PROJECT REPORT

TO: Planning Commission **AGENDA DATE: December 17, 2020**

FROM: PLANNING & DEVELOPMENT SERVICES **AGENDA TIME 9:00 a.m./ No.1**

PROJECT TYPE: IS #20-0034 Incorporation of the updated Multi-Jurisdiction Hazard Mitigation Plan into Safety Element SUPERVISOR DIST: All

LOCATION: Countywide (Unincorporated Areas of the County) APN: All

PARCEL SIZE: N/A

GENERAL PLAN (existing) N/A GENERAL PLAN (proposed) N/A

ZONE (existing) N/A ZONE (proposed) N/A

GENERAL PLAN FINDINGS ☒ CONSISTENT ☐ INCONSISTENT ☐ MAY BE/FINDINGS

PLANNING COMMISSION DECISION: HEARING DATE: 12/17/2020

☐ APPROVED ☐ DENIED ☐ OTHER

PLANNING DIRECTORS DECISION: HEARING DATE: N/A

☐ APPROVED ☐ DENIED ☐ OTHER

ENVIROMENTAL EVALUATION COMMITTEE DECISION: HEARING DATE: N/A

INITIAL STUDY: N/A

☐ NEGATIVE DECLARATION ☐ MITIGATED NEG. DECLARATION ☐ EIR

DEPARTMENTAL REPORTS / APPROVALS:

PUBLIC WORKS	☒ NONE	☐ ATTACHED
AG	☒ NONE	☐ ATTACHED
APCD	☒ NONE	☐ ATTACHED
E.H.S.	☒ NONE	☐ ATTACHED
FIRE / OES	☒ NONE	☐ ATTACHED
OTHER		

REQUESTED ACTION:

IT IS RECOMMENDED THAT YOU CONDUCT A PUBLIC HEARING AND THAT YOU HEAR ALL THE OPPONENTS AND PROPONENTS OF THE PROPOSED PROJECT. STAFF WOULD THEN RECOMMEND THAT YOU TAKE THE FOLLOWING ACTIONS:

1) **ADOPT THE RESOLUTION THAT RECOMMENDS TO THE BOARD OF SUPERVISORS THE ADOPTION OF THE INCORPORATION OF THE UPDATED MULTI-JURISDICTION HAZARD MITIGATION PLAN INTO THE SAFETY ELEMENT AS AN APPENDIX.**

STAFF REPORT
Planning Commission Meeting
December 17, 2020

Project Name: **Initial Study #20-0034 Incorporation of the updated Multi-Jurisdiction Hazard Mitigation Plan (MHMP) into Safety Element**

Applicant: **Imperial County Planning and Development Services Department (ICPDS)**

Location: **Countywide**

Project Description:

The Imperial County Planning & Development Services Department (ICPDS) proposes to include the updated Multi-Jurisdictional Hazard Mitigation Plan into the Imperial County's Safety Element as an Appendix pursuant to Assembly Bill 2140 and as required by recent State law.

Land Use Analysis:

The plan applies to all of the unincorporated area of Imperial County and is exempt from CEQA per Section 15061 (b)(3), which is the common-sense rule.

Staff Recommendations:

It is requested that you conduct a public hearing and that you hear all the opponents and proponents of the proposed project. Staff would then recommend that you take the following actions:

1. Adopt the Resolution that recommends to the Board of Supervisors the adoption of the proposed incorporation of the updated Multi-Jurisdictional Hazard Mitigation Plan into the Imperial County's Safety Element as an appendix.

Prepared By: Diana Robinson, Planner III

for

Reviewed By: Michael Abraham, AICP, Assistant Director
Planning & Development Services

Reviewed By: Jim Minnick, Director
Planning & Development Services

for

Attachments:

A. PC Resolution and Findings
B. Seismic and Public Safety Element
C. Updated Multi-Jurisdiction Hazard Mitigation Plan

Attachment A.

PC Resolution and Findings

RESOLUTION NO. 2020-0041

A RESOLUTION OF THE PLANNING COMMISSION OF THE COUNTY OF IMPERIAL, CALIFORNIA, RECOMMENDING TO THE IMPERIAL COUNTY BOARD OF SUPERVISORS APPROVAL OF THE INCORPORATION OF THE UPDATED MULTI-JURISDICTION HAZARD MITIGATION PLAN INTO THE SAFETY ELEMENT

WHEREAS, the purpose of including the updated Multi-Jurisdictional Hazard Mitigation Plan into the Imperial County's Safety Element as an appendix is to be in accordance with recent State law and pursuant to Assembly Bill 2140;

WHEREAS, the Planning Commission of the County of Imperial has been delegated with the responsibility of making recommendations to the Imperial County Board of Supervisors regarding the Project for approval;

WHEREAS, the updated Multi-Jurisdictional Hazard Mitigation Plan, has been provided in a timely manner to public agencies;

WHEREAS, timely public notice of the Planning Commission's public hearing on the Project has been given, and the Planning Commission has considered evidence presented by the Imperial County Planning & Development Services Department and other interested parties at that public hearing held with respect to this item on December 17, 2020, and,

NOW THEREFORE, the Planning Commission of the County of Imperial **DOES HEREBY RESOLVE** as follows:

SECTION 1. The Planning Commission independently has reviewed and considered the updated Multi-Jurisdictional Hazard Mitigation Plan, prior to making a decision to recommend that the Board of Supervisors adopt the proposed revisions and the following Findings of Fact.

SECTION 2. That in accordance with CEQA, State Planning and Zoning law and the County of Imperial Land Use Ordinance revisions, the following findings for the recommendation for approval are being made as follows:

1. That the Commission independently reviewed, analyzed, and considered the proposed Multi-Jurisdictional Hazard Mitigation Plan update, and the entire Record of Proceedings prior to recommending approval of this project.

3. That these Findings reflect the independent judgment of the County.

4. The Findings are supported by substantial evidence.

5. That the Project will not individually or cumulative have an unmitigated adverse effect on fish and wildlife resources, as defined in Section 711.2 of the Fish and Game Code.

6. That the Record of Proceedings consists of the updated Multi-Jurisdictional Hazard Mitigation Plan being incorporated into the Imperial County's Safety Element as an appendix, the County staff reports; CEQA Findings; the documents referenced therein; all other planning documents prepared and/or utilized by the County staff; documents submitted by members of the public and public agencies in connection with the Project; minutes and transcripts of all public meetings and public hearings; all written and verbal public testimony presented during a noticed public hearing for the proposed Project which such testimony was taken and any and all other materials which constitute the record of proceeding pursuant to Public Resources Code, Section 21167.6(e); and matters of common knowledge to the County staff and Planning Commission, including, but not limited to the County General Plan, the County Land Use Ordinance, and County policies, which may be found at the Clerk of Board's Office located at 940 Main Street, Suite 209, El Centro, CA, 92243 during regular business hours, and the Imperial County Planning & Development Services Department at 801 Main Street, El Centro, CA 92243.

7. Furthermore, the Commission recommends that the Board of Supervisors approve the incorporation of the updated Multi-Jurisdictional Hazard Mitigation Plan into the Imperial County's Safety Element as an appendix, based on the following findings:

FINDINGS

1. The Codified Ordinances with the revisions proposed incorporation of the updated Multi-Jurisdictional Hazard Mitigation Plan into the Imperial County's Safety Element as an appendix, is consistent with Federal and State requirements.

2. The Project is not likely to cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat.

3. The Project is not likely to cause serious health problems.

4. There will be no adverse impacts upon wildlife or natural resources, and no intrusion upon any known habitat, nor is it likely to have a future impact.

NOW, THEREFORE, based on the above findings, the Planning Commission of the County of Imperial **DOES HEREBY RECOMMEND** that the Board of Supervisors approve the proposed incorporation of the updated Multi-Jurisdictional Hazard Mitigation Plan into the Imperial County's Safety Element as an appendix.

Rudy Schaffner, Chairperson
Imperial County Planning Commission

I hereby certify that the preceding resolution was taken by the Planning Commission at a meeting conducted on December 17, 2020, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

Jim Minnick, Director of Planning & Development Services
Secretary to the Planning Commission

Attachment B.

Seismic and Public Safety Element

SEISMIC AND PUBLIC SAFETY ELEMENT

Prepared by:

Planning/Building Department
County of Imperial
939 Main Street
El Centro, California 92243-2875

Jurg Heuberger, AICP
Planning Director

Approved by:
Board of Supervisors

SEISMIC AND PUBLIC SAFETY ELEMENT
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IMPERIAL COUNTY GENERAL PLAN
SEISMIC AND PUBLIC SAFETY ELEMENT

I. INTRODUCTION

A. Preface

The County of Imperial is exposed to a wide variety of hazards that result from natural phenomena and human-induced accidents. These hazards can result in loss of life, bodily injury, and property damage. The County is bisected by active seismic faults that could generate dangerous earthquakes and other geologic activity. Although the County is located in a desert with very low precipitation, it is sometimes subject to heavy rains and subsequent flooding. Flooding could also result from damage to the All American Canal and associated transmission aqueducts. A few hazardous waste facilities are located in the County and accidents could dangerously pollute air and water.

The Seismic and Public Safety Element identifies potential natural and human-induced hazards and provides policy to avoid or minimize the risk associated with hazards. Potential hazards must be addressed in the land use planning process to avoid the unfolding of dangerous situations. For example, the risk associated with dangerous flooding can be avoided by not allowing development in floodplains and imposing strict safety standards on water transmission facilities.

A Safety Element is a mandatory element of the General Plan according to California Government Code Section 65302. This Seismic and Public Safety Element has been prepared to conform to the following requirement of the Government Code:

> A safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides, subsidence and other geologic hazards known to the legislative body; flooding; and wildland and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

B. Purpose of the 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.

C. Risk Assessment

Risk assessment refers to the subjective process of comparing the cost to avoid or reduce a hazard with the cost of the potential damage produced by the hazard. The concepts "acceptable risk" and "avoidable risk" are important in risk assessment. An avoidable risk refers to situations where the risk of a potential hazard can be entirely reduced by circumventing the development of the potential hazard. An example of an avoidable risk is the preclusion of residential development in floodplains. Avoiding the risk, however, can involve costs which are measured by time, money, inconvenience, and inefficiency. Under these circumstances, the reduction in risk must be weighed against costs. An acceptable risk refers to the point where an incremental reduction in risk does not justify increased cost. An example of an acceptable risk is the development of a gravel mining operation in a floodplain that possesses large gravel reserves. While there is a risk of flooding, locating a gravel mining operation outside of the floodplain would be inefficient and economically infeasible.

In establishing guidelines for acceptable risk, the County makes distinctions between hazards resulting in personal injury or loss of life, hazards resulting in disruption of essential services, and hazards resulting in damage to structures and property. The risks of personal injury, loss of life, and the disruption of lifelines are unacceptable but the risk of structural damage is acceptable. The County will impose restrictions or conditions on development to avoid personal injury, loss of life, and lifeline disruption and reduce the threat of structural damage.

II. EXISTING CONDITIONS AND TRENDS

A. Geologic Activity

Earthquakes are the principal geologic activity affecting public safety in Imperial County. They are a triggering event which permit the force of gravity to operate and create many secondary hazards from ground shaking, including: (1) differential ground settlement, soil liquefaction, rock and mudslides, ground lurching, and avalanches; (2) ground displacement along the fault; (3) floods from dam and levee failure, and seiches; (4) fires; and (5) the various adverse results of disruption of essential facilities and systems - water, sewer, gas, electricity, transportation, and communication (and notably in Imperial Valley, the irrigation and drainage system). This section will focus on earthquakes and other geologic activities; flooding, fires, and disruption of essential services, whether seismically induced or otherwise, will be discussed separately.

1. Earthquakes

Earthquakes, are the result of an abrupt release of energy stored in the earth. This energy is generated from the forces which cause the continents to change their relative position on the earth's surface, a process called "plate tectonics." The earth's outer shell is composed of a number of relatively rigid plates which move slowly over the comparatively fluid molten layer below. The boundaries between plates are where the more active geologic processes take place. Earthquakes are an incidental product of these processes.

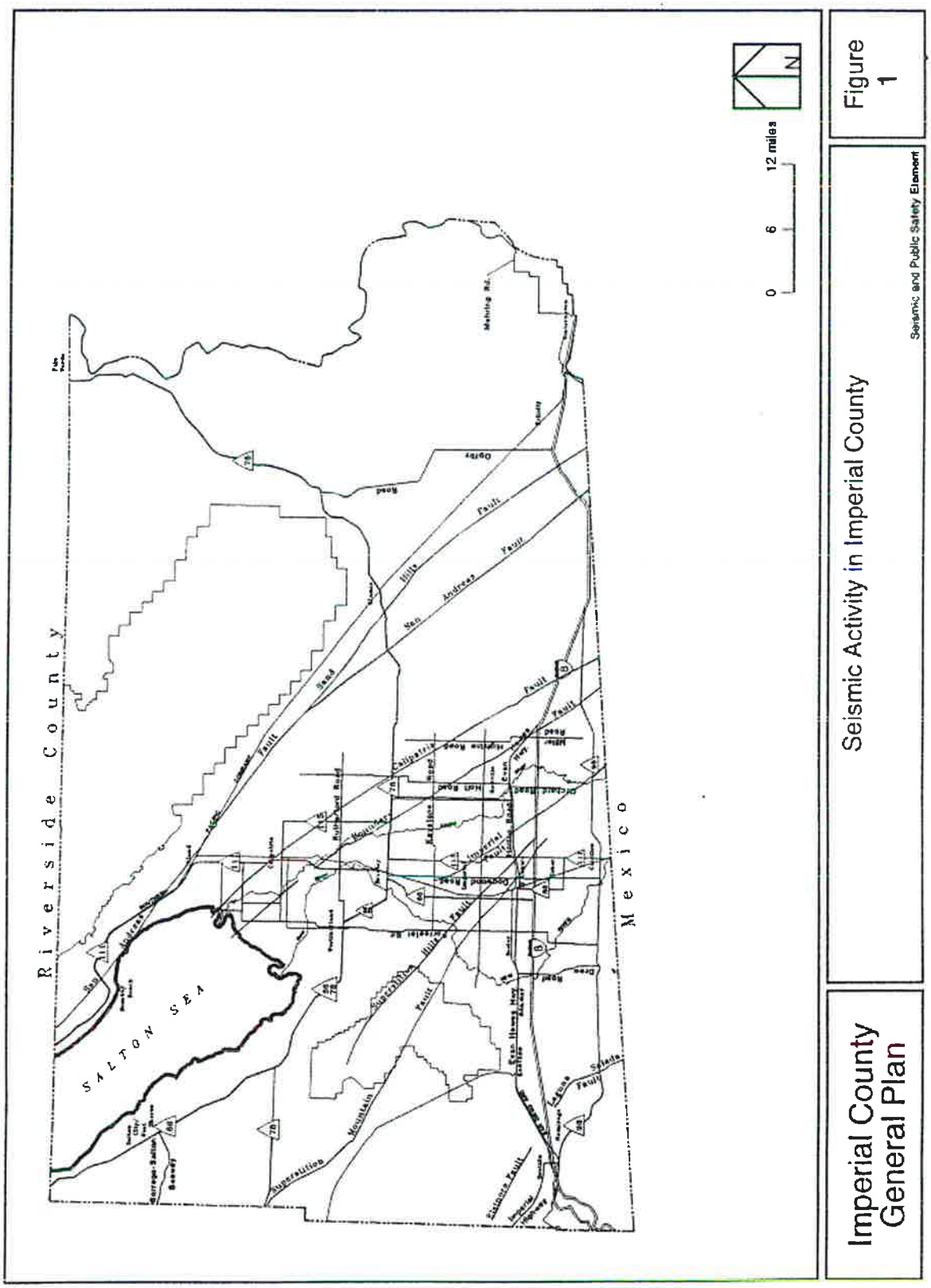
California rests on the boundary between the North American Plate and the Pacific Plate. The San Andreas Fault system is located where the northwesterly drifting Pacific Plate grinds along and is subducted by the southwesterly drifting North American Plate. Baja, and California west of the fault system, are part of the Pacific Plate and move northwest compared to the rest of California and North America.

The Imperial Valley is a broad, flat, alluviated area that lies partly below sea level, cut off from the Gulf of California to the south by the Colorado River Delta. The valley, also known as the Salton Trough, is one of the most tectonically active regions in the United States. The eastern boundary is formed by branches of the San Andreas fault and the western boundary is formed by the San Jacinto-Coyote Creek and the Elsinore-Laguna Salada Faults. Consequently, the Valley is subject to potentially destructive and devastating earthquakes. Figure 1 shows the general location of known or inferred major fault lines in Imperial County.

More small to moderate earthquakes have occurred in the Imperial Valley area than along any other section of the San Andreas Fault system. During the current century, the areas has experienced eleven earthquakes of magnitude 6.0

or greater on the Richter scale with the strongest being a magnitude of 7.1 on the Imperial Fault in 1940.

Figure 1 - Seismic Activity in Imperial County


Riverside County
Mexico
SALTON SEA
San Andreas Fault
Superstition Hills Fault
Superstition Mountain Fault
Elsinore Fault
Imperial Fault
Brawley Fault
Calipatria Fault
Algodones Fault
Sand Hills Fault
Westmorland Fault
Coyote Creek Fault
Obsidian Butte Fault
Salton Sea Fault
Garnet Hill Fault
Banning Fault
Cleghorn Fault
Mission Creek Fault
Indio Hills Fault
Dos Palmas Fault
Powerline Fault
Pinto Mountain Fault
Morongo Valley Fault
Burnt Mountain Fault
Eureka Peak Fault
Johnson Valley Fault
Homestead Valley Fault
Emerson Fault
Camp Rock Fault
Gravel Hills Fault
Lenwood Fault
Helendale Fault
Lockhart Fault
Old Woman Mountains Fault
Manix Fault
Coyote Mountain Fault
Laguna Salada Fault
Cerro Prieto Fault
Imperial Valley
Calipatria
Niland
Westmorland
Brawley
Holtville
Calexico
El Centro
Seeley
Heber
Ocotillo
Plaster City
Superstition Mountain
Superstition Hills
Salton City
Desert Beach
Bombay Beach
Mecca
Thermal
Oasis
Coachella
Indio
Indio Hills
Palm Springs
Desert Hot Springs
Cabazon
Banning
Beaumont
Yucaipa
San Bernardino
Redlands
Riverside
Corona
Norco
Jurupa Valley
Eastvale
Mira Loma
Pedley
Rubidoux
Glen Avon
Pyrite
Home Gardens
Temescal Canyon
Lake Elsinore
Wildomar
Murrieta
Temecula
Anza
Aguanga
Warner Springs
Julian
Santa Ysabel
Ramona
Poway
Rancho Santa Fe
Encinitas
Carlsbad
Oceanside
San Clemente
Dana Point
Laguna Beach
Irvine
Tustin
Santa Ana
Orange
Anaheim
Fullerton
La Habra
Whittier
La Mirada
Norwalk
Downey
Bellflower
Lakewood
Long Beach
Seal Beach
Huntington Beach
Fountain Valley
Westminster
Garden Grove
Stanton
Cypress
Los Alamitos
Buena Park
La Palma
Cerritos
Artesia
Hawaiian Gardens
Lynwood
Paramount
Bell Gardens
Bell
Maywood
Huntington Park
South Gate
Compton
Carson
Gardena
Hawthorne
Lawndale
Torrance
Redondo Beach
Manhattan Beach
Hermosa Beach
El Segundo
Inglewood
Culver City
Los Angeles
Pasadena
Glendale
Burbank
San Fernando
Sylmar
Granada Hills
Chatsworth
Northridge
Reseda
Van Nuys
Sherman Oaks
Encino
Tarzana
Woodland Hills
Canoga Park
Calabasas
Agoura Hills
Malibu
Thousand Oaks
Simi Valley
Moorpark
Fillmore
Santa Paula
Ventura
Oxnard
Port Hueneme
Camarillo
Point Mugu
Santa Barbara
Goleta
Carpinteria
Montecito
Summerland
Santa Maria
Lompoc
Vandenberg Village
Guadalupe
Orcutt
Los Alamos
Solvang
Buellton
Santa Ynez

The deep, sediment-filled geologic structure of the Imperial Valley makes the area particularly susceptible to severe earthquake damage. The Cities of Brawley, Imperial, El Centro, and Calexico have experienced damage from the movements of major faults in the San Jacinto fault zone, which includes the Imperial and Superstition Hills Faults.

A moderate to severe incident with intense ground shaking in the populated areas of Imperial County could reasonably be expected to cause numerous casualties, extensive property damage, fire, road closures, disruption of rail systems, communication systems (particularly telephone systems), the County's extensive canal system, and utilities. In addition, health hazards would be posed by damaged sewer systems, waste treatment facilities, and the possible contamination of the County's potable water supply. Medical treatment facilities would most likely be overtaxed. Theft and looting may also be a problem. The resultant disruption of the agricultural community would affect the local economy.

In accordance with the Alquist - Priolo Special Studies Zone Act (Chapter 7.5, Division 2, Public Resources Code, State of California, effective May 4, 1975) the Office of State Geologist delineated Special Study Zones which encompass potentially and recently active traces of four major faults (San Andreas, Calaveras, Hayward and San Jacinto). These Special Study Zone Maps depicting active fault traces are available for public review at the Imperial County Planning Department and the Imperial County Public Works Department. The Alquist - Priolo Special Study Zone Act is enforced by the County to assure that homes, offices, hospitals, public buildings, and other structures for human occupancy which are built on or near active faults, or if built within special study areas, are designed and constructed in compliance with the County of Imperial Codified Ordinance.

It is difficult to predict the severity of casualties and property damage that could result from an earthquake. The severity of casualties and property damage depend on the intensity of the earthquake, location of the epicenter to populated areas, and the time of day of the occurrence. The analysis of past earthquakes provides some useful information regarding the potential consequences of future severe earthquakes. Appendix A provides a summary of earthquakes that have impacted the County between 1852 and 1988.

The 1940 earthquake along the Imperial Fault registered a 7.1 on the Richter scale. The epicenter was located east of El Centro. The ground was ruptured for forty miles from Volcano Lake in Baja California to a point near the City of Imperial. Seven deaths occurred and property loss was in excess of $5 million. Eighty percent of the buildings in Imperial were destroyed; fifty percent of Brawley's structures were damaged. Indirect damage to crops was substantial due to the subsequent disruption of drainage and flooding. Horizontal displacement across the completed but unfilled International Canal was 14 feet, 10 inches and the U.S.-Mexico boundary was permanently changed. The Alamo

Canal in Baja California was also offset and a local flood resulted from water spilling out of the broken channel.

Perhaps the most conspicuous area of surface rupture was on State Highway 98 eight miles east of Calexico. The roadway was broken by a four-foot scarp, and rows of trees in an orange grove south of the highway and west of the Alamo River bridge were offset almost 10 feet. The maximum horizontal displacements of the earthquake, which were approximately 29 feet, were measured in the area just south of the orange grove.

Existing information about earthquakes that have occurred in Imperial Valley suggest that an equal number of earthquakes of equal intensity may occur within the future. The County can expect injuries, casualties and property damage from earthquakes as some time in the future because of the past frequency of moderately high magnitude and intensity earthquakes; the distribution of active faults and epicenters; and the projected increase in population.

2. Landslides

A landslide refers to slowly to very rapidly descending rock or debris caused by the pull of gravity. Landslides affect humans in many ways. A very rapid landslide could result in casualties and devastating property damage while a slow landslide could result in the nuisance of having a fence slowly pulled apart. The cost in lives and property from landslides is surprisingly high. According to the U.S. Geological Survey, more people in the United States died from landslides during the last three months of 1985 than were killed by all other geologic hazards, such as earthquakes and volcanic eruptions. The damage to property from landslides each year exceeds the cost of earthquake damage for the last twenty years.

The process of grading can accelerate landslide activity. Slope and material failure often results from failing to utilize precautionary measures to stabilize slopes or cutting into the failure plane of an existing landslide. In California, landslides are a common problem in the hillside areas and particularly in developed hillside areas that required grading.

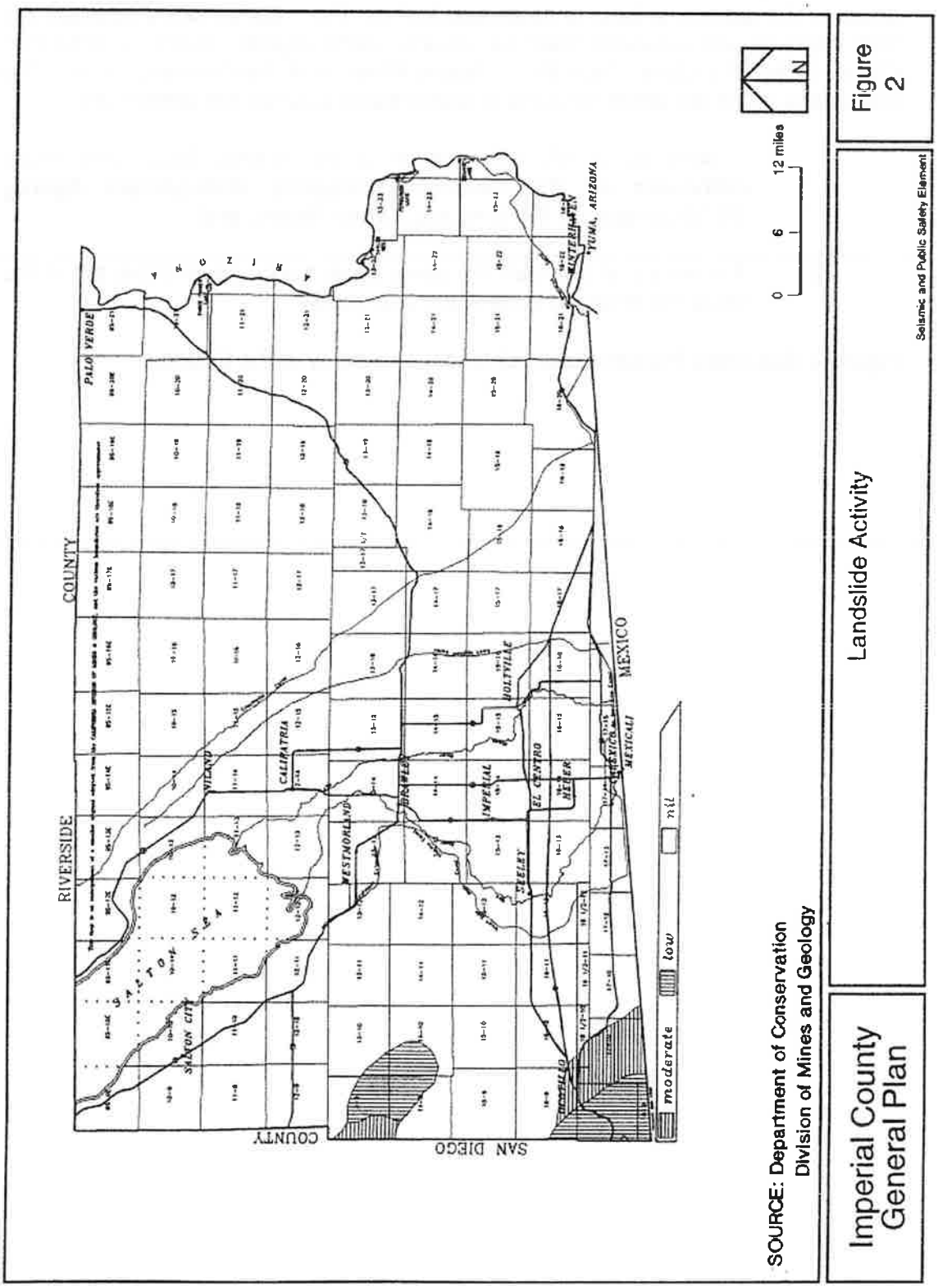
The potential for landslides in Imperial County is low to moderate along the western edge of the County parallel to the Coast Range Mountains. Additional areas in the County subject to landslides include the irrigated valley between the East Highline and Westside Main canals and bluffs adjacent to the All American Canal, Coachella Canal, New River, Alamo River, and the Colorado River. The hazardous landslide areas adjacent to these water courses are defined as:

1. A distance of fifty feet outside of the shaded flood zone areas delineated on the Federal Emergency Management Agency (FEMA) maps for the New and Alamo Rivers; and

2. A distance of one-half the canal bank height beyond the toe of the slope for all of the levee and canal banks.

Figure 2 illustrates the distribution of landslide activity in the County.

Figure 2 - Landslide Activity



3. Subsidence

Subsidence is the gradual, local settling or sinking of the earth's surface with little or no horizontal motion. Subsidence is usually the result of gas, oil, or water extraction, hydrocompaction, or peat oxidation, and not the result of a landslide or slope failure. Ground surface effects related to subsidence are generally restricted to long surface structures such as canals, drains, and sewers, which are sensitive to slight changes in elevation.

Subsidence from earthquakes and other activities, including geothermal resources development, can disrupt drainage systems and cause localized flooding. Agricultural operations within the County depend on gravity-fed irrigation, drainage, and tiling systems. These systems utilize existing land contours and have little tolerance for change. Areas away from the irrigated fields, canals, and drains may be less sensitive to land surface elevation change.

It is also to be noted that the "Valley", within the County, experiences a continuous natural subsidence toward the Salton Sea. Natural subsidence has been occurring within the Salton Trough, averaging nearly two inches per year at the center of the Salton Sea and it decreases to zero near the Mexican border. It is generally uniform, but local depressions have formed such as the Mesquite Sink located along Highway 86 between Imperial and Brawley. Earthquakes have caused abrupt elevation changes in excess of one foot across fault lines.

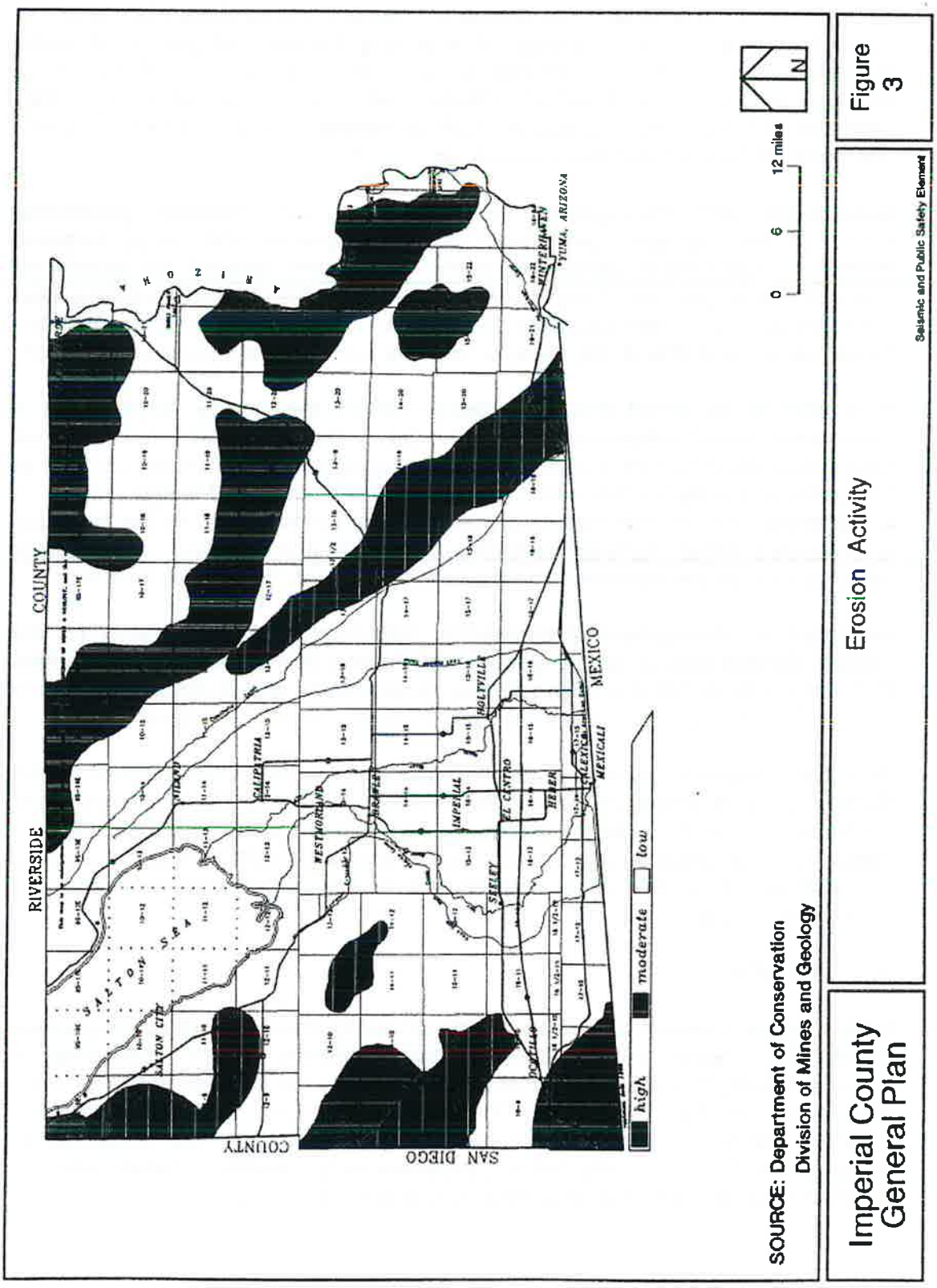
Increases in development of geothermal resources could be a factor for the future. Recent reports by the geothermal industry in the Heber area indicates that some subsidence has occurred over several years and could be expected to change further depending on the rate and volume of extraction/injection.

