

4. OPEN SPACE AND CONSERVATION

OPEN SPACE AND CONSERVATION ELEMENT

INTRODUCTION

This element is a combination of two elements required by state law. The state General Plan Guidelines permit the combination of elements, provided that all of the issues required to be discussed in each are included. Under California Government Code Section 65302(d) and (e), the general plan must include:

"A conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources."

"An open-space element as provided in Article 10.5 (commencing with Government Code Section 65560)."

The Open Space Element requires the discussion of various open space issues. These issues include open space for preservation of natural resources, open space used for the managed production of resources, open space for outdoor recreation, and open space for public health and safety. Open space for public health and safety is discussed in the Safety Element. Open space for outdoor recreation is addressed within the Land Use, Public Facilities, and Community Infrastructure Element.

Within the Atwater Planning Area, the most significant natural resource is the prime agricultural land surrounding the City. Issues include the conversion of farmland and the consequent loss of open space. Due to historic agricultural uses, the presence of wildlife species and habitat is relatively minor. However, the open space at the CAADC site contains sensitive habitats and species.

There are few other natural features within the Planning Area. Additional conservation issues of concern include air quality and water quality, since the City is located in an area where both have been adversely affected.

WATER SUPPLY AND QUALITY

Surface Waters



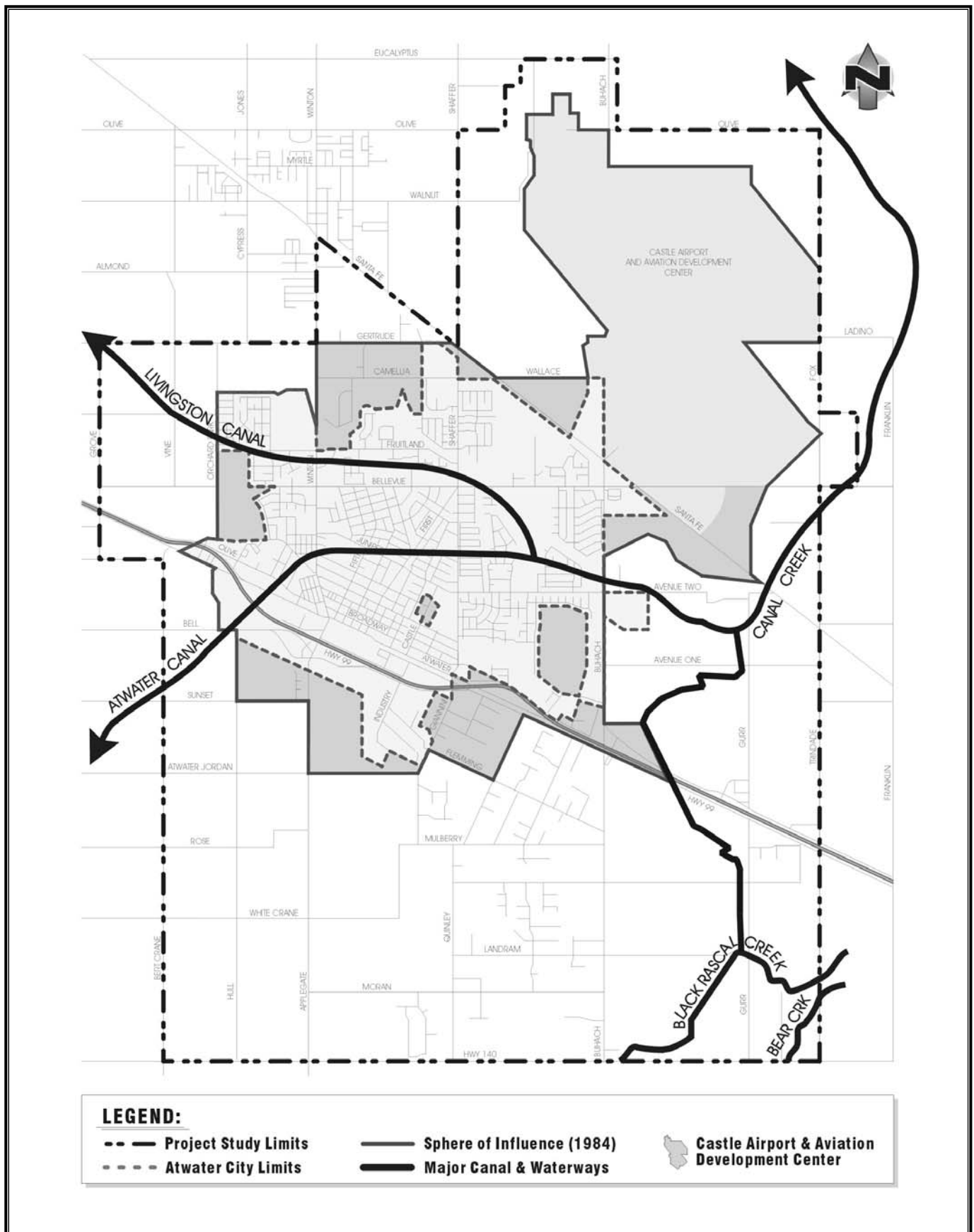
As noted in Figure 4-1, there are few natural streams in the Planning Area. Canal Creek lies adjacent to the southeastern boundary of the CAADC site. South of the City, the Parreira Drain and

Atwater Drain accept storm water drainage. Bear Creek and Black Rascal Creek traverse the far southeastern corner of the Study Area. More significant are the irrigation canals, managed by the Merced Irrigation District (MID). These include the Livingston Canal and the Atwater Canal, both of which pass through the City itself. The Escaladian Canal is located in the northern portion of the Planning Area. The Main Canal diverts water from the Merced River into Canal Creek, which in turn feeds the Livingston and Atwater Canals.



There are no large surface bodies of water within the Planning Area. The closest

body of water is Castle Reservoir, which is located approximately four miles northeast of the City. Constructed by the U.S. Army Corps of Engineers, Castle Reservoir has a maximum storage capacity of 10,400 acre-feet, and it is held back by an earthen dam 52.5 feet high and 2,250 feet long at its crest. Its primary purpose is flood control. Further northeast, Lake McClure and Lake McSwain, both MID reservoirs, are used to provide irrigation water and to generate electricity.



Groundwater Resources

Groundwater supplies the domestic water needs of the City. The groundwater comes from the San Joaquin-Tulare Valley Storage Basin, an aquifer that serves the entire Central Valley. Groundwater quality is better in the higher valley areas and decreases toward the valley trough.

Although static groundwater levels in the Atwater area are generally between 55 and 89 feet below ground level, Figure 4-2 indicates the presence of high water tables within the Planning Area. High water tables occur where dense layers of heavy clay soils block the downward percolation of applied or naturally occurring moisture into the substrata. Most of the areas subject to this condition are located south of Highway 99. The depth to the water table within the affected areas varies from 0 to 10 feet.

In 1989, the Merced County Planning Department noted that nitrate was a groundwater quality problem in the Atwater area (Figure 4-3). Nitrate pollution problems were attributed to fertilizers, animal manures, treated and untreated sewage, geologic sources, and plant residues. It was also noted that shallow wells northwest of the City were contaminated with pesticides, mainly dibromochloropropane (DBCP). DBCP, a pesticide used to control soil nematodes, was heavily used by area farmers until it was banned in 1977 because it was identified as a carcinogen. Pollution of shallow wells from DBCP is widespread.

Contamination of groundwater resources has also occurred as a result of past operations at Castle Air Force Base. Disposal practices have contaminated local groundwater with trichloroethylene (TCE), 1,2-dichloroethane (1,2-DCA), 1,2-dichloroethylene (1,2-DCE), tetrachloroethylene (PCE), carbon tetrachloride, benzene, methylene chloride, dibromochloromethane, and chloroform, among others. Three contaminant plumes have been identified underneath the CAADC site, with the main TCE plume covering most of the area south of the airfield and extending

off site. The EIR for the Castle Reuse Plan stated that a Remediation Investigation/Feasibility Study (RI/FS) was being finalized. The RI/FS identified the plumes as Operable Units 1 and 2 (OU-1 and OU-2). OU-1 was in a Phase 1 Remedial Action stage, which involves modeling and evaluation of a groundwater pump and treatment pilot study. OU-2 was in the Remedial Design/Remedial Action stage.

GOAL CO-1. Support efforts to monitor and remediate existing groundwater contamination within the planning area.

Policy CO-1.1. Encourage responsible agencies to continue monitoring and remediation of contamination of the aquifer underneath the CAADC site.

Policy CO-1.2. Encourage the County of Merced to pursue remediation of groundwater contamination in the unincorporated portions of the Planning Area.

