/Traffic

The No Project Alternative would generate less traffic than the proposed General Plan since there would be less development. The No Project Alternative would yield approximately 5,190,000 daily vehicle miles of travel (VMT) whereas the proposed General Plan would yield approximately 8,657,000 daily VMT. While the No Project Alternative would generate less traffic, the alternative does not provide, in detail, the improvements that would be necessary for the roadway system to accommodate projected traffic volumes. Nevertheless the analysis of future traffic shows that the proposed General Plan would result in levels of services that exceed "C" on more roadway segments than in the No Project Alternative. The No Project Alternative avoids significant impacts by maintaining a level of service of "C" or better on portions of Thornton Avenue, North SR 59, "R" Street, "M" Street, Martin Luther King Jr. Way/South SR 59, "G" Street, Parsons Avenue/Gardner Road, Campus Parkway, Tyler Road, Old Lake Road, Bellevue Road, Cardella Road, Yosemite Avenue, Olive Avenue, SR 140, 16th Street, 14th Street, 13th Street, Childs Avenue, Gerard Avenue and Dickenson Ferry/Mission Avenue. The No Project Alternative would result in ***less*** potential impacts to traffic and circulation compared to the proposed General Plan.

Utilities/Services

Implementation of the No Project Alternative would result in a smaller population at buildout than the proposed General Plan at buildout, which would place a smaller demand on utility services. Although the proposed General Plan includes a range of policies that would ensure the adequate provision of utility services, resulting in a less than significant impact, the No Project Alternative would result in ***less*** potential impacts than the proposed General Plan.

Greenhouse Gas Emissions (Global Climate Change)

Implementation of the No Project Area Alternative would result in a reduction of locally generated greenhouse gas emissions that contribute to global warming. It may be argued that development that is not accommodated in Merced would occur elsewhere in the region to accommodate population and jobs growth, and there would be no real avoidance or reduction in impacts from a cumulative perspective. The proposed General Plan includes policies to lessen such impacts. If development occurs elsewhere, these policies will not be imposed on new development although other local agencies may have their own policies to address greenhouse gas emissions. Since the existing General Plan does not directly address greenhouse gas emissions and global warming, development under the No Project Alternative would have a ***greater*** impact on greenhouse gas emissions.

4.4.2 REDUCED PROJECT AREA ALTERNATIVE

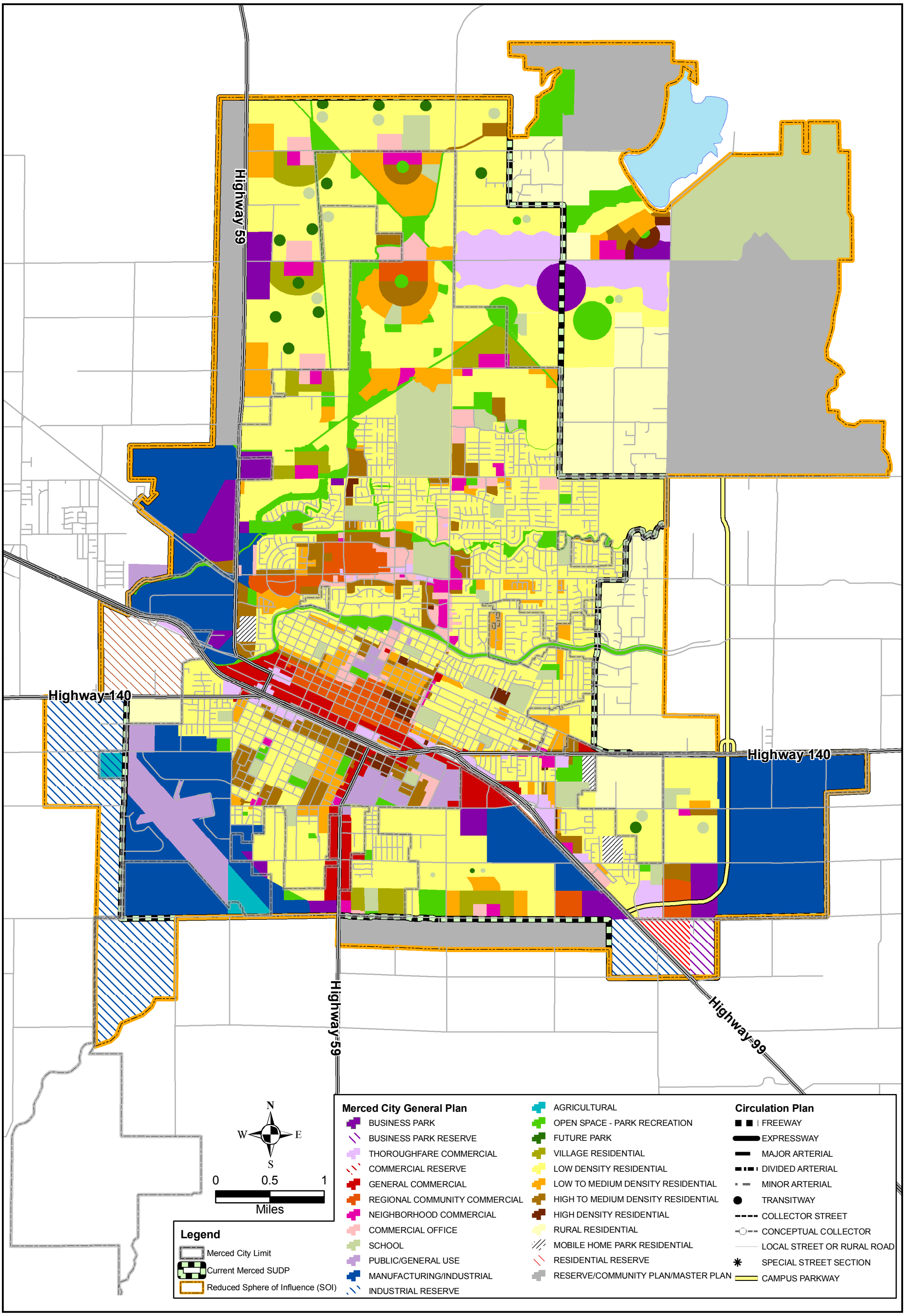
The Reduced Project Area Alternative would update the General Plan elements and policies, but would restrict growth to a smaller area. In this Alternative, the two Community Plan areas identified in the northwest and southwest corners of the 2030 Plan area are deleted from the proposed Project. This alternative was considered feasible because the City could grow at a slower pace than is being planned for. Further, the potential population under the proposed General Plan at buildout (between 152,063 and 328,956 persons) exceeds that projected for 2030 (116,800). Figure 4-1 shows the Reduced Project Area Alternative.