Well field programs covering production and injection plans are required by the Bureau of Land Management and the Division of Oil and Gas for each major geothermal project. Detrimental subsidence from geothermal development needs to be avoided through careful permit review by CDOG and the County, establishment of standards for each project, and through impact mitigation and monitoring programs.

4. Erosion

Erosion is the removal of rock fragments or soil by the action of running water, glacial ice, or wind. Human activities can accelerate erosion. The areas in Imperial County that are most subject to erosion are the Algodones Sand Dunes parallelling the East Mesa and Superstition Mountain, and the Chocolate, Picacho, Cargo Muchacho, and Coast Range Mountains. The remainder of Imperial County is generally flat and experiences low levels of natural erosion. Figure 3 illustrates the erosion activity throughout the County.

Figure 3 - Erosion Activity



5. Soil Stability

The geologically young, unconsolidated sediments of the Salton Trough are subject to failure during earthquakes, especially throughout the irrigation portion of the Valley where the soil is generally saturated. Liquefaction, and related loss of foundation support, is a common hazard.

B. Flooding

Flooding is a natural hazard present in Imperial County due to the County's geography, geology and climate. There are various facets to flooding; all of which are relevant to Imperial County. Flood hazards include the following: natural floodplains, seiches, and dam failure.

1. Natural Floodplains

The entire county is subject to various degrees of flooding in the form of flash floods or slow floods caused by heavy precipitation. Flash flooding is not infrequent in desert areas. Such flooding occurs when sudden downpours over the mountains and/or desert tend to create instantaneous peak flows which roughly follow empty stream beds and mountain washes.

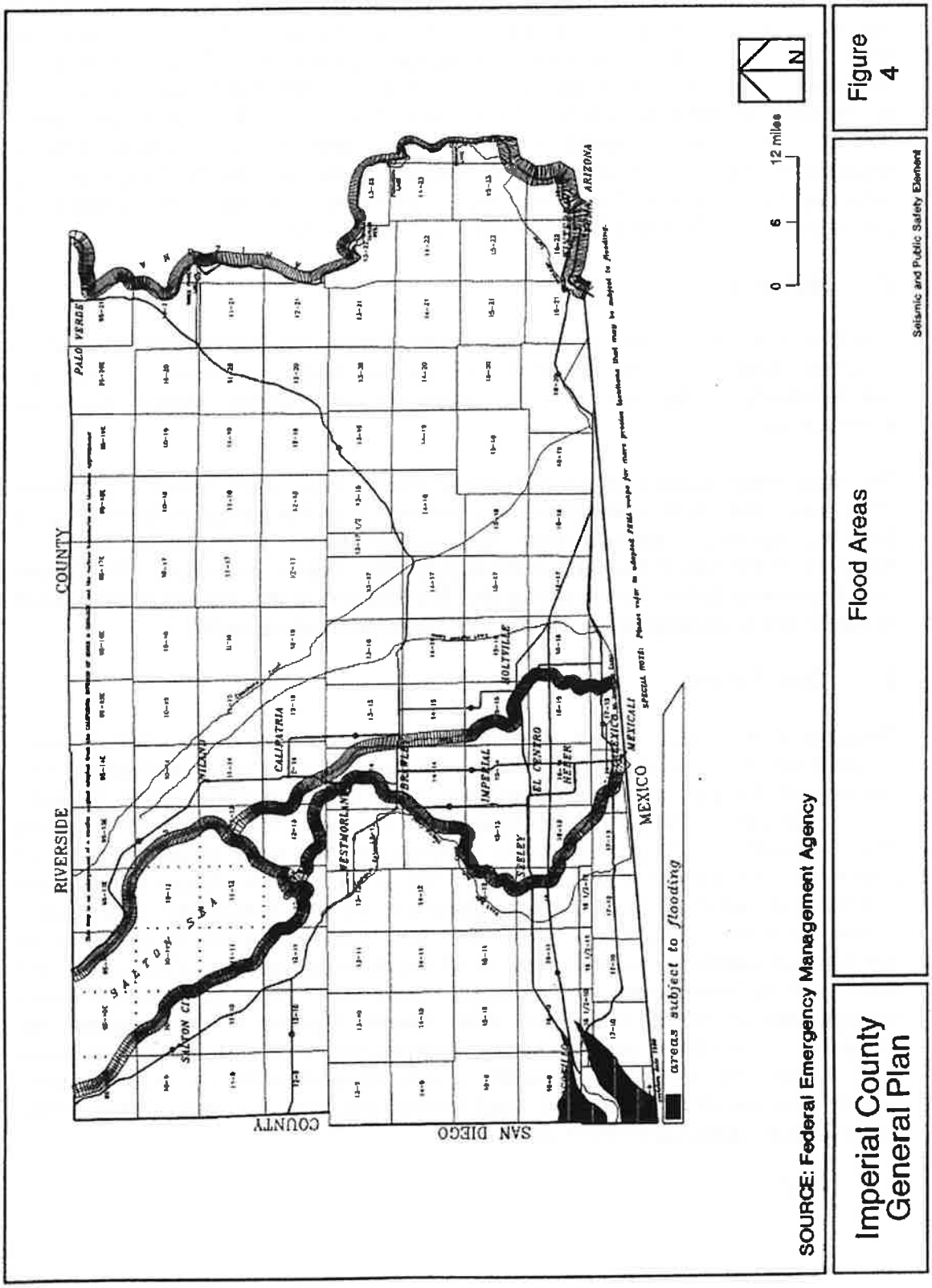
Flooding can occur either in floodplains or floodways. Floodplains are generally located adjacent to rivers and other bodies of water, and in low lying areas near a water source. The external boundary of floodplains is defined by the predicted extent of inundation that would result from the most intense storm that occurs once every one hundred years. Floodways are defined by discernible drainage channels. 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 Myer Creek (through Ocotillo) and within the levees along the Colorado River. Further information can be obtained by consulting the Flood Insurance Rate Maps (FIRM's) prepared by the Federal Emergency Management Agency, which are on file with the County Department of Planning. Figure 4 illustrates the areas in the County that are particularly at risk to flood hazards.

Within the County jurisdiction, the communities of Bombay Beach and Ocotillo are considered to be the most likely to experience significant flooding. In El Centro, the Gillett/Cannon Roads area receives the heaviest flooding. It is at a low elevation east of El Centro and south of East Evan Hewes Highway.

Bombay Beach is located in a pocket created by the Salton Sea on the west and the Chocolate Mountains on the east. Severe flooding could isolate the community. In the event of a major flood, approximately 300 to 1,000 residents would have to be evacuated.

The communities of Ocotillo and Nomirage are at risk due to their location at the base of an alluvial fan originating at the base of Myer Creek. More specifically, Myer Creek is located in the southwestern part of Imperial County and flows in a northeasterly direction through the townsites of Ocotillo and Nomirage, draining over 21.8 square miles.

Figure 4 - Natural Floodplains



Flood plain management is the key component to effective flood control within Imperial County. The Federal Insurance Administration delineates areas of special flood hazards, the risk premium zones, and floodways through official maps: Flood Insurance Rate Map (F.I.R.M.); and Flood Boundary and Floodway Map. These maps form the basis for Imperial County's Flood Ordinance which is intended to be applied to those areas which are subject to periodic flooding and accompanying hazards. These official maps show all canals, drains, and rivers, and at 1"-1000' are a useful reference map. Most of the irrigated valley is designated zone "C" - indefinite minor flooding - reflecting the flat terrain and the canal system. Official Flood Insurance Rate Maps (F.I.R.M.) are available for public use at the Planning Department of Imperial County.

2. Seiches

A seiche is a to and from vibration of a body of water like the slopping of water in a jolted basin. Once initiated, the water body continues to oscillate independently. Seiches can be triggered by seismic events such as earthquakes.

The most likely location for a significant seiche to occur is the Salton Sea. While there have been a number of seismic events since the formation of the Salton Sea, no significant seiches have occurred to date. A seiche could occur, however, in the Salton Sea under the appropriate seismic conditions. The Salton Sea is proximal to the San Andreas and San Jacinto faults and would be subject to significant seismic ground shaking that could generate a seiche.

3. Dam Failure

Flooding, due to dam failure, is a factor which could seriously affect eastern Imperial County. The California Office of Emergency Services is charged with keeping on file the "inundation map" and "dam failure response plan" for each dam in the state. The dam owner/operator is, however, responsible for map and plan preparation. These documents generally do not exist. Imperial Dam, the only significant dam in Imperial County, has a plan, but no map; Laguna Dam has no plan, but the map is under preparation; Senator Wash Dam has no plan or map; and the Parker Dam has a plan, but no map. Failure of any of these dams would certainly cause inundation of the down stream shorelines, all of the Bard - Winterhaven area, and possibly would flush large quantities of water through Mexico into the New and Alamo Rivers. Inundation of the community, however, is considered unlikely; hazard analysis suggests that dam failure would likely occur only if heavy precipitation was coupled with significant seismic activity near the dam. Flooding through Mexico would most probably be confined to the already designated flood areas.

C. Fire

The potential for a major fire in the unincorporated areas of the County is generally low. Fire hazards exist, however, at two different sites in the County at the fuel storage farms located south of the City of Imperial and east of Niland. In the event of a fire, assistance from various fire departments within the County would be required. The threat of fire spreading and causing major problems to other areas of the County are minimal due to the isolated locations of the fuel storage farms.

The most significant regulatory codes from the standpoint of fire safety are fire prevention and building codes. The County implements the Uniform Building Code (UBC) and the Uniform Fire Code (UFC). These uniform codes are intended to serve only as minimum standards. Therefore, it is important that these minimum fire safety standards be strictly enforced by fire and building agencies in the unincorporated County.

The Imperial County Codified Zoning Ordinance also contains provisions which act to reduce fire hazards. The Zoning Ordinance is a tool that helps prevent the construction of incompatible or hazardous structures. For example, the ordinance separates industrial, commercial and residential uses and provides for the isolation of land uses that may create excessive fire exposure to other properties. It also limits the height and bulk of buildings, specifies setbacks and distances between buildings.

The Imperial County Subdivision Ordinance is also used to reduce the risk of fire by securing, as a condition of subdivision of land, water systems of adequate size and pressure for fire fighting, and adequate roadway widths for emergency service vehicle access including maneuverability of fire trucks. As part of the review process, the Imperial County Planning Department seeks recommendations from fire and water districts wherever the proposed subdivision is located.

The County of Imperial Fire Prevention and Explosives Ordinance, Section 53101-53300, contains provisions for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion. Such measures in this Ordinance include the following:

Storage of flammable materials
Storage of Radioactive materials
Permit required for sale and use of fireworks
Abatement of weeds and other vegetation

The Fire Prevention Education Program encompasses a public information and education component that promotes public awareness of the significance of Fire/Safety prevention measures. This program enables the public to be better prepared when an emergency fire situation occurs.

D. Hazardous Material Accident

A hazardous material accident could occur in Imperial County due to the agricultural economy, proliferation of fuel tanks and transmission facilities, intricate canal system, and the confluence of major surface arteries and rail systems. Although a hazardous material accident can occur almost anywhere, particular regions are more vulnerable. The potential for an accident is increased in regions near roadways that are frequently used for transporting hazardous material, and in regions with agricultural or industrial facilities that use, store, handle, or dispose of hazardous material.

The release of hazardous material into the environment could cause a multitude of problems. The release of explosive and highly flammable materials have cause fatalities and injuries, required large-scale evacuations, and destroyed millions of dollars worth of property. Toxic chemicals in gaseous form have caused injuries and fatalities among emergency response teams and passerby. Serious health problems have occurred where toxins have entered either surface or groundwater supplies. Serious health problems have occurred. Releases of hazardous chemicals have been especially damaging when they have occurred in highly populated areas, or along heavily traveled transportation routes. The decree of threat posed to life and property is dependent on the type, location, and concentration of the material released, in addition to prevailing weather conditions such as precipitation, wind speed, and wind direction. Appendix B contains a summary of hazardous material storage sites, handlers, and vendors.

The Laidlaw Environmental Services hazardous waste facility located west of Westmorland is unique in the sense that a major wash traverses the site. Substantial engineering design was utilized to minimize flooding, and channel maintenance requirements have been implemented. While the facility does pose a potential risk, the continued monitoring and stringent design standards imposed on the facility have minimized the probability of a serious failure. Special reports on design requirements and risk concerns are on file at the Planning Department.

A second type of facility which is more predominant and more difficult to assess. These facilities is the chemical handling and storage facilities and include distributors, transporters, and crop dusting firms. These firms are not permitted to store the various chemicals in open areas, or in buildings not adequately protected from flood conditions. During severe flooding the potential for these chemicals to be mixed with the flood water can pose a potentially serious health concern.

Pursuant to Section 25500 et seq. of the California Health and Safety Code, the County Health Services Department is designated as the "administering agency" responsible for maintaining a list of handlers/vendors of toxics within the County. In addition, they are required to maintain, for each handler/vendor, to maintain an inventory and business plan. This information is also available to the County Fire

Marshal and city fire departments. The "Imperial County Emergency Plan" (1988) lists the ten largest concentrations of toxics in the County, which are shown on Figure 5 and are: (1) Naval Air Facility El Centro; (2) Santa Fe Pacific Pipe Line Tank Farm; (3) ST Services; (4) 89.92 miles of fuel pipelines; (5) Brea Agricultural Service; (6) United Agriculture Products; (7) Puregro Company: (8) Rockwood Chemical Company; (9) Helena Chemical Products; and (10) Wilbur Ellis Company.

E. Lifelines and Critical Facilities

The disruption of lifelines and critical facilities can endanger the safety of the public. Lifelines refer to networks of services that extend over a wide area and are vital to the public welfare. Lifelines typically involve supply sources, transmission lines, storage facilities, and distribution systems. Damage to any one of these key elements might cause loss of service to large areas or the entire service area. Lifelines can be classified into four categories: Energy, Water Transportation, and Communication. These categories circumscribe the lifelines indicated in Table 1.

TABLE 1
SUMMARY OF LIFELINES

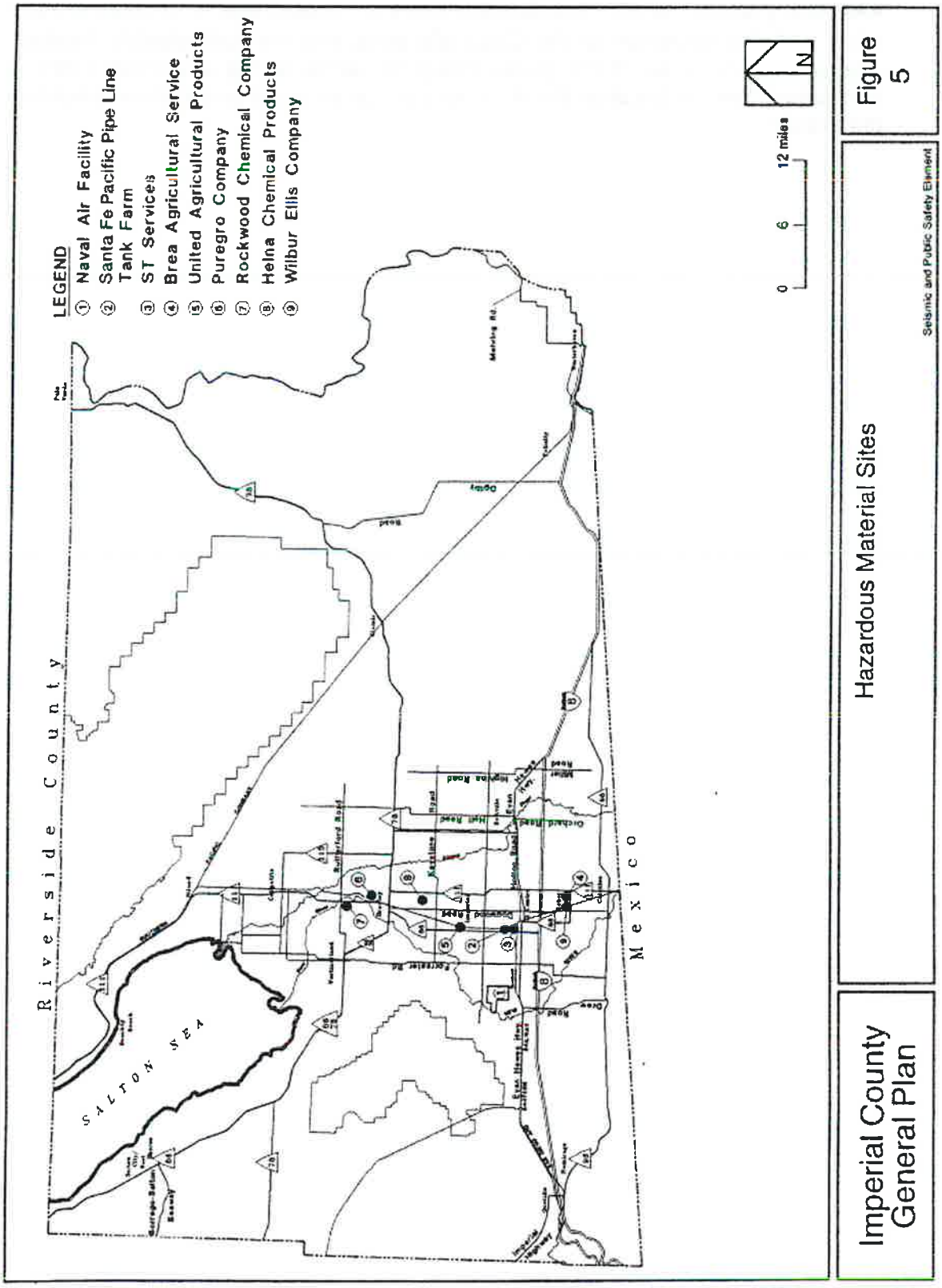
	Energy	Water	Transportation	Communications
Type of Lifelines	Electricity Liquid Fuel Gas	Potable Water Sewage Solid Waste	Highway Railway Airport Harbor	Telephone Telegraph Radio Television Mail Press

Energy. Electricity is provided to the vast majority of Imperial County and the Coachella Valley area of Riverside County by the IID. The transmission and distribution system is moderately resistant to earthquakes. When parallel overhead power lines have too much slack or sag unevenly, they may come in contact with one another during an earthquake. The resulting arcing could cause conductors to burn and fall to the ground. On the other hand, if overhead powerlines are too taut, they could snap and fall to the ground from earthquake shaking. Overhead powerlines can also be broken by objects jostled from earthquake shaking, (e.g., trees, antennas). The entire electrical distribution system is protected by relays designed to prevent current overload. Seismic vibrations themselves can cause the relays to "trip" and cut off power. Such an abrupt power disruption could cause current overloads in other parts of the system. As a result, other relays could trip and cut off more power. Although the risk of serious damage to the distribution system is low, the risk of partial or total loss of power is fairly high.

The IID's generating facilities and sources of power are varied and dispersed across the County. The probability is low for all of the facilities being disrupted simultaneously. The main generating facilities are El Centro (180 megawatts), Brawley (18 megawatts), Rockwood (50 megawatts), and Coachella (80

megawatts). Hydroelectric facilities along the All American Canal have a maximum capacity of 45 megawatts. All of these facilities are located in seismically active zones. The facilities are also located within 15 miles of each other with the exception of the Coachella plant and the hydroelectric facilities. The probability of all of the plants being disrupted during a seismic event is considered low. A break in the All American Canal could also reduce electricity generation.

Figure 5 - Hazardous Material Sites



Liquid petroleum products are delivered to and are transported through the County via the twenty-inch Santa Fe Pacific Pipe Line. This line is generally located within the Southern Pacific Railroad right-of-way. The right-of-way follows the northwest to southeast trend of Imperial Valley and subsequently parallels the major faults. It passes near the east side of the Salton Sea and serves the storage facility at Niland. Southeast of Ogilby, the line turns east and travels to Yuma. A six-inch branch line distributes gas to the storage facility south of Imperial and a four-inch line serves the Naval Air Facility near Seeley. The maintenance staff for the line anticipates no special problems from earthquakes or fault movement and are unaware of such a situation occurring in California in past years. A major break would take one to two days to repair.

The petroleum storage facilities in Niland and Imperial are vulnerable to earthquakes. Storage capacity at Niland is 77,500 barrels and at Imperial is 289,000 barrels. Storage tanks, however, are never full at one time but are normally filled fifty percent. The 1979 earthquake resulted in the rupture of one tank and a gasoline leak of 100 gallon per minute at the Imperial facility. The potential for a major disaster does exist. The probability of loss of all liquid petroleum in the County is low. Emergency service via tanker is readily available if required during an emergency situation.

Natural gas is delivered by the Southern California Gas Company via twin ten-inch lines which generally run south through the County in Range 14 East. These lines serve Niland, Calipatria, Brawley, Imperial, El Centro, Heber, and Calexico and branch lines serve Holtville, Westmorland, Seeley, NAF, and Plaster City. Rural residents are served by laterals from the branch lines. The lateral lines typically do not exceed a quarter mile in length.

The gas lines are less resilient to seismic stress than the liquid lines and the entire natural gas system is vulnerable to disruption. The lines were damaged from the 1979 earthquake. The north-south line was damaged in the area it crossed the fault. The line suffered compressive stress and a fitting buckled and resulted in a major leak. The leak was repaired without shutting down the line. The line to Holtville was stretched where it crossed the fault. The line did not break and was repaired without shutting down the line.

The natural gas network is much more extensive than the liquid petroleum system. Leaks are more insidious. The risk of an explosion or fire is greater. The most serious potential hazards are at the customer service connections. Gas connections to hot water heaters are notably vulnerable to seismic shaking.

The biggest potential problem would result from damage that required shutting the natural gas delivery system down. A major rupture of the ten-inch line would be difficult to repair. Once pressure was lost and air entered the system, a total shut down would be required. Service personnel would have to visit the

customer connections at each twice. The initial visit would be require to insure that the gas was turned off. The second visit would be required to turn the gas back on, bleed the air, and assist in relighting fixtures. This would be a massive job that would take weeks. The main purpose of the twin lines is to avoid this type of disaster.

Water and Sewer. About seventy percent of the population is provided potable water for domestic purposes from municipal water systems, which are primarily served by the Imperial Irrigation District (IID). Rural residents obtain potable water from truck delivery companies, such as the AAA Company, or from individual wells. IID operates 1700 miles of canals; and the Coachella Irrigation District operates 83 miles of canals that traverse the County. The entire system is vulnerable to disruption by earthquakes. Approximately half of the system could generate flooding from a break. IID has adopted the Disaster Readiness Standard Operating Procedure to respond to earthquakes and other emergencies.

A number of the communities in the County are provided sewer service by municipal districts. Earthquakes can rupture line and affect lift station operations. These problems are not considered serious. Unless the seismic event totally disables the treatment plant, sewage can be transported using alternative means such as portable pumps and lines. In the event of a complete plant failure, temporary evaporation ponds could be utilized for the interim repair period.

Transportation. The County is well served by a variety of transportation routes which are unlikely to be so extensively damaged by a natural disaster as to endanger the public safety due to disruption of lifelines. Interstate 8 to San Diego County is potentially the most critical because it goes through mountainous terrain. No other convenient surface route to the metropolitan San Diego area exists. The Southern Pacific Railroad line along the east side of the Salton Sea is also endangered by its proximity to the San Andreas Fault. Severe damage to either of these facilities is likely to significantly impact local and interstate commerce, but not substantially threaten public safety.

Communications. The telephone system in the County is the most elaborate communication network in the country. The equipment and facilities can withstand earthquakes up to 8.0 on the Richter scale. An Emergency Preparedness Plan has been developed by the telephone company. The telephone network is designed to service sixty percent of the customers requesting dial tone.

The telephone system was not damaged by the 1979 earthquake, but was overloaded with attempted phone calls within minutes of the earthquake and remained essentially inoperative for up to 18 hours in parts of the County. There is a high probability that the telephone system would be significantly dysfunctional following a major earthquake. The Countywide Communication

Plan was adopted in 1980 and provides direction for communication via the various radio networks when there are no telephone capabilities. Due to problems with the telephone system immediately after the 1979 earthquake, the IID installed its own in-house telephone system that utilizes a microwave system. The microwave towers have been designed to withstand the most severe earthquake.

Critical Facilities. This refers to site specific facilities that serve to maintain the health, safety, and general welfare of the public. Critical facilities can serve the public under normal circumstances (e.g., hospitals, fire stations, water reservoirs, and power plants) or under emergency circumstances (e.g., emergency operating centers, armories, or disaster supply warehouses). The "Imperial County Emergency Plan" provides specific details on functional, organizational, and operational concepts and procedures for the provision of critical services during an emergency. This includes overall management of emergency operations, fire and rescue, law enforcement and traffic control, medical, public health, coroner, care and shelter, evacuation movement, construction and engineering, and resources and support operations.

F. Disaster Preparedness

The "Imperial County Emergency Plan" also addresses Imperial County's planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and nuclear defense operations. The plan does not apply to normal day-to-day emergencies and the routine procedures used in coping with such emergencies. Instead, the operational concepts in the Emergency Plan focus on potential large-scale disasters that can generate unique situations requiring unusual responses. Such disasters pose major threats to life and property and can impact the well-being of large numbers of people. The Emergency Plan also identifies the sources of outside support which might be provided by other jurisdictions, state and federal agencies, and the private sector through mutual aid and specific statutory authorities.

III. GOALS AND OBJECTIVES

A. Preface

The Seismic and Public Safety Element of the General Plan is to be consulted in the implementation of development policies and land uses in Imperial County. This section (Chapter III) of the Seismic and Public Safety Element presents Imperial County's Goals and Objectives relative to all land use decisions within the unincorporated areas of the County. They have been prepared in collaboration with the General Plan Ad-Hoc Advisory Committee appointed by the Board of Supervisors.

The Goals and Objectives, together with the Implementation Programs and Policies in Chapter IV, are the statements that shall provide direction for private development as well as government actions and programs. Imperial County's Goals and Objectives are intended to serve as long-term principles and policy statements representing ideals which have been determined by the citizens as being desirable and deserving of community time and resources to achieve. These Goals and Objectives, therefore, are important guidelines for public safety decision making It is recognized, however, that other social, economic, environmental, and legal considerations are involved in land use decisions and that these Goals and Objectives, and those of the other General Plan Elements, should be used as guidelines but not doctrines.

B. Goals and Objectives

Land Use Planning and Public Safety

Goal 1: Include public health and safety considerations in land use planning.

Objective 1.1 Ensure that data on geological hazards is incorporated into the land use review process, and future development process.

Objective 1.2 Regulate development within flood-way areas in accordance with Federal Emergency Management Agency (FEMA).

Objective 1.3 Regulate development adjacent to or near all mineral deposits and geothermal operations.

Objective 1.4 Require, where possessing the authority, that avoidable seismic risks be avoided; and that measures, commensurate with risks, be taken to reduce injury, loss of life, destruction of property, and disruption of service.

Objective 1.5 Encourage other governmental agencies and the private sector to pursue an objective similar to Objective 1.4.

Objective 1.6 Ensure environmental hazards are considered when siting critical facilities.

Objective 1.7 Require developers to provide information related to geologic and seismic hazards when siting a proposed project.

Objective 1.8 Reduce fire hazards by the design of new developments.

Objective 1.9 Encourage the reclamation of lands where mining, irrigation, landfills, solid waste, hazardous materials/waste storage or disposal, and natural soil erosion has occurred, so as to pose no danger to public health and safety.

Objective 1.10 Encourage underground pipelining of all open canals adjacent to and within urban areas to prevent accidental drownings, without placing unreasonable cost burden on agricultural water users.

Objective 1.11 Recognize that certain lands are unsuitable for high density development and that prohibition or restriction of such high density uses are in the public interest, health, and safety.

Emergency Preparedness

Goal 2: Minimize potential hazards to public health, safety, and welfare and prevent the loss of life and damage to health and property resulting from both natural and human-related phenomena.

Objective 2.1 Ensure the adequacy of existing emergency preparedness and evacuation plans to deal with identified hazards and potential emergencies.

Objective 2.2 Reduce risk and damage due to seismic hazards by appropriate regulation.

Objective 2.3 Identify potential risk and damage due to inundation from dam failure and/or water releases.

Objective 2.4 Support and assist in informing the public and other agencies of the hazards and risks of earthquakes and of techniques to employ to reduce those hazards.

Objective 2.5 Minimize injury, loss of life, and damage to property by implementing all state codes where applicable.

Objective 2.6 Maintain, utilize, and provide geologic and seismic information as furnished by the State Geologist as required.

Objective 2.7 When appropriate situations are identified, require rehabilitation of buildings that pose a public hazard due to inadequate seismic design, or presents a structural hazard.

Objective 2.8 Prevent and reduce death, injuries, property damage, and economic and social dislocation resulting from natural hazards including flooding, land subsidence, earthquakes, other geologic phenomena, levee or dam failure, urban and wildland fires and building collapse by appropriate planning and emergency measures.

Objective 2.9 Reduce vehicle accidents through appropriate standards.

Objective 2.10 Reduce the risk of damage due to subsidence resulting from extraction of groundwater and geothermal resources by appropriate regulation.

Control Hazardous Materials

Goal 3: Protect the public from exposure to hazardous materials and wastes.

Objective 3.1 Discourage the transporting of hazardous materials/waste near or through residential areas and critical facilities.

Objective 3.2 Minimize the possibility of hazardous materials/waste spills.

Objective 3.3 Discourage incompatible development adjacent to sites and facilities for the production, storage, disposal, and transport of hazardous materials/waste as identified in the County General Plan and other regulations.

Objective 3.4 Adopt and implement ordinances, policies, and guidelines that assure the safety of County ground and surface waters from toxic or hazardous materials and wastes.

C. Relationship to Other General Plan Elements

The Seismic and Public Safety Policy Matrix (Table 2) identifies the relationship between the Seismic and Public Safety Element Goals and Objectives to other Elements of the Imperial County General Plan. The Issue Area identifies the broader goals of the Element and the "Xs" identify that related objectives are contained in the corresponding Elements.

TABLE 2 SEISMIC AND PUBLIC SAFETY ELEMENT POLICY MATRIX								
Issue Area	**Land Use**	**Housing**	**Circulation**	**Noise**	**Agricultural**	**Open Space Conservation**	**Geothermal**	**Water**
Land Use Planning	X	X	X			X	X	
Emergency Preparedness	X						X	
Hazardous Materials	X		X					X

IV. IMPLEMENTATION PROGRAMS AND POLICIES

A. Preface

This Chapter provides an implementation program to reduce the threat of seismic and public safety hazards within the unincorporated areas of the County. The natural hazards discussed in this Chapter are relative to Imperial County's geography, geology and flooding and is divided into three major topics: Seismic/Geological Hazards; Flood Hazards; and Imperial Irrigation District Lifelines.

B. Programs and Policies

Seismic/Geologic Hazards

1. Implement codified ordinances and procedures which require the review and restriction of land use due to possible natural hazards.

2. Monitor, evaluate, and analyze existing seismic and geological data as it pertains to Imperial County to determine future regulations and programs.

3. Implement the geologic hazards section of the County's Codified Ordinances pursuant to the requirements of the Alquist - Priolo Geologic Hazards Zone Act.

4. Ensure that no structure for human occupancy, other than one-story wood frame structures, shall be permitted within fifty feet of an active fault trace as designated on maps compiled by the State Geologist under the Alquist - Priolo Geologist Hazards Zone Act.

5. The County should require suppliers of all existing utilities which cross active faults to file with the County an operation plan describing the probable effects of failures at the fault and the various emergency facilities and procedures which exist to assure that failure does not threaten public safety.

6. Ensure that proposed highway construction which falls within an Alquist - Priolo Act Special Studies Zone shall be reviewed to ensure that grade-separated interchange structures are not located on or near an active fault.

7. Periodically update maps of existing faults, slide areas, and other geographically unstable areas in the unincorporated area of the County.

8. Support the safety awareness efforts of the Office of Emergency Services of Imperial County and other agencies through public information and educational activities.

9. Continue to implement the Alquist - Priolo requirements in designated special study zones in the Imperial County Ordinance.

Flood Hazards

1. Provide technical and policy information regarding flood hazards to developers, interested parties, and the general public.

2. Regulate and restrict development near major water courses and floodplains through application of appropriate land use measures.

3. Both the ground floor elevation of any building for human occupancy and the driving surface, if designated evacuation routes within the 100-year floodplain, shall be constructed above the projected profile of a 100-year flood event.

4. Require all new development for human occupancy within the 100-year floodplain to be adequately flood-proofed.

5. Establish technical design criteria which minimizes or mitigates impacts associated with crossing of floodplains by development. Unless such engineering alternatives are implemented, development in floodplains is to be restricted or prohibited.

Imperial Irrigation District Lifelines

Imperial Irrigation District has a formal Disaster Readiness Standard Operating Procedure for the Water Department, Power Department, and the entire District staff for response to earthquakes and other emergencies. The general policy for the Water Department is as follows:

1. Cooperate with the Imperial County Office of Emergency Service.

2. Lower the level in canals after a need has been determined, and only to the extent necessary.

3. If the need arises, divert the entire flow of the All American Canal at Pilot Knob back into the Colorado River; and divert the remaining water into the Alamo and at the New River where the canal crosses those rivers.

4. Routinely hold water in many of the canals by check gates to maintain availability for domestic uses. This would also be available for fire fighting

APPENDIX A

SEISMIC SAFETY TECHNICAL REPORT

INTRODUCTION

In terms of seismic activities, Imperial County is similar to most regions bordering the Pacific Ocean. It is an area of high seismic activity. Most of the seismic activity is in the Salton Trough (Imperial Valley) consequently, the Valley is subject to potentially destructive and devastating earthquakes. (Imperial Valley in this instance, encompasses the central area, commonly known as the "irrigated" area.)