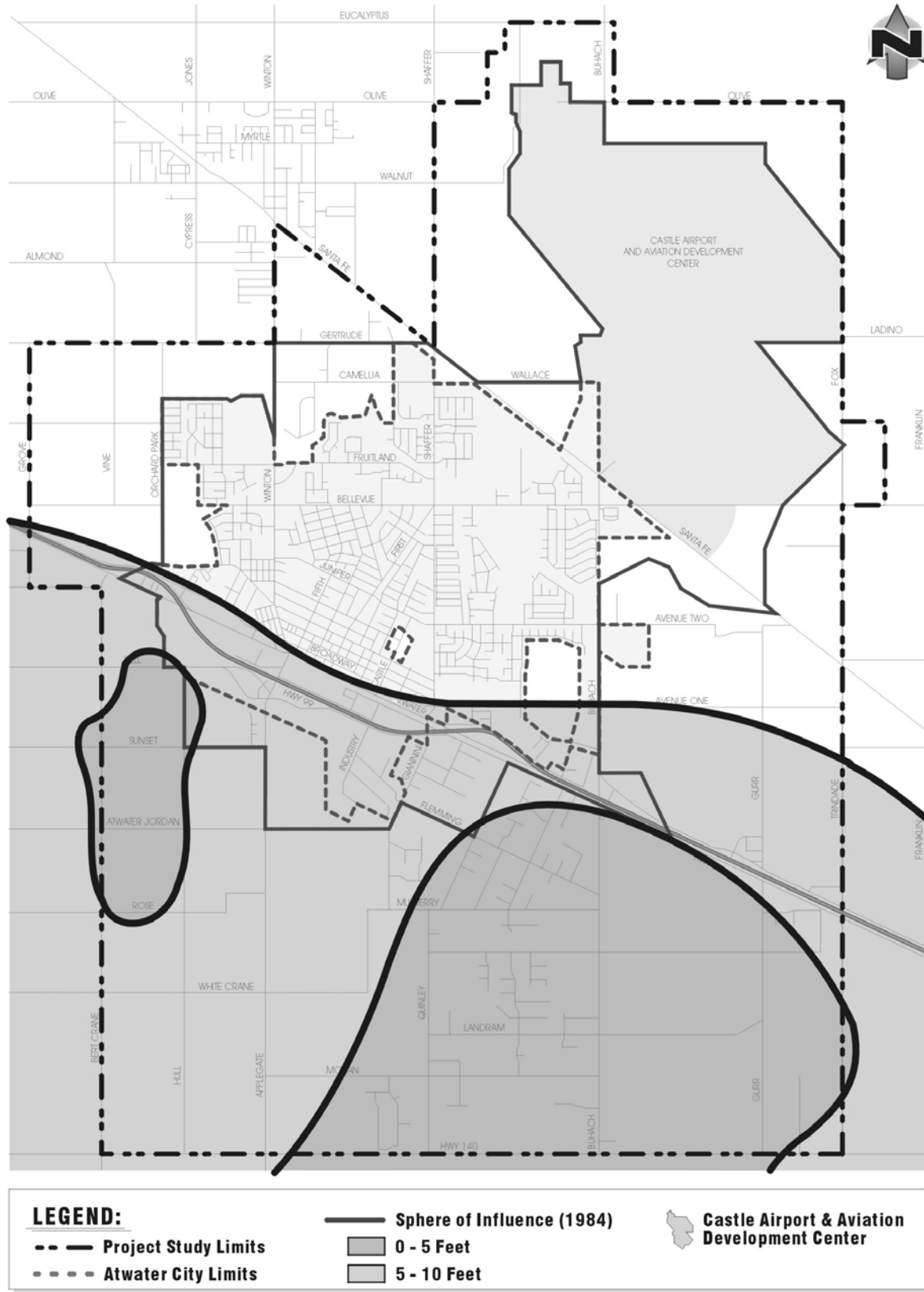
Implementation Program CO-1.a. Encourage the efforts of the Merced County Environmental Health Department to identify and monitor areas of groundwater contamination in the City limits and unincorporated portions of the Planning Area. Work with appropriate agencies to ensure cleanup of identified sites.

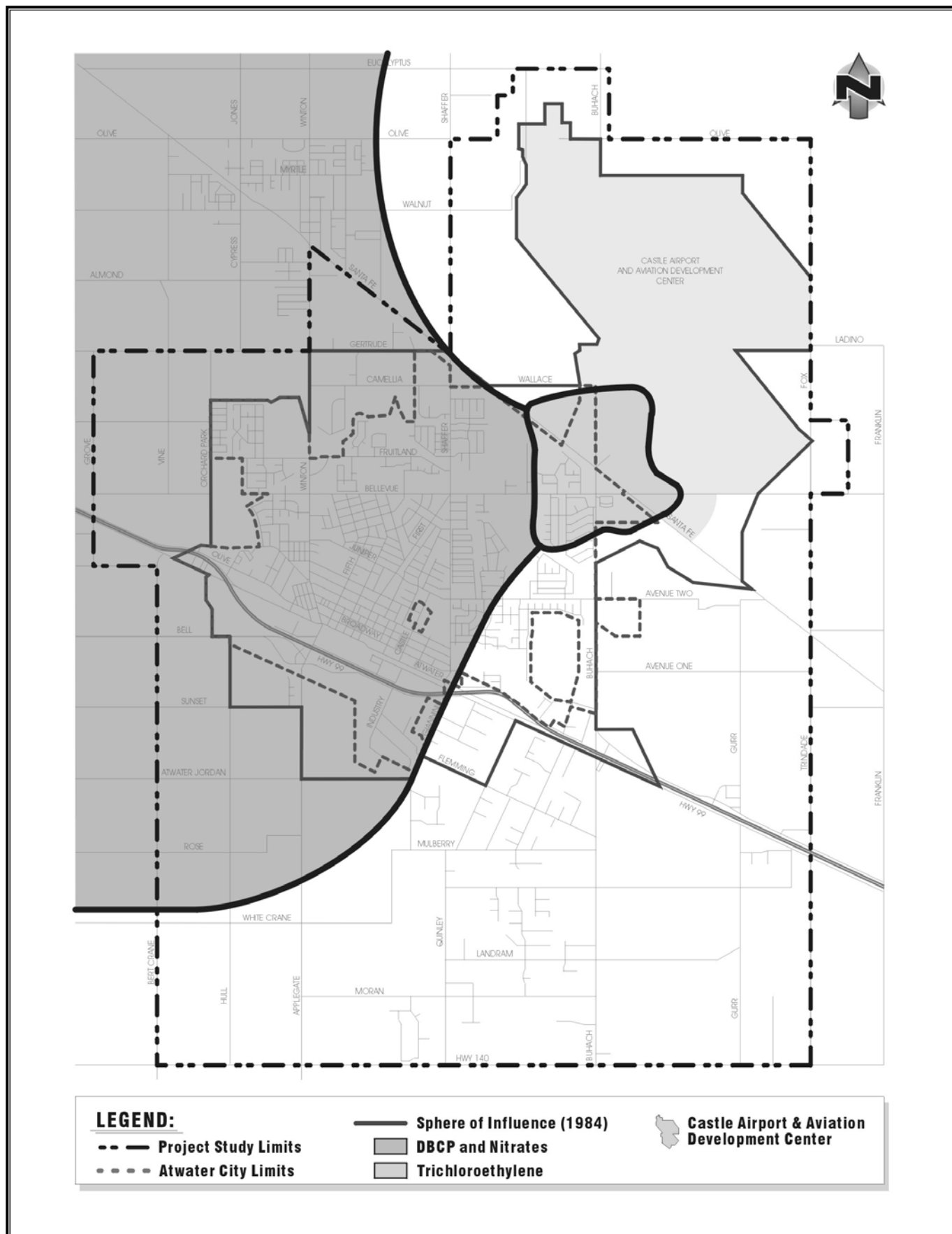
GOAL CO-2. Prevent the creation of new groundwater contamination or the spread of existing contamination.

Policy CO-2.1. Work with the Regional Water Quality Control Board (RWQCB) to protect, improve, and enhance groundwater quality in the region.

Policy CO-2.2. Educate the public on the proper handling and disposal of hazardous materials and household hazardous waste.

Implementation Program CO-2.a. In cooperation with other appropriate agencies, establish and participate in an education program for the public that may include brochures, mailings, and media advertisements.

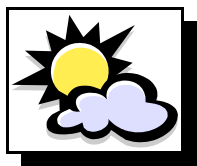




Open Space and Conservation Element

AIR QUALITY

Environmental Setting



The City lies within the central portion of the San Joaquin Valley Air Basin (SJVAB) presented in Figure 4-4. It is surrounded by the Sierra Nevada mountain range to the east and the Coast Range toward the west. These features direct air circulation and dispersion patterns. The climate in Merced County during the summer is dry and very warm. Temperature inversions can trap air within the Valley, thereby preventing the vertical dispersal of air pollutants. Surface radiant cooling can also cause temperature inversions. On clear winter nights, the ground loses heat at a rapid rate, causing air in contact with it to cool. As a result, conditions in Atwater are conducive to the containment of air pollutants. The prevailing winds during the summer from the north and west, known as "up-valley" winds, play an important role in both the dispersion and transport of air pollutants.