Aesthetics

The Reduced Growth Alternative would contain the same goals, policies and standards addressing the visual appearance of new development as the proposed General Plan. As a result, the potential project-level aesthetic impacts of new development would be ***similar*** to the proposed General Plan.

Agriculture and Forest Resources

The Reduced Project Area Alternative would result in less land designated for urban uses than the proposed General Plan. While some of this area may develop as very low density residential uses, as allowed by the County's agricultural designations, there would be a decrease in the amount of agricultural resources lost to urban development. Under this alternative, the impacts, including cumulative impacts, would remain significant and unavoidable to agricultural resources, since the alternative would still result in the conversion of agricultural land to urban



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MERCED VISION 2030 GENERAL PLAN EIR
2030 REDUCE SPHERE OF INFLUENCE LAND USE MAP

Figure 4-1

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uses. Since less agricultural land would be converted, the Reduced Growth Alternative would have ***less*** impact to agricultural resources than the proposed General Plan.

Air Quality

The Reduced Project Area Alternative would result in less land designated for urban uses, leading to fewer homes and commercial uses and less traffic, which would result in fewer greenhouse gas emissions. Although the effects to air quality from this alternative would still result in significant unavoidable and cumulative impacts, they would be ***less*** than under the proposed General Plan.

Biological Resources

There are limited biological resources in the Planning Area due to urbanization and intense agricultural production. Implementation of the Reduced Project Area Alternative would decrease the amount of land converted from farmland to urban development and there may be a reduction in the potential for biological resources to be affected by conversion of land to urbanized uses. The Reduced Growth Alternative would result in ***less*** biological resource impacts in comparison with the proposed General Plan.

Cultural Resources

The Reduced Project Area Alternative would result in less development than the proposed General Plan. While there is a low probability for archeological and paleontological resources to occur in the excluded areas, this alternative would result in less extensive grading activities. Because this alternative would also be subject to the proposed General Plan policies and mitigation measures that address the protection of cultural and historical resources, the alternative's impacts to cultural and historical resources would also be reduced to a less than significant level. As a result, the Reduced Project Area Alternative would be ***similar*** to the proposed General Plan with regard to cultural and historic resources.

Geology and Soils

While the Reduced Project Area Alternative would result in fewer housing units and nonresidential uses compared to the proposed General Plan, there are no geological or soil related hazards in the area that would increase the risk of geology and soils hazards. In addition, the Reduced Project Area Alternative would be subject to the same General Plan policies, as well as federal, state and local regulations, that would reduce the potential for geology or soils related impacts to a less than significant level. As a result, the Reduced Project Area Alternative would result in ***similar*** impacts to geology and soils as the proposed General Plan.

Hazards and Hazardous Materials

In comparison with the proposed General Plan, the Reduced Project Area Alternative would result in fewer residential non-residential uses, a reduction in population increase, and a reduction in the generation of hazardous materials and waste. The Reduced Project Area

Alternative would be subject to the same General Plan policies and standards, as well as federal, State and local regulations, that would reduce the potential for hazards and hazardous materials related impacts to a less than significant level. The Reduced Project Area Alternative would result in ***less*** potential impacts compared to the proposed General Plan.

Hydrology and Water Quality

Implementation of the Reduced Project Area Alternative would result in a decrease in the amount of land converted from farmland to urban development in comparison with the proposed Plan Update, thereby decreasing the amount of land subject to grading for new construction; however, vacant land may still be cleared on a regular basis for agricultural activities, leaving bare soil open to erosion. Water use under this alternative could potentially be increased in that agricultural irrigation demands could exceed urban use demands. Urban development under this alternative would be subject to the same General Plan policies as the proposed General Plan, as well as federal, State and local regulations, which would reduce the potential impacts on hydrology and water quality to a less than significant level. Impacts to hydrology and water quality would be ***similar*** under the Reduced Project Area Alternative.

Land Use and Planning

The area surrounding the City limits and within the Planning Area does not include any established communities that would be divided by the Reduced Project Area Alternative, and the alternative would be subject to the same General Plan policies as the proposed General Plan in regards to updating other land use plans and policies for consistency. The Reduced Project Area Alternative would have ***similar*** land use impacts as the proposed General Plan.

Mineral Resources

Impacts to mineral resources are not an issue within the City of Merced and implementation of the Reduced Project Area Alternative would have a ***similar*** effect on this resource than implementation of the proposed Plan Update.

Noise

The Reduced Project Area Alternative would result in fewer housing units and non-residential uses and would generate fewer vehicle trips, resulting in less noise. The alternative would include the same General Plan policies pertaining to noise as the proposed General Plan that would reduce potential noise impacts to a less than significant level. The Reduced Project Area Alternative would result in ***less*** noise impacts in comparison to the proposed General Plan.

Population and Housing

As is the case with the proposed General Plan, the Reduced Project Area Alternative would not result in displacement of housing or people. Both the Reduced Project Area Alternative and Plan Update would have less than significant impacts. Since the Reduced Project Area Alternative would result in less population growth there would be ***less*** impact on population and housing.

Recreation

The Reduced Project Area Alternative would result in fewer housing units and would place a smaller demand on parks/recreation services and the Reduced Project Area Alternative would result in fewer potential recreation impacts in comparison to the proposed General Plan. The Reduced Project Area Alternative would include the same General Plan policies pertaining to recreation as the proposed General Plan ensuring the adequate provision of parks/recreation services. The Reduced Project Area Alternative would have ***less*** impact on parks and recreation services.

Public Services

The Reduced Project Area Alternative would include the same General Plan public service policies as the proposed Plan, reducing potential public services impacts to a less than significant level. However, due to less development, the Reduced Project Area Alternative would result in ***less*** public services impacts in comparison to the proposed General Plan.