Earthquakes, are the result of an abrupt release of energy stored in the earth. This energy is generated from the forces which cause the continents to change their relative position on the earth's surface. This process is called "plate tectonics."

The earth's outer shell is composed of a number of relatively rigid plates which move slowly over the comparatively fluid molten layer below. The boundaries between plates are where the more active geologic processes take place. Earthquakes are an incidental product of these processes.

California rests on the boundary between the North American Plate and the Pacific Plate. The San Andreas Fault system is located where the northwesterly drifting Pacific Plate grinds along and is subducted by the southwesterly drifting North American Plate. Baja, and California west of the fault system, are part of the Pacific Plate and move northwest compared to the rest of California and North America. The relative motion is two inches per year, but the plates do not slide easily past each other as they do over the molten layer below. They stick until the strain exceeds the elastic capacity of the rock which then fractures and allows the sudden movement which is an earthquake.

When sudden movement ruptures the earth's surface, it causes vibrations called seismic waves. Complex methods and equipment have been developed to measure earthquakes. Magnitude is a measurement of the energy released. Intensity is a measurement of the damage done. Earthquake prediction methods have been developed, but at this time it is not possible to tell when or where a quake will occur with any reliability.

Effect of Earthquakes

The principal seismic hazards in Imperial County are (1) ground shaking including differential ground settlement, soil liquefaction, rock and mudslides, ground lurching, and avalanches; (2) ground displacement along the fault; (3) floods from dam and levee failure, and seiches; (4) fires; and (5) the various adverse results of disruption of essential facilities and systems - water, sewer, gas, electricity, transportation, and communication (and notably in Imperial Valley, the irrigation and drainage system).[1]

Ground shaking is by far the most important hazard. However, many people believe that fault displacement is the greatest danger. In accordance with the Alquist - Priolo Special Studies Zone Act (Chapter 7.5, Division 2, Public Resources Code, State of California, effective May 4, 1975) the Office of State Geologist delineated Special Study Zones which encompass potentially and recently active traces of four major faults (San Andreas, Calaveras, Hayward and San Jacinto). These Special Study Zone Maps depicting active fault traces are available for public review at the Imperial County Planning Department and the Imperial County Public Works Department. The Alquist - Priolo Special Study Zone Act is enforced by the County to assure that homes, offices, hospitals, public buildings, and other structures for human occupancy which are built on or near active faults, or if built within special study areas, are designed and constructed in compliance with the County of Imperial Codified Ordinance.

An earthquake is the release of force built up by plate stress and triggered by some action; therefore an earthquake is the triggering event to permit the force of gravity to operate. Rockslides, mudslides, avalanches, slope slumping, and ground settlement illustrate this. Water saturated, sandy and fine grained soils subjected to vibrations may lose their shear strength, take on a liquid character, and fail to support structures (liquefaction). Buildings may "sink" into the soil; lighter structures may be buoyed up.

Seiches are earthquake generated waves in small bodies of water. Although there are no records of seiches in the Salton Sea, the following account from the Owens Valley quake of 1872 is instructive: "A huge wave developed in Owen Lake... the water (was) drawn away from the shore and standing in a perpendicular wall... But the return was fairly gentle so only 200 feet of new ground was covered by the waves."[ii]

Floods from dam failure are a notable secondary effect of earthquakes. Often, in earthquake country, the most economical (and sometimes only) dam site is in a high risk seismic zone. The geological forces generating faults often produce the topographic features desirable for dams. Earthfill dams are obviously more susceptible to seismic induced failure than concrete or other structural dams.

In Imperial County, there are three major dams - Imperial, Laguna, and Senator Wash, located on the Colorado River; and in the irrigated area, several large, earthfill impoundment reservoirs; hundreds of miles of above ground level earth levee canals, and hundreds of check dams, drops and gates. The Colorado River is not a known seismically active zone and, to date, there have been no reported cases of earthquake damage to the dams there. Within the irrigated area, there have been a number of instances of levee failure from earthquakes and resultant flooding. Because of the comparatively small volumes of water involved, low head, variety of options to check or divert flows in the canals, and the ubiquitous drainage network, the flooding hazard is not great. Nevertheless, some hazard does exist and even minor flooding could be an incremental contribution to the other disruptions an earthquake might cause.

Effects on Structures

Five main factors effect building damage from earthquakes are:

1. The strength of earthquake waves. For record purposes, accelerations over 0.1g are considered "strong shaking" although this level generally does not produce significant damage. Imperial County's two largest quakes; 1940 and 1979, produced .22g vertical, .36g horizontal, and .38g vertical, .40g horizontal, respectively, as measured at El Centro.[iii]

2. The frequency of the waves. Ordinary structures respond mainly to shaking at frequencies higher than 1 Hz (1 cycle per second). These occur out to a maximum of about 20 miles from the epicenter. However, large structures such as large bridges, and/or high-rise buildings respond to frequencies as long as 10 Hz. These may be significant as much as 60 miles away.

3. The duration of the shaking. It is the cumulative effect of the shaking -- not the single pulse -- that affects structures and causes their collapse. Each shake can weaken part of the structure. Subsequent oscillations further weaken the structure especially if magnified by the resonance of the natural frequency of the structure with the frequency of the waves.

   Relating strength and duration, it is the "repeatable high ground acceleration (RHGA)" as opposed to the peak ground acceleration that is the main criterion in designing structures to be safe from ground shaking impacts. In this respect, aftershocks also play an important role. They frequently produce substantial damage to buildings weakened by the main shock sequence. The Kern County quake of July 21, 1952 had a magnitude of 7.3. However, most of the actual damage occurred a month later when an ordinarily mild 5.8 aftershock brought down the already weakened buildings.

4. The geologic foundation. Engineers and insurance companies often consider this the most important factor in building damage. Fill and "made" land, especially when saturated, transmits much greater intensity of motion than solid rock even when both are subjected to the same seismic waves. The greater stress on the structure, as well as the possibility of liquefaction, differential settlement, or slope failure, make a poor geological foundation and create a double jeopardy in earthquakes.

5. The building design. Where subjected to the effects of a major event, an "earthquake proof" building may, at least with current technology be impossible to design. Architects and engineers know how to design earthquake resistant structures.

Buildings traditionally are designed first to resist the force of gravity. The traditional building techniques and materials are very good for this: post and beam, bricks, concrete. The loads are very easy to calculate and to design for; "dead load" representing the weight of the building itself, and the "live load" representing the contents of the building, wind, people, furniture, goods, etc. All of these are static and dynamic forces acting in the vertical plane. Often, in older buildings the main

force holding the building together is the force of gravity itself - the upper parts pressing down on the lower parts.

When an earthquake occurs, it introduces vertical and horizontal dynamic forces. Newer buildings generally have reasonably large margins of safety designed into them to withstand the constant pull of gravity. Therefore they generally withstand vertical seismic accelerations reasonably well. However, horizontal accelerations and sudden rapid vertical acceleration are what cause the major damage.

During an earthquake, buildings usually fail at the location where their various parts are joined together. Weakened structural sections are then affected by gravity which then may cause them to collapse. The majority of buildings usually "pancake". They seldom fall or roll over. Because there are so many factors that affect the structural integrity of a building, it is possible to have two identical buildings exhibit substantially different results in an earthquake.

The second consideration in traditional building safety design is against fire (also a major secondary effect from earthquakes). Here too, the most resistant materials are stone, bricks, concrete, etc. As buildings became larger, and safer in their resistance to gravity and fire, and to weathering and wind, they become more massive and have greater inertia. Like the damaging seismic forces, wind is dynamic and also acts horizontally. Most of the wind resisting design techniques also resist earthquakes. However, whereas the inertia of massive buildings works positively to help resist horizontal wind forces, it can be detrimental in withstanding horizontal earthquake accelerations.

"Rigid Strength" buildings tend to hold together well with little or no damage from quakes up to the point at which some part fails and then the whole building may come apart... To design "rigid strength" to withstand the greatest expected quakes may require bulk and costs that would prevent the building from ever being built in the first place. There are numerous architectural designs that have been implemented across the world to minimize earthquake damage, such as massive shock absorbers, counter balance weights, floating support systems, etc. Unfortunately most of these solutions are only practical in very large and expensive structures.

The alternative to "rigid strength" is flexibility. Wood (in small buildings), and especially steel, permits construction that will bend and deform, and allow the energy of the earth movements to pass through the building rather than try to resist and absorb the energy. Flexibility permits the construction of buildings which are lighter, freer in design, much less costly, and which still won't completely fail under very large quakes. Wood has both tensile and compressive strength. It is usually readily available, is easy to work and assemble, and is thus both a popular and a fairly good earthquake resistant building material. Its notable failing is at the joints. Where bolts and screws, in addition to nails are combined with steel straps and "strong ties", and plywood is used for shear walls and horizontal diaphragms, quite excellent "flexible strength" can be built into wooden structures up to three stories high. Larger than this, the weight of the structure begins to exceed the "cost effective strength" of the lower floor wooden supports. Since flexible designs do permit various parts of a

structure to move in relation to its other parts, damage such as cracked tile and plaster, shattered windows, and broken pipes, may occur from moderate quakes.

Because earthquakes involve dynamic oscillations, building design can also influence its reaction to a quake in ways not expected solely on the basis of strength to accommodate applied force. All things, including buildings, have a natural frequency at which they oscillate. If this natural frequency matches that of the passing seismic waves, the building oscillations may build up to a much greater amplitude than would otherwise occur.

Buildings with irregular layouts or abrupt changes in structural materials have been shown to suffer more earthquake damage than other buildings with the same "strength". Particularly vulnerable are buildings with mixed rigidity and flexibility. A classic example is the house in which a wall opening has been enlarged to install bigger windows. That wall now is weaker, but also more flexible than its opposite wall counterpart. In a quake, most of the load previously carried by both walls, will be absorbed by the stronger, stiffer wall, and it may fail while the weaker, more flexible wall, remains intact.[iv]

An aspect of building design is building orientation. In Imperial County, faults all trend northwest to southeast and fault movement is mostly strike slip. The waves from an earthquake can be expected to be stronger in the northwest/southeast direction. Wise residents in earthquake country are known to take such basic precautions as anchoring furniture, water heaters, and breakables such as china cabinets, in order to diminish hazards. Architects and engineers can apply this knowledge of predominant seismic wave orientation to building and site design.

The foregoing discussion on building design is not meant to suggest design alternatives, as much as to illustrate the necessity to think in terms of "trade offs" and cost versus risk. We cannot prevent earthquakes. We can build resistant characteristics into structures and avoid building those which are particularly susceptible to the effects of earthquakes.

Seiches

"A seiche is a to and from vibration of a body of water in its own natural tempo like the slopping of water in a jolted basin. Once started, the water body will continue to oscillate independently with its own proper period. Seismic sea waves are only one of the many causes of seiches which often occur also in lakes and ponds."[v]

While there have been a number of seismic events since the formation of the Salton Sea, to date seiches have not occurred to any significant recorded magnitude. There is, however, no guarantee that under specific circumstances one could not occur.

Although "the San Andreas Fault is known to be quite active in the Salton - Imperial Basin, it is difficult to define and almost impossible to trace."[vi] In addition to the San Andreas fault, the San Jacinto Fault lies west of the Salton Basin and, on the east side of the Salton Sea, another fault trace is recognizable near Durmid, where

sandstone and shale beds on the southwest side of the fault have been opened and contorted near the fault.[vii]

Nevertheless, it is reasonable to believe that close proximity of these faults to the Salton Basin implies that the Salton - Imperial Basin could be subjected to an occurrence of significant seismic ground shaking in the future, thus, possibly inducing a seiche.

SEISMIC HISTORY IN IMPERIAL VALLEY

Reliable accounting of earthquakes began around the turn of the century when Imperial County became inhabited. What evidence exists, suggests that earlier seismic activity was similar to recent activity. Generally only events of intensity V or greater are included here.

The following accounts, (through 1970), are taken largely from *An Earthquake History of the United States* by the U.S. Department of Commerce. The accounts for after 1970 are compiled from a variety of sources, all listed in the reference section.

1853 November. Based on reported effects in distant towns, a large earthquake is believed to have occurred in the northern Salton Trough, probably in the Imperial Valley. A magnitude of 6.5 is estimated for this event.

1853 December. Fort Yuma. Many shocks. Possibly of destructive force.

1868 May. Los Palmas, east and north of Salton Sea. One source states that a long fissure opened in the earth. (If this is true, the intensity was IX, perhaps X).

1871 (Month Unknown). Imperial Valley. Halfway between Los Palmas and Yuma, the shock rolled men over who were sleeping on the ground.

1877 June 11. Imperial County. Violent vibrations preceded volcanic eruption in the mountains near Flowing Well Station, about 60 miles northeast of Yuma.

1892 February 23. Northern Baja California. The intensity of this shock probably reached X near the epicenter, which was apparently in the uninhabited region of northern Baja California. It was felt strongly along the Pacific coast of Baja California, as far as San Quentin, Mexico and as far north as Vislia, California. At Carrizo, all adobe buildings were destroyed; at Jamul, walls of stone kilns cracked. At Campo, there were 155 shocks in 12 hours. After shocks were numerous for several days.

1903 January 23. Baja California. A strong earthquake, centering in the uninhabited region south of Imperial Valley, was felt throughout southern California, southern Nevada, and western Arizona. A similar shock under present conditions in the Imperial Valley would cause damage. Recorded by distant seismographs. Magnitude 7+.

1906 March 3. Southern California. Felt widely in southern California. Origin south of border. Recorded by distant seismographs, which indicates moderately destructive power.

1906 April 18. Brawley, Imperial Valley. Chimneys fell. Banks of New River caved in; water tanks destroyed at Cocopah in Baja California. The published information is very limited, but H. O. Wood, on the basis of verbal information, reported this to be a very severe shock. Magnitude 6+. It came just hours after the great San Francisco quake and most probably was related.

1915 June 22. El Centro, Calexico, and Mexicali. Two destructive shocks, nearly 1 hour apart. Heavy damage (about $900,000) in southern Imperial Valley was caused as much by poor quality buildings as by the intensity of shock. In El Centro, well constructed buildings merely suffered cracks. At Mexicali, Mexico, people returned to buildings after the first shock; six were killed and many were injured by the second earthquake. Though a few cracks were formed in the alluvium, the irrigation ditches and works were damaged very little. The unstable banks of the New and Alamo Rivers slid down in many places. Several farmers observed that after the shocks, one-third more water was required for irrigation because of the cracks in the soil. Despite the rather high local intensity, the total energy was moderate. Magnitude 6 1/4 for both shocks.

1915 November 20. Baja California. A shock, revealed by seismograms to have been considerably greater than that of June 22, occurred in the Volcano Lake region south of the Mexican boundary. In the Imperial Valley, the highest intensity was at Calexico; at Volcano Lake, levees and damp ground were cracked. Magnitude 7.1.

1917 May 27. Imperial Valley. Seems to have been most severe in open country. Walls were reported cracked at Brawley.

1918 April 30. Calexico, Plate glass broke. Felt over an area of about 100 mile radius.

1919 September 29. Baja California. Levees slumped and many longitudinal cracks were formed in the Volcano Lake region south of Imperial Valley. Reported intensity distribution suggests that more than one shock occurred. A few fore shocks and numerous after shocks.

1919 October 1. Baja California. A shock similar in location and energy to that of September 29.

1921 September 8. South of Imperial Valley. Duration at Calexico 30 seconds, than a second shock of same duration. Felt over a large area; probably of destructive intensity in the epicenter area.

1923 November 5. Calexico. The epicenter was probably near Calexico where a hotel shifted several inches on its foundation and other buildings sustained minor damage. Intensity was about the same at El Centro.

1923 November 7. Baja California. Intensity VII at Calexico. Damage caused by the shock of November 5 was increased, and one fire resulted. A stronger shock than that of November 5. Epicenter appears to have been in Baja California, south of Calexico.

1925 April 15. Calexico. Plaster was shaken from walls; inhabitants fled to the streets. Again, the epicenter probably was a short distance south of the border.

1926 April 19. Baja California. Volcano Lake region. Light at Calexico, duration 20 seconds. Seismograms indicate energy sufficient to be destructive over a small area. Felt as far as San Diego.

1927 January 1. Imperial Valley, near Mexican border. Two heavy shocks about an hour apart began a long earthquake series, though none of the latter exceeded VI in intensity. In Calexico and Mexicali many buildings were damaged, water mains broke, and some fires ignited. Between 15 and 20 persons were injured. At Heber, El Centro, and Imperial, slight damage was reported. At Heber, telephone service was interrupted. Magnitude 5 3/4 and 5 1/2, respectively. The after shock of February 12, 00:59, was farther north and was felt as strongly at Brawley as the main shocks. Hundreds of aftershocks occurred.

1930 February 25. Imperial Valley. At Westmorland, walls cracked, chimneys toppled and inferior buildings were damaged. Mud craterlets were found a few miles east of Westmorland. Several fore shocks and many after shocks. Magnitude 5.0.

1930 March 1. Imperial Valley. This shock was of smaller magnitude than that of February 25. At Brawley, brick buildings were damaged, chimneys were thrown down, and plate glass shattered. Structural damage included falling of cornice sand walls, severe cracks in walls, and displacement of roofs. Well-constructed buildings sustained little damage. Magnitude 4.5.

1934 December 30 and 31. South of Calexico. Two separate main events, the first, magnitude 6.5 and the second 7.1. It is difficult to determine which event caused what damage. Railroad bridges were damaged and tracks twisted. Surface cracks appeared. Water sprouted in dry river beds. Adobe houses were wrecked and a large water tower was thrown down. Irrigation ditches were damaged, roads buckled and communication systems disrupted. It was felt strongly in Tijuana. Chimneys and walls were thrown down at Calipatria. Intensities XI and X in Baja, VI and VII in Imperial Valley.

1940 May 18. Imperial Valley. Sixty thousand square miles affected in the United States (including Arizona and Nevada) and an unknown area in Mexico. The epicenter was located southeast of El Centro, but there was surface slipping with surface rupture over a known distance of 40 miles. The existence of the Imperial Fault was revealed for the first time. The horizontal displacement reached 19 feet near the border. Vertical displacements up to 4 feet were observed. There was damage at all towns in the Imperial Valley and canals were damaged with serious interruption to water service.

The Alamo Canal (still in use) was opened by the displacement causing a local flood south of the border.

At Imperial, the city water tanks collapsed and 80% of the buildings were damaged. At the more heavily populated town of Brawley, there was greater total damage but less percentage of loss. Possibly 40% of the buildings were damaged, but the percentage was higher in business buildings.

At Holtville, the city's water tank collapsed, but the damage was not great. Damage at Calexico and at Mexicali, Mexico was not as extensive as might have been expected. The principle loss in Mexicali was fire set by a short circuit.

Indirect loss of crops was considerable; direct earthquake loss in the United States was 6 million dollars. Nine lives were loss. Magnitude 7.1, intensity X.

Again, the rest of the decade was relatively quiet. There were eight quakes of magnitude 5 or greater in the area. Six of these came in 1942, with five of these on October 21-22. A landslide damage the SD&AE railroad bridge in Carrizo Gorge and some cracked plaster was reported throughout the Imperial Valley. A 5.4 event centered south of Borrego, January 8, 1946, caused no damage.

1950 July 29. Imperial Valley. Strongest of the series of shocks centering near Calipatria on July 27, 28 and 29. Fifty thousand dollars in damage resulted, chiefly from merchandise being thrown from the shelves in the Calipatria, Westmorland, and Niland areas. In Calipatria, concrete standpipes broke and a small railroad bridge shifted six to eight inches. There was considerable plaster damage. In the outskirts, sand boils appeared and irrigation ditch banks sloughed. In Westmorland, reinforced concrete walls of the post office building cracked and window broke at the City Hall and at the Food Center Building. Also felt at Parker and Yuma, Arizona. Magnitude 5.4. A 4.7 aftershock August 1, caused sand boils and ground fissures around the North End Dam.

1951 January 23. Near Calipatria, cracked Westside Main canal. Magnitude 5.6, intensity VII.

1953 June 13-13. Brawley-Westmorland area. Landslides at Tamarack Road and the New River. Windows broken and plaster cracked. First event and aftershock of 5.5, intensity VII.

1954 November 12. A 6.3 event in Baja was strongly felt in the Imperial Valley.

1955 December 16. Brawley area, magnitude 5.4, intensity VII.

1957 April 25. South end of Salton Sea slight damage in El Centro, Brawley and Westmorland, magnitude 5.2, intensity VII.

1958 November 30. Main shock of a series caused minor damage at Calexico and Seeley. Magnitude 5.8, intensity VII.

1963 June 11. A 5.8 event in Baja was felt widely in Imperial Valley.

1965 June 15. A 4.5 main event in a series. Slight damage to buildings, broken windows, and "residents alarmed" in Brawley and Westmorland.

The history of seismic events is also a history of improvements in recording earthquakes and in understanding of seismic phenomena. Two events at this time are notable more for what they revealed about earthquakes than for damage that occurred.

1966 March 4. Imperial. Magnitude 3.6. This quake caused virtually no damage, but did cause surface rupture and horizontal displacement. It is the smallest known earthquake to do so. (Some authorities question these effects.)

1968 April 9. South of Ocotillo Wells. The main shock of a series was felt over a large area of California, Arizona, and Nevada. Minor ground cracking and displacement occurred on the Coyote Creek Fault, and Highway 78 was cracked and adjacent to Ocotillo Wells. Ground cracking, minor building damage, and power disruption occurred in some areas of Imperial Valley. A 200-foot long, 2 inch wide crack occurred in a road 6 miles west of Imperial. Minor damage was also sustained at Calexico, El Centro, Los Angeles, San Diego, and Yuma Arizona. Magnitude 6.5. Intensity VII. Later an aftershock of magnitude 5.2 was widely felt. The significant feature of this earthquake was the triggering of minor ground ruptures on neighboring Superstition Hills Fault, Imperial Fault, and the Banning Mission Creek portion of the San Andreas Fault. A 4.7 aftershock at Calexico knocked down plaster. A 4.4 event, listed as an aftershock, occurred at Salton City on May 22.

1969 May 19. A 4.5 quake near Borrego Springs was felt in San Diego, Riverside and Imperial Counties. There was no damage.

1971 September 30. Superstition Hills area, magnitude 5.1. No known effects.

1975 January 23-25. Eight events from 4.0 to 4.8 in the Brawley are. The smallest, on January 23 was assigned the highest intensity VII, but there was no significant damage recorded.

1975 June 20. Two events at Mexicali of 4.1 and 4.2.

1976 November 4. Eight events from 4.0 to 4.9 in the Calipatria area with no recorded significant effect.

1977 October 20 to November 14. Eight events from 4.0 to 4.3 southeast of El Centro, but with no recorded damage or effects.

Seismic activity from 1940 to 1979 was characterized by "earthquake swarms" with little or no damage. These were in addition to and sometimes associated with the individual events and series of events listed above. They occurred in 1950, 1955, 1966, 1973, 1975 and 1976. For example, eighty-two separate tremors were reported felt in Brawley between December 16 and 20, 1955. The 1975 Brawley

swarm was studied in detail by C.E. Johnson and revealed complex interaction between the Brawley and Imperial Faults. These "swarms" were composed of dozens, and sometimes hundreds, of events in the range of 2.0 to 4.0.

Seismic monitoring arrays installed by Chevron and Union Geothermal Companies, to assist in their exploration of the geothermal reservoirs and to determine what effects their operations might cause, have semitivities of 1.0 Richter magnitude. They frequently reveal hundreds of events daily. There is no easy way to tell if these "swarms" and "microseismicity" (events less than 2.0 Richter magnitude) are normal to the Valley and not recorded in earlier years, or are a change in the normal pattern.

1979 October 15. The earthquake occurred at 4:16 p.m. (PDT). The epicenter was on the Imperial Fault approximately 12 miles south of the Mexican border and 12 miles east of Mexicali. It was widely felt throughout Southern California, and was assigned a magnitude of 6.6 ML (Richter). Two aftershocks of 5.0 or greater occurred by 9:00 p.m.

Approximately 100 persons were reported injured; two were hospitalized. The six story County Services Building, the largest building ever built in Imperial County, suffered the most notable damage resulting in its subsequent demolition and total loss. It was occupied by 400 persons at the time of the quake. None were seriously injured. Commercial damage was widespread, particularly in the older sections of Imperial, Calexico, Brawley, El Centro, and Mexicali. Sixty percent of the commercial buildings in Imperial were subsequently condemned. Windows and bottle goods were the major loss. One hundred and three mobile home units in El Centro were knocked from their piers, Throughout the quake area (in Imperial County) two homes were destroyed and 1,565 damaged. Broken windows, cracked plaster, and collapsed brick chimneys were typical.

One 30,000 gallon gasoline tank (among 18 at the Santa Fe Pacific Tank Farm at Aten and Clark Roads) were ruptured and began leaking 100 gallons per minute. It was controlled by the next morning. All roads within one mile were closed and ten families in the area were evacuated.

There were 15 ruptures of water mains in El Centro and a temporary loss of ninety percent of the fire fighting capability. The Southern Pacific Railroad tracks were offset nine inches where they cross the Imperial Fault. Traffic was halted for 30 hours. Interstate 8, Routes 98 and 80 were damaged where they crossed the fault. The New River Bridge west of Brawley suffered serious damage by an aftershock about midnight. The west end of Runway 26 at the Naval Air Facility settled. The runway was closed 62 days for repairs. Sewage treatment plants in El Centro, Brawley, and Imperial were seriously disrupted. Clarifiers at all three were knocked out, pumps at Imperial were misaligned and subsequently burned out, and miscellaneous other damage occurred. All exceeded their holding capacity and dumped raw sewage into the drainage system. Normal service was not restored for from 2 to 6 months. Estimates of sewer main ruptures have never been summarized.

The All American Canal suffered major slumping to its embankments on both sides for an eight mile stretch in the vicinity of the Imperial Fault. There were extensive slope failures in many of the other canals. The IID immediately reduced flow to about fifteen percent and later shut the entire irrigation system down for several days for inspection and repairs. (Although media accounts, and the "staff report" state this, the system never was completely "shut down".) There was extensive drainage tile damage in fields crossed by the fault.

Electrical power was out in parts of the Valley for 3 to 4 hours. Several key emergency generators failed to function - one for the County fire station and control tower at the Imperial Airport and another at a local hospital. All hospitals remained otherwise functional with only minor damage. Students were not in class at the time of the quake. Schools remained closed the following day to assess damage. It was all non-structural -- estimated at $345,000, "County-wide". Telephone and telegraph facilities were undamaged, but became inoperative due to overload of attempted calls for up to 18 hours in certain areas. This seriously interfered with emergency analysis and response. Local radio and television (including designated Emergency Broadcast Station) were off the air for about an hour. Total loss was estimated at $30,000,000.

1981 April 27. Westmorland. Magnitude 5.6 Intensity VII. There was more damage to Westmorland than resulted from the October 1979 quake. Several commercial buildings and 16 homes were substantially damaged. The water tower, and the water and sewage treatment plants received $500,000 damage. A quarter mile of the concrete lined Vail Canal was broken up. An eight inch crack opened in Lack Road. There were no injuries, nor significant damage reported elsewhere in the valley.

The swarm of thirty quakes (seven between 3.0 and 4.1) occurred over a 12 hour period three days before the main quake. More than three dozen quakes (over 3.0) occurred in the 24 hours afterwards.

This quake apparently ruptured underground gasoline storage tanks, which was revealed months later with fumes and seepage into surface waters.

1985 May 8. An earthquake measuring 5.2 on the Richter Scale, rocked a large uninhabited area of the Mexican desert 65 miles southwest of Calexico, but there were no reports of damage or injuries, authorities said.

The quake was followed by a series of aftershocks, including one that registered 4.3 on the Richter Scale, according to a spokesman for the California Institute of Technology at Pasadena.

1986 July 8. A quake struck 12 miles northwest of Palm Springs measuring 5.9 on the Richter Scale of ground motion. It did an estimated $5.75 million damage and injured 40 people. Numerous aftershocks, some measuring as high as 4.0 on the Richter scale, have jostled the area since then.

1986 July 13. A 5.3 earthquake epicentered 28 miles southwest of Oceanside in the Pacific Ocean. The quake was felt as far away as Yuma, AZ, 160 miles east of San Diego, but caused no reported damage or injuries in Imperial Valley.

1987 February 6. A strong earthquake shattered windows and disrupted power in Mexicali and briefly interrupted phone service in the Imperial Valley but there were no reported injuries, authorities said. The trembler registered 5.6 on the Richter Scale and was centered 19 miles southeast of Mexicali according to a spokesman of Caltech in Pasadena.

The quake was felt as far east as Yuma, about 60 miles from the epicenter and as far west as San Diego.

1987 November 23-24. Two strong earthquakes, which registered 6.0 and 6.3 on the Richter Scale, caused widespread damage, but few injuries were reported. The Calexico area was apparently the hardest hit by the trembler, which was centered near Westmorland.

Two bridges, on Forrester Road over the New River and on Worthington Road over the New River were damaged according to the County Public Works Department. The California Highway Patrol also reported that Keystone Road between Forrester and Highway 86 is closed because of bridge damage.

1988 January 25. A large earthquake struck Baja California, Mexico, shaking some Californians awake but triggering no immediate damage reports either north or south of the border, officials said.

The quake registered 5.3 on the Richter Scale was centered in a sparsely populated area about 45 miles east of the resort city of Ensenada according to a spokesman of the California Institute of Technology in Pasadena. The U.S. Geological Survey in Golden, Colorado, measured the quake at 5.0. There were no reports of damage in Imperial County.

ENDNOTES

APPENDIX B

STORAGE SITES, HANDLERS, AND VENDORS OF HAZARDOUS MATERIALS AND WASTE

This report contains a summary of the largest concentrations of hazardous material and the obvious sources of massive leaks or spills in the County of Imperial. Space requirements of this document preclude the listing of every potential source of hazardous material and waste. This type of detailed information may be obtained by contacting the County of Imperial Department of Health Services.

1. Santa Fe Pacific Pipe Line Tank Farm

The Santa Fe Pacific Pipe Line Tank Farm is located at Aten Road and the Southern Pacific Railroad junction in the southeast quadrant of the City of Imperial. This facility is a component of the Santa Fe Pacific Pipe Line network that delivers gasoline, diesel, and jet fuel to Southern California and Arizona. The tank farm contains 16 storage tanks, in varying sizes, with a total storage capacity of approximately ten million gallons.

2. Naval Air Facility (El Centro)

The Naval Air Facility (El Centro) is serviced by a four-inch fuel line directly from the Santa Fe Pacific Pipe Line Tank Farm. Safety devices include manual and automatic shutoff valves, as well as pressure regulators. The facility also stores one million gallons of fuel, which is predominantly jet fuel, in underground tanks. Munitions storage is limited to aircraft and small arms training ammunition.

3. ST Services

ST Services is located south of the Santa Fe Pacific Pipe Line Tank Farm and has the capacity to store 70,000 gallons of fuel.

4. Brea Agricultural Service

Brea Agricultural Service is located at 89 East Main Street in the City of Heber and serves as a chemical and fertilizer storage facility.

5. United Agriculture Products

United Agriculture Products is located at 2415 Clark Street in the City of Imperial. This facility handles hazardous wastes, chemicals, insecticides, and pesticides.

6. Puregro Company

The Puregro Company is located at 10th Street and River Drive in the City of Brawley. This facility handles chemicals and fertilizers.

7. Rockwood Chemical Company

Rockwood Chemical Company is located at 47 West Rutherford Road in Brawley. This facility handles chemical and fertilizers.

8. Helena Chemical Products

Helena Chemical Products is located at 101 East Carey Road in the City of Brawley. This facility handles chemicals, fertilizers, insecticides, and pesticides.

9. Wilbur Ellis Company

The Wilbur Ellis Company is located at 45 West Danenberg Road in the community of Heber. This facility handles chemicals, fertilizers, insecticides, and pesticides.

10. Pipelines

There are 89.92 miles of pipeline in Imperial County that transport hazardous material. Pipe sizes vary in size from 12 to 20 inches and the average size is 12 inches. Pipelines are located adjacent to the Southern Pacific tracks from the Arizona border at Yuma to the Niland tank farm, north to the Riverside County Line, and south to the Imperial tank farm. The pipeline system has section fuel control valves.

Source: 1988 Imperial County Emergency Plan

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i. Robert Iacopi, *Earthquake Country*, (California:Menlo Park, Lane Books, 1976):58-60.

ii. Matthews H. William, *Geology Made Simple*, (New York:Doubleday & Company, Inc., 1982):78.

iii. The World Book Encyclopedia, 1988 Edition, *Flash Flood*, (Chicago:World Book Inc., 1987 F Volume 7):237.

iv. Office of Emergency Services Imperial County, *Imperial County Emergency Plan*, (June 1988):Appendix 1-3, 57.

v. Federal Emergency Agency, *Flood Insurance Study Imperial County, California Unincorporated Areas*, (September 15, 1983):4.

vi. Ibid. p. 4.

vii. Ibid. p. 5.

Attachment C.

Updated Multi-Jurisdiction Hazard Mitigation Plan (MHMP)

Imperial County

Multi-Jurisdictional Mitigation Plan (MHMP)

November 2020

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Section 1. Executive Summary

1.1. Introduction

Across the United States, natural and human-caused disasters have led to increasing levels of death, injury, property damage, and interruption of business and government services. The impact on families and individuals can be immense and damages to businesses can result in regional economic consequences. The time, money and effort to respond to and recover from these disasters divert public resources and attention from other important programs and problems.