In general, there are four major sources of air pollutant emissions in the SJVAB: motor vehicles, industrial plants, agricultural activities, and construction activities. Motor vehicles account for significant portions of regional gaseous and particulate emissions. Local large employers such as industrial plants, can also generate substantial regional gaseous and particulate emissions. In addition, construction and agricultural activities can generate significant temporary gaseous and particulate emissions (dust, ash, smoke, etc.). Finally, urban areas upwind from Merced County can cause or generate transported emissions into the Atwater area.

The principal factors that affect air quality in and around Atwater are: (1) the *sink effect*, climatic subsidence and temperature inversions and low wind speeds; (2) *automobile and truck travel*; and (3) increases in mobile and stationary pollutants generated by *local urban growth*.

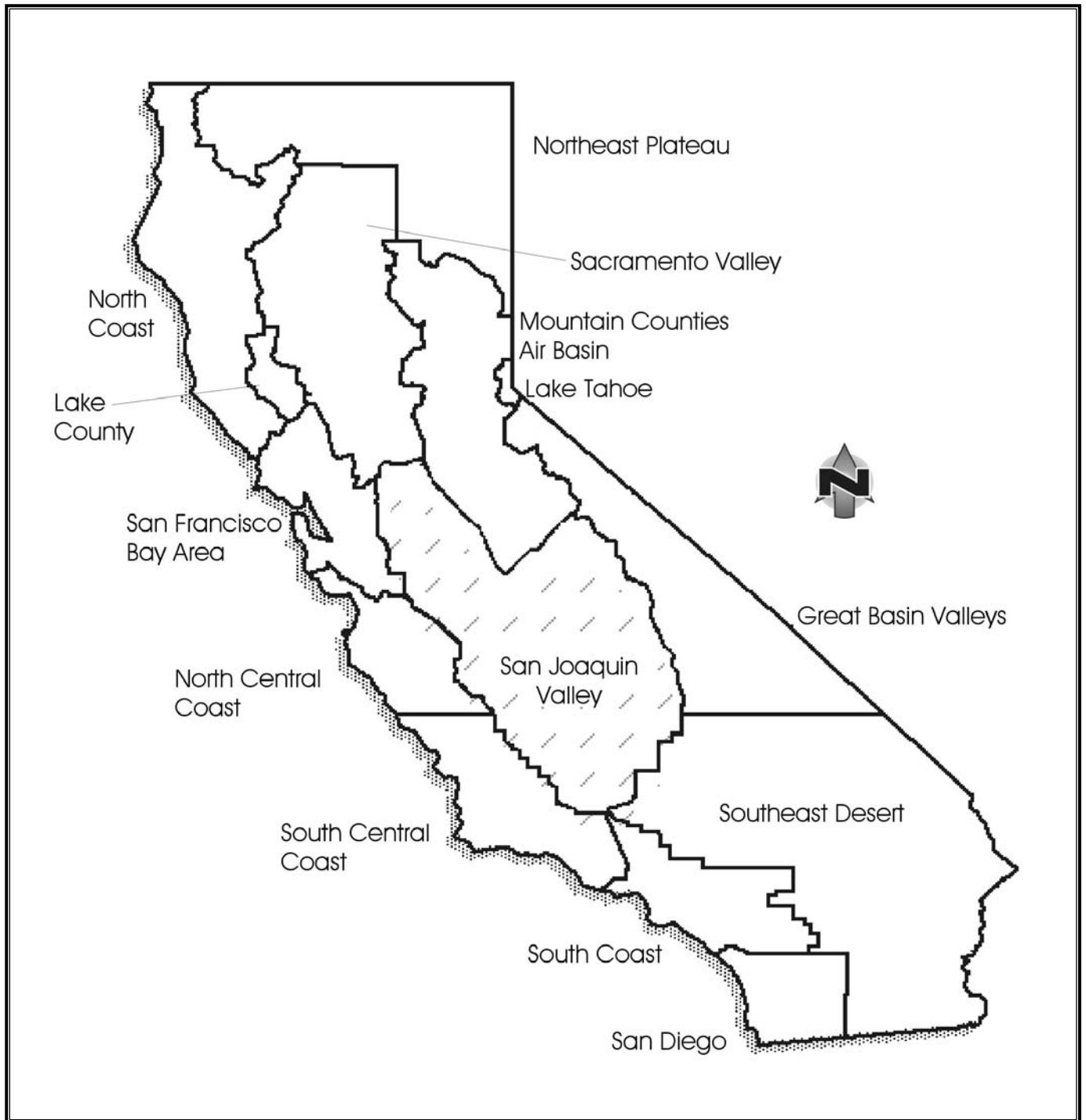
Air Quality Agencies and Regulations



Air quality is an issue that is dealt with by all levels of government. At the federal level, the Environmental Protection Agency (EPA) is charged with implementing national air quality programs. Under the federal Clean Air Act, the EPA is required to set National Ambient Air Quality Standards (NAAQS) for several problem air pollutants. Other Clean Air Act amendments, passed in 1990, allow the EPA to share responsibility with states in reducing emissions from mobile sources.

The California Clean Air Act establishes California Ambient Air Quality Standards (CAAQS), which are more stringent than Federal standards. State air basins are established by the California Air Resources Board (CARB). The state Act classifies "nonattainment areas" based on the severity of violation of the state air quality standards: moderate, serious, severe, and extreme. CARB implements state ambient air quality standards and cooperates with the federal government in implementing pertinent sections of the federal Clean Air Act. Also, CARB has responsibility for controlling stationary and mobile source air pollutant emissions throughout the State.

Air quality planning in the air basin is conducted by the San Joaquin Valley Unified Air Pollution Control District (APCD). The APCD was formed by an act of the State Legislature in 1991. The APCD includes all of seven counties and the portion of Kern County northwest of the Tehachapi Mountains. The APCD is the agency responsible for monitoring and regulating air pollutant emissions from stationary, area, and indirect sources within Merced County and throughout the SJVAB. It does so through both its permitting authority for most types of stationary emission sources and its planning and review activities for other sources. The APCD also has responsibility for monitoring air quality and setting and enforcing limits for source emissions.



Open Space and Conservation Element

Current Air Quality

Federal and state ambient air quality standards have been established for the following six "criteria" pollutants: nitrogen dioxide, sulfur dioxide, particulate matter less than 10 microns in diameter (PM₁₀), carbon monoxide, lead, and ozone. Criteria pollutants are those for which air quality standards that protect human health have been established. Applicable federal and state standards for each regulated pollution category, along with data from the applicable monitoring sites, are provided in Table 4-1.

**Table 4-1
Federal and State Standards
for Nonattainment Pollutants
in the City of Atwater**

Pollutant	Applicable Standard	Averaging Time	Monitoring Station Data ¹
Ozone	0.09 ppm State 0.12 ppm Federal	Max. Hourly High	0.13 ppm
		Standard Violation	44 days
Carbon Monoxide (CO) ²	9.0 ppm State/ Federal 20.0 ppm State	Max. Eight-Hour High	N/A
		Standard Violation	
Particulates (PM ₁₀)	50 ug/m ³	24-Hour High	61 ug/m ³

- 1) The closest monitoring sites to the City of Atwater are located on South Coffee Avenue and the Health Department in the City of Merced. First highest annual data used.
- 2) CO monitoring site is in the City of Modesto (Stanislaus County).

Source: California Air Resources Board, 1996, *Air Quality Data Summary*; VRPA.

The City of Atwater is located in a nonattainment area for ozone and PM₁₀. More detailed information concerning the status of criteria pollutants in Atwater and the San Joaquin Valley Air basin is presented below.

Ozone

The most severe air quality problem in the SJVAB is the high level of ozone. Ozone is not directly emitted into the atmosphere, but instead is a product of chemical reactions between reactive organic gases (ROG), nitrogen oxides, and sunlight. Ozone can cause eye irritation and impair respiratory functions. The SJVAB has been designated a "serious" nonattainment area under federal ozone standards, and a "severe" nonattainment area under state standards. In 1991, the APCD prepared an Air Quality Attainment Plan that contains strategies for the reduction of ozone emissions. In 1992, the ARB postponed a decision on the Plan's ozone strategies until more information was collected.

Suspended PM₁₀

PM₁₀ refers to particulate matter less than 10 microns in diameter - those that can be inhaled and cause health effects. Very small particulate of certain substances can cause direct lung damage, or can contain absorbed gases that may be harmful when inhaled. Particulates can also damage materials and reduce visibility. The SJVAB has been classified as a "serious" nonattainment area for PM₁₀ by the federal government. The air basin is also classified as being in nonattainment of state PM₁₀ standards. The APCD prepared a PM₁₀ Nonattainment Area Plan in 1991, which was subsequently incorporated into California's State Improvement Plan (SIP). In 1994, the APCD approved and submitted a Serious Area PM₁₀ Nonattainment Plan after the EPA redesignated the San Joaquin Valley Air Basin as a serious nonattainment area.