Transportation/Traffic

Although the Reduced Project Area Alternative would include the same General Plan policies as the proposed General Plan there would be less new urban development and fewer street improvements, commensurate with development under the Reduced Project Area Alternative, compared to implementation of the proposed Plan. Consequently, implementation of the Reduced Project Area Alternative would ***lessen*** the severity of some of the significant unavoidable impacts to portions of the circulation system in comparison with the proposed General Plan.

Utilities/Services

The Reduced Project Area Alternative would include the same General Plan policies to address the provision of utilities and mitigation of potential impacts associated with development related construction of new utility services. The Reduced Project Area Alternative would result in fewer housing units and non-residential uses and the demand for utilities would be ***less*** than would occur under the proposed General Plan.

Greenhouse Gas Emissions (Global Climate Change)

Implementation of the Reduced Project Area Alternative would result in less land being designated for urban uses and less vehicular use. Greenhouse gas emissions which contribute to global climate change would be reduced under this alternative. Global climate change impacts resulting from implementation of this alternative could be ***less*** due to less development, but would remain significant and unavoidable.

4.4.3 CONCENTRATED GROWTH ALTERNATIVE

The Concentrated Growth Alternative assumes approximately the same number of residential units at buildout as the proposed General Plan, as well as the same goals, objectives, and policies. The density of residential development would increase to reduce the amount of land needed to provide the same growth capacity. Residential land use densities near and within proposed village locations and Transit Oriented Development (TOD) corridors would be increased significantly (25-50%), and minimum densities would be imposed. As a result, more of the land in the Planning Area would be left in open space or agricultural use. Figure 4-2 shows the Concentrated Growth Alternative.

The Concentrated Growth Alternative would have the following impacts relative to adoption of the proposed General Plan.

Aesthetics

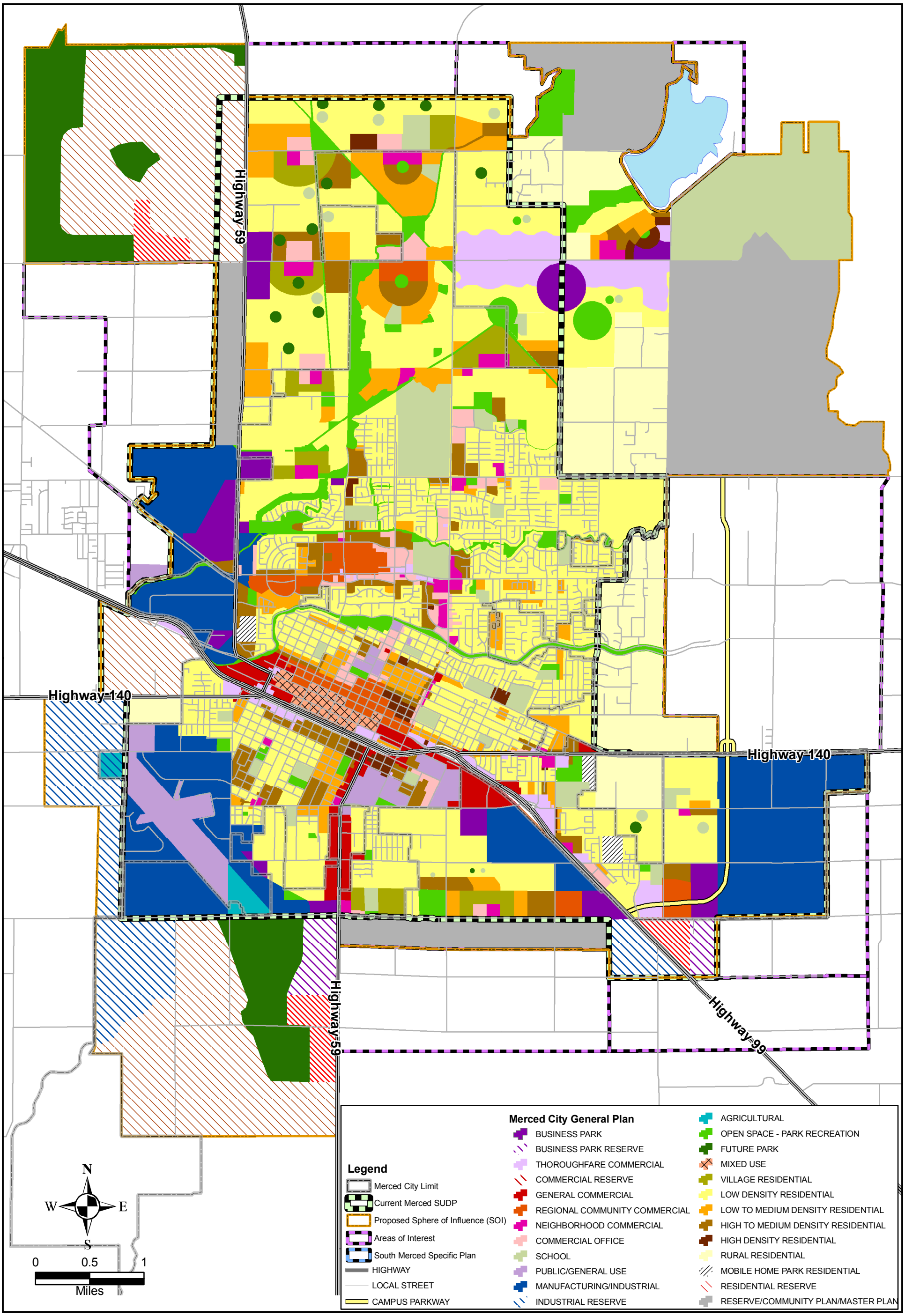
The Concentrated Growth Alternative would contain the same policies addressing the visual appearance of new development as the proposed General Plan. As a result, the potential project-level aesthetic impacts of new development would be self-mitigated in the same manner as the proposed General Plan. However, since the Concentrated Growth Alternative would reduce the amount of land converted to urban uses compared to the proposed General Plan, this alternative would have ***less*** of an impact to aesthetics than the proposed General Plan.

