

II. PROJECT DESCRIPTION

A. Project Location

The proposed General Plan for the County of Imperial encompasses approximately 4,597 square miles, or 2,942,080 acres. It is located in the southeastern most part of the State of California, bordering Mexico on the south and Arizona on the east (Figures 1 and 2). San Diego County is to the west and Riverside County is to the north.

B. Proposed General Plan

The proposed General Plan is a statement of intent by the County as to the future development of the region. Included in this General Plan are eight Elements entitled Land Use, Circulation and Scenic Highways, Noise, Seismic and Public Safety, Agricultural, Conservation and Open Space, Geothermal and Transmission, and Water. Also associated with the General Plan is a Land Use Map designating a series of land use categories which identifies locations, and describes the type and anticipated maximum allowable density of ultimate development. A ninth Element, Housing, was previously updated and adopted by the Board of Supervisors in October 1990, and is not being amended with this General Plan Update.

The General Plan is the product of a cooperative effort on the part of County staff, a community Ad Hoc Advisory Committee, Planning Commission, Board of Supervisors, and many citizens and groups aimed at creating a comprehensive guide for development within the County. The Plan provides the mechanisms to achieve desired community goals and objectives through a coordinated implementation program with specific policies.

This comprehensive plan and associated implementation procedures have been developed by a thorough examination of the opportunities and constraints derived from the physical and cultural resources, socio-economic conditions and the business climate in Imperial County. It provides a balance of land uses which seek to maintain the "quality of life" in the region. The General Plan is a dynamic document in that it can and should be revised/updated on a regular basis to respond the changing community goals, physical resources and social concerns.

The preparation of the General Plan also responds to requirements set forth by the State of California Government Code Section 65300, which states that each "county shall adopt a comprehensive, long-term General Plan for the physical development of the County...". Further, Government Code Section 65302 continues that, "The General Plan shall consist of a statement of development policies and shall include a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals." The Government Code identifies seven required elements of a General Plan, which are the following: Land Use Element, Circulation and Scenic Highways Element, Housing Element, Conservation and Open Space Element, Noise Element, and Safety Element.

As provided by state law, the County of Imperial has chosen to incorporate the Scenic Highways Element (an optional element, Sec. 65303) with the Circulation Element, and the Open Space Element with the Conservation Element (Sec. 65301(a)). The County has also chosen to include the following optional elements, Agricultural, Geothermal and Transmission, and Water.

1. Land Use Element

The intent of the Land Use Element is to determine appropriate urban development centers and encourage their economic development, protect the existing character of rural and recreational communities and areas, maintain and promote the economic prominence of agricultural enterprises, and preserve the unique natural and cultural resources of the Imperial Valley region.

A key component of this Element is to delineate boundaries and establish development standards for land use categories in order to maintain consistency and compatibility between uses and to classify the various land uses recognized by the General Plan. Land use categories are based on the existing land uses and the development of a strategic design for growth within the region.

To clearly define distribution of development and preservation, the following land use designations have been defined: Agriculture, Community Area, Government/Special Public, Industry, Recreation/Open Space, Rural Residential, Special Purpose Facility, Specific Plan Area, and Urban Area.

a. Agriculture

This category is intended to preserve lands for agricultural production and related industries including aquaculture (fish farms), ranging from light to heavy agriculture. Packing and processing of agricultural products may also be allowed in certain areas, as would other uses necessary or supportive of agriculture. The Agriculture category includes most of the central irrigated area known as the Imperial Valley, the Bard/Winterhaven Valley and the south end of the Palo Verde Valley.

Where this designation is applied, agriculture shall be promoted as the principal and dominant use to which all other uses shall be subordinate. Where questions of land use compatibility arise, the burden of proof shall be on the non-agricultural use to clearly demonstrate that an existing or proposed use does not conflict with agricultural operations and will not result in the premature elimination of such agricultural operations. No use should be permitted that would have a serious adverse effect on agricultural production, including food and fiber production, horticulture, floriculture, or animal husbandry.

The Land Use Element of the Plan Update includes a requirement that, for a period of five years after adoption of this General Plan revision by the County Board of Supervisors, no land shall be removed from the Agriculture category except where needed for use by a public agency, for geothermal purposes, where a mapping error may have occurred, or where a clear long term economic benefit to the County can be demonstrated through the planning and environmental review process.