Never have these risks been clearer in recent times than in the year 2020 when the entire nation and globe are experiencing the COVID-19 pandemic. The illness, death, and economic disruption of the COVID-19 crisis has impacted every American in ways for which many were unprepared.

Hazard Mitigation is defined by the Disaster Mitigation Act of 2000 (DMA 2000) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." For the purpose of this Multi-Jurisdiction Hazard Mitigation Plan (MHMP) Update, hazards are both natural and human-caused. A "hazard" is defined by FEMA as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss" (44 CFR Section 206 401). Hazard mitigation generally involves alteration of physical environments, significantly reducing risk and vulnerability to hazards by altering the built environment so that life and property losses can be avoided or reduced. Mitigation also makes it faster and less expensive to respond to and recover from disasters.

The planning partners of the County of Imperial, City of Brawley, City of Calexico, City of Calipatria, City of El Centro, City of Holtville, City of Imperial, City of Westmorland, the Imperial Irrigation District and the Imperial County Office of Education (representing all of Imperial County's School Districts) recognize the consequences of disasters and the need to reduce the impacts of natural and human-caused hazards. These planning partners shall be known in this Plan as the Planning Jurisdictions.

The elected and appointed officials of the MHMP Planning Jurisdictions have chosen to carefully select mitigation actions in the form of projects and programs that can become long- term, cost effective means for reducing the impact of hazards.

The original MHMP planning partners of the County of Imperial, City of Brawley, City of Calexico, City of Calipatria, City of El Centro, City of Holtville, City of Imperial, and the City of Westmorland prepared an MHMP which was approved by FEMA in 2009. An update to the MHMP was approved by FEMA in 2014.

This document is a comprehensive update of the 2009 MHMP. Each section of the 2014 MHMP was reviewed and analyzed by the Planning Jurisdictions and revisions and updates were made, including the identification and rating of local hazards; addition of new hazard incidents which have

occurred since the last Plan was developed; description of mitigation progress and updates, goals, objectives and actions plans. Through the completion of this Plan, the Planning Jurisdictions have reaffirmed an effort that will continue with many years of commitment to the reduction of risks through hazard mitigation.

This Plan will be shared in electronic format with regional jurisdictions to encourage and assist with a regional risk reduction effort. The MHMP Update will guide the Planning Jurisdictions toward greater disaster resistance in cooperation and coordination with the character and needs of the community.

1.2. Definition of Hazard Mitigation

Hazard is defined by FEMA as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss." sustained action taken to eliminate or reduce long term risk to human life, property and the environment posed by a hazard.

Hazard Mitigation is defined by FEMA as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." For the purpose of this MHMP, hazards are both natural and human-caused.

Hazard Mitigation Planning is the process of developing a sustained course of action taken to reduce or eliminate long-term risk to people and property from both natural and human-caused hazards and their effects. The planning process includes establishing goals and recommendations for mitigation strategies.

Hazard mitigation may occur during any phase of a threat, emergency or disaster. Mitigation can and may take place during the *preparedness* (before), *response* (during), and *recovery* (after) phases.

The process of hazard mitigation involves evaluating a hazard's impact and identifying and implementing actions to minimize or eliminate the impact.

1.3. Purpose of the Plan

Imperial County has developed this MHMP to create a safer community. The purpose of the MHMP is to significantly reduce deaths, injuries, and other disaster losses caused by natural and human-caused hazards in Imperial County. The MHMP describes past and current hazard mitigation activities and outlines goals, strategies, and actions for reducing future disaster losses. The Imperial County MHMP is the representation of the County's commitment to reduce risks from natural and other hazards and serves as a guide for decision-makers as they commit resources to reducing the effects of natural and other hazards.

While DMA 2000 requires that local communities address only natural hazards, the Federal Emergency Management Agency (FEMA) recommends that local comprehensive mitigation plans address man-made and technological hazards to the extent possible. Towards that goal, the Planning Jurisdictions have addressed an expansive set of hazards.

Jurisdictions included in this MHMP Update are Imperial County; the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland; the Imperial Irrigation District; and the Imperial County Office of Education. Throughout this document, the word "County" may be used to refer to Imperial County and the Participating Jurisdictions.

The Planning Jurisdictions are required to adopt a federally-approved Hazard Mitigation Plan to be eligible for certain disaster assistance and mitigation funding. The overall intent of this Plan is to reduce or prevent injury and damage from hazards in the County and participating jurisdictions. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. This Plan also guides hazard mitigation activities by establishing hazard mitigation goals, objectives, and an action plan.

The MHMP is a "living document" that will be reviewed and updated annually to reflect changing conditions and improvements by new information, especially information on local planning activities. The MHMP is written to meet the statutory requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) and Title 44 Code of Federal Regulations (CFR) 201.6 – Local Mitigation Plans.

1.4. Goals Shared with State Multi-Hazard Mitigation Plan

Imperial County's MHMP supports the goals that it shares with the State of California Multi- Hazard Mitigation Plan, namely:

- ***Goal 1: Significantly reduce life loss and injuries.*** This goal involves reducing potential casualties from disasters through long-term physical changes that make places and buildings safer through mitigation investments and actions.
- ***Goal 2: Minimize damage to structures and property, as well as disruption of essential services and human activities.*** This goal includes structures as an important aspect of both life safety and property damage and reflects the desired outcome of minimizing disruption of essential services (e.g., police, fire, and medical response) as well as normal human activities after a disaster.
- ***Goal 3: Protect the environment.***
- ***Goal 4: Promote hazard mitigation as an integrated public policy.*** This goal suggests both governmental and societal attention to the need for mitigation.

1.5. Imperial County Vision

The Multi-Jurisdictional Hazard Mitigation Plan Update supports the broader vision and values of Imperial County as stated in the County's Mission Statement.

1.6. Imperial County Mission Statement

To promote quality of life for the residents of Imperial County by providing superior County services in a timely, cost effective manner.

1.7. Imperial County Goals/Objectives

- To continue to explore creative funding strategies to balance budget in light of reductions in State revenue.
- To continue to improve County leadership, team building, and coordination of services.
- To continue to improve customer services.
- To continue to encourage more public input on issues affecting the County.
- To continue to streamline and improve efficiency of services.
- To continue to improve a "team process" starting with Board Members and Department Heads.

1.8. Plan Adoption

This updated MHMP is a comprehensive description of the County of Imperial and participating jurisdictions commitment to reduce or eliminate the impacts of disasters. The Plan will be coordinated and maintained by the Planning Jurisdictions and is the culmination of input and recommendations from numerous stakeholders, citizens, private businesses, and organizations.

Upon review and approval of the final draft Plan by the Planning Jurisdictions, the Plan will be forwarded to the California Office of Emergency Services (Cal OES) for review and approval and then forwarded to FEMA for approval. After FEMA approval, the Plan will be sent to each participating jurisdiction for adoption by their governing body.

The Planning Jurisdictions will comply with all applicable federal, state, and local statutes and regulations, and will review and update the Plan at least every five years.

1.9. Legal Authority Assurances

This Plan will comply with all principal federal, state, and local laws guiding disaster management as applicable.

1.10. Federal Laws

1. Flood Insurance Act of 1968
2. Flood Disaster Protection Act of 1973 (PL-91-646)
3. Mitigation Planning of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988
4. Disaster Mitigation Act of 2000 (DMA)

1.11. State Laws

1. AB 2140: Qualifying for Additional California Disaster Assistance Act (CDAA)
2. AB 162, AB156, SB 5: 2007 California Flood Bills
3. Standardized Emergency Management System (SEMS)
4. Un-reinforced Masonry Building Law
5. California Earthquake Hazards Reduction Act of 1986
6. Caltrans Seismic Retrofit Program
7. California Fire Alliance
8. California Earthquake Authority's Seismic Retrofit Program
9. NFIP, administered by the Department of Water Resources
10. State planning law and Office of Planning and Research's general plan guidance documents
11. California Department of Insurance (CDI) Residential Retrofit Program

1.12. Ordinances and Regulations

In addition to the legal authorities listed above, the following are local and state ordinances and regulations which affect or promote disaster mitigation, preparedness, response or recovery for Imperial County and all of the participating jurisdictions. Local ordinances and regulations will be expanded, improved, or modified to support the mitigation strategy. Authorities, policies, programs, and land use programs are identified after each Hazard listed in the Plan and in the Land Use section of the Plan for the specific individual jurisdictions of Imperial County, City of Brawley, City of Calexico, City of Calipatria, City of Holtville, City of Imperial, and City of Westmorland. In addition, policies and programs of the Imperial Irrigation District and the Imperial County Office of Education special districts are identified where appropriate.

Table 1. Local and State Ordinances and Regulations

Local and State Ordinances and Regulations	
Title 9 Land Use Ordinance for the County of Imperial	This Title (Title 9 inclusive) is hereby established and adopted pursuant to the authority vested in the County of Imperial by the State of California, including but not limited to the State Constitution, Government Code, Public Resources Code, the California Environmental Quality Act, the Subdivision Map Act, the Housing Act, and the Surface Mining and Reclamation Act. This ordinance shall be known as, and may be cited and referred to as, the "Land Use Ordinance" of the County of Imperial, hereinafter referred to as "Title".
Imperial County Codified Zoning Ordinance	Contains provisions which act to reduce fire hazards. The Zoning Ordinance is a tool that helps prevent the construction of incompatible or hazardous structures. For example, the ordinance separates industrial, commercial and residential uses and provides for the isolation of land uses that may create excessive fire exposure to other properties. It also limits the height and bulk of buildings, specifies setbacks and distances between buildings.

Local and State Ordinances and Regulations	
Imperial County Subdivision Ordinance	Used to reduce the risk of fire by securing, as a condition of subdivision of land, water systems of adequate size and pressure for firefighting, and adequate roadway widths for emergency service vehicle access including maneuverability of fire trucks. As part of the review process, the Imperial County Planning Department seeks recommendations from fire and water districts wherever the proposed subdivision is located.
Imperial County Fire Prevention and Explosives Ordinance	Section 53101-53300, contains provisions for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion. Such measures in this Ordinance include the following: Storage of flammable materials; Storage of Radioactive materials; Permit required for sale and use of fireworks; Abatement of weeds and other vegetation.
Imperial County Ordinance, Title 8 Health and Safety Section 8.36.010	Inspection by the agricultural commissioner. It is unlawful to sell, transport or ship, or have in possession for sale, transportation or shipment in amounts exceeding two standard containers for commercial purposes, any lettuce, broccoli, cabbage, cauliflower, corn, melons, market tomatoes, asparagus, market onions or salad products, without first obtaining from the agricultural commissioner an inspection in accordance with the provisions of Section 42791 of the California Food and Agricultural Code. (Ord. 1371 § 2 (part), 2003 (prior code § 62200)
Imperial County Ordinance, Title 8 Health and Safety Section 8.36.090	Inspection of imported fruits, nuts, and vegetables – Findings. A. The Imperial County board of supervisors, upon the recommendation of the Imperial County agricultural commissioner, finds that extraordinary circumstances have resulted in the need for inspection of imported fruits, nuts and vegetables. B. Funding from the state of California has eliminated an inspection position at ports of entry and ports of initial availability in the county of Imperial. C. In order to properly inspect imported fruits, nuts and vegetables under the current operation and further, with the increased demand for inspection services under the North American Free Trade Agreement, the board of supervisors finds it necessary to establish fees for the inspection of imported fruits, nuts and vegetables at ports of entry and points of initial availability located within the county of Imperial. (Ord. 1371 § 2 (part), 2003
Public Resource Code (PRC) 4290	Fire Safe Regulations. These regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction and development in State Responsibility Areas (SRA).The future design and construction of structures, subdivisions and developments in SRAs shall provide for basic emergency access and perimeter wildfire protection measures as specified in PRC 4290.
Public Resource Code 4291	PRC 4291 is the law requiring annual defensible space be provided around all structures in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material.
Public Resources Code 2694	PRC2694 states that a person who is acting as an agent for a transferor of real property that is located within a seismic hazard zone, shall disclose to any prospective transferee the fact that the property is located within a seismic hazard zone.

Local and State Ordinances and Regulations	
Uniform Fire Code	This Code may be adopted by local jurisdictions, with amendments, and provides minimum standards for many aspects of fire prevention and suppression activities. These standards include provisions for access, water supply, fire protection systems, and the use of fire resistant building materials.
California Fire Code	The California Fire Code is the Uniform Fire Code with State of California amendments. It is located in Part 9 of Title 24 of the California Code of Regulations (Title 24 is commonly referred to as the California Building Standards Code). The California Fire Code is revised and published every three years by the California Building Standards Commission. Local jurisdictions have 180 days to make more restrictive amendments to the Code after it is released. The Imperial County Board of Supervisors adopts the California Fire Code, 2001 Edition together with the County of Imperial amendments. The California Fire Code, 2001 Edition, is based on the Uniform Fire Code, 2000 Edition, published by the Western Fire Chiefs Association and is integrated with the State of California amendments.
Title 24, Part 2 California Code of Regulations	2007 California Building Code. 701A.3.2 New Buildings Located in Any Fire Hazard Severity Zone. New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas, any Local Agency Very-High Fire Hazard Severity Zone, or any Wildland-Urban Interface Fire Area designated by the enforcing agency for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter.
California Health and Safety Code and the Uniform Building Code	The Health and Safety Code provides regulation pertaining to the abatement of fire related hazards. It also requires that local jurisdictions enforce the Uniform Building Code, which provides standards for fire resistive building and roofing materials, and other fire-related construction methods.
Uniform Mechanical Code, National Electrical Code, Uniform Code for the Abatement of Dangerous Buildings	These codes contain structural requirements for existing and new buildings. The codes are designed to ensure structural integrity during seismic and other hazardous events to prevent personal injury, loss of life and substantial property damage.
Title 19 California Code of Regulations	These regulations pertain to fire prevention and engineering measures for new construction.
Title 14, Article 10 California Code of Regulations	Seismic Hazards Mapping. These regulations shall govern the exercise of city, county and state agency responsibilities to identify and map seismic hazard zones and to mitigate seismic hazards to protect public health and safety in accordance with the provisions of Public Resources Code, Section 2690 et seq.
Earthquake Safety and Public Buildings Rehabilitation Bond Act (Proposition 122)	In 1990, the State of California passed the Earthquake Safety and Public Buildings Rehabilitation Bond Act (Proposition 122). Up to $50 million was allocated for the seismic retrofit of essential services facilities. Many local governments and special districts have retrofitted their essential services buildings with local funds.
Title 14 Public Resources Code	These regulations provided additional fire prevention and suppression standards.

Local and State Ordinances and Regulations	
Assembly Bill 337 (Bates Bill)	In response to the Oakland Hills, California fire of 1991, this bill was passed in 1992. It requires brush clearance and fire resistant roof material (Class A or B) to be used on all new construction that is located in areas designated as being a "Very High Fire Severity Zone."
California Civil Code 1103	This article mandates three natural hazard disclosures and consolidates these and previously required disclosures onto a statutory form called the Natural Hazard Disclosure Statement (NHDS). This form is now a legally required part of most residential property transactions.
California Health and Safety Code, Section 25500 et seq.	Pursuant to Section 25500 et seq. the Imperial County Health Services Department is designated as the "administering agency" responsible for maintaining a list of handlers/vendors of toxics within the County. In addition, they are required to maintain, for each handler/vendor, to maintain an inventory and business plan.
Alquist-Priolo Earthquake Fault Zoning Act	The Alquist-Priolo Earthquake Fault Zoning Act requires the state Geologist to identify earthquake fault zones along traces of both recently and potentially active major faults. The Alquist-Priolo Zones are usually one-quarter mile or less in width and proposed development plans within these fault zones must be accompanied by a geotechnical report prepared by a geologist describing the likelihood of surface rupture and other seismically induced hazards.
California Environmental Quality Act (CEQA) and Guidelines	The California Environmental Quality Act was adopted by the state legislature to provide public disclosure of the substantial adverse environmental effects of proposed development within the state. The CEQA Statutes and Guidelines (California Code of Regulations Title 14, Chapter 3, Section 15000, *et. seq.)* include disclosure of and mitigation for safety hazards as environmental impacts.
Cobey-Alquist Floodplain Management Act	The Cobey-Alquist Floodplain Management Act encourages local governments to plan, adopt and enforce land use regulations for floodplain management in order to protect people and property from flooding hazards. This act also identifies requirements which jurisdictions must meet in order to receive state and financial assistance for flood control.
Flood Damage Prevention Code, Earthquake Hazard Reduction in Existing Building Code	These codes address safety issues associated with flooding and earthquakes directly.

1.13. Imperial County and Participating Jurisdiction's Resources for MHMP Projects

The table below lists financial resources Imperial County and the Participating Jurisdictions identified as resources available to accomplish mitigation and reduce long-term vulnerability.

Table 2. Capabilities Assessment: Financial and Other Resources for Hazard Mitigation Projects

Capabilities Assessment: Financial and Other Resources for Hazard Mitigation Projects
General Fund (County and Participating Jurisdictions)
Enterprise Fund (These funds are restricted to specific use, i.e., solid waste enterprise fund)
Development fees (Restricted to expansion costs for new development)

Capabilities Assessment: Financial and Other Resources for Hazard Mitigation Projects
Building Permit fees
Capital Improvements project funding
Proposition 1E Disaster Preparedness and Flood Prevention (funds projects that show measurable reductions to local/regional flood risks)
Proposition 84 (allocated $900,000,000 to support Integrated Regional Water Management planning and implementation of projects)
Weed Abatement Penalty fees
Fees for water, sewer, gas, or electric service
Impact fees for homebuyers or developers for new developments/homes
Key engineers, planners, emergency managers, public works, building inspectors staff/personnel from each jurisdiction
State Funding Sources: Caltrans Commerce and Economic Development Program Infrastructure State Revolving Fund (ISRF) Program Rural Economic Development Infrastructure Program (REDIP) Proposition 13 California State Water Resources Control Board (SWRCB) Proposition 40 California State Water Resources Control Board (SWRCB) Proposition 50 Clean Water State Revolving Fund (SRF) Program Watershed Protection Program California Fire Alliance Pandemic Influenza State General Fund Grant California Fire Safe Council (Grants Clearinghouse – distributes some Federal National Fire Plan Grants in California)
Federal Funding Sources: FEMA Hazard Mitigation Grant Program (HMGP) Housing and Urban Development (HUD) Community Development Block Grant Program U.S. Army Corp of Engineers (USACE) U.S. Small Business Administration (SBA) Funding U.S. Department of Agriculture (USDA) Programs Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) Highway Bridge Program (HBP) Small Watershed Program Flood Prevention Program Emergency Watershed Protection (EWP) Program Homeland Security Grants (Terrorism) Homeland Security Grant (Staffing Adequate Fire and Emergency Response) Hospital Preparedness Program (HPP) Grant Public Health Emergency Preparedness Grant Bureau of Land Management (BLM) Programs National Fire Plan

The table below lists the County's and Participating Jurisdiction's hazard mitigation projects and programs currently in-progress, are ongoing, or have been completed since the 2009 and 2014 MHMPs were completed.

Table 3. In-Progress/Ongoing/Completed Mitigation Projects and Programs

In-progress/Ongoing/Completed Mitigation Projects and Programs		
Program or Project	**Status**	**Description**
Multi-Jurisdictional Hazard Mitigation Plan Update	In-Progress	An Update Multi-Jurisdictional Hazard Mitigation Plan for Imperial County and the participating jurisdictions: Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial City, Westmorland, Imperial Irrigation District and the Imperial County Office of Education. The overall goal of this Plan Update is to reduce or prevent injury and damage from hazards in the County. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. This Plan Update also guides hazard mitigation activities by establishing hazard mitigation goals and objectives.
Multi-Jurisdictional Hazard Mitigation Plan Update	Completed	A Multi-Jurisdictional Hazard Mitigation Plan for Imperial County and the participating jurisdictions: Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial City and Westmorland as well as the County Office of Education and the Imperial Irrigation District was completed and approved by FEMA in 2014. The overall of this Plan is to reduce or prevent injury and damage from hazards in the County. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. This Plan also guides hazard mitigation activities by establishing hazard mitigation goals and objectives.
Multi-Jurisdictional Hazard Mitigation Plan	Completed	A Multi-Jurisdictional Hazard Mitigation Plan for Imperial County and the participating jurisdictions: Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial City and Westmorland as well as the County Office of Education and the Imperial Irrigation District was completed and approved by FEMA in 2009. The overall of this Plan is to reduce or prevent injury and damage from hazards in the County. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. This Plan also guides hazard mitigation activities by establishing hazard mitigation goals and objectives.

In-progress/Ongoing/Completed Mitigation Projects and Programs		
Program or Project	**Status**	**Description**
Flood Management Plan	Completed	Countywide Flood Management Plan including the participating jurisdictions: Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial City, Westmorland was completed in 2008. The Imperial County Flood Management Plan will be developed to: • Identify the County's known flood problem areas, • Establish goals, objectives, policies and an implementation plan to reduce flooding and flood related hazards, and • Ensure the natural and beneficial functions of the floodplains are protected.
Emergency Operations Plan	Completed	Countywide Emergency Operations Plan has been designed to establish the framework for implementation of the National Response Plan, predicated on a new National Incident Management System (NIMS).
Imperial County Hazardous Materials Area Plan	Completed	The Hazardous Materials Area Plan was prepared pursuant to Chapter 6.95 of the California Health and Safety Code to protect public health and safety from hazardous materials.
Annual Countywide Disaster Drills	Ongoing	Members of the participating jurisdictions' Police and Fire Departments, Office of Emergency Services personnel, and Emergency Managers participate in annual tabletop and/or field exercises.
ICS/SEM Training	Ongoing	Incident Command System/Standardized Emergency Management System training for appropriate personnel.
Fire Department Equipment	Completed	Fire Operations and Firefighter Safety grants for firefighting equipment to Imperial County Fire Department and El Centro Fire Department.
Fire Prevention Education Program	Ongoing	This program encompasses a public information and education component that promotes public awareness of the significance of Fire/Safety prevention measures. This program enables the public to be better prepared when an emergency fire situation occurs.
Pest Exclusion Program	Ongoing	This program provides protection to the County by regulatory control through the use of quarantines to prevent the introduction of pests, which are not known to exist or are of very limited distribution within the County.
California Global Warming Solutions Act of 2006	Ongoing	The law establishes a comprehensive program to achieve quantifiable, cost-effective reductions of greenhouse gases on a scheduled basis. It requires the California Air Resources Board (ARB) to develop regulations and market mechanisms that will ultimately reduce California's greenhouse gas emissions by 25 percent by 2020.

Section 2. The Planning Process

Imperial County Office of Emergency Services (OES) was responsible for the development of the MHMP Update. The County OES hired a consultant, Bluecrane, Inc. (*bluecrane*) to assist in the preparation of the Plan.

Following the open and publicly attended County Board of Supervisors' discussion and approval of the project in April 2020, the initial MHMP Update meeting was held on April 30, 2020, and provided a forum for engaging team members in the Plan Update and revision process.

The planning process utilized by Imperial County is depicted in the figure below.

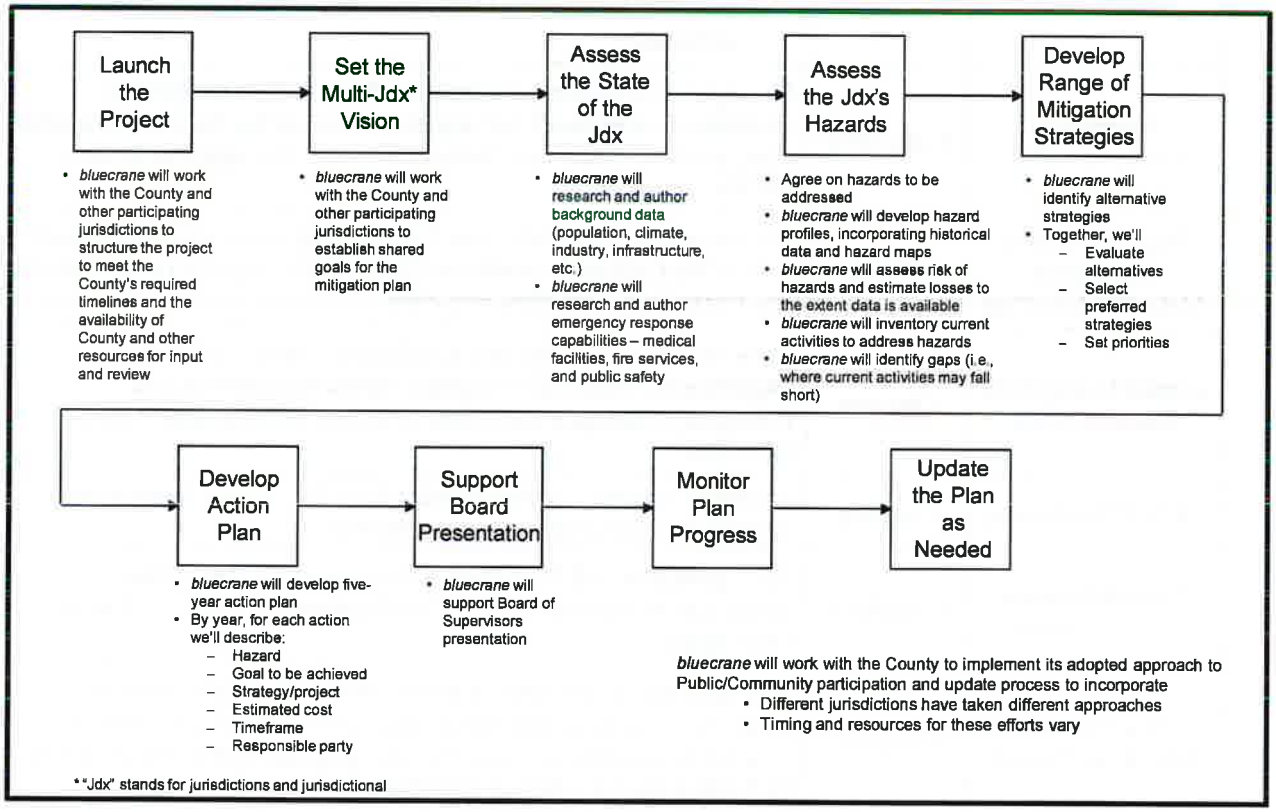

Figure 1. Imperial County MHMP Planning Process

The County OES formed a planning committee with representatives from the participating jurisdictions within the County which included the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland as well as the Imperial Irrigation District and the County Office of Education. The Planning Committee has participated actively in the MHMP's update development, conferring at least monthly throughout the process to review draft documents and assess progress on the Plan.

The departments listed below were designated as the lead agency for each participating jurisdiction.

- Imperial County Office of Emergency Services

- Imperial County Fire Department
- Imperial County Public Works Department
- Imperial County Public Health Department
- Imperial County Agricultural Commissioner's Office
- Imperial County Planning & Development Services
- Imperial County Sheriff's Office
- City of Brawley Fire Department
- City of Calexico Fire Department
- City of El Centro Fire Department
- City of Calipatria
- City of Holtville
- City of Westmorland
- City of Imperial
- City of Imperial Police Department
- Imperial Irrigation District
- Imperial County Office of Education

The individuals, as members of the Planning Committee, from these departments were responsible for communicating with and soliciting input from all applicable departments, offices and bureaus within their home jurisdiction as the MHMP Update progressed through the various stages of development. In this manner, all departments, offices, and bureaus from each participating jurisdiction were fully involved in the development of the Plan.

Below is a list of the formally scheduled MHMP Update development and public meetings followed by meeting summaries and a list of attendees throughout the planning process. The list of attendees includes neighboring communities and local and regional agencies who were invited to attend all meetings.

Table 4. Meetings Held for Development of MHMP

Date	Meeting Event
April 30, 2020	Hazard Mitigation Planning Committee Meeting – Kickoff Session
June 3, 2020	Hazard Mitigation Planning Committee Meeting – Hazard Workshop

Date	Meeting Event
July 20, 2020	Hazard Mitigation Planning Committee Meeting – Mitigation Workshop
August 2020	Hazard Mitigation Planning Committee – MHMP Update Review
Various Dates	On-going telephone conversations and emails with the Planning Committee members throughout the Planning process.
August 24 – September 30, 2020	Public and Private Sector Review and Comments on Draft 2020 MHMP Update

2.1. MHMP Update Meeting Summaries

2.1.1. April 30, 2020: Hazard Mitigation Update Meeting – Kickoff Session

Agenda

Introductions
Background on Bluecrane, Inc.

Overview of Hazard Assessment and Mitigation Planning
Review of Deliverables/Process/Schedule

Immediate Needs for Plan Update
Questions/Discussion Items

Summary of highlights of the MHMP Update kickoff meeting:

- Met with county and city officials and other stakeholders/participants to structure the project to meet the County's required timelines and the availability of resources for input and review.
- Overview presentation of the Disaster Mitigation Act of 2000 and Hazard Mitigation Plan Update process (especially for any new members of the planning effort). The 2014 MHMP was briefly discussed. New items discussed included identification of current hazards, existing mitigation activities, new hazard policies/ordinances, thoughts on new mitigation projects, mitigation measures-prevention-property protection-public education and awareness, natural resource protection, emergency services, structural projects)
- Preliminary updates to assessments of local capabilities
- Identification of other planning efforts that might be integrated into the Updated MHMP

2.1.2. June 3, 2020: Hazard Mitigation Update Meeting – Hazard Workshop

Agenda

Hazards Assessment Update

Review Results of Discussion/Voting

Next Steps

Summary of highlights of the MHMP Update Hazard Workshop meeting:

- Facilitated session was held for Planning Committee members and stakeholders to develop a revised assessment of hazards based on events and new information since the last MHMP Plan was published.
    - Reviewed list of hazards from current MHMP
    - Assessed each hazard (group discussion)
        - Reassessed likelihood ("probability") of a hazard event occurring (rough order estimate: VH (very high), H (high), M (moderate), L (low), VL (very low)
        - Likely severity if an event occurs (rough order estimate: VH, H, M, L, VL)
    - Discussed changes from previous MHMP (additions, deletions)
- Reviewed results
    - Gained approval from Planning Committee on the revised prioritization
- Recapped accomplishments and discussed next steps

2.1.3. July 20, 2020: Hazard Mitigation Update Meeting – Mitigation Workshop

Agenda

Reviewed Mitigation Projects from Prior MHP

Discussed New Mitigation Projects for each Hazard Identified at Previous Meeting

Review Results of Discussion

Next Steps

Summary of highlights of the MHMP Update Mitigation Workshop meeting:

- Mitigation Planning
  - For each hazard, discussed:
    - Mitigation strategy
    - Status of mitigation projects from current plan (complete, in progress, deferred, eliminated)
    - Inventory any mitigation projects that aren't in current plan that (1) were conducted since the current plan was written or (2) are underway
    - Brainstorm/discussed other potential mitigation projects
- Reviewed results
  - Gained approval from Planning Committee on the planned mitigation efforts
- Recapped accomplishments and discussed next steps

2.1.4. August 24 – September 30, 2020: Public and Stakeholder Review

Neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as other interests to be involved in the planning process, have been given an opportunity to participate, comment, and review the Plan throughout the planning process.

Since August 24, 2020 the MHMP was placed on the Disaster Council Meeting agenda every quarter for Disaster Council members, local agencies, and public/stakeholder review and comments until the Plan is completed. Note: to date no public or stakeholder comments were received in these quarterly meetings.

Imperial County and the participating jurisdictions abide by the California Environmental Quality Act (CEQA) which requires state and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts. All website postings of the Plan during the development stages allowing for public and stakeholders reviews were in compliance with CEQA.

On an on-going basis, a copy of the 2014 FEMA approved MHMP and the Draft 2020 MHMP Update are posted on the County's website: www.co.imperial.ca.us, the County OES website: www.co.imperial.ca.us/emergencyPlans/multihazard_mitigation_plan.htm, the City of El Centro's website: www.cityofelcentro.org and the Imperial Irrigation District's website: www.iid.com inviting the public and local agencies to review, provide feedback, and make comments. To-date, no feedback has been received.

In addition to requesting public input into the Plan throughout the planning process, a Public Notice for the final draft MHMP public review was posted on the Imperial County, City of El Centro, Imperial Irrigation District, and the Imperial County Office of Education websites.

Although there was no public interest or involvement in the planning process, the Planning Jurisdictions will continue to keep the public and stakeholders informed of the Plan updates and changes through regularly held public meetings such as the open Board of Supervisor's meeting, IID Board of Director's meetings, City Council meetings, quarterly Disaster Council meetings, Water Forum meetings, and School Board meetings as necessary, in addition to posting information on their websites. No public attendees or feedback was received throughout the entire planning process. Below are copies of two of the Multi-Hazard Mitigation Plan website postings.

Public Notice:

Multi-Jurisdictional Hazard Mitigation Plan (MHMP) Update
Public Comments

September 1, 2020 - Imperial County, five cities within the County, and two Special Districts are in the process of updating the Multi-Jurisdictional Hazard Mitigation Plan (MHMP). The Plan will assess the likelihood of various natural hazards such as flooding, earthquakes, severe weather, and more, along with man-made hazards including hazardous materials and terrorism.

We are seeking the participation of people living in the community to help us assess the likelihood of natural and man-made disasters and to identify measures to minimize the likelihood that these disasters occur and to minimize the impact if and when they do occur. This Plan is part of the ongoing process to evaluate risks that hazards pose to Imperial County and will set the framework for the community to pursue in order to reduce the risks.

The Federal Emergency Management Agency (FEMA) has targeted natural disaster loss reduction as one of its primary goals. The Disaster Mitigation Act of 2000 (DMA 2000) establishes hazard mitigation planning requirements for local governments. DMA 2000 is intended to make communities across the nation more "disaster resistant" by encouraging pre-disaster planning and mitigation efforts.