Agriculture and Forest Resources

The primary difference between the Concentrated Growth Alternative and the proposed General Plan is that the Concentrated Growth Alternative would designate fewer acres for urban development, since it would focus new residential uses at medium and high density residential development over a more limited area. While some of this agricultural land surrounding the City may develop with very low density residential uses, as allowed by the County's agricultural designations, there would be a decrease in the amount of agricultural resources lost to urban development. Under the Concentrated Growth Alternative, impacts to agricultural resources, including cumulative impacts, would remain significant and unavoidable, as the alternative would still result in the conversion of agricultural land to some non-agricultural uses. The Concentrated Growth Alternative would have a ***less*** severe impact on agricultural resources than implementation of the proposed General Plan.

Air Quality

Implementation of the Concentrated Growth Alternative would result in a similar number of housing units and non-residential square footage and would generate a similar number of vehicle trips compared to the proposed General Plan. The Concentrated Growth Alternative would result in placement of higher residential density in proximity to existing and proposed commercial areas. As a result, there may be a decrease in vehicle trips generated per dwelling unit compared to the proposed General Plan. The resulting reduction in vehicle miles traveled associated with the Concentrated Growth Alternative would result in a decrease in mobile source emissions;



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MERCED VISION 2030 GENERAL PLAN EIR
2030 CONCENTRATED GROWTH ALTERNATIVE LAND USE MAP

Figure 4-2

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however, for short local trips, trip length is not a significant factor in total overall vehicle emissions. This alternative would have ***less*** impact on air quality.

Biological Resources

Implementation of the Concentrated Growth Alternative would decrease the amount of land converted from farmland to urban development and there would be a reduction in the potential for biological resources to be affected by conversion of land to urbanized uses. Both the proposed General Plan and the Concentrated Growth Alternative would have less-than-significant impacts to biological resources, but this alternative would have ***less*** impact.

Cultural Resources

The Concentrated Growth Alternative would result in less extensive grading activities on undeveloped land, but there would still be the potential for disturbance of unknown cultural resources within the more developed areas of the City. Because this alternative would also be subject to the proposed General Plan policies designed to reduce potential impacts to cultural and historical resources to a less than significant level, the Concentrated Growth Alternative's impact to cultural resources would also be reduced to a less than significant level and the Concentrated Growth Alternative would be ***similar*** to the proposed Plan Update with regard to cultural and historic resources impact.

Geology and Soils

The Concentrated Growth Alternative would result in a similar number of people subject to the risk of geological and soils-based hazards as the proposed General Plan. The Concentrated Growth Alternative would also be subject to the same General Plan policies, as well as federal, state and local regulations, that would reduce the potential for geology or soils related impacts to a less than significant level. As a result, the Concentrated Growth Alternative would result in ***similar*** impacts as the proposed General Plan.

Hazards and Hazardous Materials

Implementation of the Concentrated Growth Alternative would result in a similar number of housing units and non-residential square footage within the planning area and would generate a similar increase in population and amount of hazardous materials and waste as implementation of the proposed General Plan. The Concentrated Growth Alternative would be subject to the same General Plan policies as the proposed General Plan, as well as federal, state, and local regulations reducing the potential for hazards and hazardous materials related impacts to a less than significant level and implementation of the Concentrated Growth Alternative would result in a ***similar*** impact as the proposed General Plan.

Hydrology and Water Quality

Implementation of the Concentrated Growth Alternative would result in a decrease in the amount of land converted from farmland to urban development in comparison with the proposed General

Plan, thereby decreasing the amount of land subject to grading for new construction. Vacant land may still be cleared on a regular basis for agricultural activities, leaving bare soil open to erosion and water use under this alternative could potentially be increased in that agricultural irrigation demands could exceed urban use demands. Urban development under this alternative would be subject to the same General Plan policies as the proposed General Plan Update, as well as federal, State and local regulations, which would reduce the potential impacts on hydrology and water quality to a less than significant level, resulting in a ***similar*** level of impact in comparison with the proposed General Plan Update.

Land Use and Planning

The area surrounding the City limits and within the Planning Area does not include any established communities that would be divided by the Concentrated Growth Alternative, and the Concentrated Growth Alternative would be subject to the same General Plan policies in regards to updating other land use plans and policies for consistency as the proposed General Plan. The Concentrated Growth Alternative would have ***similar*** land use impacts to the proposed General Plan.

Mineral Resources

Impacts to mineral resources are not an issue within the City of Merced SUDP/SOI and implementation of the Concentrated Growth Alternative would have a ***similar*** effect on this resource than implementation of the proposed Plan.

Noise

Implementation of the Concentrated Growth Alternative would result in generation of similar noise impacts due to a similar number of housing units and non-residential uses and related vehicle trips in comparison with the Plan. The Concentrated Growth Alternative would include the same General Plan noise policies as the proposed General Plan, reducing the noise impacts for both alternatives to a less than significant level. The Concentrated Growth Alternative would have a ***similar*** impact on noise as the proposed General Plan.

Population and Housing

In comparison with the proposed General Plan, implementation of the Concentrated Growth Alternative would result in a similar number of housing units and non-residential uses and the same planned population growth as the proposed General Plan. As is the case with the proposed General Plan, this alternative would not result in displacement of housing or people. This alternative would have a ***similar*** impact on population and housing as compared to the proposed General Plan.

Recreation

The Concentrated Growth Alternative would result in a similar number of housing units with a similar demand for parks/recreation services throughout the community. The same General Plan

policies for recreation would apply to this alternative as the proposed General Plan. The Concentrated Growth Alternative would result in a ***similar*** potential impact to recreation services as the proposed General Plan.

Public Services

As the Concentrated Growth Alternative would result in a similar number of housing units and non-residential square footage, it would result in a similar increase in demand for public services as the proposed project. The alternative would include the same General Plan policies to address the provision of public services and mitigation of potential impacts associated with the construction of new facilities. Because extension of public infrastructure and services to undeveloped areas surrounding the City would be lessened under this alternative, the Concentrated Growth Alternative would result in ***less*** impact on public services in comparison with the proposed General Plan.