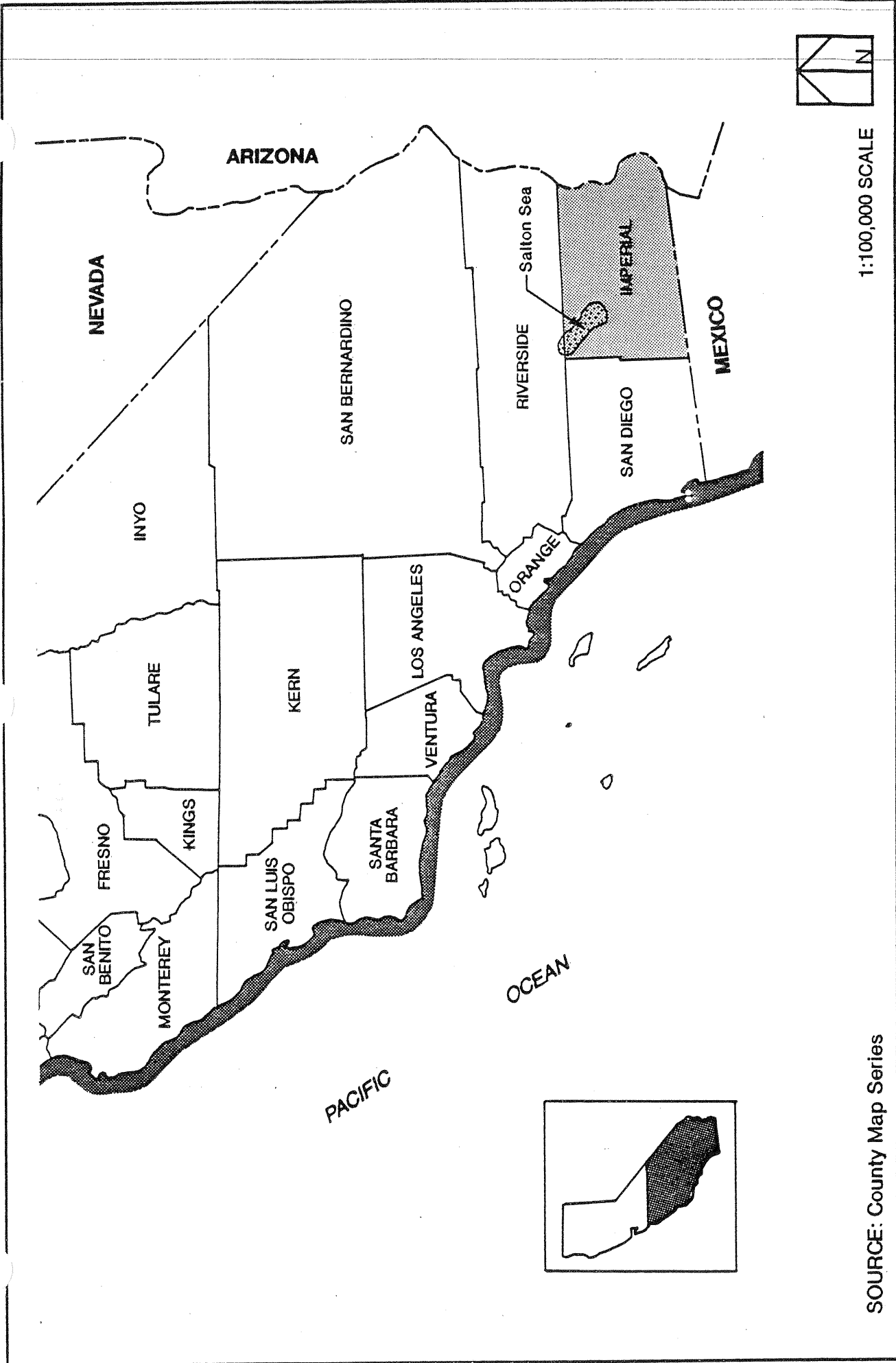
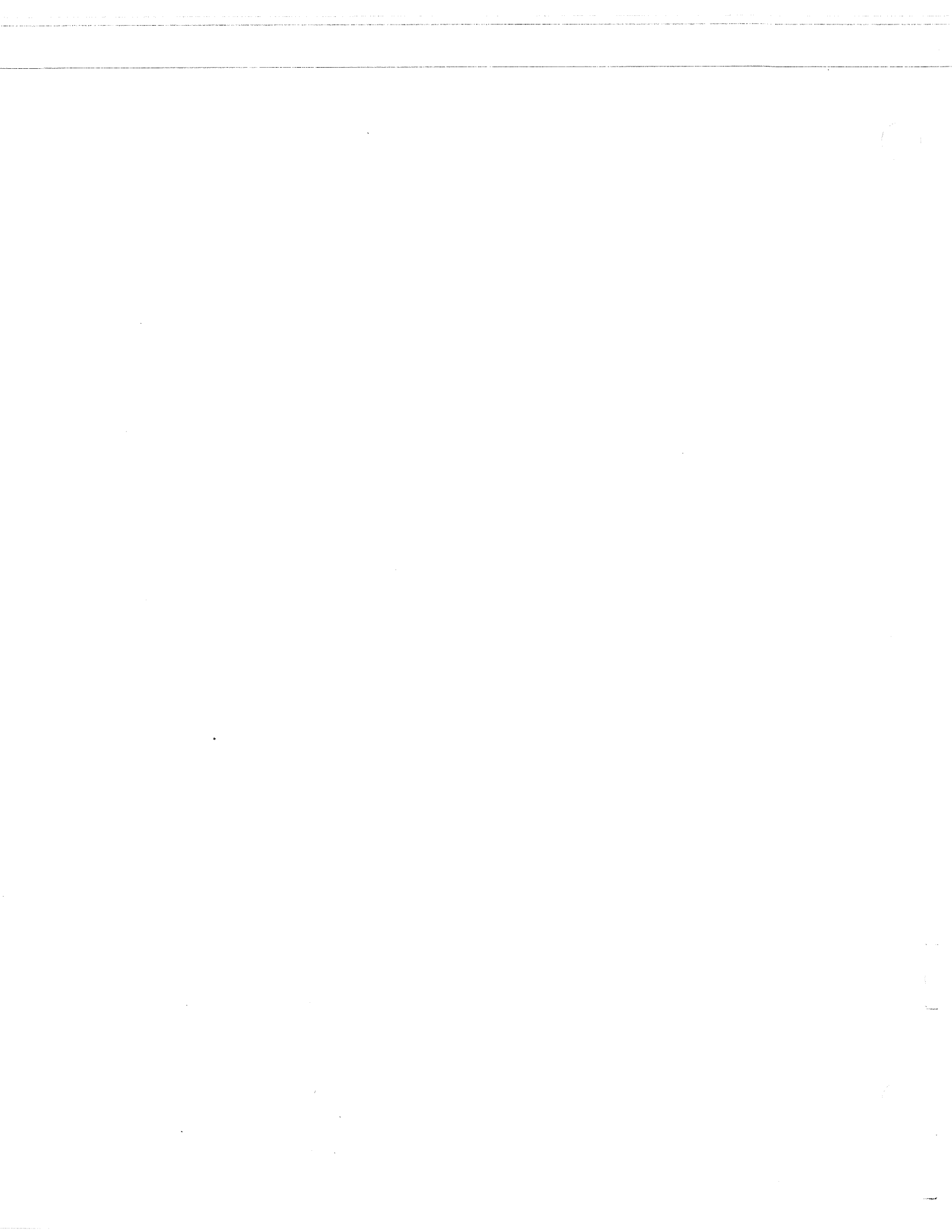