Each participating jurisdiction in Imperial County will have its own sections within the overall Imperial County Plan. Your comments and ideas are encouraged by reviewing the Plan at the following location and website:

El Centro City Hall 1275 W. Main Street, El Centro

City of El Centro Website www.cityofelcentro.org

Public input into this process is very important and residents are encouraged to participate, make comments, and ask questions. Without ideas from the public, the plan will not be nearly as effective. We are counting on a high degree of public participation to help shape this plan. The deadline to provide public comments is September 15, 2020.

For more information, you may contact:

Maricela Robles
Office Assistant I- Extra Help
Imperial County Fire/OES
442 265 6018
maricelarobles@co.imperial.ca.us

CITY OF CALEXICO

608 Heber Avenue
Calexico, CA 92231
www.calexico.ca.gov

August 24, 2020

Public Notice:

Multi-Jurisdictional Hazard Mitigation Plan (MHMP) Update
Public Comments

Imperial County, five cities within the County, and two Special Districts are in the process of updating the Multi-Jurisdictional Hazard Mitigation Plan (MHMP). The Plan will assess the likelihood of various natural hazards such as flooding, earthquakes, severe weather, and more, along with man-made hazards including hazardous materials and terrorism.

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Each participating jurisdiction in Imperial County will have its own sections within the overall Imperial County Plan. Your comments and ideas are encouraged by reviewing the Plan at the following locations and websites:

City of Calexico
608 Heber Avenue
Calexico, CA 92231
https://www.calexico.ca.gov/publicannouncements

Public input into this process is very important and residents are encouraged to participate, make comments, and ask questions. Without ideas from the public, the plan will not be nearly as effective. We are counting on a high degree of public participation to help shape this plan. Public input is needed by September 1, 2020.

For more information, you may contact Maricela Robles at (442) 265-6018.
maricelarobles@co.imperial.ca.us

Viva Calexico!

Imperial County
Multi-Jurisdiction Hazard Mitigation Plan
Meeting Attendance / Contact List

x – MHMP Planning Committee Members and key stakeholders who participated in planning discussions, identified and prioritized hazards, provided Plan data, and developed mitigation items.
x – Stakeholders, Neighboring Communities, Academia, Local and Regional Agencies who attended meetings. No feedback or participation received during the development of the Plan.

Table 5. Contact List for Imperial County MHMP

4/30	6/3	7/20	Name	Title/Department	Phone Number	Email
x	x		Esperanza Colio	Deputy County Executive Officer	available upon request	esperanzacolio@co.imperial.ca.us
x	x	x	Alfredo Estrada, Jr.	Chief, Imperial Fire and OES	available upon request	alfredoestradajr@co.imperial.ca.us
x	x	x	Salvador Flores	Deputy Chief, Imperial Fire and OES	available upon request	salvadorflores@co.imperial.ca.us
x	x	x	Maricela Robles	Imperial Fire and OES	available upon request	maricelarobles@co.imperial.ca.us
x	x		Alvaro Ramirez	Imperial County Office of Education (ICOE)	available upon request	alvaro.ramirez@icoe.org
x	x	x	P. Robert Amparano	Imperial Irrigation District (IID)	available upon request	pramparano@iid.com
x	x		Rosanna Bayton Moore	City of Brawley	available upon request	rbmoore@brawley-ca.gov
x	x		David Dale	City of Calexico	available upon request	ddale@calexico.ca.gov
x	x		Miguel Figueroa	City of Calexico	available upon request	mfigueroa@calexico.ca.gov
x	x		Romualdo J. Medina	City of Calipatria	available upon request	Rj_medina@calipatria.com
x			Marcela Piedra	City of El Centro	available upon request	mpiedra@cityofelcentro.org
x	x		Nick Wells	City of Holtville	available upon request	nwells@holtville.ca.gov
x		x	Dennis H. Morita	City of Imperial	available upon request	dmorita@cityofimperial.org

4/30	6/3	7/20	Name	Title/Department	Phone Number	Email
x			Alexis Brown	City of Imperial	available upon request	abrown@cityofimperial.org
			Anna Beltran	City of Westmorland	available upon request	abeltran@cityofwestmorland.net
			Raquel Fonseca	City of Westmorland	available upon request	available upon request
x	x	x	Allen Mills	Bluecrane, Inc.	available upon request	allen.mills@bluecranesolutions.com
x	x	x	Lillian Zellmer	Bluecrane, Inc.	available upon request	lillian.zellmer@bluecranesolutions.com

2.2. Stakeholder Participation

An effort was undertaken to solicit input from stakeholders during the planning process. Via e-mail, stakeholders were invited to meetings and phone calls made by members of the Planning Committee (see pages 21-22 for a list of all attendees). Comments and input from neighboring communities, local and regional agencies, businesses, academia, non-profits, and other private sector parties were allowed during the review of the draft Plan. Even though stakeholders attended some planning meetings, no feedback was received throughout the entire planning process.

The agenda for the interactive information sharing and input gathering sessions for the public, neighboring communities, local and regional agencies, academia, and Planning Committee members included:

- Introductions
- An overview of the MHMP purpose and process
- A broad overview of the Plan as it stood at that time
- A detailed interactive discussion of each hazard
- Solicitation of all comments
- An interactive discussion of the next steps

Please see pages 13-22 for a complete list of meetings, agendas, meeting summaries, and attendees.

Paper copies of the draft Plan were displayed at the Imperial County Public Library, County OES/Fire Department, City of El Centro Library, and the Imperial Irrigation District office and postings on the County's website: www.co.imperial.ca.us, the County OES website: www.co.imperial.ca.us/emergencyPlans/multihazard mitigation plan.htm, the City of El Centro's website: www.cityofelcentro.org and the Imperial Irrigation District's website: www.iid.com.

Public Notices for the draft MHMP review were posted on the Imperial County, City of El Centro, Imperial Irrigation District and the Imperial County Office of Education websites. The Public Notice was also displayed at the City Hall buildings of the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, City of Imperial and Westmorland.

Although there were no local agencies/stakeholder comments and no public interest or involvement in the planning process, the Planning Jurisdictions will continue to keep the public and stakeholders informed of the Plan updates and changes through regularly held public meetings such as the open Board of Supervisor's meeting, IID Board of Director's meetings, City Council meetings, quarterly Disaster Council meetings, Water Forum meetings, and School Board meetings as necessary, in addition to posting information on their websites.

2.3. Integration of MHMP and Incorporation to Existing Plans

Integrating the MHMP into existing and the future development of local plans and policies ensures that they are consistent and complements the MHMP.

Imperial County and the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland have integrated the hazard information, risk assessments, and mitigation strategies of the MHMP, including data, analysis, and maps, into their General Plans, Flood Management Plans, Emergency Plans, Integrated Regional Water Management Plan, Land Use Elements, Seismic, Health and Public Safety Elements, Hazardous Material Area Plan, Pest Exclusion Plan, and Capital Improvement Plans where needed. These Plans and Elements identifies hazards, goals, and policies that will minimize the risks associated with natural and human-made hazards and specifies land use and capital improvement planning procedures that should be implemented to avoid hazardous situations.

The IID has integrated the MHMP in their Drainage Master Plan, Capital Facility Plan, Integrated Water Management Plan and Conservation Plan. In addition, the Office of Education has considered all hazards from the MHMP for the development of their Emergency Action Plan, Department Emergency Guide, and Employee Health and Safety Manual.

The MHMP will be used to inform policy and decision makers, emergency and evacuation operators, capital improvement commissions, and others to guide growth and redevelopment away from identified high-risk locations. The Plan information will also be used to design and site future public facilities to minimize exposure to hazards.

Imperial County and the Participating Jurisdictions currently utilize their General Plan which consists of Elements, i.e., Seismic and Public Safety, Land Use, Housing, Circulation and Scenic Highways, Noise, Agricultural, Conservation, Open Space, Geothermal Alternative Energy and Transmission, Water, and Parks and Recreation. Also included in their General Plan is a Land Use Map designating various land use categories which identifies locations and describes the type and anticipated maximum allowable density of ultimate development. The Land Use Element describes existing land uses within the County and the Participating Jurisdictions, and the facilities and services which provide the public infrastructure to support these uses. The primary purpose of the Land Use Element is to identify the goals, policies, and standards of the General Plan that will guide the physical growth of Imperial County and the Participating Jurisdictions, including the public facilities necessary to support such growth.

The Seismic and Public Safety Element identifies goals and policies that will minimize the risks associated with natural and human-made hazards and specifies land use planning procedures that should be implemented to avoid hazardous situations. 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. For example, the risk associated with dangerous flooding can be avoided by not allowing development in floodplains and imposing strict safety standards on water transmission facilities.

Imperial County and the Participating Jurisdictions currently use comprehensive land use planning, capital improvements planning, and building codes to guide and control development. The hazard mitigation strategies and relevant information from the Imperial County and Participating Jurisdictions' General Plans, Flood Management Plan, and Seismic and Public Safety Elements have been integrated into this MHMP.

In addition, this MHMP will be provided to those responsible for the General Plan and Land Use development and update mechanisms for the County and the seven participating cities of Brawley, Calexico, Calipatria, El Centro, Holtville, City of Imperial, and Westmorland, to insure that consistency is maintained; see Section 4: Land Use, and Seismic and Public Safety Elements listed after each of the nine hazards discussed in Section 5.

Imperial County has developed a Flood Management Plan (FMP) that identifies the County's known flood problem areas; establishes goals, objectives, policies, and implementation programs to reduce flooding and flood related hazards; and ensures the natural and beneficial functions of the floodplains are protected. This FMP provides guidance to agencies and the public responsible for and interested in protecting life, property, and agriculture; involved in land use planning; responsible for administering the FEMA National Flood Insurance Program (NFIP) if necessary, and responsible for responding to flood emergencies within Imperial County. Imperial County invited the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial and Westmorland; the Imperial County Office of Education; the Imperial Irrigation District; and the Salton Community Services District to participate and provide input into the Plan, which they all did.

Section 3. Participating Jurisdictions

3.1. Imperial County

According to a profile of Imperial County published by the Southern California Association of Governments (SCAG) in May 2019, Imperial County is home to 190,624 residents. Imperial County residents live and work within its cities and unincorporated areas. Imperial County consists of seven cities: Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial and Westmorland.

The city population had a growth rate of 33.9% between 2000-2018. Imperial County also has eight unincorporated communities: Bombay Beach, Heber, Niland, Ocotillo, Palo Verde, Salton City, Seeley, and Winterhaven. Between 2000 and 2018, the population of the unincorporated area of Imperial County increased by 7,424 residents, raising the number to 40,007 (22.8% growth rate). Imperial County is the ninth largest California County encompassing 4,284 square miles.

Imperial County has much to offer. We have a rich agricultural heritage, which includes the production of half of our nation's winter vegetables, an extensive amount of renewable resources, including geothermal, wind, and solar, a wide-range of cultural and outdoor recreational activities with hundreds of points of interest such as the Imperial Sand Dunes Recreation Area, a magnet for off-road enthusiasts, and the Sonny Bono Salton Sea National Wildlife Refuge, a renowned birding site, and a lively population with frequent family-oriented community events. The small community of Calipatria has the lowest elevation in the United States at 180 feet below sea level.

Originally part of San Diego County, Imperial County was founded August 7, 1907. The area was visited as early as 1540 by Hernando de Alarcon, discoverer of the Colorado River. It was further explored by Spanish explorers and Catholic friars. Settlements existed along the Butterfield Stage Route as early as 1858, but no real development took place until water was brought into the area in 1901.

Located in the southeast corner of California, Imperial County is bordered on the north by Riverside County, on the west by San Diego County, on the south by Mexico, and on the east by the Colorado River, which forms the boundary between California and Arizona. Imperial County is rich in natural beauty, with a local history and economy based on agriculture and cross-border family and trade relationships with neighboring Mexico. The County has three international ports of entry. There are two ports of entry located in Calexico, and the third port is at Andrade in eastern Imperial County. In 2019, over 21 million people and over 782,000 cargo trucks travelled through these three ports.

In 2019, there were an estimated 21 million overall annual crossings into the U.S. from Mexico through the U.S. Customs and Border Protection Agency's two busiest land ports of entry between Imperial County and Mexicali, Mexico at Calexico West/Mexicali I, and Calexico East/Mexicali II (by cars and as pedestrians) Ports of Entry (POEs). The Downtown Calexico POE provides pedestrian and passenger vehicle inspection facilities, expanding the port onto the site of the former commercial inspection facility.

SOURCE: Department of Transportation, Bureau of Transportation Statistics, Border Crossing Annual Data
https://www.bts.gov/content/border-crossingentry-data

The County's strategic location adjacent to the City of Mexicali, the capital of Baja California Norte, will continue to be a strategic advantage. In addition to its importance as a state capital, Mexicali is also an education center with multiple universities and postsecondary educational opportunities. The City is also known for the wide range of medical services enjoyed by both Mexican and United States citizens. Lastly, the city hosts hundreds of factories or maquiladoras across a multitude of industries, including aerospace.

In its one-hundred year history, Imperial County has emerged as one of the world's leading agriculture production and export regions. The Pioneers from the Midwest settled in the Imperial Valley hoping to create a new life in the desert. Transporting Colorado River water through the All-American Canal provided one of the necessary ingredients for successful farming. The water, along with 360 days of annual sunshine and mild winter climate, transformed the desert into a rich producer of food and feeds for the world. Today, there is economic growth through foreign investment, Fortune 500 companies, and the development of renewable energy projects.

Seventy-five percent of the county area is desert sand and rugged mountains with an average annual rainfall of less than three inches. The main farming area is 830 square miles that extends from the Mexico border north to the Salton Sea. An extensive irrigation system has been developed, and water is supplied from the Colorado River through the All-American Canal.

The County contains seven incorporated cities: the County Seat of El Centro, Brawley, Calexico, Calipatria, Holtville, Imperial, and Westmorland, plus several small unincorporated rural communities.

SOURCES:
Southern California Association of Governments (SCAG) http://scag.ca.gov/Documents/UnIncAreaImperialCounty.pdf
Imperial County https://imperialcounty.org/

3.1.1. Population

Table 6. Populations of Participating Jurisdictions

Jurisdiction	07/01/2018 *	07/01/2019 *
Imperial County		181,215
City of Brawley	26,226	N/A
City of Calexico	40,139	N/A
City of Calipatria	7,412	N/A
City of El Centro	44,120	N/A
City of Holtville	6,678	N/A
City of Imperial	17,695	N/A
City of Westmorland	** 2,444	N/A

SOURCES:
*U.S. Census Bureau https://www.census.gov/quickfacts/fact/table/imperialcountycalifornia/PST045218#PST045218
**City of Westmorland Website http://www.cityofwestmorland.net/

3.1.2. Employment

Employment in Imperial County has been impacted by the COVID-19 pandemic. Numerous businesses have been adversely affected with an estimated unemployment rate of 20.5% for the county in March 2020. The following information was obtained from the California Employment Development Department (EDD) in May 2020.

Table 7. EDD Statistics on Unemployment and Wages in Imperial County

EMPLOYMENT AND WAGES
Unemployment Rate and Labor Force (Not Seasonally Adjusted) [Top]

Area	Year	Time Period	Labor Force	No. of Employed	No. of Unemployed	Unemployment Rate
Imperial County	2020	Mar	73,200	58,200	15,000	20.5

SOURCE: State of California, Employment Development Department, Labor Market Information Division, Imperial County
https://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSResults.asp?selectedarea=Imperial+County&selectedindex=13&menuChoice=localAreaPro&state=true&geogArea=0604000025&countyName=

Below is a memo dated April 17, 2020 from Angel Cordero of State of California EDD, Labor Market Information Division, regarding the Unemployment Rate in March 2020:

IMMEDIATE RELEASE
EL CENTRO METROPOLITAN STATISTICAL AREA (MSA) Imperial County.

The unemployment rate in Imperial County was 20.5 percent in March 2020, up from a revised 17.0 percent in February 2020, and above the year-ago estimate of 16.4 percent. This compares with an unadjusted unemployment rate of 5.6 percent for California and 4.5 percent for the nation during the same period.

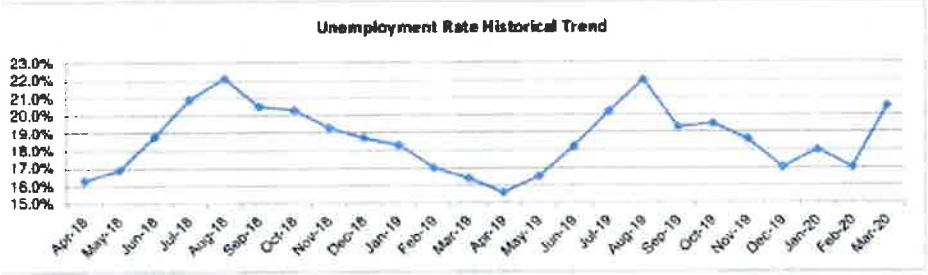
State of California
EMPLOYMENT DEVELOPMENT DEPARTMENT
Labor Market Information Division
1949 Avenida Del Oro, Ste. 106
Oceanside, CA 92056

April 17, 2020

Angel Cordero
760-414-3564

IMMEDIATE RELEASE
EL CENTRO METROPOLITAN STATISTICAL AREA (MSA)
(Imperial County)

The unemployment rate in Imperial County was 20.5 percent in March 2020, up from a revised 17.0 percent in February 2020, and above the year-ago estimate of 16.4 percent. This compares with an unadjusted unemployment rate of 5.6 percent for California and 4.5 percent for the nation during the same period.



Industry	Feb-2020 Revised	Mar-2020 Prelim	Change		Mar-2019	Mar-2020 Prelim	Change
Total, All Industries	66,400	64,600	(1,800)		65,500	64,600	(900)
Total Farm	12,300	10,600	(1,700)		12,200	10,600	(1,600)
Total Nonfarm	54,100	54,000	(100)		53,300	54,000	700
Mining, Logging, and Construction	1,900	1,900	0		1,900	1,900	0
Manufacturing	1,700	1,700	0		1,600	1,700	100
Trade, Transportation & Utilities	12,100	12,000	(100)		12,200	12,000	(200)
Information	300	300	0		300	300	0
Financial Activities	1,200	1,200	0		1,200	1,200	0
Professional & Business Services	2,700	2,600	(100)		2,500	2,600	100
Educational & Health Services	9,300	9,200	(100)		8,800	9,200	400
Leisure & Hospitality	4,400	4,400	0		4,400	4,400	0
Other Services	900	900	0		900	900	0
Government	19,600	19,800	200		19,500	19,800	300

Notes: Data not adjusted for seasonality. Data may not add due to rounding
Labor force data are revised month to month
Additional data are available on line at www.labormarketinfo.edd.ca.gov

April 17, 2020
Employment Development Department
Labor Market Information Division
(916) 262-2162

El Centro MSA
(Imperial County)
Industry Employment & Labor Force
March 2019 Benchmark

Data Not Seasonally Adjusted

	Mar 19	Jan 20	Feb 20 Revised	Mar 20 Prelim	Percent Change Month	Percent Change Year
Civilian Labor Force (1)	71,000	72,400	71,700	73,200	2.1%	3.1%
Civilian Employment	59,300	59,400	59,400	58,200	-2.0%	-1.9%
Civilian Unemployment	11,700	13,000	12,200	15,000	23.0%	28.2%
Civilian Unemployment Rate	16.4%	18.0%	17.0%	20.5%		
(CA Unemployment Rate)	4.5%	4.3%	4.3%	5.6%		
(U.S. Unemployment Rate)	3.9%	4.0%	3.8%	4.5%		
Total, All Industries (2)	65,500	66,100	66,400	64,600	-2.7%	-1.4%
Total Farm	12,200	12,500	12,300	10,600	-13.8%	-13.1%
Total Nonfarm	53,300	53,600	54,100	54,000	-0.2%	1.3%
Total Private	33,800	34,200	34,500	34,200	-0.9%	1.2%
Goods Producing	3,500	3,400	3,600	3,600	0.0%	2.9%
Mining, Logging, and Construction	1,900	1,800	1,900	1,900	0.0%	0.0%
Manufacturing	1,600	1,600	1,700	1,700	0.0%	6.3%
Durable Goods	500	500	500	500	0.0%	0.0%
Nondurable Goods	1,100	1,100	1,200	1,200	0.0%	9.1%
Service Providing	49,800	50,200	50,500	50,400	-0.2%	1.2%
Private Service Providing	30,300	30,800	30,900	30,600	-1.0%	1.0%
Trade, Transportation & Utilities	12,200	12,300	12,100	12,000	-0.8%	-1.6%
Wholesale Trade	1,800	1,800	1,800	1,800	0.0%	0.0%
Retail Trade	7,800	8,000	7,800	7,800	0.0%	0.0%
Transportation, Warehousing & Utilities	2,600	2,500	2,500	2,400	-4.0%	-7.7%
Information	300	300	300	300	0.0%	0.0%
Financial Activities	1,200	1,200	1,200	1,200	0.0%	0.0%
Professional & Business Services	2,500	2,600	2,700	2,600	-3.7%	4.0%
Educational & Health Services	8,800	9,100	9,300	9,200	-1.1%	4.5%
Leisure & Hospitality	4,400	4,400	4,400	4,400	0.0%	0.0%
Other Services	900	900	900	900	0.0%	0.0%
Government	19,500	19,400	19,600	19,800	1.0%	1.5%
Federal Government	2,100	2,200	2,200	2,200	0.0%	4.8%
State & Local Government	17,400	17,200	17,400	17,600	1.1%	1.1%
State Government	2,800	2,800	2,800	2,800	0.0%	0.0%
Local Government	14,600	14,400	14,600	14,800	1.4%	1.4%
Local Government Excluding Education	7,600	7,500	7,500	7,600	1.3%	0.0%
Special Districts plus Indian Tribes	3,100	3,100	3,100	3,200	3.2%	3.2%

Notes:

(1) Civilian labor force data are by place of residence; include self-employed individuals, unpaid family workers, household domestic workers, & workers on strike. Data may not add due to rounding. The unemployment rate is calculated using unrounded data.

(2) Industry employment is by place of work; excludes self-employed individuals, unpaid family workers, household domestic workers, & workers on strike. Data may not add due to rounding.

These data are produced by the Labor Market Information Division of the California Employment Development Department (EDD). Questions should be directed to: Emerson Figueroa 909-948-6657 or Frances Gines 951-955-3204

These data, as well as other labor market data, are available via the Internet at http://www.labormarketinfo.edd.ca.gov. If you need assistance, please call (916) 262-2162.

SOURCE: Employment Development Department, Labor Market Information Division, Unemployment Rate and Labor Force Press Release for Imperial County https://www.labormarketinfo.edd.ca.gov/file/lfmonth/cccn$pds.pdf

3.1.3. Historical Data for Unemployment in Imperial County

As the data below from 2018 – 2020 shows, the unemployment rate in Imperial County has varied from a low of just over 15% in April 2019 to a high of 20.9% in July 2018. Thus, while the impact of COVID-19 has been significant for Imperial County, in relative terms, the impact has not been as severe as in other parts of the state and nation. However, the recent unemployment has occurred in new sectors (such as retail) and it remains to be seen if those sectors will recover and, if so, how quickly.

Table 8. Historical Unemployment Data for Imperial County

California LaborMarketInfo **5/8/2020**

Historical Data for unemployment rate in Imperial County

Year	Adjusted	Prelim	Period	Labor Force	No.of Employed	No.of Unemployed	Unemployment Rate %
2020	Not Adj	Not Prelim	Jan	72,400	59,400	13,000	18
2020	Not Adj	Not Prelim	Feb	71,700	59,400	12,200	17
2020	Not Adj	Prelim	Mar	73,200	58,200	15,000	20.5
2019	Not Adj	Prelim	Annual	71,300	58,300	13,000	18.2
2019	Not Adj	Prelim	Jan	72,000	58,900	13,200	18.3
2019	Not Adj	Prelim	Feb	71,200	59,100	12,100	17
2019	Not Adj	Prelim	Mar	71,000	59,300	11,700	16.4
2019	Not Adj	Prelim	Apr	68,900	58,200	10,700	15.6
2019	Not Adj	Prelim	May	70,500	58,800	11,600	16.5
2019	Not Adj	Prelim	Jun	71,800	58,800	13,100	18.2
2019	Not Adj	Prelim	Jul	70,200	56,100	14,200	20.2
2019	Not Adj	Prelim	Aug	72,300	56,400	15,900	22
2019	Not Adj	Prelim	Sep	71,300	57,500	13,800	19.3
2019	Not Adj	Prelim	Oct	72,600	58,400	14,200	19.5
2019	Not Adj	Prelim	Nov	72,400	58,900	13,500	18.6
2019	Not Adj	Not Prelim	Dec	71,900	59,600	12,200	17
2018	Not Adj	Not Prelim	Annual	71,200	57,800	13,400	18.9
2018	Not Adj	Not Prelim	Jan	71,300	58,700	12,600	17.6
2018	Not Adj	Not Prelim	Feb	71,100	58,800	12,300	17.3
2018	Not Adj	Not Prelim	Mar	70,700	58,500	12,200	17.3
2018	Not Adj	Not Prelim	Apr	69,000	57,800	11,300	16.3
2018	Not Adj	Not Prelim	May	70,500	58,600	11,900	16.9
2018	Not Adj	Not Prelim	Jun	72,300	58,700	13,600	18.8
2018	Not Adj	Not Prelim	Jul	70,400	55,700	14,700	20.9
2018	Not Adj	Not Prelim	Aug	72,200	56,200	16,000	22.1
2018	Not Adj	Not Prelim	Sep	71,200	56,600	14,600	20.5
2018	Not Adj	Not Prelim	Oct	72,100	57,400	14,700	20.3
2018	Not Adj	Not Prelim	Nov	72,400	58,500	14,000	19.3

SOURCE: CA Employment Development Department, Labor Market Information Division
https://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSMoreResult.asp?menuChoice=localAreaPro&criteria=unemployment+rate&categoryType=employment&geogArea=0604000025&area=Imperial+County&timeseries=unemployment+rateTimeSeries

3.1.4. EDD Projections (2016-2026)

Prior to the COVID-19 pandemic, EDD projected the number of jobs in Imperial County to grow at a rate of 9.6% over a 10- year period (2016-2026). According to the EDD Labor Market Information Division, the total number of projected growth of jobs was 9,000 pre-COVID-19.

Actual pre-COVID-19 industry projections are listed below.

- Government: 5,900 jobs, a 10% increase;
- Trade, Transportation, and Utilities: 1,800 jobs, a 14.6% increase
- Education, Healthcare and Social Assistance: 2,700 jobs, a 29.3% increase
- Retail trade: 800 jobs, a 10% increase
- Mining, Logging, and Construction: 200 jobs, an 11.1% increase
- Manufacturing: 100 jobs, a 7.1% increase;
- Professional & Business Services: 400 jobs, a 16.7% increase
- Transportation, Warehousing and Utilities: 600 jobs, an 25% increase
- Financial Activities: no jobs, no increase
- Leisure and Hospitality: 800 jobs, a 18.2% increase
- Non-Durable Goods Manufacturing: 100 jobs, and 11.1% increase
- Wholesale Trade: 400 jobs, a 21.1% increase
- Self-Employment: 500 jobs, an 11.9% increase

According to EDD, the pre-COVID-19 occupational projections indicated there would be approximately 9,000 new jobs from industry growth and net replacements for the forecast period 2016 to 2026.

SOURCE: Employment Development Department, Labor Market Information Division
https://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSMoreResult.asp?viewAll=yes&viewAllUS=&currentPage=&currentPageUS=&sortUp=&sortDown=&criteria=fast+growing+occupations&categoryType=employment&geogArea=0604000025&timeseries=&more=More&menuChoice=localAreaPro&printerFriendly=&BackHistory=-1&goTOPageText=

https://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSMoreResult.asp?viewAll=yes&viewAllUS=&currentPage=&currentPageUS=&sortUp=CC.SERIESTTLL&sortDown=&criteria=current+employment+statistics+%28ces%29&categoryType=employment&geogArea=0604000025&timeseries=&more=More&menuChoice=localAreaPro&printerFriendly=&BackHistory=-2&goTOPageText=

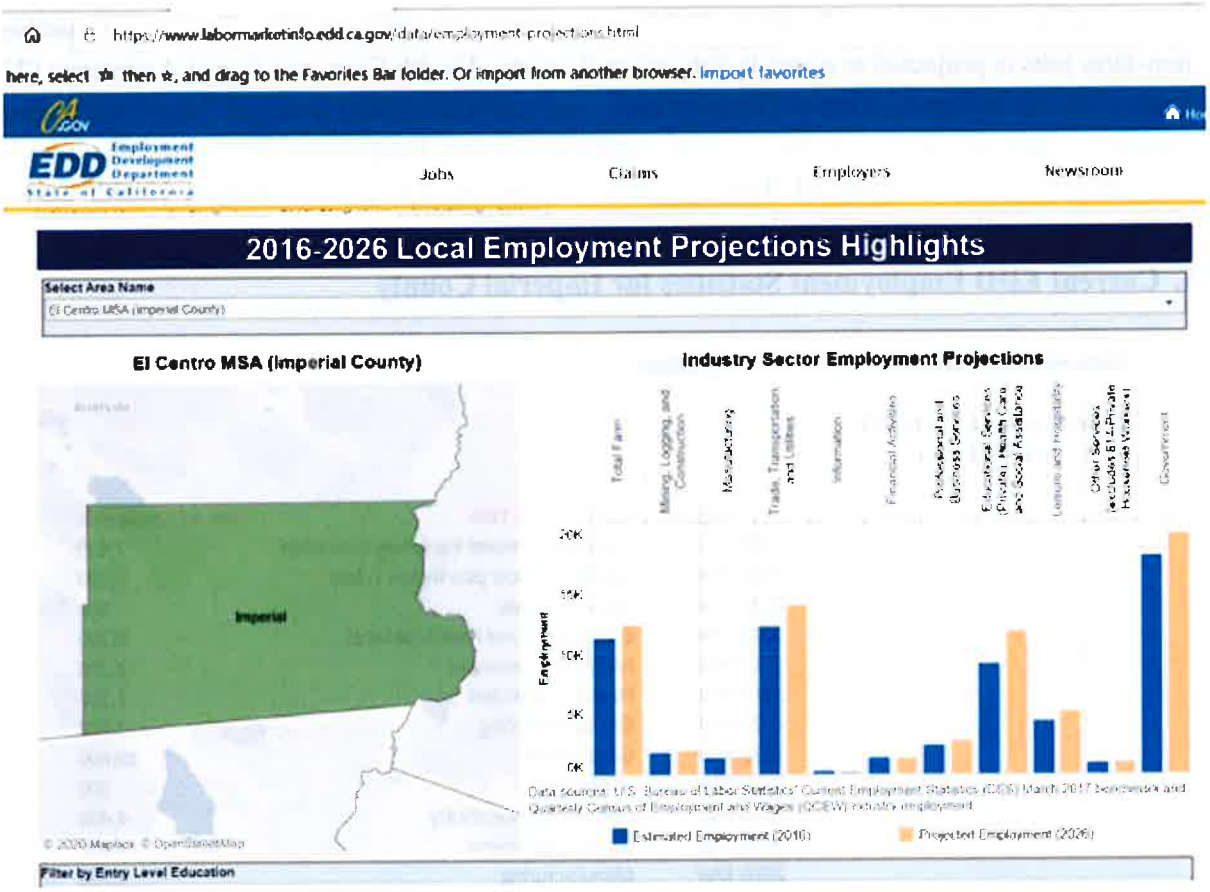


Figure 2. Local Employment Projections for Imperial County

SOURCE: Employment Development Department, Labor Market Information Division, 2016-2026 Industry Employment Projections https://www.labormarketinfo.edd.ca.gov/data/employment-projections.html

3.1.5. Employment by Industry (Not Seasonally Adjusted)

Table 9. Imperial County Employment by Industry

Year	Time Period	Industry Title	No. of Employed
2020	Mar	Total Wage and Salary	64,600
2020	Mar	Total Non-Farm	54,000
2020	Mar	Service Providing	50,400
2020	Mar	Total Private	34,200
2020	Mar	Private Service Providing	30,600

SOURCE: State of California, Employment Development Department, Labor Market Information Division https://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSResults.asp?selectedarea=Imperial+County&selectedindex=13&menuChoice=localAreaPro&state=true&geogArea=0604000025&countyName=

The 2016-2026 Imperial County Projections states that the Farm industry, which makes up 9.6% of the

total employment, will climb to 12,500 by 2026, an increase of 1,100 new jobs. The largest number of new non-farm jobs is projected to occur in Education Services, Health Care, and Social Assistance (2,700 new jobs, a 29.3% increase), Trade, Transportation, and Utilities (1,800 new jobs, a 14.6% increase), Government (1,800 new jobs, a 9.9% increase), and Leisure and Hospitality (800 new jobs, an 18.2% increase). Information and Financial Activities will remain flat. Education Services, Health Care and Social Assistance, will continue to be driven by the aging and growing population.