Transportation/Traffic

Implementation of the Concentrated Growth Alternative would result in fewer vehicular trips in comparison with the proposed General Plan due to more compact development within the City. The Concentrated Growth Alternative would include the same General Plan policies as the proposed General Plan Update, but there would be a reduction in the extent of new public streets extending to outlying areas compared to implementation of the proposed General Plan. Implementation of the Concentrated Growth Alternative would not reduce the severity of significant impacts to deficient existing street segments or intersections in comparison with the proposed General Plan. The Concentrated Growth Alternative would result in ***less*** impact on transportation and traffic in comparison with the proposed General Plan.

Utilities/Services

Implementation of the Concentrated Growth Alternative would result in a similar number of housing units and non-residential uses, accompanied by similar demand for utilities in comparison with the proposed General Plan. The Concentrated Growth Alternative would include the same General Plan policies pertaining to utilities as the proposed General Plan, reducing potential utility-related impacts to a less than significant level. Because extension of utilities and services to undeveloped areas surrounding the City would be lessened under this alternative, the Concentrated Growth Alternative would result in ***less*** impact on utilities and services in comparison with the proposed General Plan.

Greenhouse Gas Emissions (Global Climate Change)

Implementation of the Concentrated Growth Alternative would result in a similar number of housing units and non-residential square footage but would generate fewer vehicular trips contributing to global warming in comparison with the proposed General Plan due to more compact development within the City. The reduction in vehicle miles traveled associated with the Concentrated Growth Alternative could result in a ***lessened*** greenhouse gas emissions contributing to global warming in comparison with the proposed General Plan.

4.5 Comparison of Alternatives and the Project

Table 4-1 shows a qualitative comparison of the alternatives and the project. This comparison provides the means to determine, in conformance with Section 15126.6 of the CEQA Guidelines, if any of the alternatives are feasible, and if feasible, would mitigate, avoid or substantially lessen environmental impacts associated with the project.

4.6 Conclusions

In accordance with the *CEQA Guidelines*, a reasonable range of project alternatives have been evaluated for their comparative environmental superiority. Based on Table 4-1 and the analyses developed in this EIR, the Reduced Project Area Alternative is the environmentally superior alternative because it reduces more potential impacts than other alternatives relative to the proposed General Plan and serves to reduce the severity of three significant cumulative impacts (agriculture, air quality, and transportation/traffic). The No Project alternative (existing General Plan) is environmentally inferior to the proposed General Plan and the other alternatives because it fails to achieve the objectives of the proposed General Plan.

Table 4-1
Environmental Impacts of Alternatives Compared to Project with Mitigations

Topic	Project with Mitigation	No Project Alternative	Reduced Project Area	Concentrated Growth
Feasible?	Yes	No	Yes	Yes
Aesthetics	Less than Significant	Greater	Similar	Lesser
Agriculture and Forest Resources	Significant, Cumulative	Lesser	Lesser	Lesser
Air Quality	Significant, Cumulative	Similar	Lesser	Lesser
Biological Resources	Less than Significant	Lesser	Lesser	Lesser
Cultural Resources	Less than Significant	Similar	Similar	Similar
Geology and Soils	Less than Significant	Lesser	Similar	Similar
Hazards and Hazardous Materials	Less than Significant	Lesser	Lesser	Similar
Hydrology and Water Quality	Less than Significant	Similar	Similar	Similar
Land Use and Planning	Less than Significant	Greater	Similar	Similar
Mineral Resources	No Impact	Similar	Similar	Similar
Noise	Less than Significant	Lesser	Lesser	Similar
Population and Housing	Less than Significant	Lesser	Lesser	Similar

Topic	Project with Mitigation	No Project Alternative	Reduced Project Area	Concentrated Growth
Recreation	Less than Significant	Lesser	Lesser	Similar
Public Services	Less than Significant	Lesser	Lesser	Lesser
Transportation/Traffic	Significant, Cumulative	Lesser	Lesser	Lesser
Utilities/Services	Less than Significant	Lesser	Lesser	Lesser
Greenhouse Gas Emissions (Global Climate Change)	Less than Significant	Greater	Lesser	Lesser
Number of Impacts Reduced		10	11	8
Number of Impacts Increased		3	0	0
Number of Impacts Unchanged		4	6	9

CHAPTER FIVE

MANDATORY CEQA SECTIONS

CHAPTER FIVE
MANDATORY CEQA SECTIONS

5.1 Unavoidable Significant Environmental Effects

The CEQA Guidelines, Section 15126.2(b), requires a description of any significant impacts, including those which can be mitigated but not reduced to a level of insignificance. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, not withstanding their effect, should be described. The project was evaluated with respect to specific resource areas to determine whether implementation would result in significant adverse impacts. The resource areas analyzed included aesthetics; agricultural resources; air quality; biological resources; cultural resources; geology/soils; hazards/hazardous materials; hydrology and water quality; land use and planning; mineral resources; noise; population and housing; public services; recreation; transportation/traffic; utilities/service systems; and greenhouse gas emissions (global climate change). A specific significance threshold was defined for each potential impact associated with each resource area. Based on the environmental impact assessment presented in Chapter Three of this EIR, the resource areas of biological resources, cultural resources, geology/soils, hazards/hazardous materials, land use and planning, mineral resources, population and housing, recreation, public services, and utilities/services would not result in significant impacts either with or without mitigation. When such significant impacts were identified, mitigation measures were developed that would reduce impacts to below a level of significance. Most of the significant impacts identified in Chapter Three of this EIR can be mitigated to below a level of significance. The remaining resource areas (aesthetics, agricultural and forest resources, air quality, hydrology and water quality, noise, transportation/traffic, and greenhouse gas emissions) would result in some form of significant impact.

Where the decision of the public agency allows the occurrence of significant effects which are identified in the Final EIR but are not at least substantially mitigated, the Lead Agency shall state in writing the specific reasons to support its action based on the Final EIR and/or the information in the record (Section 15093(b)). This statement is called a "Statement of Overriding Consideration." This statement will be prepared at the end of the CEQA review process, after the Final EIR for this project has been completed.

5.2 Significant Irreversible Environmental Changes

Section 15126.2(c) of the CEQA Guidelines requires an EIR to address significant irreversible environmental changes which would be involved in the proposed project should it be implemented. An example of such an irreversible commitment is the construction of a new roadway that would provide public access to previously inaccessible areas.