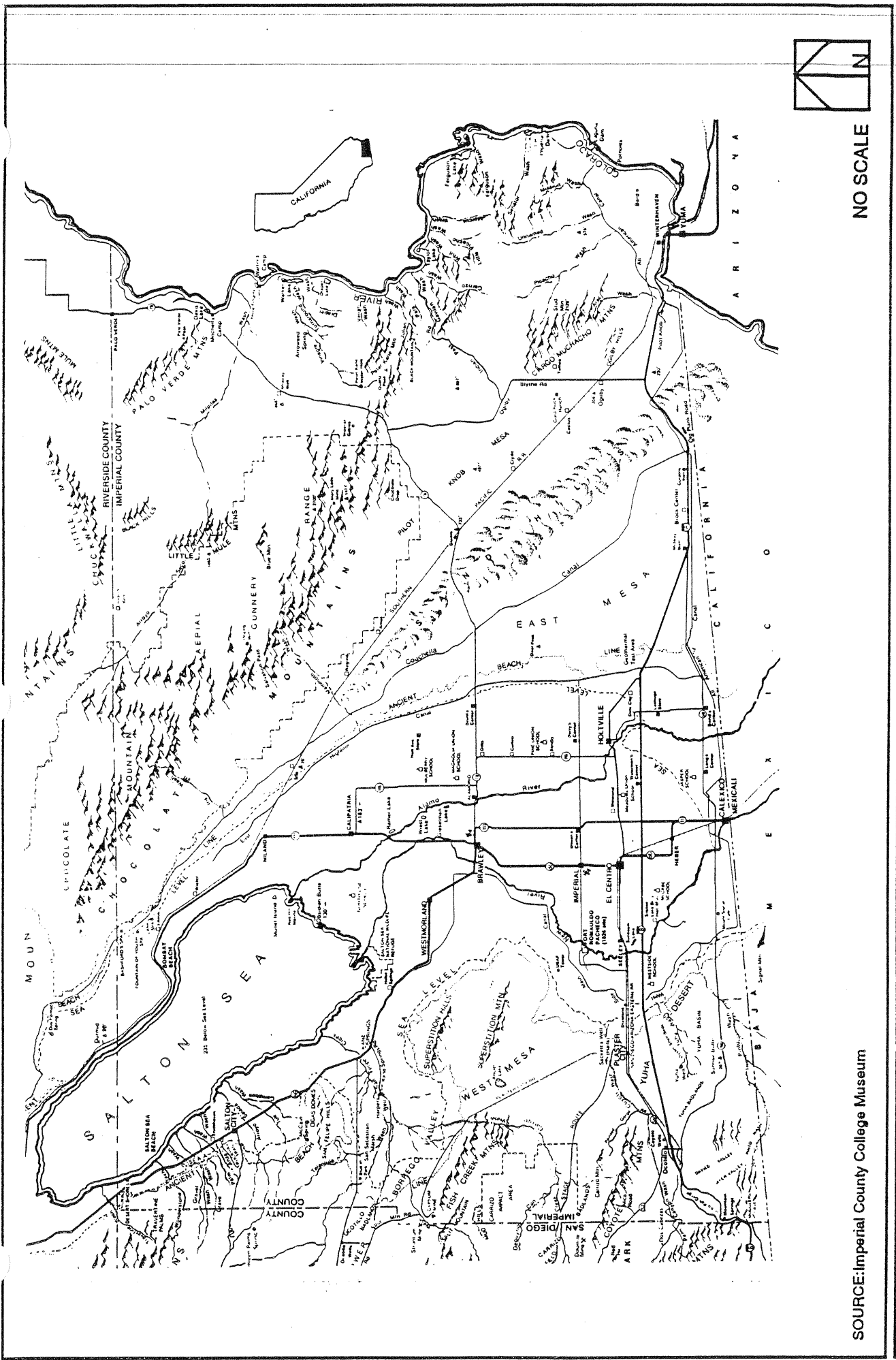