Other Criteria Pollutants

Because carbon monoxide (CO) is emitted primarily by motor vehicles and is non-reactive, ambient CO concentrations normally follow the spatial and temporal distributions of vehicular traffic. High levels of CO can impair the transport of oxygen in the bloodstream and thereby aggravate cardiovascular

disease and cause fatigue, headaches, and dizziness. Within the SJVAB, one urban area is designated as non-attainment for carbon monoxide - Fresno. Since the City of Atwater is not located within the Fresno urban area, Atwater is not considered to be in non-attainment of CO standards. The SJVAB is currently in attainment of all standards for other criteria pollutants.

GOAL CO-3. Strive to reduce air emissions and obtain goals set in local and regional air quality attainment plans.

Policy CO-3.1. Cooperate with the San Joaquin Valley Unified Air Pollution Control District (APCD) in implementing air quality improvement plans prepared by the District.

Policy CO-3.2. Encourage land use development projects that would result in fewer adverse air quality impacts, such as mixed use and pedestrian-oriented projects.

Policy CO-3.3. Encourage the use of modes of transportation other than automobiles.

Implementation Program CO-3.a. In cooperation with the APCD, adopt thresholds of significance for air quality impacts that the City can apply in the evaluation of development projects for which the City has received an application, and for use in developing mitigation measures that may be necessary.

Implementation Program CO-3.b. Implement the sections of the Circulation Element of the City's General Plan that encourage the use of alternative modes of transportation, such as the development of the bikeway system.

Implementation Program CO-3.c. Incorporate as a condition of approval for projects that include significant grading or other earth moving activities measures that control emissions of dust.



The Soil Survey of the Merced Area, conducted by the Soil Conservation Service (now the Natural Resources Conservation Service), indicates that soils in the Atwater area are of the Delhi-Atwater association. This association consists of well-drained, wind-modified, sandy soils. In scattered depressions, the water table is high. Delhi soils consist of sand and loamy sand. Atwater soils are similar, but they have a slight accumulation of clay in their subsoil. Most of the City sits upon Atwater Series soils. Atwater sand, 0 to 3 percent slopes, has good natural drainage and little or no hazard of water erosion, but there is a severe hazard of wind erosion. The southeastern corner of the City is underlain by Atwater loamy sand, 0 to 3 percent slopes. The water holding capacity of this soil and wind erosion hazard are moderate. This soil is considered very suitable for agricultural use. In the northeast portion of the City, the predominant soil is Atwater loamy sand, deep over hardpan, 0 to 3 percent. This soil is similar to the Atwater loamy sand soil, except that it is underlain by a cemented hardpan of 3.5 to 5 feet. Scattered throughout the City are pockets of Atwater loamy sand, imperfectly drained variant, 0 to 3 percent slopes, and Atwater loamy sand, deep over hardpan, poorly drained variant, 0 to 1 percent slopes. Both soils present some drainage problems.

Outside the City limits, Greenfield Series soils are found along Canal Creek southeast of the CAADC site, in the McSwain area and other portions of the Planning Area south of the City. Greenfield soils tend to be well drained and good for agricultural uses.

Scattered throughout the southern part of the Planning Area are Dinuba Series soils, Hilmar Series soils and Snelling Series soils. Dinuba soils in the Planning Area are sandy loam in composition and tend to be located in high water table areas. The Hilmar soil is a loamy sand that is slightly saline-alkali. It is useful mainly for pasture and some field crops. The Snelling soil is well drained, has a low erosion hazard, and is suitable for pasture and field

SOILS

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crops.

AGRICULTURAL RESOURCES



Agriculture has been, and continues to be, an important part of the Atwater economy. Outside of the urbanized City, most of the land in the Planning Area is currently devoted to agricultural uses. Almonds, grains, grapes, and pasturage are the main crops that are grown.

The state Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) produces maps of Important Farmlands and keeps records of farmland acreage. Information depicted within the 1996 Important Farmland Map for Merced County, as reflected in Figure 4-5, shows that the City is mostly surrounded by land designated as Prime Farmland, which has the best combination of physical and chemical characteristics for crop production. A large parcel of land adjacent to and southwest of the City is classified as Farmland of Local Importance. This is land of importance to the local agricultural economy, and it may include dairies, dryland farming, aquaculture, and uncultivated land with soils that qualify as Prime Farmland or Farmland of Statewide Importance.

One of the principal constraints to the expansion of the City is the adverse impact expansion would have on prime farmlands. However, given the City's location, urbanization in any direction would mean the loss of farmland. Further development in the unincorporated areas outside the City would also lead to farmland conversion. Such a process has been occurring in the McSwain area, where residential subdivisions have been gradually displacing almond orchards. This General Plan focuses future urban development in compact growth areas and encourages the retention of Agricultural and open space uses outside of the City's 2000 proposed Sphere of Influence.

As urbanization moves out into agricultural

areas, urban/rural conflicts may occur. Residents in new developments located adjacent to agricultural lands may be subject to adverse impacts from agricultural operations, including noise, dust, odors, and chemical fertilizers and pesticides. The agricultural activities, in turn, may face pressure to modify, curtail, or cease operations that generate the nuisances.

GOAL CO-4. Ensure the continued viability of agriculture in the area surrounding the City's proposed Sphere of Influence.

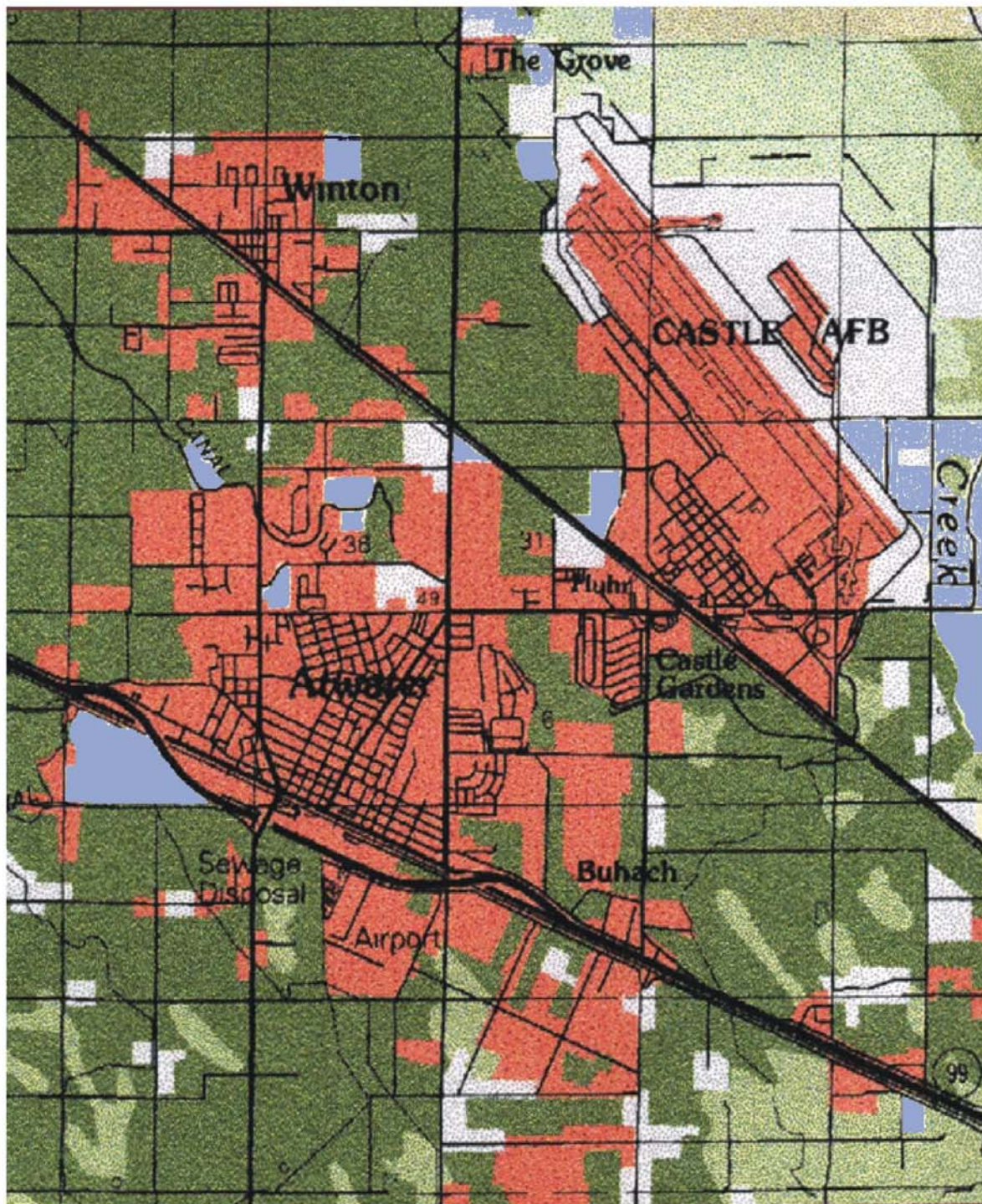
Policy CO-4.1. Comply with all agricultural preservation policies and implementation programs developed jointly by the City and Merced County.