A project would generally result in a significant irreversible impact if:

- The project would involve a large commitment of nonrenewable resources.
- Primary and secondary impacts would commit future generations to similar uses.

- The project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project.

COMMITMENT OF RESOURCES

Development allowed under the proposed General Plan would irretrievably commit nonrenewable resources to the construction and maintenance of buildings, infrastructure and roadways. These nonrenewable resources include mining resources such as sand, gravel, lead, steel, copper and other metals. Buildout of the proposed General Plan also represents a long-term commitment to the consumption of fossil fuels, including natural gas and gasoline. Increased energy would be required for construction, lighting, cooling and heating of residences, and transportation of people within, to, and from the Planning Area. The proposed General Plan policies and standards promoting energy conservation (Transportation and Circulation Policy T-1.5, Urban Development Policy UD-2.2, Open Space, Conservation, and Recreation Policy OS-5.1, and Sustainable Development Policies SD-3.1 and SD-3.2) would result in some savings in non-renewable energy supplies.

Implementation of proposed General Plan would also result in an irreversible commitment of limited, renewable resources such as lumber and water. Policies and standards contained in the proposed General Plan that promote resource and water conservation and green building (Public Services and Facilities Policy P-3.2, Urban Development Policy UD-2.2, Open Space, Conservation, and Recreation Policy OS-5.1, and Sustainable Development Policy SD-3.2) would result in some savings of renewable resources.

CHANGES IN LAND USE THAT COMMIT FUTURE GENERATIONS

Development under the proposed General Plan would result in the conversion of agricultural and vacant land to employment generating and residential uses, and the intensification of underutilized areas. This development would constitute a long-term commitment to residential, commercial, industrial, public facility and other urban uses. The proposed General Plan Planning Area includes 12,865 additional acres of land designated for urban use beyond the existing Merced Specific Urban Development Planning (SUDP) Area (see Table 2-1).

IRREVERSIBLE DAMAGE FROM ENVIRONMENTAL ACCIDENTS

Irreversible changes to the physical environment could occur from accidental release of hazardous materials associated with development activities. However, compliance with federal and State hazardous materials regulations and proposed General Plan policies, as outlined in Section 3.7, is expected to maintain this potential impact at a less than significant level.

5.3 Growth-Inducing Impacts

Section 15126.2(d) of the CEQA Guidelines requires a discussion of how the potential growth-inducing impacts of the proposed project could foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment. Induced growth is distinguished from the direct employment, population, or housing growth of a project. If a project has characteristics that "may encourage and facilitate other activities that

could significantly affect the environment, either individually or cumulatively," then these aspects of the project must be discussed as well. Induced growth is any growth that exceeds planned growth and results from new development that would not have taken place in the absence of the proposed project. For example, a project could induce growth by lowering or removing barriers to growth or by creating or allowing a use such as an industrial facility that attracts new population or economic activity. CEQA Guidelines also indicate that the topic of growth should not be assumed to be either beneficial or detrimental. Negative impacts associated with growth inducement occur only where the projected growth would cause adverse environmental impacts.

Growth-inducing impacts fall into two general categories: direct and indirect. Direct growth-inducing impacts are generally associated with the provision of urban services to an undeveloped area. The provision of these services to a site, and the subsequent development, can serve to induce other landowners in the vicinity to convert their property to urban uses. Indirect, or secondary growth-inducing impacts consist of growth induced in the area by the additional demands for housing, goods, and services associated with the population increase caused by, or attracted to, a new project.

The proposed Project consists of the adoption and implementation of a General Plan Update. The primary economic effect of this project will be continued growth through the 2030 planning period due to the additional public services, utilities, and infrastructure planned for by the proposed General Plan to support predicted growth.

Although there are no specific development plans on file, adoption of the proposed Merced Vision 2030 General Plan will directly result in the rezoning of existing agricultural and vacant land to allow commercial, residential, industrial, and other land uses. This will facilitate the growth and future development of the area, resulting in a possible exceedance of predicted growth. However, the purpose of the growth management policies and standards of the proposed General Plan are to define the limits for extending City services and infrastructure so as to accommodate new development anticipated within the time frame of this General Plan. The proposed General Plan includes the proposed SUDP/Sphere of Influence boundary and an outer boundary which is called the Area of Interest (AOI).

The indirect growth inducing impacts of the project are held as potentially significant impacts according to Appendix G of the CEQA Guidelines. However, the policies of the proposed General Plan have been formulated to control such growth and to guide new development in the area in an orderly manner compatible with existing uses.

5.4 Effects Not Found to be Significant

CEQA Guidelines, Section 15128, states that "An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR." During the scoping process for this EIR, it was determined that only the issues found to be potentially significant in the Notice of Preparation process should be evaluated in detail; therefore, only the potentially significant effects of the project were analyzed in detail.

Results of the comprehensive environmental analysis are presented in Chapter Three of this EIR. No initial study was prepared and all potential effects were analyzed in this EIR. Consult the Notice of Preparation (NOP) comments in Appendix A for additional information on potential effects that were of particular interest to the NOP respondents.

5.5 Cumulative Impacts

CEQA requires that an EIR examine the cumulative impacts associated with a project. The range of projects to be included in the cumulative analysis encompasses "past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those outside of the control of the agency." Section 15130 requires cumulative impacts to be discussed "where they are significant." A cumulative effect is deemed significant if the project's incremental contribution to a cumulative impact is "considerable." A cumulative impact is not considered significant if the impact can be mitigated to below the level of significance through mitigation, including providing improvements and/or contributing funds through fee-payment programs. The EIR must examine "reasonable options for mitigating or avoiding any significant cumulative effects of a proposed project" (CEQA, Section 15130).

The Guidelines allow for the use of two alternative methods to determine the scope of projects for the cumulative impact analysis:

- List Method – A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency (Section 15130(A)).

- General Plan Projection Method – A summary of projections contained in an adopted General Plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact (Section 15130 (B)).

The General Plan Projection Model was selected to conduct the cumulative impact analysis for this EIR. Although the City has not yet adopted the proposed Merced Vision 2030 General Plan, the Draft will be used as the basis for this analysis as it contains the most current predicted improvements and development guidelines of the City.