Figure 1

Regional Location Map

Imperial County
General Plan





SOURCE: Imperial County College Museum

Imperial County General Plan

Vicinity Map



Development densities within this category are not more than one dwelling unit per forty acres. Any industrial or commercial development must be agriculturally related, except for geothermal plants which may be allowed.

b. Community Area

The Community Area category represents land uses associated with the unincorporated communities of Hot Mineral Spa/Bombay Beach, Ocotillo/Nomirage, and Palo Verde. Except for Hot Mineral Spa, the land use within Community Areas is planned to be oriented primarily toward relatively low density second home and retirement dwellings and recreation services, rather than urban residential, commercial, and industrial uses. Community Areas usually include small local-and tourist-serving central business districts with a rural orientation.

Urban services, including sewer, water, and physical improvements such as curbs and sidewalks, are limited. Ocotillo/Nomirage is provided water service by private water companies and individual water wells; Palo Verde by the Palo Verde County Water District, and Hot Mineral Spa/Bombay Beach by the Coachella Valley County Water District. Only Bombay Beach has a public sewage system, also operated by the Coachella Valley County Water District, the others rely on subsurface septic systems or private systems operated by mobilehome and R.V. parks. Future growth is expected to consist primarily of infill on existing lots, rather than expansion of community boundaries, except at very low densities. The designation of "Community Area" is not intended to preclude incorporation of a particular community.

Residential densities are from less than one dwelling unit per acre to a maximum of four dwelling units per acre. Higher densities may be allowed pursuant to an approved Master Plan for the overall Community Area where adequate public infrastructure exists. Neighborhood and general commercial uses are allowed; manufacturing and industrial land uses are generally not allowed within this category, except pursuant to an approved Master Plan.

c. Government/Special Public

This designation indicates lands generally owned by public agencies which are presently, and for the foreseeable future, used for a specific governmental purpose. This designation includes military bases, national wildlife refuges, State parks, and most County parks and may also be applied to airports, sewer and water facilities, cemeteries, and other public utilities and facilities.

d. Industry

Within this category, industrial land uses consist of heavy manufacturing land uses located in areas with the necessary supporting infrastructure, away from conflicting existing or planned land uses. Generally, these lands are not suitable for agricultural use and are located adjacent to major transportation systems.

The Industry category is intended to designate areas outside of existing cities where heavy industrial uses exist, such as Plaster City, or can be accommodated without impacting residential

or agricultural land uses. Heavy manufacturing and industrial use may be allowed in these areas and certain Specific Plan Areas, but should not be allowed in other unincorporated areas of the County or in other land use designations of the General Plan. Residential and commercial land uses are generally not allowed within this designation.

e. Recreation/Open Space

The Recreation/Open Space category recognizes the unique recreational character of Imperial County and includes desert, mountain, and waterfront areas with the potential for development as public or private parks and recreation facilities in appropriate areas. Primarily, however, it is characterized by a low intensity of human utilization and includes mountain areas, sand dunes, desert lands and other open lands that are essentially unimproved and not predominantly used for agriculture.

Recreation-related uses include mobilehome and recreational vehicle parks, and resort and recreation facilities. Development is a mixture of seasonally and permanently occupied residential units, recreation facilities, community facilities, and light commercial activities. Examples include Sunbeam Lake, Imperial Lakes, Rio Bend, Red Hill Marina, Goldrock Ranch, and Colorado River camps such as Mitchell Camp and Walter's Camp.

Uncontrolled desert residential development has occurred in this area in the past; examples are Imperial Gables and Milpitas Wash areas in northeastern Imperial County where no water, sewer, electrical, or telephone services exist. Further development of this type shall be restricted to dwellings in compliance with the Uniform Building Code and which can be supported by adequate public access, potable water, and sewage disposal satisfactory to the County Health Department.

Some areas designated Recreation/Open Space contain soils suitable for agriculture, such as the East and West Mesa and Pilot Knob Units of Imperial Irrigation District, which are predominately owned by the Bureau of Land Management and not presently improved for agricultural cropland. Other areas are suitable for aquaculture. Agricultural uses are, therefore, permitted in the Recreation/Open Space category as long as they do not conflict with Bureau of Land Management "Areas of Critical Environmental Concern".

The Recreation/Open Space category also includes lands for the preservation of natural resources; areas for the recharge of ground water basins; rivers and lakes which are important as wildlife habitat and for the enjoyment of recreational sportfishing; areas for the conservation and managed production of mineral resources; and areas for the preservation of areas of outstanding scenic, historic and cultural value. It is intended that this category be used to protect public health and safety, including areas that require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soils, floodplains, watersheds, and other areas required for the protection of water quality.