Implementation Program CO-4.a. Continue to work with the County of Merced to develop mutually acceptable policies and implementation programs designed to avoid and/or mitigate the conversion of Agricultural land outside of the City's proposed Sphere of Influence.

MINERAL RESOURCES



The City, along with most of Merced County, is located in the center of a great agricultural belt, produced primarily from unconsolidated sedimentary rocks and alluvial sediments deposited by several of the river tributaries draining into the San Joaquin River. Mineralogical occurrences within the County, therefore, are less numerous than other areas of the state. The Merced County General Plan identified two active mining sites located southwest of Atwater near State Highway 140. Although the product mined at the sites is not explicitly stated, the County's General Plan mentions that a sand deposit is located in the vicinity of Atwater. No other mining activity has been identified in or near the Planning Area.



LEGEND:

- Project Study Limits
- - - Atwater City Limits
- Sphere of Influence (1984)

- Urban & Built-Up Land
- Prime Farmland
- Unique Farmland
- Otherland

- Farmland of Local Importance
- Grazing Land
- Castle Airport & Aviation Development Center

The State Mining and Reclamation Act (SMARA) of 1975 requires the State Geologist to prepare a geological inventory of selected important mineral commodities within a defined study region. The State Geologist then classifies surveyed areas based on the presence or absence of mineral resources. For areas classified as having mineral resources, the State Mining and Geology Board may designate all or part of these areas as having mineral resources of "statewide" or "regional significance." The Board must transmit a report of its designation to the affected local government, which must then develop and adopt policies for the management of land use of designated areas. The state Division of Mines and Geology is in the process of preparing a mineral land classification map for Merced County. However, the map is not scheduled to be adopted until summer or fall of 2000. Once the resource areas have been classified, additional actions are necessary to formally apply a state designation. (John Clinkenbeard, pers. comm.). Thus, no state-designated mineral resource areas currently exist in Merced County.

The County's General Plan identified potential sand and gravel resource sites. The nearest site to the City of Atwater is the Merced River to the north. However, the river itself is located outside of the Planning Area.

BIOLOGICAL RESOURCES

Habitat Types

The Planning Area is within the central eastern portion of the San Joaquin Valley. Prior to settlement in the mid-19th century, the area consisted of grassland with scattered oaks. Scattered vernal pools were also present on the higher terraces adjacent to the foothills of the Sierra Nevada mountain range.

The majority of natural vegetation in the area has been removed for urban and agricultural land uses, and the only large area of natural vegetation remaining is at the former Castle Air Force Base site. Natural habitat types present in the area include: annual grassland,

riparian scrub, vernal pools and swales, seasonal wetland, and emergent marsh (Figure 4-6).

Annual Grassland

Annual grassland is limited to the area immediately northeast of the runways at the CAADC site. Annual grassland at Castle has undergone many years of significant disturbances as a result of military activities. Annual grassland elsewhere in the Planning Area has been converted to urban or agricultural land uses.

Riparian Scrub

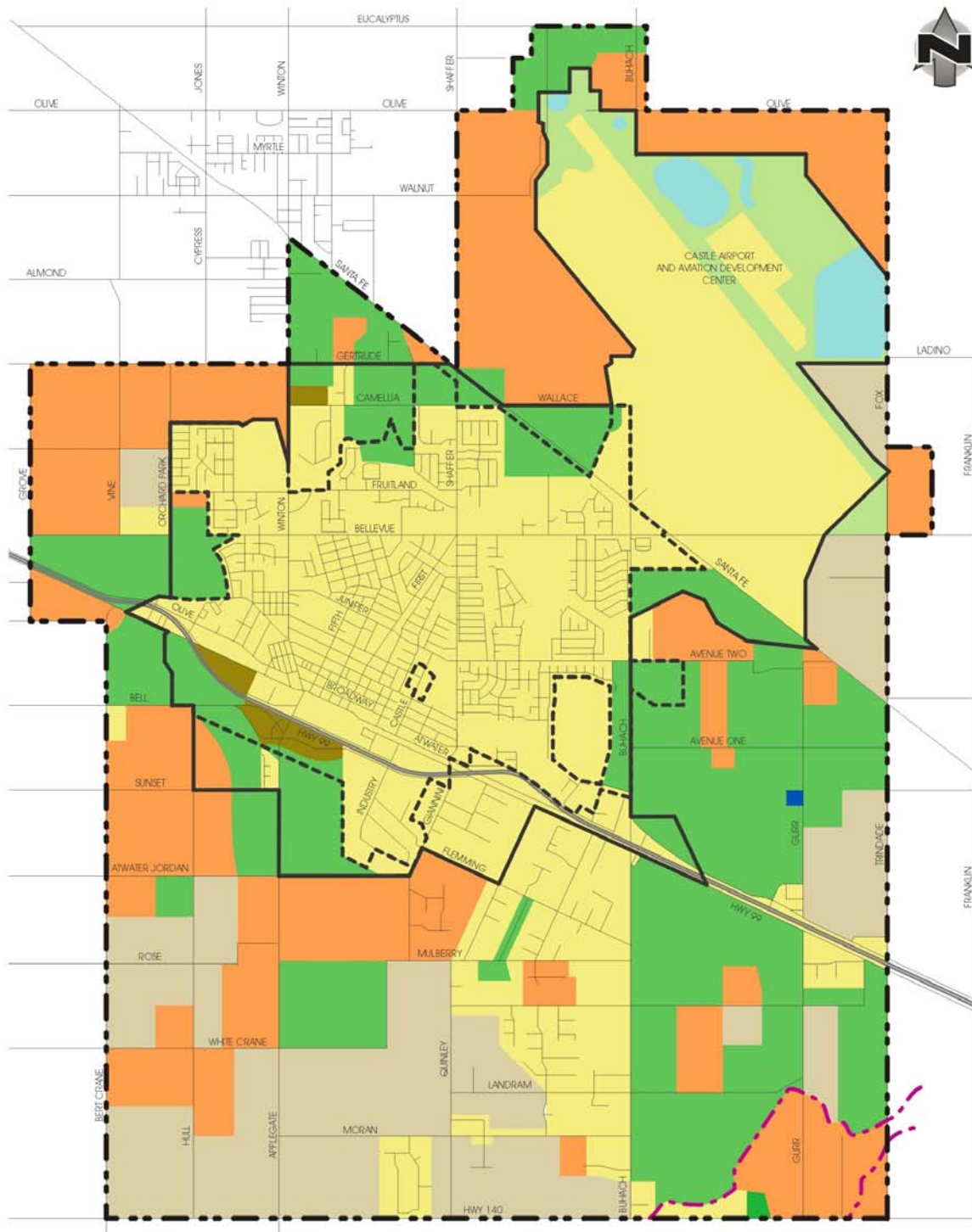
Riparian habitat in the Planning Area consists primarily of open to dense patches of scrub along Black Rascal and Bear Creeks. Riparian scrub in the Planning Area is characterized as sporadically occurring dense assemblages of shrubs with occasional trees.

Vernal Pool and Swale

Vernal pools are landscape depressions that pond shallow water seasonally. The pools support a distinctive biota adapted to periodic or continuous inundation during the winter-spring season and to the absence of ponded water or saturated soil during the summer-fall season. In contrast, swales are broad, shallow, seasonally wet areas that convey water primarily during and shortly after rain events and do not actually pond water like vernal pools. Surface runoff collects in swales, wetting and saturating the soil for short periods. Some swales connect vernal pools, filling or draining them. Others meander through vernal pool terrains but do not physically connect with individual vernal pools. In the Planning Area, vernal pools and swales are limited to an area east of the runways at the CAADC site.

Seasonal Wetland

Seasonal wetlands are shallow to deep depressions underlain by soils with slow permeability that promote ponding or soil



LEGEND:

- Project Study Limits
- - - Atwater City Limits
- Sphere of Influence
- Castle Airport & Aviation Dev. Center

Upland Habitats:

- Orchard
- Cropland
- Annual Grassland
- Irrigated Pasture
- Oldfield

- Urban/Landscape (i.e., developed)

Wetland Habitats:

- Emergent Marsh
- Riparian Scrub

Vernal Pool & Swale Concentration

(may contain some emergent marsh and/or seasonal wetlands habitats)

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saturation of varying durations during the wet season. Seasonal wetlands are differentiated from vernal pools and vernal swales by plant species composition. In the Planning Area, seasonal wetlands occur predominantly within the annual grassland matrix at Castle Airport.