3.1.6. Current EDD Employment Statistics for Imperial County

California LaborMarketInfo **5/8/2020**

current employment statistics (ces) in Imperial County

Year	Period	CES Industry Title	No. of Employed
	2020 Mar	Local Government Excluding Education	7,600
	2020 Mar	Special Districts plus Indian Tribes	3,200
	2020 Mar	Durable Goods	500
	2020 Mar	Educational and Health Services	9,200
	2020 Mar	Federal Government	2,200
	2020 Mar	Financial Activities	1,200
	2020 Mar	Goods Producing	3,600
	2020 Mar	Government	19,800
	2020 Mar	Information	300
	2020 Mar	Leisure and Hospitality	4,400
	2020 Mar	Local Government	14,800
	2020 Mar	Manufacturing	1,700
	2020 Mar	Natural Resources, Mining and Constructi	1,900
	2020 Mar	Nondurable Goods	1,200
	2020 Mar	Other Services	900
	2020 Mar	Private Service Providing	30,600
	2020 Mar	Professional and Business Services	2,600
	2020 Mar	Retail Trade	7,800
	2020 Mar	Service Providing	50,400
	2020 Mar	State and Local Government	17,600
	2020 Mar	State Government	2,800
	2020 Mar	Total Farm	10,600
	2020 Mar	Total Nonfarm	54,000
	2020 Mar	Total Private	34,200
	2020 Mar	Total Wage and Salary	64,600
	2020 Mar	Trade, Transportation and Utilities	12,000
	2020 Mar	Transportation, Warehousing and Utilitie	2,400
	2020 Mar	Wholesale Trade	1,800

Figure 3. EDD Employment Statistics for Imperial County

SOURCE: State of California, Employment Development Department, Labor Market Information Division
https://www.labormarketinfo.edd.ca.gov/

3.1.7. Economy

Due to the County's good soils, a year-round growing season, gently sloping topography and complex system of irrigation canals, it has become one of the most productive agricultural regions in the world. In 2017, the Agriculture sector was the largest job sector, accounting for 34.1% of total jobs. Other large sectors included Education (17.3%), Retail (11.5%), and Leisure (6.9%). The economy of the region continues to be based on the following industries: Agriculture, Energy Production (Solar, Wind, Geothermal), Prison/Detention Facilities (Federal and State), Border Security (Department of Homeland Security), Logistics (Goods movement of agriculture products), local small business, and local/regional Government and related services (Police, Fire, Education).

SOURCE: Southern California Association of Governments (SCAG) 9th Annual Southern California Economic Summit Report for Imperial County, 2019_economy.scag.ca.gov/Economy%20site%20document%20library/2018_EconomicReportIMP.pdf

Other significant contributors to the local economy include winter visitors or "snowbirds", the construction on the two state prisons in the County, the expansion of the Naval Air Facility, and trade at the U.S./Mexico border crossing under the NAFTA agreement (soon to be replaced with USMCA Agreement).

3.1.8. Fastest Growing Occupations 2016-2026

The fastest growing occupations are: Security Guards (49.1%) Cleaners of Vehicles and Equipment (42.9%), Personal Care Aides (38%), Electricians (29.4%). A chart is included below for other fast-growing occupations.

Table 10. Fastest Growing Occupations 2016-2026

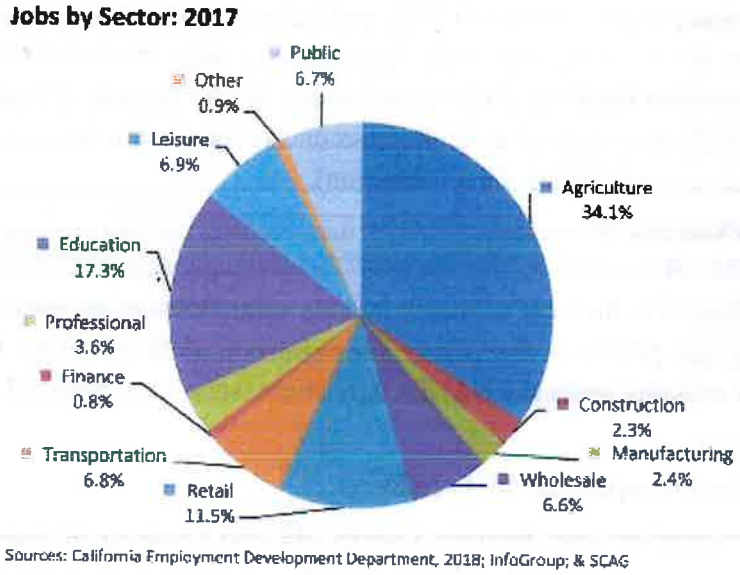
Occupational Title	Base Year Employment Estimate	Projected Year Employment Estimate	Percent Change
Security Guards	530	790	49.1%
Cleaners of Vehicles and Equipment	140	200	42.9%
Personal Care Aides	5,820	8,030	38.0%
Electricians	340	440	29.4%
Bus/Truck Mechanics & Diesel Engine	140	180	28.6%
Food Prep & Serving Workers	1,310	1,680	28.2%
Medical Assistants	430	550	27.9%
Dispatchers (except Police, Fire, Ambulance)	150	190	26.7%
Sales Representatives (Wholesale & Manufacturing)	380	480	26.3%
Medical Secretaries	300	370	23.3%

SOURCE: Employment Development Department, Labor Market Information
https://www.labormarketinfo.edd.ca.gov/data/employment-projections.html

3.1.9. SCAG Local Profile Report - Jobs by Sector 2017

On the following page, there are charts produced by The Southern California Association of Governments (SCAG) reported and published in their Local Profiles Report for Imperial County (dated May 2019). The lists present the total jobs in Imperial County between 2007-2017. "Total jobs" include wage and salary

jobs and jobs held by business owners and self-employed persons. It does not include unpaid volunteers or family workers, and private household workers. In 2017, total jobs in unincorporated Imperial Count numbered 18,387, an increase of 1.2% from 2007.



Job Sector	Percentage of Jobs
Agriculture	34.1%
Education	17.3%
Retail	11.5%
Leisure	6.9%
Transportation	6.8%
Wholesale	6.6%
Public	6.7%
Professional	3.6%
Manufacturing	2.4%
Construction	2.3%
Finance	0.9%
Other	0.8%

Figure 4. Jobs by Sector (SCAG)

SOURCE: Southern California Association of Governments (SCAG) www.scag.ca.gov/Pages/default.aspx

3.1.10. Transportation Systems

3.1.10.1. Highways

For shipping and logistics, the highway system in Imperial County handles approximately 97% of total commodity flows across the county. There are four major north- south corridors handling freight within the county, Forrester Road, from I-8 to SR-78/86 in Westmorland; State Route 7 (SR- 7) from the Calexico East Port of Entry to I-8

Freeway; SR- 111 from the Calexico West Border Crossing to SR-86 in Riverside County; and SR- 86, from SR-111 to Riverside County where it connects with Interstate 10. Additionally, there are two major east-west corridors that also handle truck freight: Interstate 8 freeway which originates in San Diego County to California/Arizona Border; and SR-98 which parallels Interstate 8 through most of the southern part of the county. This system is mostly complete and consists of the SR-7 expressway, the SR-111 expressway, the SR-78/111 Brawley Bypass Expressway, and the SR-86 Expressway north of Westmorland. This system facilitates the movement of goods from the international border with Mexico through Imperial County to Coachella Valley in Riverside County with connections west to Los Angeles/Long Beach Seaports and other key distribution centers throughout California.

3.1.11. Ports of Entry

The County is connected to Mexico through three land Ports of Entry (POEs) at Calexico West, Calexico East, and Andrade, California.

3.1.11.1. The Calexico West/Mexicali I Port of Entry (POE)

Located in the City of Calexico, this POE is the primary port for daily person crossings into the U.S. by car or as pedestrians. Calexico West/Mexicali I POE is a passenger-only port and the busiest port in Imperial County. This urban POE connects the downtown areas of the Cities of Calexico and Mexicali, with 8.8 million pedestrians and 8.2 personal vehicles carrying 14.3 million passengers crossing the border at this port in 2013. Pedestrian and vehicle wait times during peak periods can reach two hours. Mexicali is the capital of the state of Baja California Norte, while the Imperial Valley is smaller, much less populous agricultural area. Locations in the Imperial Valley dominate trip origins and destinations in the US, with Calexico as the top location, while origins and destinations in Mexicali represent almost all of the trip ends in Mexico. Individuals cross the border at this port primarily to go to work, visit family and friends, and shop. According to the U.S. Department of Transportation Statistics for Border Crossing, some 350,636 personal vehicles with 537,700 passengers passed through Calexico West. In February 2020, a total of 280,949 pedestrians walked through the POE.

3.1.11.2. The Calexico East POE

The Calexico East POE connects the cities of Calexico, CA and Mexicali, Baja California. It connects directly to CA State Route 7. In March 2020, the U.S. Department of Transportation reports border crossings as follows: Bus Passengers, 2,480; pedestrians 23,552; Personal vehicle passengers as 312,924 riding in 195,452 vehicles.

3.1.11.3. The Andrade POE

The Andrade POE is located near the California/Arizona border. The Andrade POE is an important gateway for tourism with U.S. visitors traveling into the small Mexican City of Algodones for shopping and medical services. In February 2020, the pedestrian count crossing the border was 115,655 people. In addition, 44,277 personal vehicles crossed the border with 82,972 total passengers inside the vehicles.

As with most U.S./Mexico border communities, the residents of Mexicali, Mexico are an important part of Imperial County's community and economy. Mexicali is the state capitol of Baja California with an estimated population of 1,118,113 people.

SOURCES:
Imperial County Transportation Commission Pedestrian and Bicycle Transportation Access Study for the California/Baja California Land Ports of Entry February 2015
http://www.imperialctc.org/media/managed/borderstudy/Bicycle%20and%20Pedestrian%20Border%20Study%20-%20FINAL%20Feb%202015.pdf
U.S. Department of Transportation, Border Crossing Data Query
https://data.transportation.gov/Research-and-Statistics/Border-Crossing-Entry-Data/keg4-3bc2/data

3.1.11.4. Regional Transit System.

Imperial Valley Transit (IVT) was created in 1989 and began operations as a 5-route system with 3 buses running Monday through Friday. The passenger ridership averaged approximately 3,000 passengers a month. Today, the service has 12 fixed routes and over 20 buses in operation. The passenger ridership averages approximately 55,000 passengers a month. The transit service is operated as a turnkey operation by First Transit, Inc. The service is administrated and funded by the Imperial County Transportation Commission (ICTC). The Commission members represent each City, the County and the Imperial Irrigation District.

Routes are categorized in the following manner:

- **Fixed routes** operate over a set pattern of travel and with a published schedule. The fixed route provides a low cost, reliable, accessible and comfortable way to travel.
- **Deviated Fixed Route:** In several service areas, IVT operates on a deviated fixed route basis so that persons with disabilities and limited mobility are able to travel on the bus. Passengers must call and request this service the day before service is desired in the communities of Seeley, Ocotillo and the East side of the Salton Sea.
- **Remote Zone Routes** operate once a week. These routes are "lifeline" in nature in that they provide connections from some of the more distant communities in the Imperial County area.

These routes form a roughly north-south axis along the SR-86 and SR-111 corridors from Niland to Calexico, continuing along the SR-111 corridor to Niland (Bombay Beach), and an east- west axis along I-8 and Imperial County S80/Evan Hewes Highway corridors from Seeley to El Centro and Holtville, extending to Ocotillo, and Winterhaven.

Public transit service in Imperial County includes the following:

- **Imperial Valley Transit (IVT)** is the urban circulator bus services that includes: the Blue Line in El Centro, the Green Line in El Centro, and the Gold Line in Brawley. Fixed routes operate over a set pattern of travel and with a published schedule. The fixed route provides a low cost, reliable, accessible, and comfortable way to travel.
- **IVT Access,** in response to the Americans with Disabilities Act (ADA), offers this service for individuals who have physical or cognitive disabilities that cannot use the regular, fixed-route bus

system. IVT Access provides low-cost paratransit service offering security and independence through an advanced reservation curb-to-curb transportation service. ITV Access has wheelchair lifts for mobility disadvantaged persons that have completed a certification and eligibility process.

- **IVT Ride** provides curb to curb transit services for seniors; persons age 55 and over, Persons with disabilities upon advance phone reservations. Service areas include Brawley, Calexico, El Centro, Imperial City, and West Shores (west side of the Salton Sea).
- **IVT MedTrans** (formerly known as Med-Express) provides non-emergency transportation service between Imperial Valley and San Diego County medical facilities, clinics and doctor offices.

SOURCES:
Imperial Valley Transit: http://www.ivtransit.com/about-us
Imperial Valley Transit, IVT Access: http://www.ivtaccess.org/
Imperial Valley Transit, IVT Ride: http://www.ivtride.com/
Imperial Valley Transt, MedTrans: www.ivtmedtrans.com/

3.1.11.5. Rail Infrastructure

Imperial County is also served by rail connections from Mexico, Riverside County, and Arizona. Commodity flows by rail account for about 3% of total commodity flows in the county. The Union Pacific Railroad (UPRR) owns and operates a line originating at the Calexico West border crossing, extending north to El Centro and ultimately connecting with other UPRR tracks at Niland, heading north to Riverside County and southeast to Arizona (Sunset Line). UPRR also owns and operates the section between Plaster City and El Centro.

SOURCE: Southern California Association of Governments (SCAG), TRB 2013 Annual Meeting
https://www.scag.ca.gov/DataAndTools/Documents/Resources/2013RP_08.pdf

3.1.11.6. Airport Infrastructure

The Imperial County Airport is a Code of Federal Regulations (CFR) Part 139 Commercial Airport as well as the largest general aviation airport in the county. It is centrally located within the jurisdictional boundaries of the City of Imperial, along Highway 86, owned and operated by the County of Imperial. There are four airports in Imperial County, of which three are open to the public:

- **The Imperial County (IPL) Airport** is a county-owned public-use airport in Imperial County, California, United States. Also known as Boley Field, it is mostly used for general aviation, but has scheduled passenger service from one commercial airline. The airport is located one nautical mile south of the central business district of Imperial, California, partially in the City of Imperial and partially in an unincorporated area of Imperial County. It serves nearby communities, including El Centro. Imperial County Airport covers an area of 370 acres and has two asphalt paved runways. The Imperial County Airport provides air service for private and commercial passenger and freight transportation. Currently, freight is transported through the courier services of Federal Express (FedEx) and United Parcel Service (UPS). At the Imperial County Airport, there are daily scheduled airline flights, air cargo, military operations, and Department of Homeland Security aircraft, as well as several business jets and private general aviation flights. A

hotel and several businesses are located on airport property, providing additional revenue through land leases to help fund the operation of the airport. Aviation services provided at the airport include hangar rentals, aircraft fueling, flight training, business aircraft charters, aerial fertilizer and pesticide applications, and aircraft maintenance.

- **Brawly Municipal (BWC) Airport** is one mile northeast of the city of Brawley. It covers 160 acres and has one asphalt runway.
- **The Cliff Hatfield Memorial (CLR) Airport** is a city-owned, public-use airport located one nautical mile northwest of the central business district of Calipatria. It is also approximately 5 statute miles southeast of the Salton Sea. Cliff Hatfield Memorial Airport covers an area of 200 acres and has one runway.

SOURCES:
Wikipedia: https://en.wikipedia.org/wiki/Imperial_County_Airport, https://en.wikipedia.org/wiki/Brawley_Municipal_Airport
Google: https://www.google.com/search?q=cliff+hatfield+memorial+airport&ie=&oe=

3.1.12. Tourism

The Imperial Valley offers plenty of activities and educational opportunities for locals and visitors! Each year, millions of people from San Diego, Los Angeles, and Riverside Counties and beyond visit the Imperial Sand Dunes. During the fall to spring months, visitors from colder northern climates migrate to Imperial County to enjoy the mild winter weather and participate in activities such as golfing, cycling, water-skiing, fishing, and shopping.

Expansion of tourism to winter visitors is an economic development strategy with tremendous economic potential. Baby-boomers are reaching retirement age and many will have disposal income and are considered the most active retirees in history seeking sunny winter areas with outdoor activities.

Imperial County is recognized as one of the "Best birding habitats in Southern California". In the past years, thousands of bird watchers have traveled from as far away as British Columbia to attend the International Bird Festival featuring Salton Sea, Imperial County and in the Mexicali/San Felipe region.

3.1.12.1. Major Recreation Areas

- **Algodones Dunes (aka, Imperial Sand Dunes).** The dunes are a well-known landmark to both local residents and the thousands of travelers who pass by them each year. The dunes extend along the east perimeter of the Imperial Valley. The 40-mile dune system is one of the largest in the United States. The dunes were formed from the windblown beach sands of prehistoric Blake Sea. Some dune crests reach heights of more than 300 feet. The largest and tallest dunes are located in the central area and west side, while the east side contains smaller dunes and numerous washes. The three most popular areas are Glamis/Gecko, Buttercup Valley, and Dunebuggy Flats. The dunes are also a popular filming location.
- **Anza Borrego Desert State Park.** With over 600,000 acres, Anza-Borrego Desert State Park is the largest desert state park in the contiguous United States. 500 miles of dirt roads, two huge wilderness areas (comprising 2/3 of the park) and 110 miles of riding and hiking trails provide

visitors with an unparalleled opportunity to experience the wonders of the Colorado Desert. The park features washes, wildflowers, palm groves, cacti, and sweeping vistas. Visitors may also have the chance to see roadrunners, golden eagles, kit foxes, mule deer, and bighorn sheep as well as desert iguanas, chuckwallas, and four species of rattlesnake.

- **Coyote Mountain Wilderness**. Described as a fish-hook shaped mountain range, the Coyote Mountains make up 40% of this wilderness. Part of the Carrizo Badlands lie within the northern portion of the wilderness, their narrow and twisting gullies giving the landscape its austere, forbidding appearance. A group of unusual sandstone rock formations, believed to be 6,000,000 years old, add to the character of this region.
- **Desert Oasis (Hot Spring Spa and Long Term Visitor Area).** This year-round hot springs attracts both local and winter visitors. Average water temperature is in the 100° F range.
- **Desert View Tower**. To honor the builders of the railroad and highway that made the journey so much easier, the tower was built in 1923 as a commemoration to the pioneers who crossed the desert and mountains. The tower is located at the edge of the mountains that overlook the southern area of Anza-Borrego Desert State Park and the desert of Imperial County.
- **Fish Creek Mountains Wilderness.** This wilderness area resembles a plateau rising as a great wall above the desert basin. Close up, one can see a land of jagged ridges and peaks that appear above twisting canyons and small valleys. The mountain slopes contain limestone outcrops that have resisted erosion. A gypsum mining operation in the western mountains provides raw material for the U.S. Gypsum plant at Plaster City.
- **Fossil Canyon.** The weathering of copper, iron, and sulfur within the rock has stained the multicolored canyon walls. The upper section of the gorge contains marine fossils.
- **Mesquite Mine Overlook Trail.** This one-mile trail leads to an overview of the second largest gold mine in California.
- **Mud Pots and Mud "Volcanoes" (Freaks of Nature).** The mud "volcanoes" are cones built up out of viscous mud that bubbles up through central vents. This area is near a formerly commercial carbon dioxide gas field. The age of these mud pots is not known, but survey reports in the late 1800's and early 1900's reported mud pots and steam vents in the area. These mud volcanoes can be found near the shore of the Salton Sea. The Wister mud pots are found on Hot Mineral Spa Road, just off Highway 111. The fluid level of these mud pots varies throughout the year. Several mud pots located next to each other will have different fluid levels and different colors in the mud. The temperature of the fluid is slightly higher than the ambient air temperature.
- **Salton Sea.** Covering 380 square miles, Salton Sea is the largest lake in California. It is 35 miles long and about 15 miles wide at its widest point and about 50 feet deep at its deepest point. Farther north the Salton Sea State Recreation Area encourages camping, fishing, bird watching, and relaxing. Salton Sea is a major stop for migratory birds on the Pacific Flyway. At least 375 different species of birds annually visit the wetlands along the shores of the Sea as well as the agricultural

fields, canals, and drains that feed it. The annual Salton Sea International Bird Festival attracts enthusiasts from all over the world. The Sea is considered one of the world's most productive fisheries, attracting recreationists year-round.

- **Sonny Bono Wildlife Refuge.** The Sonny Bono Salton Sea National Wildlife Refuge is a treasure of the Sea's ecological systems, especially birds. With over 375 bird species, this refuge provides world class bird watching. Hundreds of thousands of birds use this refuge to winter and as a migration stop. Endangered species such as the Bald Eagle, the Peregrine Falcon, and the California Brown Pelican can be seen here. Other species that frequent the reserve are the Fulvous Whistling Duck, the Wood Stork, the Mountain Plover, the Borrowing Owl, and the Long Billed Curlew. In February, the reserve is host to the Salton Sea International Bird Festival (see above) which draws thousands of visitors from around the world.

SOURCE: Imperial County Chamber of Commerce www.imperialchamber.org/community-resources/tourism/

3.1.13. Climate

The climate in Imperial County is hot and dry, ranging from lows in the mid-30s in January to highs of 110+ in July and August (mean temperatures: low of 55.0 degrees; high of 89.6 degrees), with little moisture (average annual rainfall: 2.92 inches; 25 percent average relative humidity).

3.1.14. Temperatures

The lowest daily minimum temperature ever recorded was 16 degrees on January 22, 1937. The highest daily maximum temperature ever recorded was 121 degrees on July 28, 1995. The lowest daily maximum temperature was 42 degrees, recorded on January 24, 1949, and the highest daily minimum temperature was 92 degrees on June 30, 1946. The highest monthly mean temperature was 95.9 degrees, recorded in August 1969, and the lowest mean temperature was 42.3 degrees in February 1939.

3.1.15. Rainfall

The 85-year average annual rainfall is 2.92 inches with June being the driest month. Since 1914, there has been measurable rainfall only three times during the month of June: 0.04 of an inch on June 2, 1948; 0.01 of an inch on June 18, 1988; and 0.01 of an inch on June 7, 1997. The highest rainfall in one day was recorded on September 6, 1939, when 4.08 inches was measured. The total for the month, 7.06 inches, made September 1939 the month with the highest rainfall on record. For the year of 1939, rainfall totaled 8.52 inches, the highest annual record. The lowest annual rainfall record was in 1956 with 0.16 of an inch.

3.1.16. Snow

The only recorded snowfall of consequence occurred on December 12, 1932. Snow began falling at 8:45 p.m. and by 5:00 a.m. the following day, 2½ inches had been recorded. In the southwest portion of Imperial Valley, four inches of snow was reported that day. This is the only snowfall of record to cover the entire Valley.

3.1.17. Historical Setting

As noted earlier, Imperial County, originally part of San Diego County, was founded on August 7, 1907. The area was visited as early as 1540 by Hernando de Alarcon, discoverer of the Colorado River. It was further explored by Spanish explorers and Catholic friars. White settlements existed along the Butterfield State Route as early as 1858, but no real development took place until water was brought into the area in 1901.

Imperial County is the youngest of California's 58 counties. In 1907 San Diego County extended from the Pacific Ocean, on the west, to the Colorado River, Arizona border on the east, with Mexico being its southern border. By a vote of the people, the County was divided in half, and the eastern portion became Imperial County.

3.1.18. Governing Bodies

The Imperial County Seat is El Centro. The governing body of the County is the Board of Supervisors, comprised of five members elected by the voters for four-year terms in each of the five County districts. Normally, the Board meets every Tuesday, plus other special meeting times, to conduct the affairs and business of the County. Certain departments are administered by elected department heads, while others are administered by persons selected and appointed by the Board.

3.2. City of Brawley

The City of Brawley was incorporated in 1908 and is a General Law municipality. The City is centrally located in the agriculturally rich Imperial Valley, 119 feet below sea level and covers an area of about 5.8 square miles. Brawley is located approximately 25 miles north of the International Border and 100 miles east of San Diego. State highways 111, 86, and 78 all intersect in Brawley.

The City has a population of 26,226 (2018) and utilizes services from the Imperial County School District and the Imperial Irrigation District. Brawley is a family-oriented community with good schools and 14 parks. Brawley's features include a lighted class B baseball park, 13 public parks, an acoustically correct auditorium, a sizeable industrial park, a municipal airport, a world class rodeo arena, and an Olympic-size swimming pool. Brawley also has an 18-hole golf course which features a large club house and tennis courts. Three lakes are located within fifteen minutes of town, and the sand dunes are twenty minutes away. The winter climate in Brawley is one of the best in the country. Average daily temperatures are in the 70's all winter long. Average annual rainfall is around two inches per year.

SOURCE: U.S. Census Bureau https://www.census.gov/quickfacts/brawleycitycalifornia

3.3. City of Calexico

The City of Calexico was incorporated in 1908. The City is located 230 miles southeast of Los Angeles and 125 miles east of San Diego. The City is situated directly along the U.S./Mexico International border, adjacent to the city of Mexicali, Baja California, Mexico. Calexico's port of entry is a major entrance point for thousands of persons as well as large amounts of goods traveling between the two countries. Its economy reflects its proximity to the Mexican border, and its location in an agriculturally-oriented California county.

The City has a population of approximately 40,139 (2018) and utilizes services from the Imperial County School District and the Imperial Irrigation District. Given its geographic location immediately adjacent to the international border crossing, the City largely functions as a suburb of the metropolitan complex of Mexicali, Baja California, Mexico. Calexico also functions as one of the Imperial Valley's communities, surrounded by and supported by agriculture. Traditionally, Calexico has had a relatively strong retail sector, which is oriented to providing finished goods and services for the Mexicali market. Businesses in Calexico rely heavily on sales to Mexicali residents and merchants have greatly benefited from this relationship.

Calexico is a blend of American and Mexican cultures and small-town lifestyle, combined with convenient proximity to the metropolitan areas of Mexicali and San Diego. Calexico's climate is sunny year-round and offers a variety of outdoor recreation. Golfing, water sports, hunting, fishing, and hiking are all available in the immediate area, and the beautiful beaches of San Diego and Baja California are easily accessible for day trips or vacations. Just across the border, Mexicali is a cultural and entertainment center offering ample opportunity for fine dining, theatre, music, and more.

SOURCE: U.S. Census Bureau https://www.census.gov/quickfacts/fact/table/calexicocitycalifornia/PST045219

3.4. City of Calipatria

The City of Calipatria was incorporated on February 28, 1918 as a General Law municipality. Since its incorporation, the City of Calipatria has developed as a semi-rural community with farming as its major industry. The City of Calipatria has been a gateway for the North American Free Trade Agreement (NAFTA). Recently, the NAFTA agreement was renegotiated and replaced by the United States-Mexico-Canada Agreement (USMCA). When implemented (July 2020), the USMCA will create more balanced, reciprocal trade that supports high-paying jobs for Americans and grows the North American economy. Until the USMCA agreement goes into effect, the impact on Calipatria is unknown.

Calipatria is ideally situated within an ever-growing corridor of commerce between Los Angeles and Mexico. Calipatria has excellent transportation opportunities and a projected growth that make it a premier place to do business.

Calipatria is located 50 miles north of the Mexico Border in the northern part of Imperial County. The City has a general population of approximately 7,412 (2018) including an inmate count in Calipatria State Prison of 3,021 inmates (February 2020). Located about three miles outside of the City, the state prison is annexed into the City limits. The City utilizes services from the Imperial County School District and the Imperial Irrigation District. Calipatria has a small town flavor and enjoys a multi-cultural ambience. The City's elevation is 185 feet below sea level.

The area is predominately agricultural but is surrounded by various recreational locations as well. The Glamis Dunes are located about 40 miles from the City and are home to many off- road enthusiasts. Rock collecting, deer hunting, and dove hunting are also about 30 miles from the City in the Chocolate Mountain area. Fishing, camping, and bird watching are big interests along the Salton Sea area. The Salton Sea is also home to the Sonny Bono Wildlife Refuge where bird watching enthusiasts can enjoy the various species of birds frequenting the area. Boat tours are available at the Salton Sea to view the various habitats of the migratory birds. Seven geothermal plants and three new mineral recovery plants are located along a seven-mile radius near the Salton Sea. The Colorado River is about a one-hour drive from the City.

SOURCES:

International Trade Administration, USMCA https://legacy.trade.gov/usmca/

California Department of Corrections and Rehabilitation Article (dated Feb 15, 2020) https://www.cdcr.ca.gov/news/2020/02/15/calipatria-state-prison-officials-investigating-inmate-death-as-a-homicide/

3.5. City of El Centro

The City of El Centro is the County Seat and principal trading center of Imperial County. Covering approximately 25 square miles of land, El Centro is the largest City in Imperial County, with a population of 44,120 (July 2018). The City utilizes services from the Imperial County School District and the Imperial Irrigation District. The City of El Centro is located near the Mexican border near Interstate 8 between Calexico and Brawley. El Centro shares its northern border with the City of Imperial, while the City of Mexicali is located 10 miles to the south just beyond the border, and the City of Yuma, Arizona, is 60 miles to the east. El Centro is accessible via Interstate 8, State Highway 86, and State Highway 111.

In 1906, W. F. Holt and C.A. Barker purchased the land on which El Centro was eventually built. The City was incorporated on April 6, 1908. By the mid-1940s, El Centro had become the second largest City in the Imperial Valley, with a population of about 11,000. At this point in the City's history, its economy revolved around agriculture with fruit and vegetable packing and shipping yards, ice plants, box factories, concrete pipe and brick yards, and a flax fiber plant as the major employment centers.

El Centro also became the principal wholesale center of the area. In the 1970s, agriculture was still an important part of the City's economic life. Imperial County had become one of the most agriculturally productive areas in the country, and many growers and shippers still operated in El Centro. However, by the early 1980s, the two largest employment sectors in the El Centro labor market were government and wholesale/retail trade, reflecting El Centro's emerging role as a regional administrative and commercial center.

El Centro is operated by a council/manager form of government. It is strategically located in the Imperial economic base. Several state and federal government offices are located in El Centro, including the Bureau of Land Management, Federal Bureau of Investigation, U.S. Border Patrol, Social Security Administration, Employment Development Department, and the Department of Agriculture. El Centro is 15 minutes from the international industrial complexes in Mexicali. There are two international border crossings nearby for commercial and noncommercial vehicles.

SOURCE: U.S. Census Bureau https://www.census.gov/quickfacts/fact/table/elcentrocitycalifornia/PST045219

3.6. City of Holtville

The City of Holtville is a small town with a population of 6,678 (July 2018). The City utilizes services from the Imperial County School District and the Imperial Irrigation District. It is conveniently located in the Imperial Valley near tourist, trade, and travel centers of the southwestern United States. The City of Holtville is located along the southern portion of Imperial County, along the eastern fringe of the irrigation areas. It is situated within ten miles of the Mexican Border, minutes from Mexico's Mexicali port of entry, and centrally located a few hours from Los Angeles, Phoenix, Tucson, and Las Vegas; one hour from the Colorado River, Palm Springs, and Yuma; and two hours from San Diego and Baja California.

The City of Holtville, or Holton as it was first called, was founded by W.F. Holt. He had a vision of what the Imperial Valley would become, and he was the first to envision a town east of the Alamo River. In 1903, the City of Holtville was born. Construction of the new town was slow in the beginning because of a town policy which only allowed brick construction. That policy was later changed. The City of was incorporated on June 20, 1908. The summer weather in Holtville has an average temperature of 105 degrees, but in the winter, the temperature averages about 70 degrees. The town is approximately 16 feet below sea level. Holtville has several different recreational facilities.

SOURCE: U.S. Census Bureau https://www.census.gov/quickfacts/fact/table/holtvillecitycalifornia/PST045219

3.7. City of Imperial

The City of Imperial was incorporated in 1904 and is located in the south-central County area in the irrigated Imperial Valley. It is 13 miles north of the Mexican border and three miles north of the County

Seat in El Centro. The City has a population of 17,695 (July 2018) and utilizes services from the Imperial County School District and the Imperial Irrigation District. The City covers approximately 1,500 acres stretching along both sides of State Highway 89, the major north-south route through Imperial County. The 245-acre Imperial County Airport, the 97-acre California Mid-Winter Fairgrounds, 45 acres of Imperial Irrigation District facilities, and a 40-acre INS facility are located in the City of Imperial.

Conveniently, the City of Imperial is located between major cities of California, Arizona, and Mexico. State Route 111, which passes to the east of the City, is a major north/south corridor for the NAFTA shipping and travel route to the Calexico Port of Entry at the U.S./Mexican International border. The State Route also connect to the Brawley, California bypass, SR-86, and Interstate 10 to Los Angeles. SR 111 is broken into pieces, and the length of 130.175 miles does not reflect the SR 86 overlap that would be required to make the route continuous. Portions of SR 111 have been relinquished to or are otherwise maintained by local or other governments, and are not included in the length.

SOURCE: Wikipedia, Route Information https://en.wikipedia.org/wiki/California_State_Route_111

Recently, the NAFTA agreement was renegotiated and replaced by the United States-Mexico-Canada Agreement (USMCA). When implemented (July 2020), the USMCA will create more balanced, reciprocal trade that supports high-paying jobs for Americans and grows the North American economy. Until the USMCA agreement goes into effect, the impact on the city of Imperial is unknown.

The City has well-established neighborhoods, new housing, multi-family housing, apartments, and nearby country living. All homes are close to parks and family recreation.

SOURCE: U.S. Census Bureau https://www.census.gov/quickfacts/fact/table/imperialcitycalifornia/PST045219

3.8. City of Westmorland

Strategically located in the Imperial Valley, Westmorland is set among one of the most fertile agricultural regions in the world. Highway 86 is a four-lane expressway connecting Westmorland to Coachella Valley and Interstate 10. Forrester Road connects Westmorland to Interstate 8. Westmorland is 87 miles southeast of Palm Springs, 122 miles east of San Diego, 192 miles southeast of Los Angeles, 261 miles west of Phoenix, Arizona, and 31 miles north of Mexicali, Mexico. It is 22 miles north of El Centro, the county seat.

Surrounded by the desert and farmland areas of Imperial County, the City of Westmorland is home to 2,444 residents (2020) and utilizes services from the Imperial County School District and the Imperial Irrigation District. The City of Westmorland lies in the northwest portion of the Imperial Valley and sits along State Highway 86. It is located approximately 12 miles south of the Salton Sea, 25 miles from the City of El Centro, and 30 miles north of the U.S./Mexico border.