Residential development will be limited to one dwelling unit per twenty acres unless further defined by a Specific Plan.

f. Rural Residential

The Rural Residential category represents predominately low density residential, recreational, and agricultural land uses in areas where public water and sewer service is limited or non-existent. Permitted development within this category is based upon the availability of public services and facilities, the adequacy of the circulation system, and compatibility with the existing and planned adjacent development. Development densities allow between one dwelling unit per five acres up to two dwelling units per acre. Limited commercial and agriculture uses are allowed, but not industrial uses.

g. Special Purpose Facility

This designation may be applied to lands which are necessary for basic governmental services which have physical or operational characteristics incompatible with most other land use categories. In particular, noise, odors, air and water quality impacts, aesthetics, and traffic may create dangerous or objectional conditions. Permitted uses are subject to approval of a Conditional Use Permit and include Class I, II, and III solid and liquid waste facilities, prisons, and general aviation airports, or sites approved for those purposes. It is the intent of this designation that such proposed and existing facilities be protected from encroachment by development or incompatible land uses.

h. Specific Plan Area

The Specific Plan Area (SPA) designation is used where a Specific Plan must be approved prior to development. Land within this category usually has environmental constraints or unique land use concerns or opportunities which require special land use and/or design control. Suitable areas also include lands proposed for large-scale urban development, natural resource protection, historic preservation, or other use requiring more detailed planning than would typically be required by the County Zoning or Subdivision Ordinances.

In order to accept a Specific Plan for processing, the Board of Supervisors is required to make affirmative findings that the proposed project will have fiscal, economic, social, public facility, and/or other local public benefits.

i. Urban Areas

The areas classified as Urban are intended to provide for low and high density residential, commercial and industrial development, and associated community services. Most urban classifications surround the incorporated cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland; but are also used for the unincorporated communities of Heber, Niland, Seeley, West Shores/Salton City, and Winterhaven. These areas are characterized by a full level of urban services, in particular public water and sewer systems, and contain or propose a broad range of residential, commercial, and industrial uses.

It is anticipated that these areas will eventually be annexed or incorporated and should be provided with the full range of public infrastructure normally associated with cities. Therefore, development in these areas shall provide for the extension of full urban services such as public sewer and water, drainage improvements, street lights, fire hydrants, and fully improved paved streets with curbs and, in most cases, sidewalks.

Development allowed within these areas include residential up to 29 dwelling units per acre, professional, neighborhood and general commercial, and light to medium industry. Urban area designations will be further implemented by Urban Area Plans.

2. Circulation and Scenic Highways Element

The purpose of this Element is to provide a comprehensive document which contains the latest knowledge about the transportation needs of the County and the various modes available to meet these needs. It is provided to meet the information needs of local residents, for regional coordination, and pursuant to requirements of law and policies of federal, state, and regional agencies. Additionally, the purpose of this Element is to provide a means of protecting and enhancing scenic resources within both rural and urban scenic highway corridors.

This Element and the accompanying Circulation and Scenic Highways Plan establish the following classification of existing and planned roadways:

Prime Arterial — the main function of this classification is to provide regional, subregional, and intra-county travel services. Features include high design standards with four to six travel lanes, raised and landscaped medians, highly restricted access, and no parking.

Major Arterial — these provide intra-county and subregional service. Access and parking may be allowed, but closely restricted in such a manner as to ensure proper function of this roadway. Typical standards include the provision for four and six travel lanes with raised and landscaped medians for added safety and efficiency by providing protected left turn lanes at selected locations.

Secondary Arterial — these are designed for intra-county travel as a link between the long haul facilities and the collector/local facilities. Although it frequently provides direct access to abutting properties, that is not its primary purpose. Typical design features include provision for four travel lanes without a raised median. Parking is generally not permitted.

Collector Street — this is designed to connect local streets with the adjacent arterial street system. Design standards include provision for two travel lanes and parking, except in specific locations where parking is removed to provide a turn lane at intersections. Collector streets frequently provide direct access to abutting properties, although that should be avoided where feasible.

Local Street — this street is designed to provide direct access to abutting properties and to give access from neighborhoods to the Collector Street system. Typical design standards include provision for one travel lane in each direction, parking on both sides, and direct driveway access.

In addition, the designation of Scenic Highway has been placed on specified roadways in the County and may be added to others in the future. The purpose of this designation is to protect and enhance the County's scenic aesthetic resources which are visible from major County and State routes.

3. Noise Element

The Noise Element of the Imperial County General Plan provides a program for incorporating noise issues into the land use planning process, with a goal of minimizing adverse noise impacts to receptors, such as residences, schools, and hospitals, which are sensitive to noise.

The Noise Element identifies existing and future noise sources, defines noise-sensitive land uses, and establishes goals, objectives and procedures to protect the public from noise intrusion. Implementation of these guidelines and procedures will promote the development of noise sensitive land uses outside of noise impact zones, and discourage the development of noise generating activities near noise-sensitive land uses.