Emergent Marsh

Emergent marsh is present in some slow moving waterways and fringe areas of permanent water such as stock ponds, creeks, and irrigation canals.

In addition, there are non-natural habitat types that include urban/landscaped areas, agricultural lands and "oldfields." Oldfields are areas that were formerly used for agricultural production but have since been abandoned. This distinguishes them from both agricultural lands and natural habitats.

Sensitive habitats are natural habitats that have high biological value and/or documented scarcity in the region or state. Sensitive habitats in the Planning Area include vernal pools and swales, seasonal wetlands, emergent marsh, and riparian scrub. These habitat types have all undergone significant losses statewide since the middle of the 19th century. Many of the areas in which these habitat types existed were converted to agricultural lands early in the 20th century. Because these habitats have become scarce, many of their dependent plant and wildlife species have become rare or endangered. All of the sensitive habitats in the Planning Area have some potential to support special status plant or wildlife species. Additionally, these habitats or portions thereof would qualify as wetlands, as defined under Section 404 of the Clean Water Act (CWA), and would therefore be under jurisdiction of the U.S. Army Corps of Engineers (Corps).

GOAL CO-5. Minimize impacts of future development on sensitive habitats.

Policy CO-5.1. Where feasible, avoid development in areas identified as sensitive habitat. Where avoidance is not feasible, apply mitigation measures to development

projects to minimize impacts to sensitive habitats.

Implementation Program CO-5.a. Require a mitigation program as a condition for any project that proposes the alteration or loss of any sensitive habitat, if avoidance is not a feasible alternative. The program shall include specifications on replacement of sensitive habitat, including ratios for the creation or enhancement of sensitive habitat. The program shall also include monitoring requirements and contingency measures should the proposed program inadequately replaces the loss of sensitive habitat.

Vegetation

The species composition of annual grassland in the Planning Area is typical of annual grassland elsewhere on the eastern side of the San Joaquin Valley. Non-native annual grasses dominate this habitat, including soft chess, wild oat, Italian ryegrass, and Mediterranean barley. Common native forbs include vinegar weed, dove weed, virgate tarweed, bicolor lupine, and Pursh's lotus. Common non-native forbs include yellow starthistle, wild lettuce, and horseweed. Common shrubs in riparian scrub habitat in the Planning Area include narrow-leaf willow, arroyo willow, blue elderberry, and Himalayan blackberry. Common tree species in riparian habitat within the Planning Area along Bear and Black Rascal Creeks include Fremont cottonwood, valley oak, Goodding's willow, and blue gum. Giant reed, an invasive non-native weed, is also a conspicuous component of riparian scrub in the Planning Area.

Vernal pools in the Planning Area support a flora typical of San Joaquin Valley vernal pools. Vernal pool basins are dominated by coyote thistle, Fremont's goldfields, small stipitate popcorn flower, bractless hedge hyssop, woolly marbles, cleistogamus spike-primrose, and common spike rush. Subdominant species interspersed among the dominant species listed above include hyssop loosetrife, Sacramento mesa mint, and hairgrass.

Several rare, threatened, or endangered plant species are also found infrequently in vernal pools in the region. These rare plant species include, but are not limited to, San Joaquin Valley orcutt grass, Myer's navarettia, Colusa grass, Greene's tuctoria, succulent owl's clover, hairy orcutt grass, and Hoover's spurge. Succulent owl's clover and Colusa grass are known to occur at Castle Airport. These two plant species are discussed in more detail later in this chapter.

Swales are dominated by many of the same species as vernal pools with the addition of Italian ryegrass and Mediterranean barley. Common seasonal wetland plant species include curly dock, ammania, cocklebur, Bermuda grass, dallis grass, and nutsedge.

Common plant species in emergent marsh within the Planning Area include broad-leaved cattail, common tule, burhead, ditch-grass, and arrowhead. Emergent marsh generally exists as a dense thicket when dominated by common tule or broad-leaved cattail or as a more sparsely vegetated habitat when dominated by burhead or arrowhead.

Vegetation in urban and landscaped areas is comprised of an array of non-native horticultural species, selected for their aesthetic appeal and ease of propagation. Orchard trees and common irrigated pasture species are found on agricultural lands. Oldfield vegetation is characterized by a predominance of native and non-native weedy herbaceous species.

Wildlife

Annual grasslands in the Planning Area are important foraging areas for many raptors, such as red-tailed hawks, American kestrels, northern harriers, great horned owls, and barn owls. Songbirds, including western kingbirds, cliff swallows, barn swallows, yellow-billed magpies, American crows, western meadowlarks, and savanna sparrows also forage in grasslands. Killdeer, ring-necked pheasants, western meadowlarks, pocket gophers, voles, and black-tailed hares nest or breed in grasslands. Several species

of reptiles also breed and forage in grasslands, including western fence lizards, gopher snakes, and common kingsnakes.

Because riparian scrub occurs in dense clumps along Black Rascal and Bear Creeks, it offers nesting, resting, breeding, and escape cover to a variety of wildlife species. This habitat type has high species diversity and wildlife value. Species that typically take cover and forage in riparian scrub habitats in the Planning Area include: California quail, American goldfinch, lesser goldfinches, spotted towhees, gray fox, coyote, raccoon, striped skunk, Virginia opossum, common kingsnake, and Pacific chorus frog.

Vernal pools and swales have high wildlife value and wildlife species diversity. Vernal pools and swales in the Planning Area, especially within the CAADC site, are probably used by many water birds and other wildlife during the wet season. Shorebirds, waterfowl, and wading birds frequent vernal pools and swales during the winter and early spring. Water birds, such as mallards, great egrets, killdeer, American avocets, greater yellow-legs, black-necked stilts, feed or roost in the shallow pools. Cliff and barn swallows feed on insects around these pools. The pools also provide drinking and bathing water into the spring months, when water in the area may be limited. Vernal pools and swales are suitable habitat for a number of federally listed invertebrates such as vernal pool fairy shrimp and vernal pool tadpole shrimp. Vernal pool fairy shrimp, a federally listed threatened species, is known to occur in vernal pools at the Castle Airport (Department of the Air Force 1994). Seasonal wetlands have similar wildlife values as vernal pools.

Although emergent marsh vegetation along Black Rascal Creek, Bear Creek, and irrigation canals is limited in distribution and extent, they have high wildlife value. Emergent marsh vegetation provides habitat for a variety of wildlife species, including pied-billed grebes, American bitterns, mallards, American coots, muskrats, and beavers. One beaver dam was observed within Black

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Rascal Creek at its intersection with Franklin Road. Reptiles, such as common garter snakes, and amphibians, including Pacific treefrogs, bullfrogs, and western toads, also breed and forage in marshes.

The croplands in the Planning Area have moderate to high wildlife value. Alfalfa has high value for wildlife, especially raptors (e.g., Swainson's hawks, red-tailed hawks, and northern harriers), wading birds (e.g., great egrets), rodents (e.g., voles and pocket gophers), and songbirds (e.g., Brewer's blackbirds, red-winged blackbirds, brown-headed cowbird, and western meadowlarks). Coyotes, common kingsnakes, and striped skunks are other common wildlife species that may forage in alfalfa fields and other agricultural crops.

Irrigated pasture and oldfields have low wildlife value and low wildlife species diversity. Yet many common wildlife species are often found in both habitats. These include coyotes, California voles, California ground squirrels, pocket gophers, morning doves, rock doves, western meadowlarks, red-winged blackbirds, Brewer's blackbirds, cowbirds, killdeer, western fence lizards, common gopher snakes, and kingsnakes.

Urban and landscaped areas in the Planning Area have low wildlife value and low wildlife species diversity, although some common wildlife species use this habitat type. Although orchards provide nesting habitat for several species of birds, they have low wildlife species diversity and low value for most wildlife species because of the lack of ground cover, low plant species diversity, use of pesticides, and human disturbances such as spraying, pruning, and harvesting.