5.6 Cumulative Setting

For the purposes of this EIR, the cumulative setting is based on a two-fold approach. For some impact issue areas (i.e., air quality, traffic), the cumulative setting is defined by specific regional boundaries (air basin, regional roadway network, etc.) or projected regional or area-wide conditions, contributing to cumulative impacts. For the remaining impact issue areas, the cumulative setting is based on development anticipated within the vicinity of the City, including surrounding cities within Merced County and the County as a whole. This analysis is based primarily on impacts contained in the existing general plan documents for these jurisdictions, including the adjacent City of Atwater and the County of Merced.

5.7 Cumulative Impacts Analysis

AESTHETICS

The proposed General Plan would result in changes to the visual character of the Merced area from a rural, agricultural base to one that is more characterized by urban uses, with increased light and glare sources. The proposed General Plan policies and standards, in conjunction with adopted City regulations, would reduce project-level aesthetic impacts to a less than significant level. However, while the proposed General Plan would not result in a project-level significant aesthetics impact, when combined with the overall growth trends in Merced County, cumulative conversion of the County's visual character from a rural, agricultural character to a more urban feel could result in a cumulative significant and unavoidable aesthetics impact. Within the timeframe of the proposed General Plan, it is unlikely that the portion of Merced County near Merced would be significantly converted from agricultural land to urban uses. Thus the cumulative impact would be ***less than significant***.

AGRICULTURE AND FOREST RESOURCES

The Demographic Research Unit of the California Department of Finance forecasts that the Valley's population will more than double by the year 2040 to almost 10 million people. According to the American Farmland Trust, if the land use trends of the 1990s continue and population forecasts are accurate, the Central Valley can expect to lose another 882,000 acres of farmland to urbanization and ranchette development by the year 2040. This would represent a 111% increase, bringing the total area of developed land in the Valley to 1.68 million acres. Unless things change, a significant amount of the additional land lost to agriculture will be high quality farmland, of which there is now only 6.3 million acres in the region. The annual value of production capacity permanently lost to development will reach $814 million by the year 2040. Between now and then, the cumulative loss of farm gate sales will be around $17.7 billion (both figures in 2000 dollars.).

New development in conformance with the proposed General Plan would contribute to these cumulative impacts. The proposed General Plan's policies and standards described in Section 3.2 would delay, reduce and partially offset Merced's contribution to these cumulative impacts. However, even after mitigation, Merced's contribution to cumulative impacts on agricultural resources in the region would remain ***cumulatively significant***.

AIR QUALITY

Cumulative air quality impacts, including greenhouse gas emissions, were considered in terms of the various land uses proposed under the proposed General Plan and the traffic projections generated by the traffic model. Due to the existing and projected air quality issues in the San Joaquin Valley Air Basin, the proposed General Plan would contribute considerably to a ***significant and unavoidable cumulative*** air quality impact.

BIOLOGICAL RESOURCES

Due to existing intensive urbanization and agricultural use in the proposed SUDP/SOI, and the fact that there are few natural lands in the SUDP/SOI, there is little habitat left for common species and special-status species. However, some special-status species occur in the vicinity of the SUDP/SOI. The increase in urbanization facilitated by the General Plan would contribute to the cumulative loss of biological resources. However, impacts to biological resources have been mitigated to a less than significant level by the proposed General Plan policies and standards, implementation of agency-mandated surveys and mitigation measures for special-status species. They are identified in Section 3.4, Biological Resources. As a result the ***cumulative impacts to biological resources are less than significant***.

CULTURAL RESOURCES

While grading and other construction activities have the potential to impact cultural resources in Merced and the SUDP/SOI, proposed General Plan policies and compliance with federal and State regulations reduce the project-specific impact to a less than significant level. Regional development throughout the County could also affect cultural resources located in other areas of Merced County. However, development in these areas would also be subject to federal and State laws and local regulations protecting cultural resources, including historical resources. As a result, ***no significant cumulative impacts*** would occur.

GEOLOGY AND SOILS

New development in Merced County and the Central Valley will continue to expose people and property to potential seismic hazards and adverse soil conditions. The policies contained in the proposed General Plan, along with compliance with federal, State and local regulations addressing building construction, would reduce the project-level impacts associated with geology and soils to a less than significant level. Development projects in other communities would also be subject to County and State laws and regulations, local general plan policies and planning, building and engineering regulations. Review and permitting of specific development projects, including environmental review in accordance with CEQA, would be expected to involve characterization and consideration of site-specific geologic and soils conditions, and implementation of individual project mitigations where needed. As a result, seismic and soils hazards would be a ***less than significant cumulative impact***.

HAZARDS AND HAZARDOUS MATERIALS

While there would be an increase in population and employment in Merced, the proposed General Plan would not result in a significant impact related to hazards and hazardous materials due to local, regional, State and federal regulations and policies of the General Plan. Similarly, as growth occurs in the County, additional people would be exposed to the risk of hazardous materials, wastes, safety hazards near airport/airstrips, and wildland fires. However, as would occur in Merced, regional, State and federal regulations would apply to development countywide, thereby reducing the potential for cumulative impacts associated with hazards and hazardous materials to a ***less than significant*** level.

HYDROLOGY AND WATER QUALITY

As development proceeds within Merced and the SUDP/SOI, the amount of polluted runoff would increase, as well as the amount of stormwater, which presents a potential impact to surface and groundwater quality. A greater percentage of the population would also be exposed to the risk from flooding of the 200-year floodplain, or from dam inundation. However, project-level water quality and flooding impacts would be reduced to a less than significant level by proposed General Plan policies and existing regulations. New development within the County would also result in an increase in runoff and may locate additional population and structures within areas subject to flooding. Regional development would also be required to comply with regional, State and federal regulations addressing stormwater runoff, water quality and flooding. These regulations would reduce the potential for a cumulative hydrology and water quality impact to less than significant, so the proposed General Plan would ***not contribute to a significant cumulative impact***.

Regarding groundwater depletion and recharge, Merced is within the Merced Sub-basin which is, according to the California Department of Water Resources, being subject to critical conditions of overdraft. Also, a Groundwater Impacts Analysis prepared by Brown and Caldwell for the City of Merced indicates that there is groundwater overdraft in the City's service area, and that the rate of overdraft will continue to increase with future urban development. Implementation of mitigation measures in Section 3.8 (#3.8-5a through 3.8-5h), will help to reduce this impact within Merced's Planning Area; however, it will remain a ***significant cumulative impact***.