4. Seismic and Public Safety Element

The purpose of the Seismic and Public Safety Element is directly concerned with reducing the loss of life, injury, and property damage that might result from a disaster or accident. This Element identifies goals and policies that will minimize the risks associated with natural and human-made hazards. In addition, the Element specifies land use planning procedures that should be implemented to avoid hazardous situations.

5. Agricultural Element

The Agricultural Element is an optional Element of the Imperial County General Plan, as permitted by Section 65303 of the California Government Code. Although this Element is not mandatory, it must comply with requirements that are requisite to all Elements of the General Plan and is intended to be a comprehensive, internally consistent, and long-term expression of community goals with regard to agriculture. It will serve as the foundation for development decisions by the County Board of Supervisors. An overall purpose of the Element is to describe the status and trends of agricultural resources in the planning area and to identify the goals, objectives, policies, and measures and time frames related to conserving agricultural lands while minimizing or avoiding conflicts with urban and other land uses.

6. Conservation and Open Space Element

The Conservation and Open Space Element applies to all unincorporated land within the County of Imperial. It identifies goals and policies to insure the managed use of environmental resources. The goals and policies are also designed to prevent limiting the range of resources available to future generations.

The purpose of the Conservation and Open Space Element is to: Promote the protection, maintenance, and use the County's natural resources with particular emphasis on scarce resources and resources that require special control and management; prevent the wasteful exploitation, destruction, and neglect of the State's natural resources; recognize that natural resources must be maintained for their ecological value as well as for the direct benefit to the public; and protect open space for the preservation of natural resources, the managed production of resources, outdoor recreation, and public health and safety.

It is not the intent of this Element to impose any restriction on the use of any private land which would constitute a taking or a damaging of property for public use. This type of action might require payment or just compensation for damages. It is specifically not the intent of this Element to preclude the placement, construction, or the use of one single-family residence on any parcel that exists as a legal parcel of record, and no individual or public safety hazard or danger would result from such placement or construction.

7. Water Element

The purpose of this Element is to identify and analyze the types of water resources within Imperial County and to assure that goals and policies are adopted that preserve and enhance resource availability and quality. It has been prepared to assure that water resources are conserved and utilized to enhance long-term availability, while providing for current supplies and demands. In addition, this document has been prepared to improve the use and distribution of water in Imperial County, including the extension of current water conservation programs. Through this document the County provides leadership, information and advisory services to help users increase efficiencies in their water consumption within the county.

As an official document of the County of Imperial, the Water Element provides goals, objectives and policies to guide the development, utilization and preservation of water resources in the County.

The implementation of the Water Element is meant to assure that water resources are conserved and utilized as possible, and to provide for the long-term viability and availability of this precious resource. The goals and objectives of the Water Element of the Imperial County General Plan are designed to help the County play an important role in the management of future water demands due to future expansion of urban and non-urban developments.

8. Geothermal and Transmission Element

The Geothermal and Transmission Element is an optional element of the Imperial County General Plan as permitted by Section 65303 of the California Government Code. The purpose of the Element is to provide a comprehensive document that contains the latest knowledge about the resource, workable development technology, legal requirements, policy (County, State, and federal), and implementation measures. The Element also provides a framework for the review and approval of geothermal projects in the County.

9. Housing Element

The Housing Element was previously adopted by the County Board of Supervisors in accordance with Government Code, Section 65302(c).

C. Environmental Setting

The County of Imperial contains many diverse natural and cultural environmental resources which are addressed in this EIR. A generalized environmental setting for the entire County is presented below under the topics of landform, geology, soils, climate and air quality, water resources, biology, cultural resources, and geothermal resources. Importantly, details on the environmental setting of the County are also provided under the Existing Conditions sections of the various technical issues evaluated in the Environmental Analysis chapter of the EIR.

1. Landform

The Salton Trough, the most dominant landform within the County, comprises the northern landlocked portion of the Gulf of California and includes the Coachella, Imperial and Mexicali Valleys. The elevation of this broad alluvial plain ranges from 47 feet above sea level at the high point of the Colorado River Delta in Mexico to -275 feet below sea level near the Riverside County line. The lowest portion of the Trough is covered by the Salton Sea, California's largest inland body of water. The sea covers approximately 211,000 acres or 330 square miles, and was at its highest level in April, 1986 at -226 feet.

The complex geologic structure of the Salton Trough has been evolving for millions of years. It is a "rift" in the earth's crustal plates. The East Pacific Rise is the boundary between the Pacific and North American Plates. It extends up the Gulf of California by a series of "spreading centers" with strike slip faults. The thinning of the crust from the slow but continuous widening of the Salton Trough causes the earth's magma to rise closer to the surface and generate abnormally high heat flow which, in turn, heats deep groundwaters.

The irrigated portion of the County is roughly coincident with the shoreline of the ancient Lake Cahuilla and the sea level contour. Non-marine and alluvium sediments cover large portions of the area, especially at the base of the mountain ranges. The major drainage watershed of the County and northern Baja California into the Salton Sea covers 8,360 square miles. The valley

has two natural waterways, the Alamo River and New River, which originate south of the border and flow northward to the Salton Sea. These waterways are historic channels which carried Colorado River water and/or stormwater at various times. Presently, the continuous flow into the Salton Sea is due to irrigation run-off.