Special Status Species

For the purposes of this General Plan, special status species are defined as follows:

- Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under the federal Endangered Species Act (62 FR 182: 49397-49411, September 19, 1997).
- Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 CCR 670.5).
- Species that meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA) (State CEQA Guidelines, Section 15380).
- Plants listed as rare or endangered under the California Native Plant Protection Act (Cal. Fish and Game Code, Section 1900 et seq.).
- Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (Lists 1B and 2 in Skinner and Pavlik 1994).
- Plants listed by the CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in Skinner and Pavlik 1994), which may be included as special-status species on the basis of local significance or recent biological information;
- Animal species of special concern to the California Department of Fish and Game (Remsen 1978 [birds], Williams 1986 [mammals], and Jennings and Hayes 1984 [amphibians and reptiles]).
- Animals fully protected in California (Cal. Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

As noted in Figure 4-7, two special status plant species, Colusa grass and succulent owl's clover, are known to exist in the area. Both Colusa grass and succulent owl's clover are federally listed as threatened, state listed as endangered, and are considered rare and endangered (List 1B) by the California Native Plant Society (Skinner and Pavlik 1994). In the Atwater area, Colusa grass is known to exist only in vernal pools at Castle Airport. The species was observed in vernal pools at the airport during surveys in 1993 for the base closure, but was not relocated during surveys in 1994 (Department of the Air Force 1994). Succulent owl's clover is also only known to occur in several vernal pools at Castle Airport. This species was observed growing in these vernal pools during surveys at the Airport in the spring of 1998 (Preston pers.comm.). However, specific information regarding the exact location of this species at Castle Airport could not be obtained.

Twenty-one special status wildlife species have the potential to occur in the Atwater Planning Area. Five special status wildlife species have been observed in or near the Planning Area. They are vernal pool fairy shrimp, Molestan blister beetle, western burrowing owl, loggerhead shrike, and tricolored blackbird. Suitable habitat exists in the Planning Area for an additional 16 special status wildlife species: Conservancy fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, California tiger salamander, western spadefoot toad, California red-legged frog, northwestern pond turtle, southwestern pond turtle, California horned lizard, giant garter snake, white-tailed kite, northern harrier, Swainson's hawk, Fresno kangaroo rat, San Joaquin pocket mouse, and San Joaquin kit fox.

GOAL CO-6. Minimize impacts of development on wildlife and wildlife habitat, particularly special status species.

Policy CO-6.1. Consider opportunities for habitat preservation and enhancement in conjunction with public facility projects, particularly parks and storm drainage facilities.

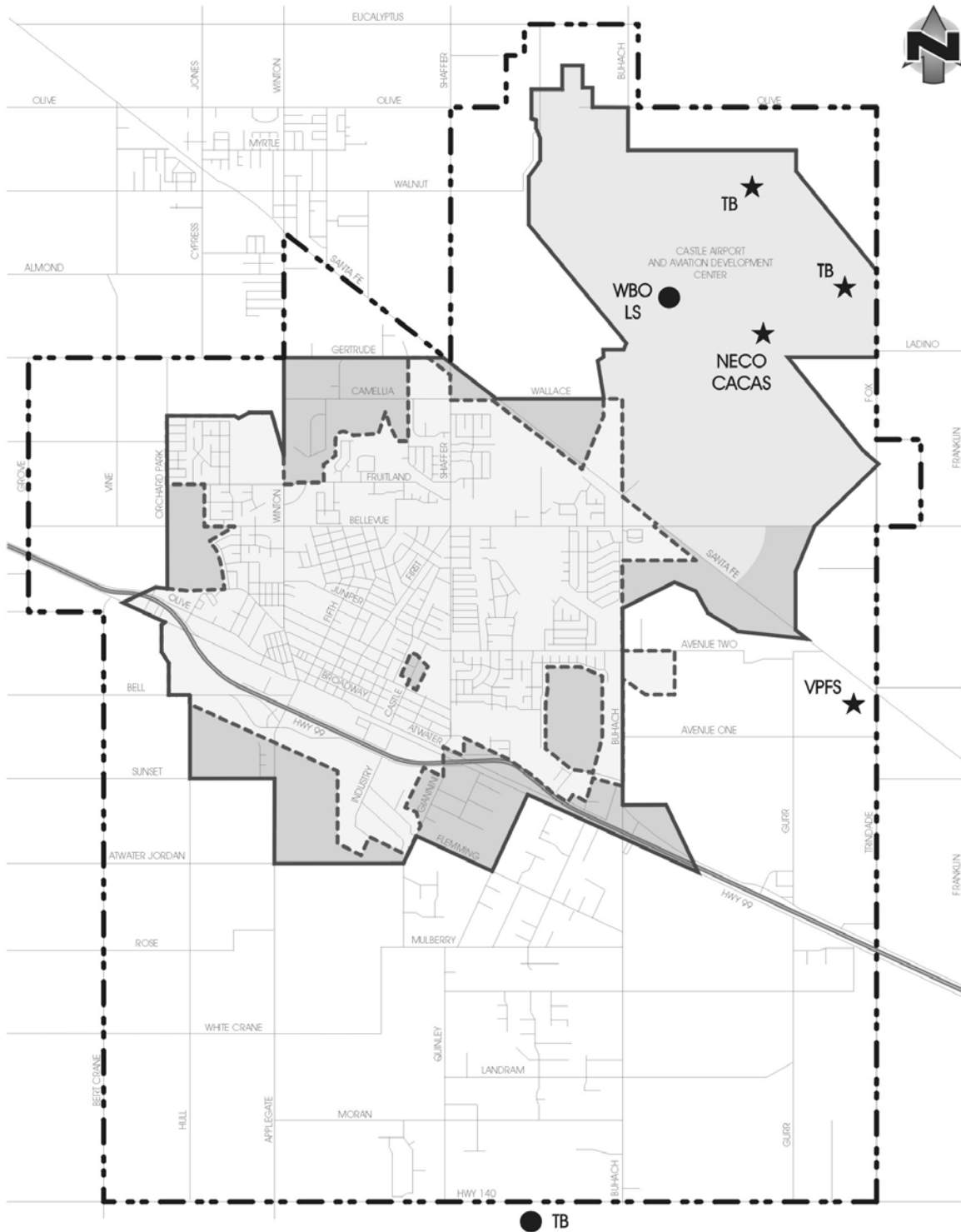
Policy CO-6.2. Encourage the preservation of corridors between natural habitat areas to allow for the movement of wildlife and to prevent the creation of "biological islands."

Implementation Program CO-6.a. When new development or redevelopment activities are proposed in locations with the potential for special status species to occur, require the project applicant to submit a report by a qualified biologist addressing the presence or absence of any special status species on the development site. The report shall include recommendations for avoiding or minimizing impacts on any special status species or habitat found to be present.

ENERGY RESOURCES AND CONSERVATION

Electrical and natural gas service has been provided to the City by Pacific Gas & Electric (PG&E), primarily from fossil fuel and hydroelectric sources. According to the City's 1992 General Plan, future supplies were anticipated to be adequate, and no transmission problems were foreseen.

At the CAADC site, electrical service, including maintenance, is provided by the Merced Irrigation District (MID). Electricity from MID is generated by the McSwain and New Exchequer Dams in Mariposa County. MID is pursuing a larger role in the provision of electricity to the eastern part of Merced County. In 1996, it built the Pioneer Substation and began delivery of retail electric power with service to the Foster Farms plant in Livingston. MID has prepared an Electric Utility Development Plan to extend electrical service to Livingston, Atwater, and Merced. The plan calls for the expansion of the Pioneer Substation to provide service to other Livingston customers and to serve as a base for a 115 kilovolt line extension to Atwater and Merced. Line extensions are proposed to eastern and western Atwater and Castle Airport, among other places. Proposed substations in Atwater and Castle will be built as required. While energy supplies for the City appear to be adequate for the immediate future, energy conservation



LEGEND:

Special-Status Wildlife Species

- LS** Loggerhead Shrike (*Lanius ludovicianus*)
- TB** Tricolored Blackbird (*Agelaius tricolor*)
- VPFS** Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)
- WBO** Western Burrowing Owl (*Athene cunicularia hypugae*)

Special-Status Plant Species

- CACAS** *Castilleja Campestris* SSP. *Succulenta* (Succulent Owl Clover)
- NECO** *Neostaphia Colusana* (Colusa Grass)
- Known Location Within ½ Mile Radius
- ★ Known Location Within 1 Mile Radius

is still an important issue. Reduced energy consumption saves money that could be invested in the community or, in the case of reduced public facility consumption, spent on other public services. Also, air quality is an important issue when generation plants rely upon fossil fuels or other materials that are burned. Less energy demand reduces the reliance on such sources, which not only have potentially adverse impacts on the environment, but could become more costly if more stringent environmental regulations are placed upon them.

GOAL CO-7. Manage and efficiently use energy resources available to the City.

Policy CO-7.1. Encourage the incorporation of energy conservation features into new development, such as high-density development, bikeways and pedestrian paths, proper solar orientation, and transit routes and facilities.

Policy CO-7.2. Encourage the community to reduce energy consumption by providing information on programs that promote energy conservation.

Implementation Program CO-7.a. The City shall conduct an "energy audit" of its facilities and explore means to reduce its energy consumption.

SOURCE REDUCTION AND RECYCLING



In 1989, the state enacted the California Integrated Waste Management Act. Under this Act, local jurisdictions are required to divert 25 percent of their solid waste from disposal by 1995 and 50 percent by 2000. The Act sets the following priorities for promoting integrated waste management: diversion through source reduction, diversion through recycling and composting, environmentally safe transformation, and environmentally safe land disposal.