LAND USE AND PLANNING

The land use analysis in Section 3.8 of this General Plan EIR found that it would not conflict with established land uses or conflict with adopted land use or habitat plans or policies. Since the project would not result in a land use impact, the project would ***not contribute to a cumulative*** land use impact.

MINERAL RESOURCES

The cumulative Planning Area is not known for the presence of locally important mineral resources; therefore, ***no cumulative impact*** to mineral resources is anticipated.

NOISE

Increased urban development is accompanied by increased noise. The proposed General Plan contains an update to the Noise Element which has several specific development policies and standards to minimize and mitigate noise impacts. Uses that generate noise and construction noise are time restricted to minimize impacts to adjacent land uses and have performance standards for noise levels at property lines. Based on the implementation of these policies, build-out of the proposed General Plan would result in a ***less than significant cumulative impact***.

POPULATION AND HOUSING

As discussed in Section 3.12, the proposed General Plan includes policies to control and direct growth in a well-planned manner, and would improve jobs and housing opportunities in the community. As a result, there would not be a significant or unavoidable project-level impact. Growth would also occur outside of Merced, in other nearby cities within Merced County. Merced County and other incorporated jurisdictions are required by State law to use the General Plan process, as well as other planning processes, such as utility master plans, specific and community plans, to plan for and control future growth. As a result, there would not be a cumulative impact associated with unplanned growth. With regards to the jobs/housing imbalance in Merced County, the proposed General Plan would contribute to a positive improvement in the jobs/housing balance with the contribution of additional employment opportunities. As a result, the proposed General Plan would ***not contribute to a significant cumulative impact***.

RECREATION

Future regional growth would result in increased demand for park and recreational facilities throughout the County. As a result, the County and other jurisdictions would need to expand and construct additional parks and recreational facilities to meet the increased demand. State law allows jurisdictions to require additional development to fund park improvements, which would ensure the provision of adequate parklands. However, as with the proposed General Plan project-level analysis, it is unknown exactly where these parks and recreational facilities would occur to support the cumulative increase in population. As specific parkland expansion or improvement projects are identified, additional project-specific, second-tier environmental analysis would be completed. As a result, ***a significant cumulative impact associated with parks and recreational facilities would not occur***.

PUBLIC SERVICES

The following provides a cumulative analysis broken down by each category of service or utility.

Fire Protection

Future regional growth would result in increased demand for fire services throughout the City and County. As discussed in Section 3.14 Public Services in Chapter Three of this EIR, the City will implement a variety of policies designed to address the adequate provision of a variety of public services as part of the proposed project. Therefore, the General Plan ***would not contribute considerably to a significant cumulative impact*** associated with fire protection services.

Law Enforcement

Future regional growth would result in a need for expanded law enforcement service throughout the City and County. As discussed in Section 3.14 Public Services in Chapter Three of this EIR, the City will implement a variety of policies designed to address the adequate provision of a variety of public services as part of the proposed project. Therefore, the proposed General Plan

would not contribute considerably to a significant cumulative impact associated with law enforcement services.

Schools

Future regional growth would result in increased demand for schools throughout the City and County. As with the analysis for the proposed project, it is unknown exactly where these school facilities would occur to support the cumulative increase in population resulting from growth within and outside of the City. As specific school facility expansion or improvement projects are identified, additional project-specific, second-tier environmental analysis would be completed. Additionally, the payment of school impacts fees (pursuant to SB 50), is deemed as a matter of law to help mitigate these potential impacts to school facilities. Therefore, the proposed project ***would not contribute considerably to a significant cumulative impact*** associated with schools.

Electricity and Gas

Growth in the region will continue to require construction/expansion of utility infrastructure, and as noted in Section 3.13, without definitive plans, it cannot be determined at this time whether these potential impacts would be substantial and would therefore have to be characterized as significant and unavoidable. Similar to any other development in areas of new growth, the construction of any future required utility infrastructure could also result in a variety of environmental impacts (i.e., light/glare, noise, odors, traffic, etc.) that cannot be mitigated. Due to these uncertainties, potential impacts resulting from the construction and/or expansion of any required private utility infrastructure remain ***cumulatively significant and unavoidable***.

TRANSPORTATION/TRAFFIC

Cumulative traffic impacts of the proposed General Plan are more fully described in Section 3.15 Transportation/Traffic in Chapter Three of this Draft EIR. The traffic model used considered growth under the Draft General Plan in conjunction with the projected regional growth for Merced County. Therefore, the transportation analysis of the General Plan is inherently cumulative in nature, because the implementation of the proposed project would take place over many years and would occur in conjunction with other growth and development throughout the region.

As identified in Chapter Three the proposed project would result in substantial increase in vehicular traffic on roadways in the SUDP/SOI resulting in a significant and unavoidable impact. Because this analysis was based on a cumulative model, the project's incremental contribution to traffic impacts would be ***cumulatively considerable.***

UTILITIES/SERVICES

Future regional growth would result in a need for expanded utilities/service systems throughout the County. However, only growth within Merced and its SUDP/SOI would result in the need for the City to construct additional facilities to serve its population, potentially resulting in additional environmental impacts. The analysis in Section 3.16 for the Draft General Plan EIR took into consideration potential growth within the area that would be provided utility service by

Merced and only wastewater treatment capacity was identified at this first-tier level analysis as being significant and unavoidable. The proposed General Plan would ***not contribute to a significant cumulative impact*** associated with the provision of water infrastructure, water quality, storm drainage and solid waste.

GREENHOUSE GAS EMISSIONS (GLOBAL CLIMATE CHANGE)

Policies of the proposed General Plan will reduce global climate change impacts; however, buildout under the proposed General Plan will nonetheless result in a substantial amount of GHG emissions contributing to global climate change. Because it cannot be determined to a reasonable degree of certainty that buildout under the proposed General Plan will not result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change, the impacts of the proposed project on global climate change are a ***significant, unavoidable and cumulatively considerable*** impact.