The mountains are primarily extrusions of volcanic, granitic, igneous and metamorphic rock complexes and exhibit extensive faulting. These include the Santa Rosa, Fish Creek, Coyote, and Jacumba Mountains to the west; the Chocolate Mountains to the northeast; the Algodones Sand Dunes, Picacho Peaks, and Cargo Muchacho Mountains to the southeast; and Palo Verde Peak to the northeast. The highest point in the County is 4,284 feet at Blue Angel Peak.

The Algodones Sand Dunes are over 40 miles in length and five miles wide and are generally located between the eastern edge of the Imperial Valley agricultural region and the Southern Pacific Railroad. These sand dunes are the most extensive in California, rising to heights of over 300 feet above the surrounding desert floor.

2. Geology

Several significant geologic hazards occur within Imperial County. Particularly noteworthy are seismic activity, flooding, and subsidence. Others include expansive soils and erosion. Detailed information on local geologic hazards can be found in the Seismic and Public Safety Element.

Most likely, some portion of Imperial County will be affected by a minor earthquake (less than Richter magnitude of 3.5 and causing little or no damage) every few months. Every five years, the County may experience a moderately damaging event (magnitude of 5.5 or greater). At least once every fifty years there will probably be a major earthquake (6.8 or greater). Microseismicity occurs almost continuously in Imperial County (events less than 2.0), often dozens and sometimes hundreds of events per day.

Subsidence has been naturally occurring throughout the Salton Trough. This natural subsidence averages nearly two inches per year at the center of the Salton Sea, yet decreases to zero near the Mexican border. The subsidence is generally uniform, but local depressions, such as the Mesquite Sink south of Brawley, have formed. Earthquakes have also caused abrupt elevation changes in excess of one foot across fault lines.

The geologically young, unconsolidated sediments of the Salton Trough are subject to failure during earthquakes, especially throughout the irrigated portion where it is generally saturated. Liquefaction and related loss of foundation support is a concern which requires appropriate structural design for new buildings.

Flooding is another geological hazard within the County. Floodplains are generally located adjacent to rivers and other bodies of water, and in low lying areas near a water source. These are areas that are predicted to experience inundation from storms having a frequency of once every one hundred years. Floodways are more hazardous due to the anticipated velocities of the flood waters and expected damage to life and property. Such designations occur along the New

and Alamo Rivers; Myer Creek, which flows into an alluvial fan in the Ocotillo area; within the levees along the Colorado River; along the San Felipe Creek; and where numerous washes occur throughout the County.

Further information can be obtained by maps, reports, and studies on file with the County Planning Department including Flood Insurance Rate Maps (FIRMs) prepared by the Federal Emergency Management Agency, the Alquist-Priolo Special Studies Zones maps of local earthquake faults prepared by the State Geologist, the County General Plan Conservation and Open Space Element, and the Seismic and Public Safety Element.

3. Soils

The soils of Imperial Valley consist of silty clays, silty clay loams, and clay loams that have formed on nearly level old lake beds and floodplain deposits. The soils are generally deep, high calcareous, and usually contain gypsum and soluble salts. The central part of the County, which is irrigated, generally has fine textured silts. Sandy soils predominate in higher areas, such as the East and West Mesas, and are typical of most of the deserts in the southwestern United States. These soils do not have well defined horizons and are several thousand feet deep.

In the dry climate of Imperial County, the soils have no potential for farming and only limited potential for wildlife habitat unless they are irrigated. The federal Soil Conservation Service's Soil Survey is a detailed inventory and evaluation of Imperial County soils (see Conservation and Open Space Element of the General Plan). Information derived from the Soil Survey publication may be useful in planning the use and management of soils for crops and pastures, as sites for buildings, highways, and other transportation systems, sanitary facilities, parks and other recreational facilities, and for wildlife habitats. From this data, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable may be selected, and measures to overcome soil limitations can be planned.

4. Climate and Air Quality

Imperial County has an arid climate with hot, dry summers and mild winters. The climatic condition of the area is governed by large-scale warming and sinking of air in the semi-permanent subtropical high pressure center over the Pacific Ocean. The high pressure ridge blocks out most mid-latitude storms except in the winter when the high ridge is weakest and farthest south. Also, the coastal mountains prevent the intrusion of the cool, damp air found in the California coastal regions.

The flat terrain and strong temperature differentials created by intense heating and cooling patterns produce moderate winds and deep thermal circulation systems. Thus, even though the summers are hot, the general dispersion of local air pollution is greater than in the coastal basins where polluted inversion layers may remain for long periods.

The daily temperatures and seasonal variations can be extreme. The clear skies and rapid heating and cooling of the desert soils create high temperatures by day and quick cooling by night. The average annual rainfall is about 3 inches, the average annual air temperature is about 72 degrees Fahrenheit, and the average frost-free season is about 300 days per year.