Each city in California must prepare a SRRE

and HHWE for its jurisdiction. Each county must prepare the same elements for the unincorporated areas and a County Siting Element. The county must also assemble all city and county SRREs and HHWEs within the county into the CIWMP.

After analyzing the Act, Merced County and the incorporated cities within the County decided to use the Solid Waste Joint Powers Agreement to address compliance with the Act. The Solid Waste Advisory Board (SWAB), authorized by the Agreement and having legal authority over solid waste issues, concluded that the most efficient and cost-effective method to complete the mandatory elements was to utilize a countywide approach. The SWAB designated the Merced County Public Works Department as the lead agency in preparing and developing the SRRE for all of Merced County. Each city, however, maintains ultimate control over their SRREs and must individually adopt their own plans by resolution.

An analysis of the composition of the City's waste sent to the landfill revealed that paper comprised the largest share of solid waste, following closely by organic wastes (e.g., food wastes, tires, agricultural residues, and textiles/leather). Other significant components of the City's waste include yard waste, plastics, and inert solids such as rock and concrete. Metals and glass comprised just slightly over 5 percent of the City's solid waste. As of 1990, the City was diverting 4 percent of its waste. To meet the mandated state goals, the City adopted a SRRE with the following components:

- 1) Implement *source reduction* by encouraging home composting and modifying the City's procurement policies to favor recycled, durable, and repairable products.
- 2) Participate in a regional *recycling* program that will include a mobile drop off facility, buyback/drop off facilities for individuals and business that wish to presort and sell recyclable materials, a material recovery facility (MRF) at the landfill, and source-separated residential collection of

Open Space and Conservation Element

newspaper and corrugated cardboard.

- 3) Participate in a regional *composting* facility that produces a soil enhancement product, using green wastes from self-haulers and residential collection.
- 4) Recover *special wastes* by recycling tires or by using them as paving material, and by recovery of "white goods" (e.g. large appliances) at the landfill.
- 5) Initiate an education and public information program to increase awareness of the importance of source reduction and recycling and of the means to implement these programs.

Implementation of the components of the City's SRRE has been slow. In part, this has been because the City is participating in a regional approach to meeting the state's waste reduction goals, an approach that has received the state's approval. Recycling programs in the City are conducted on a voluntary basis, with no mandatory source separation (Jerry Lawrie, pers.comm.).

The City has adopted the HHWE element prepared by Merced County, an element that applies to both the incorporated and unincorporated regions within the County. Examples of household hazardous waste include household cleaners, aerosols, solvents and thinners, and automobile fluids. The Merced County HHWE proposes the establishment of a permanent collection site at the Highway 59 landfill and temporary collection sites within or adjacent to the incorporated cities, with two vehicles to transport the waste from the temporary collection sites to the permanent site. Another component is a load checking program at both County landfills, to monitor the quantity of household hazardous waste entering the normal solid waste stream. The Merced County Association of Governments (MCAG) will implement an educational program to promote public awareness and participation in the safe use, storage, and disposal of household products that are potential hazards.

GOAL CO-8. Strive to meet or exceed the waste diversion and reduction goals

established by Public Resources Code Section 41780.

Policy CO-8.1. Continue to implement all components of the adopted Source Reduction and Recycling Element.

ARCHAEOLOGICAL, HISTORIC AND CULTURAL RESOURCES

Only a small fraction of Merced County has been surveyed for archaeological or historic cultural resources. Areas containing these resources are often located near natural waterbodies and on elevated grounds.

Original occupation of the San Joaquin Valley has been established as occurring 11,000 years before the present. At the time of European contact, the Planning Area was occupied by the Northern Valley Yokuts, a linguistically and geographically distinct division of the larger Yokuts group which lived in the San Joaquin Valley and the Sierra Nevada foothills south of the Fresno River. As many as 41,000 Yokuts may have lived in their homeland before disease and invasions by people of European descent reduced their numbers. According to the Castle Reuse Plan EIS, six cultural resource surveys have been conducted within a one-mile radius of the CAADC site, but only one cultural resource has been recorded. CA-MER-254H, consisting of a historic trash scatter, a chert flake, and a possible mano fragment, is located north of the CAADC site on the bank of Canal Creek.

Spanish missionary expeditions explored the area in the early 1800s, but no settlements were founded. American settlers appeared with the stage coach in the 1850s and began growing wheat and raising cattle. By the 1870s, the extension of the Central Pacific Railroad encouraged development, and the agricultural base began to diversify.



Downtown Atwater in the early 1900s.

Two men have had the greatest influence on Atwater history - John Mitchell and Marshall Atwater. John Mitchell eventually acquired up to a half million acres of land, which he leased out for dry-farming various grains. Upon his death, Mitchell left his estate to the families of three of his nieces. The families formed the company that would lay out the City. Marshall Atwater was a prominent tenant farmer on Mitchell land who later purchased a large tract of land and settled near present-day Atwater. Atwater persuaded the Central Pacific Railroad to place a switch and spur line to his grain warehouse, north of present-day Atwater Boulevard. The community grew and eventually incorporated in 1922. In 1941, Castle Air Force Base was constructed and later became the home of the Strategic Air Command 93rd Bombardment Wing.

Places of contemporary historical significance within the Atwater city limits include the Bloss Mansion, Bloss Library, and Castle Air Museum. George Bloss, Jr. was the son of one of the Mitchell heiresses. The Bloss family played a key role in Atwater history and made many contributions to the community, including a hospital and high school scholarships. The Castle Air Museum houses historic aircraft and remodeled World War II barracks. It attracts approximately 120,000 tourists annually.

GOAL CO-9. Protect and enhance historical and culturally significant resources within the Planning Area.

Policy CO-9.1. Ensure consideration and proper handling of prehistoric, cultural, and archaeological resources during the development process.

Policy CO-9.2. Preserve and maintain structures and features identified as historically significant by the City, including but not limited to, the Bloss Mansion and Bloss Library.

Policy CO-9.3. Encourage public and private efforts to identify, preserve, protect, and/or restore historic buildings, structures, landmarks, and important cultural resources.

Implementation Program CO-9.a. Attach the following standard condition to all discretionary development projects: "If a previously unknown archaeological site is uncovered during in the course of development, all development activity in the vicinity of the site shall cease until a qualified archaeologist completes an investigation. The archaeologist shall submit a report to the City that includes a determination of the significance of the site and recommendations on its disposition. "

SCENIC RESOURCES

The Atwater area is largely devoted to agricultural uses. As such, the open space areas associated with this specific land use offer added benefits as scenic resources. The City has designated the following routes as scenic corridors:

- Atwater Boulevard
- First Street
- Bellevue Road
- Shaffer Road
- Winton Way
- Broadway from Winton Way to First Street
- Buhach Road
- Third Street
- Part of Grove Avenue
- All entrances to the City

City policy aims to protect and beautify these

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streets with specific policies regulating signs, utility lines, land use, and other activities which would detract from the aesthetic value of these corridors. Also, the City encourages actions that enhance the scenic value of these corridors, such as landscaping, maintenance, and architectural design.

GOAL CO-10. Enhance and protect the scenic resources within the City.

Policy CO-10.1. Utilize landscaping and other features to enhance and beautify major streets and gateways into and through the City.

Policy CO-10.2. Avoid excessive signage and other features which could detract from the scenic quality of prominent circulation routes.

Implementation Program CO-10.a. Explore the use of redevelopment financing to beautify streets and gateways within the Redevelopment Project Area.

Implementation Program CO-10.b. Identify and pursue other funding sources which could be used to beautify streets and gateways outside of the Redevelopment Project Area.

HARBORS AND FISHERIES

Under state law, the Conservation Element is required to discuss harbors and fisheries. There are no harbors or commercial fisheries within the Planning Area. Due to the limited amount of waterways in the vicinity, any fishing conducted in the Planning Area is primarily of a recreational nature.

OPEN SPACE FOR RECREATION

Recreational lands are different from other open space lands by their availability for public access and direct recreational uses. State law and policies, as expressed particularly in the requirements for the Open Space Element of the General Plan, promote the retention of open space for recreational purposes. Beyond the general requirements,

however, no specific standards have been established. Rather, it has been left to the local governments to decide how much land should be set aside as open space. Because parks and other recreational features are generally considered public facilities, open space for outdoor recreation is discussed in detail within the Land Use, Public Facilities, and Community Infrastructure Element.

OPEN SPACE FOR PUBLIC SAFETY

The Open Space Element is required to address any open space considered necessary to maintain public safety. Typical hazards that are addressed in this manner include, but are not limited to, excessive slopes, areas susceptible to landslides, flood prone areas, earthquake fault zones, and areas with high wildland fire potential. Most of these issues do not apply to the Atwater Planning Area. Policies related to flood-prone areas are described within the Safety Element.