The City is a small rural community, primarily residential with some commercial establishments. The City of Westmorland was incorporated on June 30, 1934 under the laws of the State of California as a General Law City. It has a City Council form of government with seven elected positions, five Council members, one City Treasurer, and one City Clerk. The mayor is appointed by the Council members and serves a one-

year term but may be re-selected to serve more than one term.

SOURCE: City of Westmorland www.cityofwestmorland.net/home/

3.9. Imperial Irrigation District

The Imperial Irrigation District (IID) is a public corporation and was organized in 1911 under the California Irrigation District Act, as supplemented and from time to time amended (now codified as Division 11 of the Water Code, State of California). It is governed by a five- member Board of Directors, each elected at large from a separate geographical division of the District for a term of four years by the qualified electors residing within the water service area.

IID has a longstanding right to divert Colorado River water and holds legal title to all its water and water rights in trust for landowners within the IID service area. The IID performs three chief functions: (1) diversion and delivery of Colorado River water through operation and maintenance of an extensive canal system and related facilities; (2) construction and maintenance of agricultural drainage systems; and (3) generation and distribution of electricity.

Established by a vote of the people and led by a popularly elected board of directors, IID exists to serve the public. As such, its twofold missions of delivering water and electrical power to the communities that make up its service area are carried out with a public purpose. The business of IID is, by definition, the people's business. As a public agency that depends on the consent of the governed, the district's organizational structure and policy-making function are intended to be as open and transparent as possible.

3.9.1. IID Water

With more than 3,000 miles of canals and drains, IID is the largest irrigation district in the nation. As a public agency, IID strives to provide the highest level of service at the most economical price while still preserving the unique ecosystem associated with this working landscape. The IID Water Department is responsible for the timely operation and maintenance of the extensive open channel system, and effectively delivers its annual entitlement of 3.1 million acre-feet, less water transfer obligations, to nearly one-half million acres for agricultural, municipal and industrial use. Of the water IID transports, approximately 97 percent is used for agricultural purposes, making possible Imperial County's ranking as one of the top 10 agricultural regions nationwide. The remaining 3 percent of its water deliveries supply seven municipalities, one private water company and two community water systems as well as a variety of industrial uses and rural homes or businesses. As on-farm conservation efficiency measures are implemented, this ratio will change.

SOURCE: Imperial Irrigation District (IID) https://www.iid.com/water

A 1964 Supreme Court decree in California v. Arizona defined these district water rights. The district's present perfected rights were set at 2.6 MAF annually because that was the annual quantity being diverted by the district and used on the 424,145 acres under irrigation.

These vested rights preempt the 1902 Reclamation Law and are not subject to reclamation law limitations. The significance of IID's present perfected right is that in times of shortage, present perfected rights must be satisfied first.

3.9.2. IID Energy

IID entered the power industry in 1936. Today IID provides electric power to more than 150,000 customers in Imperial County and parts of Riverside and San Diego counties. As the sixth largest utility in California, IID Energy controls more than 1,100 megawatts of energy derived from a diverse resource portfolio that includes its own generation, and long- and short-term power purchases.

As a consumer-owned utility, IID Energy works to efficiently and effectively meet its customers' demands at the best possible rates, supporting the area's low-cost of living directly with low-cost utilities. The utility accomplishes this by producing 30 percent of its power supply locally, using efficient, low-cost hydroelectric facilities and steam generation facilities, as well as several natural gas turbines. IID emphasizes environmentally friendly operations by employing as many "green" resources as available. IID's diverse resource portfolio provides customers with some of the lowest rates in southern California.

SOURCE: Imperial Irrigation District, Energy https://www.iid.com/energy

3.9.3. IID Regulations and Policies Related to Hazard Mitigation

The IID complies with existing local and state ordinances and regulations.

In addition, the IID follows its own set of rules and regulations related to supplying water and power to the County and local communities. IID's rules and regulation was revised in January 2016 and will be reviewed periodically. In addition, it will be expanded on, improved, or deleted when needed. Following are IID regulations that are related to hazard mitigation.

- **Regulation No. 26: Control System.** The maintenance and operation of the canals and laterals of the District shall be under the exclusive management and control of the Manager, Water Department, and no person except authorized employees of the District shall have any right to interfere with said canals or works in any manner.
- **Regulation No. 27: Control of Structures and Delivery Gates.** The District shall have employees assigned to perform the water service duties of the District at all times, and it is essential to good service that none but assigned employees move or tamper with any part of any gate or structure in the canal system.
- **Regulation No. 30: Access to a Water User's Premises.** In order to carry on drainage investigations, make crop surveys, and to inspect the canals and drainage ditches or the flow of water therein, employees or agents of the District shall have free access at all times to lands irrigated from the canal system of the District.
- **Regulation No. 31: Rights-of-Way** related to (1) obstruction of rights-of-way; (2) keeping livestock out of canals and drains and away from banks; (3) acquisition and clearing in connection with construction of district drains.
- **Regulation No. 32: Surveys and Investigations** – (1) surveys for concrete head ditches;

  (2) farm drainage investigations (3) canal and lateral seepage investigations.

- **Regulation No. 34: Rearrangement and Concrete Lining and/or Exclusion of Irrigation Lateral Canals.**
- **Regulation No. 36: Use of Drains.** (1) The draining of water, and (2) disposal of sewage effluent or industrial waste,
- **Regulation No. 37: Deep Drains.** The District has undertaken development of a deep drainage system, which will provide facilities for one drainage outlet from each governmental subdivision of approximately 160 acres.
- **Regulation No. 38: Lateral Drains.** The District will construct lateral drains as a part of the District's drainage system to provide a tile and/or surface drain outlet for each governmental subdivision of approximately 160 acres.
- **Regulation No. 42: Pipeline Drains.** Pipelining of existing open drains or construction of a new pipeline drain may be requested by the landowners affected by such drainage in lieu of open drains to provide outlet for surface and subsurface drainage.
- **Regulation No. 43: Reconstruction and/or Deepening of Existing Drains.** When necessary to provide an outlet for open or tile drains the District will reconstruct and/or deepen existing drains.

SOURCE: Imperial Irrigation District, Rules and Regulations Governing the Distribution and Use of Water (Revised January 2016) https://www.iid.com/home/showdocument?id=7989

3.9.4. Powers and Purposes Generally

The IID Board of Directors have approved the Rules and Regulations Governing the Distribution and Use of Water complied and published in accordance with Section 22257 of the Water Code, State of California. which reads in part as follows:

"Each District shall establish equitable rules for the distribution and use of water, which shall be printed in convenient form for distribution in the District..."

SOURCE: Imperial Irrigation District, Water Rules and Regulations https://www.iid.com/water/rules-and-regulations

The following sections of the Water Code, Health and Safety Code, and Penal Code of the State of California, set forth generally the powers and purposes of IID related to hazards.

3.9.5. Water Code

- **§100:** It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or watercourse in this State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or

unreasonable method of use or unreasonable method of diversion of water.

SOURCE: California State Water Resources Control Board, Statutory Water Rights Law and Related California Code Sections, as amended, including Statutes 2018), January 2019 https://www.waterboards.ca.gov/laws_regulations/docs/wrlaws.pdf

- **§ 20529 and 22437:** IID has a longstanding right to divert Colorado River water and holds legal title to all its water and water rights in trust for landowners within the district.
- **§ 22075:** A district may do any act necessary to furnish sufficient water in the district for any beneficial use.
- **§ 22078:** A district may control, distribute, store, spread, sink, treat, purify, recapture and salvage any water including but not limited to sewage waters for the beneficial use or uses of the district or its inhabitants or the owner of rights to waters therein.
- **§ 22095:** A district may provide for any and all drainage made necessary by the irrigation provided for by the district.
- **§ 22225:** Each district has the power generally to perform all acts necessary to carry out fully the provisions of this division.
- **§ 22257:** ... a district may refuse to deliver water through a ditch, which is not clean or not in suitable condition to prevent waste of water and may determine through which of two or more available ditches it will deliver water.
- **§ 22425:** A District may acquire by any means any property or interest in property to carry out its purposes...
- **§ 25806:** Unpaid charges for water and services; lien; with exception.

SOURCE: California Legislative Information, Water Code Section
https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=25806&lawCode=WAT

3.9.6. Health and Safety Code

- **§ 116995:** Contamination of water supply by livestock. No person shall cause or permit any horses, cattle, sheep, swine, poultry, or any kind of livestock or domestic animals, to pollute the waters, or tributaries of waters, used or intended for drinking purposes by any portion of the inhabitants of this State.
- **§ 117000:** Bathing in or otherwise polluting water supply. No person shall bathe, except as permitted by law, in any stream, pond, lake or reservoir from which water is drawn for the supply of any portion of the inhabitants of this State or by any other means foul or pollute the waters of any such stream, pond, lake, or reservoir.
- **§ 117010:** Washing clothes in water supply; misdemeanor; penalty. Every person who washes clothes in any spring, stream, river, lake, reservoir, well or other waters which are used or intended for drinking purposes by the inhabitants of the vicinage or of any city, county, or town, of this state, is guilty of a misdemeanor, punishable by imprisonment in the county jail for not more than

90 days, or a fine of not less than fifty dollars ($50) nor more than one thousand dollars ($1,000), or by both such fine and imprisonment. Each day's violation of this section is a separate offense.

SOURCE: California Legislative Information, Health and Safety Code Section
https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=116995&lawCode=HSC

3.9.7. Penal Code

- **§ 498:** Theft of Utility services, et al.
- **§ 592.** Malicious Intent: Canals, ditches, flumes, or reservoirs, et al.
- **§ 607:** Malicious Mischief: Hydraulic power, et al.

SOURCE: California Legislative Information, Penal Code Section
https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=498&lawCode=PEN

3.9.8. Ordinance § 93002.01

Prohibiting Entry into the Waters of Irrigation Canals in the County of Imperial, State of California

- **§ 93002.01:** Prohibited – bathing, swimming, boating, water-skiing or otherwise shall be unlawful upon the surface of the water in any irrigation canal, lateral, ditch, or siphon in the incorporated area of the County of Imperial, State of California, however, that the provisions of this Chapter shall not apply to that body of water known as the Palo Verde Outfall Drain. *(prior code § 32200)*

SOURCE: Municipal Code, California Codified Ordinances, Imperial County
https://library.municode.com/ca/imperial_county/codes/code_of_ordinances?nodeId=TIT9LAUSCO_DIV30PARERE_CH2BOSWRE_93002.01BASWBOWASKPRXC

3.10. Imperial County Office of Education (ICOE)

3.10.1. Missions, Values, and Priorities

3.10.1.1. Mission Statement

Improve the quality of life in our community by promoting strong families and students who are prepared for life, college, and career.

3.10.1.2. Values

- Mutual respect and teamwork
- Social responsibility
- Professional and personal integrity
- Service and leadership
- Transparency and accountability
- Joy

3.10.1.3. Priorities

The ICOE prioritizes college and career readiness, comprehensive student success, promoting healthy families, positive inter-agency relationships, and establishing technology-rich practices.

3.10.1.4. Goal

The goal is to empower the community to be an ideal place to live, learn, and work.

3.10.1.5. Key Functions

ICOE provides an important support infrastructure for local schools and districts. Keys functions include: supporting and monitoring local education agencies, instructing students in special education programs and alternative education schools, offering instructional and technical support, developing the education workforce through teacher induction and professional development, and leading countywide and statewide initiatives.

SOURCES:

Imperial County Office of Education (ICOE) Mission Statement flyer https://doc-10-80-apps-viewer.googleusercontent.com/viewer/secure/pdf/o19kph24v6fbpvkrlho9s8iaim8rsrq0/c92hidt9ke2efmhd4fkd8in6ciqasjii/1589476875000/drive/10664024285216295341/ACFrOgBnKr62Ju-hbSPXXHNZTg6_z76d2TMXw7MsI-AiYoC_fcNFoPjsthhNuy-mPQtyBJXW9ovpzEbVN9l2y4HwdfEjx1iOwNp2w_djwLK8Cn1lYsBOMlrR7C5M60eGbhIcGIc6Um1ENHO22qv8?print=true&nonce=uudnvatjoin4m&user=10664024285216295341&hash=03cerj7e96c5ahb76ukgdn8f6ud6mdm2

ICOE 2018 Yearbook Annual Report to the Community
https://drive.google.com/file/d/1zUUXMpLuzgtNCkT5jMP21BNIOO6kStPU/view

The ICOE works closely with the County's 18 independent school districts, as well as its public service agencies, businesses, institutions of higher education, and elected officials to ensure that meeting the educational needs of children is a community priority. ICOE also provides direct services to students with specialized needs through its alternative education, special education, and migrant education programs.

SOURCES:

California Public School Districts, Imperial County https://californiapublicschools.org/imperial-county-school-districts

Services https://www.icoe.org/services

Special Education in Imperial County https://www.icoe.org/services/student-services/special-education
Migrant Education Services https://www.icoe.org/services/student-services/migrant-education

The five members of the Imperial County Board of Education each represent a geographic area of Imperial County. Members are elected into office and serve four-year terms. The board approves the Imperial County Office of Education annual budget and serves as an appeal board of actions for inter-district attendance requests, student expulsions, and charter school petitions.

SOURCE: ICOE 2018 Yearbook Annual Report to the Community
https://drive.google.com/file/d/1zUUXMpLuzgtNCkT5jMP21BNIOO6kStPU/view

3.10.2. ICOE Policies and Programs

The ICOE complies with existing local and state ordinances and regulations. If a need arises, the ICOE can petition for additional ordinances and regulations or expand/improve existing ones.

The current policies and programs for ICOE related to hazard mitigation are:

- The State of California and Federal law, as well as ICOE policy, make the health and safety of their employees the first consideration in operating their business. Health and safety in their business must be a part of every operation, and every employee's responsibility at all levels. It is the intent of ICOE to comply with all laws concerning the operation of the business and the health and safety of employees and the public.

SOURCES:

California Department of Education (CDE), Health and Safety Information https://www.cde.ca.gov/ls/fa/hs/

Governor's Office of Emergency Services (Cal OES) Disaster Preparedness for Schools & Educators https://www.caloes.ca.gov/schools-educators/plan-prepare

California State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC), Region VI https://www.caloes.ca.gov/cal-oes-divisions/regional-operations/southern-region/southern-region-lepc

Federal Emergency Management Agency (FEMA)/Red Cross National Strategy for Youth Preparedness Education https://www.ready.gov/sites/default/files/2019-06/fema_icpd_national_strategy.pdf

Imperial County Office of Education, Employee Safety Policies & Procedures, Health and Safety Manual (dated 6/10/2002 and revised 1/6/2010) https://drive.google.com/file/d/18LIUDM05XEMMW7qBqv8VNdvfuQfRqGQY/view

- **Prevention.** ICOE must constantly be aware of conditions in all work areas that can produce or lead to injuries. No employee is required to work at a job known to be unsafe or dangerous to their health.
- **Cooperation.** Cooperation in detecting hazards, reporting dangerous conditions and controlling workplace hazards is a condition of employment.
- **Safety Program Goals** - The objective of ICOE's health and safety program is to reduce the number of injuries and illnesses to an absolute minimum, both in keeping with, and surpassing the best experience of similar operations by others. Our goal is zero accidents and injuries.
- **Safety Policy Statement** - It is the policy of ICOE that accident prevention shall be considered of primary importance in all phases of operation and administration. It is the intention of ICOE's management to provide healthy and safe working conditions and to establish and insist upon safe practices at all times by all employees. The prevention of accidents is an objective affecting all levels of our Imperial County Office of Education and its operations. It is, therefore, a basic requirement that each supervisor make the safety of all employees an integral part of his or her regular management function. It is the reciprocal duty of each employee to accept and follow established safety regulations and procedures. It is the reciprocal duty of each employee to accept and follow established safety regulations and procedures. Every effort will be made to provide adequate training to employees. Unsafe conditions must be reported immediately.

SOURCE: Imperial County Office of Education, Employee Safety Policies & Procedures, Health and Safety Manual (6/10/2002, Revised 1/6/2010) https://drive.google.com/file/d/18LlUDM05XEMMW7qBqv8VNdvfuQfRqGQY/view

- **Social Distancing COVID-19.** The need for safety through social distancing warrants that we keep our school campuses closed to students during this pandemic. The Imperial County Health Officer issued an "Amended Stay at Home Order" (dated April 1, 2020) which will remain in effect until further notice.

SOURCE: Imperial County Office of Education (ICOE) Public Notice https://www.icoe.org/news/all-imperial-county-public-school-facilities-shall-remain-closed-remainder-2019-20-school-year

3.10.3. Imperial County School Districts

Following is a list of the 18 Imperial County School Districts, followed by a map of the sites:

1. Brawley Elementary
2. Brawley Union High
3. Calexico Unified
4. Calipatria Unified
5. Central Union High
6. El Centro Elementary
7. Heber Elementary
8. Holtville Unified
9. Imperial County Office of Education
10. Imperial Unified
11. Imperial Valley ROP
12. Magnolia Union
13. McCabe Union
14. Meadows Union
15. Mulberry Union
16. San Pasqual Valley
17. Seely Union
18. Westmorland Union

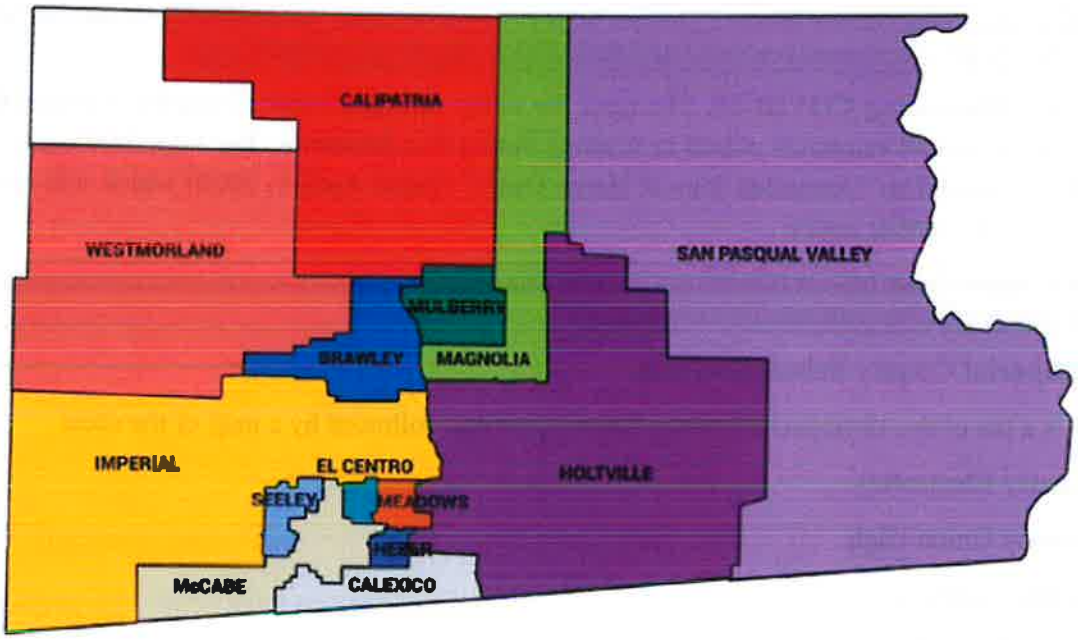


Figure 5. Imperial County School Districts

SOURCE: ICOE 2018 Yearbook Annual Report to the Community, page 21
https://drive.google.com/file/d/1zUUXMpLuzgtNCkT5jMP21BNIOO6kStPU/view

3.11. Location of Imperial County, Cities, and Offices

The following maps depict the location of Imperial County and the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland which includes the Imperial Irrigation District and Office of Education.

Figure 6. Imperial County's Location in California

SOURCE: California State Association of Counties (CSAC), Map of Imperial County
https://www.counties.org/county-profile/imperial-county

Figure 7. Imperial County and Surrounding Areas

SOURCE: Google Maps, Imperial County https://www.google.com/search?q=imperial+county+map&ie=&oe=

Figure 8. Cities in Imperial County

SOURCE: Maps of the World, Imperial County https://www.mapsofworld.com/usa/county-maps/california/imperial-county-map.html

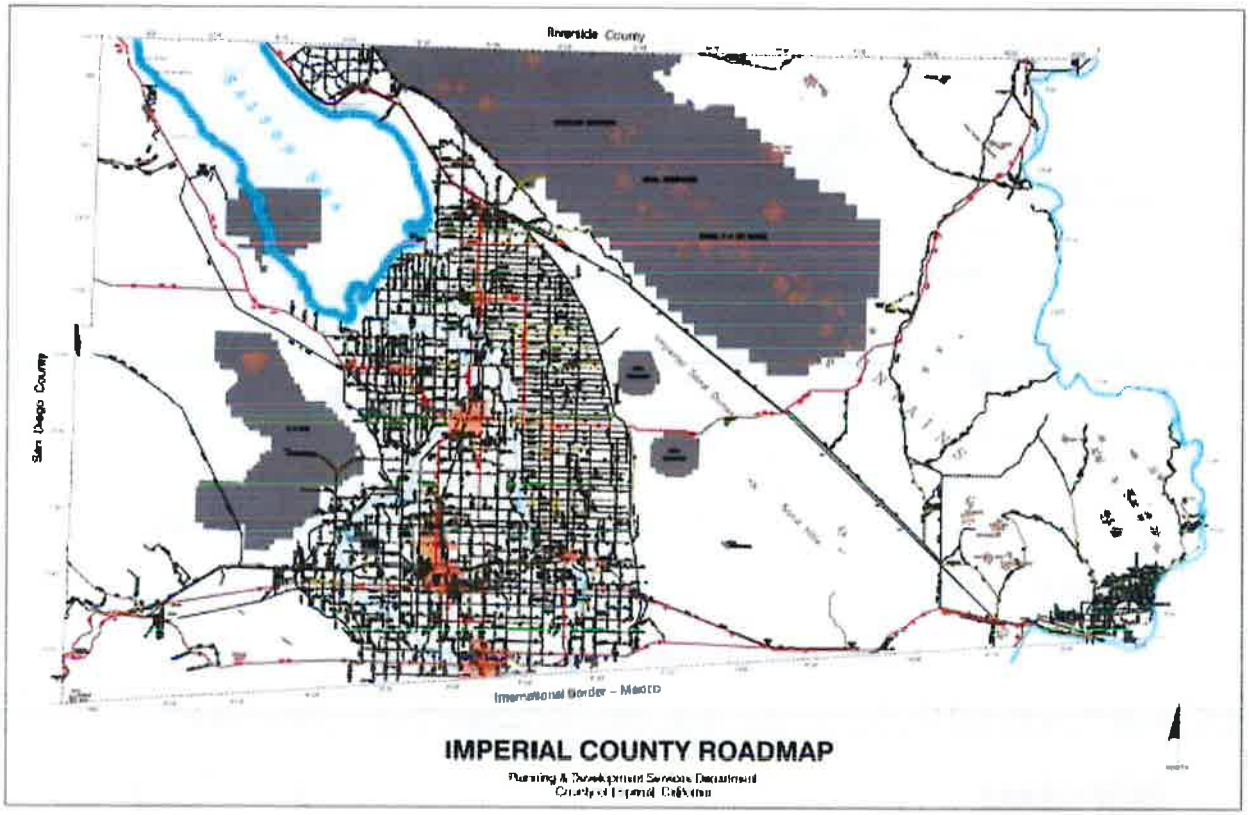


Figure 9. Imperial County Roadmap

SOURCE: Imperial County Planning and Development Services (ICPDS) Imperial County Road Map
www.icpds.com/CMS/Media/ROADMAP.pdf

Section 4. Land Use

4.1. Land Use Element

Imperial County's Land Use Element designates the general distribution, location, and extent (including standards for population density and building intensity) of the uses of land for housing, business, industry, agriculture, open space, public facilities, and other categories of public and private uses. The primary purpose of the Land Use Element is to identify the goals, policies, and standards of the General Plan that will guide the physical growth of Imperial County, including the public facilities necessary to support such growth.

4.2. Basic Concepts

Six basic concepts adopted by the Board in support of the General Plan are: (1) quality of life, (2) safety for people and property, (3) wide selection of social and economic opportunities, (4) efficient use of natural, human, and financial resources, (5) clean air, water, and land, and (6) quiet, beautiful communities and rural areas.

4.3. Intent

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

SOURCE:

Imperial County Planning & Development Services, Land Use Element http://www.icpds.com/?pid=675

County of Imperial, Planning & Development Services Department, Land Use General Plan, Adopted 11//9/1993, Revised 11/6/2015 MO#18b) www.icpds.com/CMS/Media/Land-Use-Element-(2015).pdf

4.4. Urban Areas and Community Areas

Urban Arias and Community Areas are General Plan designations which provide for a range of permitted land uses within specific geographic areas of the County. For urbanizing areas surrounding incorporated cities, the Previous (prior to 1993) Land Use Plans duplicated the land use planning efforts of the cities and, at times, conflicted with them. Implementation of this Update is intended to include zone reclassification studies for areas adjacent to cities which will be based on the adopted Land Use Plan of each city. County zoning would be changed to reflect residential densities and land use intensities which are at or below that which would be permitted by the city Land Use Plan. For the "urban" unincorporated areas of Heber, Niland, Salton City, Seeley, West Shores and Winterhaven new Land Use Plans were prepared. These may also need updates at various times. Zoning limitations may also be recommended which would limit development where public facilities are presently inadequate to provide an urban level of service; or where premature development would impact continued agricultural use of adjacent property or

cause "leapfrog" or "checkerboard" land use patterns.

4.4.1. Urban Areas

The Urban Area designation of the County's Land Use Plan includes areas surrounding the seven incorporated cities: Brawley, El Centro, Westmorland, Holtville, Calipatria and Calexico. Urban Areas also include the unincorporated communities of Westmorland, Niland, Heber, Seeley, Winterhaven and West Shores/Salton City. 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 many cases, sidewalks. If located within an urban area, such improvements shall be consistent with City standards as determined by the Director. In cases where the Urban Area is located in the unincorporated communities (i.e., Heber, Seeley, etc.) improvements shall be consistent with County standards as determined by the Director of Planning & Development Services. Development proposed outside of a designate Urban area shall either require an amendment to an existing Urban area or be designated as a new Specific Plan Area meeting full Urban area improvement standards.

4.4.2. Community Areas

The Community Areas include Palo Verde, Ocotillo/Nomirage Community Plan; and Hot Mineral Spa/Bombay Beach Community Area. Community Areas differ from Urban Areas in that they are primarily second home, retirement, or recreation areas with limited commercial or employment opportunities. Urban services, including sewer and water, are limited.

Ocotillo/Nomirage is provided water service by private water companies and individual wells; Palo Verde by the Palo Verde County Water District; and Hot Mineral Spa/Bombay Beach by the Coachella Valley Water District. Only Bombay Beach has a public sewage system, also operated by the Coachella Valley Water District. The others rely on subsurface septic systems or facilities operated by mobile home and RV parks. Future growth in Ocotillo/Nomirage and Palo Verde is expected to consist primarily of infill by single family residences on existing lots, rather than expansion of community boundaries, except at very low densities. A planned expansion of Bombay Beach was approved in 1985 but has not been constructed.

4.5. Specific Plans - Purpose and Content

Specific Plans are "planning tools" used to implement the General Plan for large development projects such as a planned residential community, large scale commercial project, industrial park, etc., or to designate an area of the County where further studies are needed prior to development. Specific Plans should be utilized where existing conventional zoning regulations do not provide

adequate controls over land use and development. Upon adoption, the Specific Plan serves as an amendment to the County General Plan for a very defined and detailed area. To be adequate, a Specific Plan must also be consistent with all aspects of the General Plan. Specific Plans may be adopted by Resolution of the County Board of Supervisors. Following adoption of the Specific Plan, all subsequent use or development of the property shall be in conformance with the Specific Plan. The minimum required contents of Specific Plans are set forth in the California Government Code, Section 65451.

SOURCE: County of Imperial, Planning & Development Services Department, Land Use General Plan, Adopted 11//9/1993, Revised 11/6/2015 MO#18b), Page 9 www.icpds.com/CMS/Media/Land-Use-Element-(2015).pdf

California Legislative Information Code Section 65451, Title 7. Planning and Land Use, Div. 1, Chapter 3. Article 8 https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=65451

4.6. Land Use/Population

Imperial County is, and will continue for the foreseeable future to be, a predominantly agricultural area, although in 2003 a significant increase in urbanization began to show. Presently, approximately one-fifth (534,328) of the nearly 3 million acres of the County is irrigated for agricultural purposes. In addition, approximately 50 percent of County lands are largely undeveloped and under federal ownership. The developed area where the County's incorporated cities, unincorporated communities, and supporting facilities are situated comprise less than one percent of the land.

Imperial County Planning & Development Services Department bases its population estimates on building permits and housing unit change. From this annual compilation, the Population Research Unit of the California Department of Finance (DOF) estimates the annual change in population.

Population in the unincorporated areas of the County tends to concentrate in agricultural areas and in recreation/retirement communities. Agricultural related communities include the townsites of Heber, Niland and Seeley in the Imperial Valley. Along the Colorado River, in the eastern portion of the County, small population clusters exist within the townsites of Palo Verde and Winterhaven.

Recreation/retirement communities include Ocotillo/Nomirage located in the southwest portion of the County, and Hot Mineral Spa and Bombay Beach, on the northeastern shore of the Salton Sea. The West Shores communities of Salton City, Salton Sea Beach, and Desert Shores are also largely retirement and recreation communities, though increasingly their populations are becoming more diversified. These communities experience a noticeable increase in population during the winter months when visitors converge to the area to avoid cold/wet winters in other parts of the country.

SOURCE: County of Imperial, Planning & Development Services Department, Land Use General Plan, Adopted 11//9/1993, Revised 11/6/2015 MO#18b), Page 22 www.icpds.com/CMS/Media/Land-Use-Element-(2015).pdf

4.7. Federal and State Facilities

With approximately 1,460,000 acres, the federal government owns approximately one-half of all land in the County, primarily the Department of the Interior's Bureau of Land Management (BLM) property and U.S. Military lands.

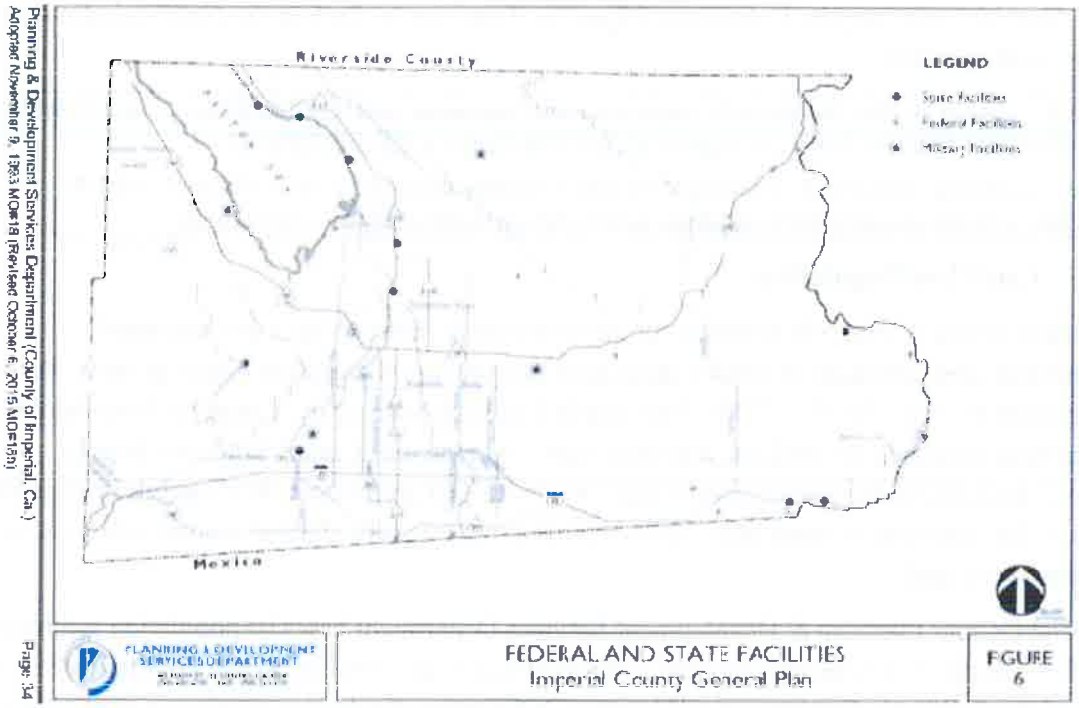


Figure 10. Federal and State Facilities in Imperial County

SOURCE: County of Imperial, Planning & Development Services Department, Land Use General Plan, Adopted 11//9/1993, Revised 11/6/2015 MO#18b), Page 34 www.icpds.com/CMS/Media/Land-Use-Element-(2015).pdf

4.7.1. Military

Military activities are centered at the Naval Air Facility El Centro, located north of Seeley, with military field and aerial operations conducted on approximately 350,000 acres in the Chocolate Mountains, 76,800 acres in the Superstition Mountains, 36,600 acres at the Salton Sea Test Base, and at other smaller sites throughout the County. The military's Yuma Proving Grounds, centered in Arizona, also includes lands in the southeast portion of the County.

4.7.2. National Wildlife Refuge

Other federal sites include National Wildlife Refuges at the south end of the Salton Sea and two sites on the Colorado River -- Cibola near Palo Verde, and Imperial farther south.