The local air quality levels are currently better than most state standards. In the last two years, the County has not exceeded the federal ozone standard of 0.12 parts per million (ppm); however, particulate matter concentrations do not meet either state or federal standards. This failure is due to natural conditions such as wind blown sand and dust, and man made conditions such as agricultural burning of fields.

5. Water Resources

The source of virtually all surface waters in Imperial County is the Colorado River. The water is diverted from the Colorado River at the Palo Verde Diversion Dam north of Blythe by the Palo Verde Irrigation District for use in the Palo Verde Valley of northeast Imperial County and southeast Riverside County; and at the Imperial Dam into the All-American Canal by the Imperial Irrigation District (IID) and the Bard Water District for use in the Imperial, Yuma, Bard, and Coachella Valleys. The 82-mile All-American Canal, the three-mile New Briar Canal, and 52 miles of drains are owned by the Bureau of Reclamation and are operated and maintained by IID.

The Imperial Irrigation District also owns and operates a 1,590-mile network of main canals and laterals and 1,406 miles of main and lateral drains to serve approximately 500,000 acres of irrigated farm land. Water is also provided by IID to cities and special districts throughout the County which treat and distribute the water for urban uses. Ground water is utilized in several rural communities in the County not serviced by irrigation districts with Colorado River water.

6. Biological Resources

Plants. As part of the lower Colorado River Basin, much of the County has historically been a creosote bush (*Larrea divaricata*) plant community. With agriculture as the dominant activity since the early 20th Century, the constant clearing of the valley floor for farming has destroyed much of the native plant life. Remnants of natural plant communities exist along the Alamo and New Rivers, along the watershed boundaries of the surrounding mountains, and at the edge of the Salton Sea.

The plant species are predominantly those which are salt tolerant: saltbush (*Atriplex canescens* spp.), iodine bush (*Allenrolfea occidentalis*), tamarisk (*Tamarix* sp.), mesquite (*Prosopis juliflora*), arrow weed (*Pluchea sericea*), sea blight (*Suaeda* sp.), and other halophytes (salt tolerant plants).

The Conservation and Open Space Element of the County General Plan has a map indicating where sensitive plant species are located. Another source which lists the rare, threatened and endangered plant species is the Bureau of Land Management's "California Desert Conservation

Area Plan (1980)." Within this federal Plan, plants are protected through the designation of Areas of Critical Environmental Concern (ACEC).

Animals. Natural desert wildlife populations can be found throughout the County, but mainly are concentrated in areas where there is limited agricultural disturbance due to plowing, planting, and the harvesting of crops. The natural desert environment surrounds the irrigated portion of the valley and also occurs as scattered patches within the farm lands. With two rivers and hundreds of miles of irrigation canals and drainage ditches, the abundant water supply creates pockets of riparian habitat where non-desert animal life exists.

Imperial County is located on one of the most important flyway corridors for migrant waterfowl, shorebirds, and songbirds. Generally, the greatest numbers and diversity of birds are found during the autumn and spring months. The presence of the Salton Sea, rivers, canals, drainage ditches, and fish farms are a strong attraction to bird species for food sources, nesting and resting sites. Refuges and management areas created by the California Department of Fish and Game and U. S. Fish and Wildlife Service also attract various mammals, bird species, reptiles, and amphibians.

7. Geothermal Resources

Generally, temperatures gradually increase with depth below the surface of the earth. Areas where increased temperatures are significantly higher are referred to as "geothermal anomalies". These anomalies may be caused by one or a combination of the following:

- Thinning of the earth's crust or volcanic activity bringing the hot magma of earth's interior closer to the surface.
- Chemical or mechanical activities deep in the crust itself which generate heat.
- Insulating layers in the rock and soil which confine the earth's heat so that temperatures build up.

If no water is present, the anomaly is called "hot dry rock". A few geothermal anomalies produce steam, such as the Geysers in Northern California. However, most water-dominated anomalies, like Imperial Valley, have hot fluids. Fifteen percent of the heat is contained in the fluids; the remaining eighty-five percent is in the rock itself.

The California Division of Mines and Geology recognizes the Salton Trough as an area underlain at shallow depths by thermal water of sufficient temperature for direct heat application. Separate anomalies are distributed throughout the Trough and have hotter fluids that are suitable for electrical generation. The percentage of dissolved salts in the hot water is extremely high which has resulted in the saline corrosion of equipment from use of this brine. Recent large scale development of geothermal resources has resulted from the ability to engineer cost-effective technology which overcomes technical problems and makes geothermal development economically feasible.

Although the entire Salton Trough is an anomaly, certain "hot spots" exist. Slow convection currents in the reservoir have developed, with the hotter fluids rising in some places, cooling near the surface, spreading out and descending in other places. Also, and perhaps most significantly, at various locations some of the sedimentary layers act as blankets preventing the heat from reaching the surface and escaping into the atmosphere. Clays, impermeable to water, and volcanic tuffs, for example, provide these confining insulating layers. Local hot spots are the Salton Sea, Heber, East Mesa and Brawley. Imperial Valley generally, and the Salton Sea anomaly in particular, may be the largest geothermal resource in the world. For this reason, the County General Plan includes the Geothermal and Transmission Element in order to provide information and policy to guide local development of this unique resource.