4.7.3. Border Patrol

U.S. Border Patrol are located at the Mexicali/Calexico and Algodones/Andrade Ports of Entry,

with Border Patrol inspection station also operated on Highway 86/78 south of Salton City, Highway 111 north of Bombay Beach, and Highway 78 south of Palo Verde.

4.7.4. State Parks and Recreation

State facilities consist of park lands of Anza-Borrego State Park and Ocotillo Wells State Recreation Area; the Salton Sea State Recreation Area on the east shore; and Picacho State Recreation Area on the Colorado River. The State Department of Fish and Game also manages two units of the Imperial Wildlife Area -- the Wister Unit on the east shore near Niland, and the Finney-Ramer Unit on the Alamo River near Calipatria.

4.7.5. Prisons

The State Department of Corrections has a maximum-security prison in the area northeast of the City of Calipatria and a medium-security prison near Seeley.

4.7.6. Agricultural Pest Inspection

An agricultural pest inspection station is located on I-8 west of Winterhaven.

4.7.7. Highway Patrol

A Highway Patrol field office is located near Felicity.

4.7.8. Ports of Entry

The County has three port of entries between the United States and the Republic of Mexico. The City of Calexico is the oldest and heaviest used port of entry. It is the primary passage vehicle port with truck traffic. The Gateway of America's or east port is the newest port of entry, built in 1995. Its primary purpose is as a commercial truck port. It also serves to relieve the Calexico port congestion. The Third port is the Algadones port near the California/Arizona boarder. As a small port, it is used primarily for passenger vehicles, typically tourist.

4.7.9. Indian Reservations

The County does not have direct authority on Indian Reservation lands which are the Torres-Martinez Reservation adjacent to the Riverside County line in the Salton City area or the Quechan Reservation in the Winterhaven-Bard area. However, the County has authority over off-site impact generated by on-site operations.

Development and land use changes are none to very minimal throughout the County and Planning Jurisdictions. However, as development and land use changes may be presented to the governing body of each jurisdiction, careful and thorough consideration is given to the potential impact by each hazard to the proposed development and or land use change. Approvals, as necessary and appropriate, may be conditioned with actions which mitigate the potential exposure to hazards as identified in this MHMP.

4.8. Land Use Distribution (in acres).

The following table shows the generalized land uses for Imperial County.

Table 11. Generalized Land Uses in Imperial County

IMPERIAL COUNTY LAND USE DISTRIBUTION (IN ACRES*)	
Irrigated (Agriculture)	
Imperial Valley	512,163
Bard Valley (Including Reservation)	14,737
Palo Verde Valley	7,428
TOTAL	**534,328 (18.2%)**
Developed	
Incorporated	9.274
Unincorporated	8,754
TOTAL	**18,028 (0.6%)**
Salton Sea **	**211,840 (7.2%)**
Desert/Mountains	
Federal	1,459,926
State	37,760
Indian	10,910
Private	669,288
TOTAL	**2,177,884 (74.0%)**
IMPERIAL COUNTY TOTAL	**2,942,080 Acres**

* All acreages are approximations and should, therefore, only be used for informational purposes.
** Calculated at elevation of –230

Source: Imperial County General Plan, County Overview

SOURCE: County of Imperial, Planning & Development Services Department, Land Use General Plan, Adopted 11//9/1993, Revised 11/6/2015 MO#18b), Page 23 www.icpds.com/CMS/Media/Land-Use-Element-(2015).pdf

Land use plans and maps for Imperial County and the participating jurisdictions are provided in the sections that follow.

4.9. Imperial County Land Use Plan

4.9.1. Goals and Objectives

The Goals and Objectives, together with the Implementation Programs and Policies in Chapter IV, are the statements that shall provide direction for private development as well as government actions and programs. Imperial County's Goals and Objectives are intended to serve as long-term principles and policy statements representing ideals which have been determined by the citizens as being desirable and deserving of community time and resources to achieve. These Goals and Objectives, therefore, are important guidelines for land use decision making. It is recognized, however, that other social, economic, environmental, and legal considerations are involved in land use decisions and that these Goals and Objectives, and those of the other General Plan Elements, should be used as guidelines but not doctrines.

Following are Imperial County and participating jurisdiction's Goals and Objectives relative to all land use within the unincorporated areas of the County.

Commercial Agriculture, Goal 1.
Preserve commercial agriculture as a prime economic force.

- **Objective 1.1** Encourage the continued agricultural use of prime/productive agricultural lands.
- **Objective 1.2** Discourage the location of incompatible development adjacent to productive agricultural lands.
- **Objective 1.3** Identify compatible agriculture-related uses appropriate for location in agricultural areas.
- **Objective 1.4** Encourage the continued participation in the County Williamson Act Program.
- **Objective 1.5** Encourage agricultural food processing or value added business to locate in Imperial County to further enhance the continued viability of the Agricultural Economy.
- **Objective 1.6** Encourage the continued viability and growth of the agricultural industry to minimize dependence on foreign food supplies to the region and the county.

Economic Growth, Goal 2.
Diversify employment and economic opportunities in the County while preserving agricultural activity.

- **Objective 2.1** Achieve a balanced and diversified local economy with a variety of economic and employment opportunities.
- **Objective 2.2** Provide adequate space and land use classifications to meet current and projected economic needs for commercial development.
- **Objective 2.3** Continue to evaluate economic development strategies, including new industrial, commercial, and tourist-oriented land uses. Tourist-oriented uses must be compatible with BLM management goals in areas near BLM lands.

- **Objective 2.4** Improve the "regional" economic development cooperation with the other agencies in the County through collaboration, partnerships, and the utilization of the public/private partnerships such as the current IVEDC (Imperial Valley Economic Development Corporation).
- **Objective 2.5** Continue partnership efforts such as the Foreign Trade Zone JPA, or the Enterprise Zone JPA to obtain economy in scale, and the better utilization of public funds in promoting the County toward a healthier economy and a healthier quality of life area.

Regional Vision, Goal 3.
Achieve balanced economic and residential growth while preserving the unique natural, scenic, and agricultural resources of Imperial County.

- **Objective 3.1** Maintain and improve the quality of life, the protection of property and the public health, safety, and welfare in Imperial County.
- **Objective 3.2** Preserve agriculture and natural resources while promoting diverse economic growth through sound land use planning.
- **Objective 3.3** Attain County growth and development patterns that are orderly, safe, and efficient utilizing appropriate financing resources.
- **Objective 3.4** Protect/improve the aesthetics of Imperial County and its communities.
- **Objective 3.5** Ensure safe and coordinated traffic patterns, contiguous growth, and promote a planned and consistent development around city/township areas.
- **Objective 3.6** Recognize and coordinate planning activities as applicable with the Bureau of Land Management (BLM), and the California Desert Conservation Plan.
- **Objective 3.7** Establish a continuing comprehensive long-range planning process for the physical, social, and economic development of the County.
- **Objective 3.8** Utilize non-agricultural land as a resource to diversify employment opportunities and facilitate regional economic growth. Uses must be consistent with each site's resource constraints, the natural environment, and the County Conservation and Open Space Element
- **Objective 3.9** Promote water recreation activities in Imperial County in suitable areas along the New, Alamo, and Colorado Rivers, and in the Salton Sea.
- **Objective 3.10** Identify and pursue funding sources for cleanup of the New and Alamo Rivers and the Salton Sea.
- **Objective 3.11** All zoning within the County of Imperial will be compatible with the General Plan.
- **Objective 3.12** Plan the County urban areas to have physical features, such as urban green belts, parks, or geographic/topographic features that distinguish one community (city) from another to avoid the future bland mega-city such as the LA basin.
- **Objective 3.13** Plan for more regional infrastructure systems to reduce the number of smaller treatment facilities to provide greater efficiency and opportunity to service areas that currently are unnerved or lack adequate services.

- **Objective 3.14** Encourage more regional cooperation and thinking among the elected bodies of the County.
- **Objective 3.15** Support the safe and orderly development of renewable energy in conformance with the goals and objectives of the Renewable Energy and Transmission Element.

Towns and Communities, Goal 4.
Preserve and enhance distinctive historic desert towns and newer communities.

- **Objective 4.1** Preserve and enhance existing urban and rural communities.
- **Objective 4.2** Encourage distinctive community identities.
- **Objective 4.3** Maintain and require compatible land uses within the existing communities.
- **Objective 4.4** Limit the establishment of non-residential uses in predominantly residential neighborhoods and require effective buffers when appropriate non-residential uses are proposed.
- **Objective 4.5** Specific Plan Area designation should be used for outlying proposed growth areas in order to better determine appropriate land uses and the timing and financing for needed community facilities.

Housing Opportunities, Goal 5.
Encourage the compatible development of a variety of housing types and densities to accommodate regional population projections and special housing needs.

- **Objective 5.1** Provide sufficient, suitable residential sites and housing supply to meet projected housing needs of all segments of the population.
- **Objective 5.2** Promote affordable housing for residents of all income groups, including low and moderate income households.

Industrial Development, Goal 6.
Promote orderly industrial development with suitable and adequately distributed industrial land.

- **Objective 6.1** Provide adequate space and land use classifications to meet current and projected economic needs for industrial development.
- **Objective 6.2** Ensure that development in the areas surrounding military, public, and private airports are consistent with the Airport Land Use Compatibility Plans.
- **Objective 6.3** Protect industrial zoned areas from incompatible adjacent land uses and from under-utilization by non-industrial uses.

Extractive Resources, Goal 7.
Identify and protect areas of regionally-significant mineral resources which are in locations suitable for extractive uses.

- **Objective 7.1** Provide adequate space and land use classifications to meet current and projected economic needs for extractive activities.
- **Objective 7.2** Require that extractive uses are designed and operated to avoid air and water quality degradation, including groundwater depletion, other adverse environmental impacts, and comply

with the State Surface Mining and Reclamation Act and County Surface Mining Ordinance.

Public Facilities, Goal 8.
Coordinate local land use planning activities among all local jurisdictions and state and federal agencies.

- **Objective 8.1** Coordinate with federal, state, and municipal agencies when planning for the acquisition and improvement of public parks and assure compatibility with adjacent communities and private property.
- **Objective 8.2** New developments shall provide improvements to meet the added demands for parks and recreational facilities.
- **Objective 8.3** Ensure that school facilities are adequate to meet the existing and projected needs of the population.
- **Objective 8.4** Ensure that all future proposed private and public facilities are adequate to meet expected population growth and the needed additional services around local cities.
- **Objective 8.5** At a minimum, provide adequate sites for solid/liquid and hazardous waste facilities to meet the current and projected demands of the County population and consistent with the County Solid Waste and Hazardous Waste Management Plans.
- **Objective 8.6** Ensure that land uses adjacent to or near existing waste disposal or storage facilities are compatible with those facilities.
- **Objective 8.7** Ensure the development, improvement, timing, and location of community sewer, water, and drainage facilities will meet the needs of existing communities and new developing areas.
- **Objective 8.8** Ensure that the siting of future facilities for the transmission of electricity, gas, and telecommunications is compatible with the environment and County regulation.
- **Objective 8.9** Require necessary public utility rights-of-way when appropriate.
- **Objective 8.10** Provide for the review of public transportation needs in order to accommodate countywide growth.

Protection of Environmental Resources, Goal 9.
Identify and preserve significant natural, cultural, and community character resources and the County's air and water quality.

- **Objective 9.1** Preserve as open space those lands containing watersheds, aquifer recharge areas, floodplains, important natural resources, sensitive vegetation, wildlife habitats, historic and prehistoric sites, or lands which are subject to seismic hazards and establish compatible minimum lot sizes.
- **Objective 9.2** Reduce risk and damage from flood hazards by appropriate regulations.
- **Objective 9.3** Adopt noise standards which protect sensitive noise receptors from adverse impacts.
- **Objective 9.4** Coordinate with the Republic of Mexico to clean up the polluted New River and Alamo River in order to ensure public health and safety as well as recreational resources.

- **Objective 9.5** Establish policies and programs for maintaining salinity levels in the Salton Sea which enable it to remain a viable fish and wildlife habitat.
- **Objective 9.6** Incorporate the strategies of the Imperial County Air Quality Attainment Plan (AQAP) in land use planning decisions and as amended.
- **Objective 9.7** Implement a review procedure for land use planning and discretionary project review which includes the Imperial County Air Pollution Control District.

SOURCE: County of Imperial, Planning & Development Services Department, Land Use General Plan, Adopted 11//9/1993, Revised 11/6/2015 MO#18b), Page 36-42 www.icpds.com/CMS/Media/Land-Use-Element-(2015).pdf

4.9.2. Imperial County Land Use Plan Map

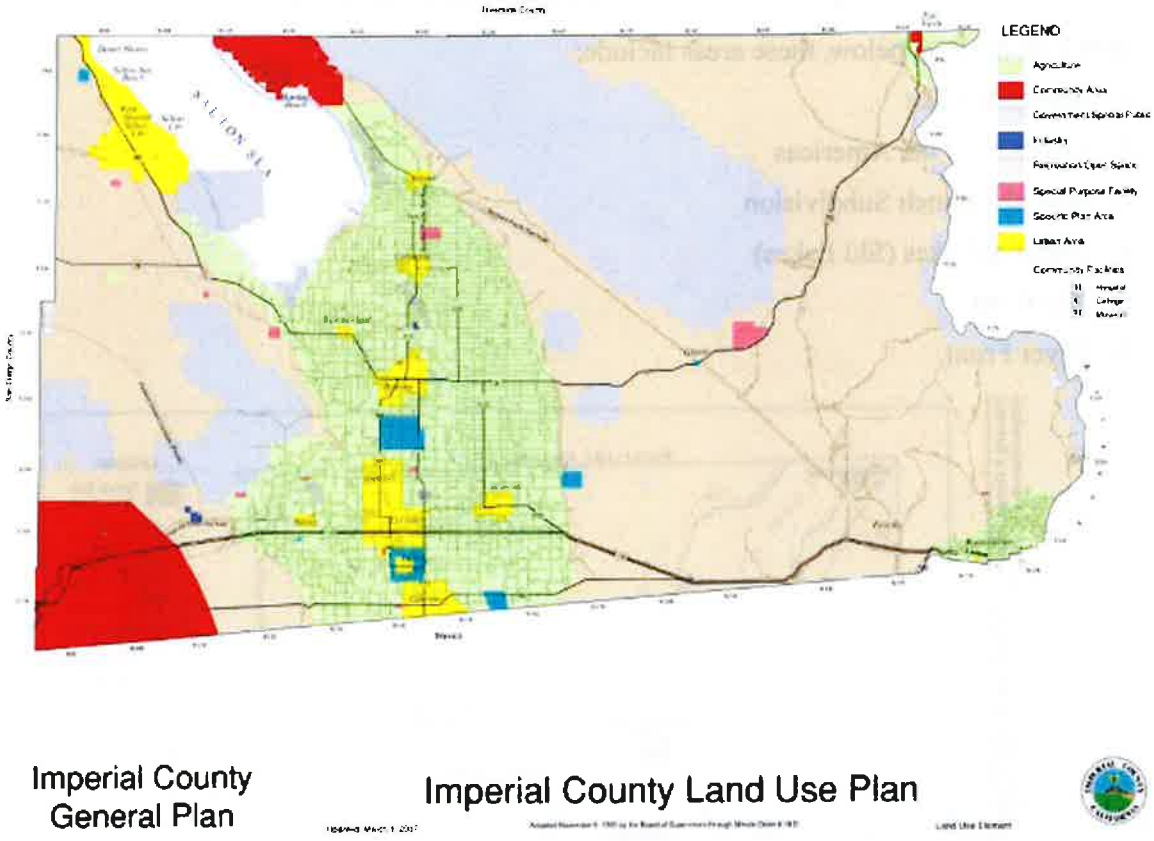


Figure 11. Imperial County Land Use Plan Map

SOURCE: Imperial County Planning & Development, Land Use Plan Map (March 1, 2007)
www.icpds.com/CMS/Media/LANDUSE-Map.pdf

4.9.3. Specific Plan Areas (SPAs).

The following Specific Plan Areas (SPAs) are shown on the map below and designated on the Land Use Plan of the County General Plan. In these areas, except for the Mesquite Lake SPA, a Specific Plan, approved by the Imperial County Board of Supervisors, is required prior to any significant new use or development, except agricultural use. This Land Use Element supersedes all prior Land Use Elements. Previously approved but never developed (as of September 30, 2006) or rescinded/deleted Specific Plan Areas no longer identified in this Element shall be deemed null in void. Plan Areas removed and deemed null in void in this update include Habitat 2000, Bombay Beach "North", and Viva del Sol (Paden/Shealy). Previously removed Specific Plan Areas include Felicity, Tamarack Canyon Ranch, and CM Ranch by Board of Supervisors (MO #24, dated Dec. 16, 2004). The General Plan was revised and adopted by the Board of Supervisors (MO #18b, dated October 6, 2015).

As shown on the map below, these areas include:

1. Mesquite Lake
2. Gateway of the Americas
3. McCabe Ranch Subdivision
4. Imperial Lakes (Ski Lakes)
5. Rio Bend
6. River Front

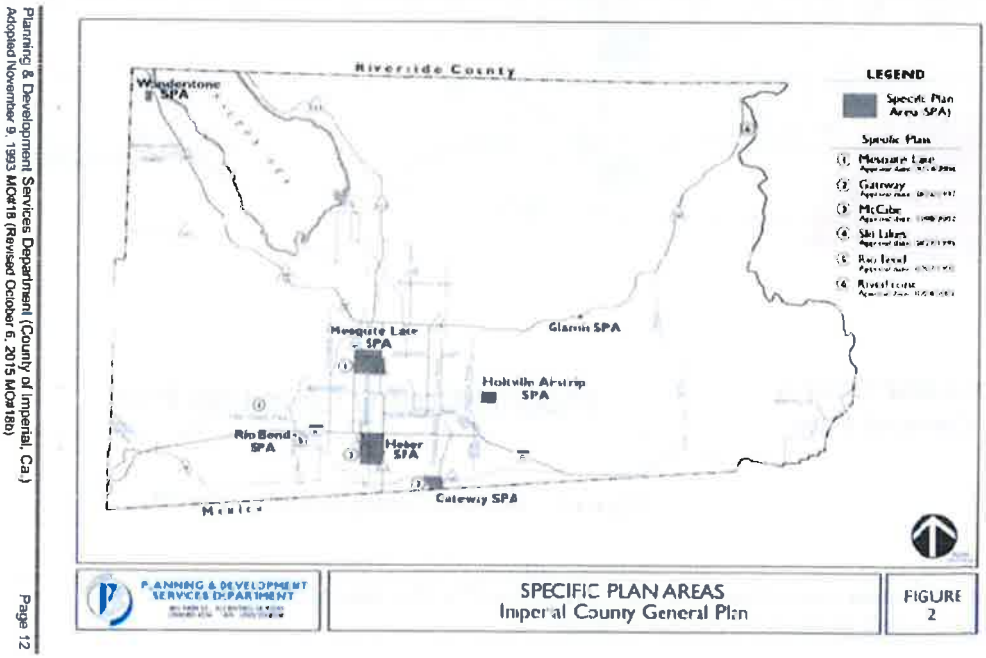


Figure 12. Specific Plan Areas

SOURCE: County of Imperial, Planning & Development Services Department, Land Use General Plan, Adopted 11//9/1993, Revised 11/6/2015 MO#18b), Pages v & 12 www.iepds.com/CMS/Media/Land-Use-Element-(2015).pdf

4.10. City of Brawley

4.10.1. General Plan Update

The most recent comprehensive update to the General Plan was prepared by the City of Brawley in 1995. Amendments to the General Plan have occurred since then and the Housing Element was last updated in 2001. As a result, the Brawley City Council authorized a program in 2005 to begin to undertake a comprehensive update of the General Plan with a planning horizon to 2030.

4.10.2. Location and Setting.

The City of Brawley is located in central Imperial County, which is in the southeastern corner of California near the Mexican border as. Brawley is located approximately 6 miles southeast of the City of Westmorland, approximately 9 miles to the south of the City of Calipatria, 9 and 12 miles north of the Cities of Imperial and El Centro respectively, and approximately 21 miles north of Calexico situated along the Mexican border. Within the context of the County, Brawley is located at the intersection of State Route 78 with State Route 86 and State Route 111. The New River flows from the southwest to the northern portion of the Brawley Planning Area and the Union Pacific Railroad generally extends north-to-south and bisects central Brawley.

4.10.3. Role

The City of Brawley has historically played a significant role in the agricultural economy that characterizes Imperial County. Brawley's strategic crossroads location at several major highways and the railroad facilitates easy access for residents and visitors, and regional shipping services. The City continues to provide a unique urban setting for residential, commercial, agribusiness, and industrial uses. The City is distinguished by a historic downtown commercial and civic center surrounded by a variety of distinct residential neighborhoods, parks, some industrial development, agriculture, and a municipal airport. The landscape around the urbanized areas is dominated by agricultural fields, scattered farmhouses, and related agricultural structures. Scenic views are enjoyed throughout Brawley including panoramic views of the stark topography of the Chocolate Mountains in the east and the foothills of the Peninsular Range in the west, the New River riparian corridor, and agricultural open space.

4.10.4. Planning Area

The Brawley Planning Area consists of approximately 10,845 acres and encompasses the City's incorporated areas and the City's Sphere of Influence (SOI). The City's incorporated areas and the SOI include approximately 4,902 acres and 5,943 acres respectively. The SOI includes areas that are currently under the jurisdiction of Imperial County but are expected to be annexed and incorporated into the City's boundary. The Sphere of Influence was last approved by the Imperial Valley Local Agency Formation Commission (LAFCO) in 2006 as the City's probable ultimate physical boundaries and service area and is to be updated at least once every five years.

4.10.5. Land Use Goals, Objectives, and Policies

The goals, objectives, and policies contained in this element address preservation of major areas of the City, revitalization of others, and guidance for new development in those portions of the City presently undeveloped. The following goals, objectives, and policies focus on maintaining a balance between residential, commercial, industrial, open space, agriculture, and public land uses promoting high quality development; and, minimizing existing and potential land use conflicts. The Implementation Chapter of the General Plan provides strategies to implement the policies and plans identified in the Land Use Element.

LUE Goal 1: Balanced Development.

- **LUE Objective 1.1**: Provide for a well-balanced land use pattern that accommodates existing and future needs for housing, commercial and industrial land, open space, agricultural land, and community facilities and services, while maintaining a healthy, diversified economy capable of supporting future City services.
    - **LUE Policy 1.1.1:** Preserve the quality of Brawley's existing low-density single-family neighborhoods while permitting compatible multi-family development to meet community housing needs where best suited from the standpoint of current development, accessibility, transportation and facilities.
    - **LUE Policy 1.1.2:** Encourage an equitable distribution of affordable housing and public services and facilities throughout the City.
    - **LUE Policy 1.1.3:** Provide for and encourage the development of neighborhood-serving commercial uses in areas of Brawley presently under-represented by such uses. Encourage the integration of retail or service commercial uses on the street level of office projects. Neighborhood-serving commercial centers should primarily provide convenience goods and services and be consistent with the scale of the surrounding neighborhood.
    - **LUE Policy 1.1.4:** Facilitate the development of vacant and under-utilized highway parcels with commercial uses where appropriate and compatible with surrounding uses to capitalize on their highway access and visibility.
    - **LUE Policy 1.1.5:** Support modification of present City boundaries in unincorporated areas within the City of Brawley's sphere of influence where they are irregular and create inefficiencies.
    - **LUE Policy 1.1.6:** Maintain an updated Sphere of Influence for the City of Brawley.
    - **LUE Policy 1.1.7:** Encourage in-fill of vacant parcels in areas already predominately developed.
    - **LUE Policy 1.1.8:** Ensure an adequate supply of commercial and industrial land for potential commercial and industrial expansion and development. Businesses within a community or neighborhood should provide a range of job types.
    - **LUE Policy 1.1.9:** As part of the City's attraction to business and industry, designate adequate residential land to house future employees.

- **LUE Policy 1.1.10:** Consider incentives (such as waiver of fees or expedited permit processing) to encourage lot consolidation and parcel assemblage to provide expanded opportunities for coordinated development and redevelopment if a positive fiscal impact will be experienced by the City as a result of said project.
- **LUE Policy 1.1.11:** Provide development of light industrial and business park uses. Encourage industrial and business parks as the preferred method of accommodating industrial growth.
- **LUE Policy 1.1.12:** Ensure that the distribution and intensity of land uses are consistent with the Land Use Plan and classification system contained in the Land Use Element. Development at an intensity or density between the effective and maximum levels can occur only where projects offer exceptional design quality or important public amenities or benefits above the standards required by the City's Zoning Ordinance and other regulatory documents.
- **LUE Policy 1.1.13:** Where feasible, increase the amount and network of public and private open space and recreational facilities which will be adequate in size and location to be useable for active or passive recreation as well as for visual enhancement.
- **LUE Policy 1.1.14:** Maintain sufficient flexibility in the types of uses allowed in commercially designated areas to address changes in market conditions and to encourage competition.

- **LUE Objective 1.2:** Ensure that future land use decisions are the result of sound and comprehensive planning.
  - **LUE Policy 1.2.1:** Consider all General Plan goals and policies in evaluating proposed development projects for General Plan consistency.
  - **LUE Policy 1.2.2:** Maintain consistency between the Land Use Element, Zoning Ordinances, and other City Ordinances, regulations and standards.
  - **LUE Policy 1.2.3:** Endeavor to promote public interest in, and understanding of, the General Plan and regulations relating to it.
  - **LUE Policy 1.2.4:** Encourage citizen participation in planning and development of land use programs.
  - **LUE Policy 1.2.5:** Foster inter-governmental cooperation and coordination in order to maximize the effectiveness of land use policies.
- **LUE Objective 1.3:** Coordinate with other federal, state, and local public agencies and other community-oriented organizations to ensure that services to the public are effectively provided.
  - **LUE Policy 1.3.1:** Participate in established networks of planning related organizations, such as the League of Cities, the Community Redevelopment Association, the American Planning Association, and others to continuously improve the City's efficiency in providing for the public health, safety, and welfare of its residents.
  - **LUE Policy 1.3.2:** Establish and maintain close contact with community-based organizations within the City to encourage coordinated approaches to address important

issues and problems.

- **LUE Policy 1.3.3:** Maintain close coordination with the County of Imperial, the Southern California Association of Governments, and other local and federal agencies on issues affecting the future of the Imperial Valley.

LUE Goal 2: Compatible and Complementary Development

- **LUE Objective 2.1:** Ensure that new development is compatible with surrounding land uses in the community and in adjacent unincorporated areas, the City's circulation network, availability of public facilities, existing development constraints and the City's unique characteristics and resources.
  - **LUE Policy 2.1.1:** Coordinate and monitor the impact and intensity of land uses in adjacent jurisdictions on Brawley's transportation and circulation systems so that the City is able to provide efficient movement of people and goods with the least interference.
  - **LUE Policy 2.1.2:** Encourage larger scale commercial uses in areas that are easily accessible to major transportation facilities.
  - **LUE Policy 2.1.3:** Regulate development in identifiable hazardous areas or in areas that are environmentally sensitive to ensure the community's public health and safety.
  - **LUE Policy 2.1.4:** Encourage the preservation and enhancement of public vistas.
  - **LUE Policy 2.1.5:** Encourage consolidation of parking and reciprocal access agreements among adjacent businesses.
  - **LUE Policy 2.1.6:** For mixed-use development, ensure that parcels of adequate size are used.
- **LUE Objective 2.2:** Assure a safe, healthy and aesthetically pleasing community for residents and businesses.
  - **LUE Policy 2.2.1:** Mitigate traffic congestion and unacceptable levels of noise, odors, dust and light and glare which affect residential areas and sensitive receptors.
  - **LUE Policy 2.2.2:** Ensure a sensitive transition between commercial or industrial uses and residential land uses by employing techniques that include adequate buffering, landscaping and setbacks.
  - **LUE Policy 2.2.3:** Where mixed uses are permitted such as in the Downtown Overlay Districts, ensure compatible integration with adjacent uses to minimize potential conflicts, such as aesthetics, noise, and traffic. Compatibility with existing neighborhoods is important and should be an important consideration.
  - **LUE Policy 2.2.4:** Encourage the elimination of non-conforming land uses and nonconforming buildings.
  - **LUE Policy 2.2.5:** Ensure adequate monitoring of uses that involve hazardous materials to avoid industrial accidents, chemical spills, fires and explosions and to ensure the community's public health and safety.
  - **LUE Policy 2.2.6:** Maintain and enhance the quality of healthy residential neighborhoods, and safeguard neighborhoods from intrusion by non-conforming and disruptive uses.

- **LUE Objective 2.3:** Ensure that development within the City's Service Area Plan is compatible with both existing and planned land uses within the City's boundaries.
  - **LUE Policy 2.3.1:** Identify appropriate uses within the Service Area Plan and discuss potential development strategies with the County Planning Department.
  - **LUE Policy 2.3.2:** Review all applications for development in the Service Area Plan and ensure all development complies with the City of Brawley rules and regulations.

LUE Goal 3: Revitalization of Aging Commercial, Industrial, and Residential Use and Properties

- **LUE Objective 3.1:** Revitalize aging commercial, industrial and residential properties.
  - **LUE Policy 3.1.1:** Encourage and continue the use of redevelopment activities, including the provision of incentives for private development, joint public-private partnerships, and public improvements in the redevelopment project areas.
  - **LUE Policy 3.1.2:** Encourage the rehabilitation of existing commercial arcades and signage.
  - **LUE Policy 3.1.3:** Continue to provide rehabilitation assistance in targeted residential neighborhoods to eliminate code violations and enable the upgrading of residential properties.
  - **LUE Policy 3.1.4:** Encourage the restoration and rehabilitation of properties in Brawley eligible for inclusion on the National Register of Historic Places (NRHP), California Register of Historic Resources (CRHR), or potentially eligible listed buildings, including historically sensitive restoration, as a means of preserving eligible structures.
  - **LUE Policy 3.1.5:** Promote vigorous enforcement of City codes, including building, zoning, and health and safety, to encourage building and property maintenance.
  - **LUE Policy 3.1.6:** Continue the graffiti removal program to facilitate prompt removal of graffiti on private and public property.
  - **LUE Policy 3.1.7**: Establish incentives to improve edge conditions and buffer areas between residential neighborhoods and adjacent commercial, industrial, and agricultural uses and highways.
  - **LUE Policy 3.1.8:** Re-establish the Brawley Central Business District as a major regional shopping, marketing, and office/commercial area for north Imperial County, while maintaining and encouraging a pedestrian friendly downtown "village" environment.
  - **LUE Policy 3.1.9:** Encourage mixed-use of commercial, residential, and institutional uses within the Central Business District. Mixed uses may be located in the same building footprint or in separate buildings.

LUE Goal 4: Improved City-wide Urban Design

- **LUE Objective 4.1:** Improve urban design in Brawley to ensure development that is both architecturally and functionally compatible and accessible by multimodal forms of transportation.

- **LUE Policy 4.1.1:** Develop citywide visual and circulation linkages through strengthened landscaping, pedestrian lighting, bicycle trails (where feasible) and public identity graphics along major street corridors. Establish gateways throughout the City that identify and highlight Brawley's unique character.
- **LUE Policy 4.1.2:** Encourage and promote high quality design and physical appearance in all development projects.
- **LUE Policy 4.1.3:** Improve the image of major highways through the use of landscaping, lighting, graphics and/or streetscape treatments.
- **LUE Policy 4.1.4:** Preserve and enhance the City's "small town" character. Neighborhoods should be designed so that housing, jobs, daily needs and other activities are within easy walking distance of each other, while preserving the aesthetic character of the community.
- **LUE Policy 4.1.5:** Preserve historically significant structures and sites, and encourage the conservation and rehabilitation of older buildings, sites and neighborhoods that contribute to the City's historic character. Establish a strong architectural theme that represents the character and history of Brawley.
- **LUE Policy 4.1.6:** Improve the overall quality of Brawley's multi-family neighborhoods through: a) improved buffers between multi-family residences and adjacent highway edges, commercial and industrial uses; b) provision of usable private and common open space in multi-family projects; c) increased code enforcement; and d) improved site, building, and landscape design.
- **LUE Policy 4.1.7:** Emphasize the Brawley Central Business District as the focal point of community, civic, cultural and recreational activities.
- **LUE Policy 4.1.8:** Wherever possible, create an "office park" or "campus-like" environment for industrial and business park developments.
- **LUE Policy 4.1.9:** Upgrade the visual quality of edge conditions between industrial and residential uses through street tree planting and on-site landscaping.
- **LUE Policy 4.1.10:** Reinforce Brawley's community identity throughout the greater Imperial County area in order to encourage developments within the City that enhances its character.
- **LUE Policy 4.1.11:** Review and revise, as necessary, the City's development standards to improve the quality of new development in the City and to protect the public health and safety.
- **LUE Policy 4.1.12:** Develop and implement design guidelines for all new development.
- **LUE Policy 4.1.13:** Develop and implement design guidelines that will preserve and enhance the character of the City's Brawley Central Business District and enhance downtown "village" environment.
- **LUE Policy 4.1.14:** Encourage entertainment opportunities such as restaurants, coffee shops, movie theatres, civic theatres, art, and water parks.
- **LUE Policy 4.1.15:** Encourage the undergrounding of utility lines in the central business

district and urban area.

- **LUE Policy 4.1.16:** Consider the use of form-based codes as a useful tool for achieving certain general plan goals, such as walkable neighborhoods and integrated land uses. The City may choose to establish form-based codes where such codes would implement General Plan policies.

LUE Goal 5: Economic Expansion and Diversification

- **LUE Objective 5.1:** Promote expansion of the City's economic base and diversification of economic activity.
  - **LUE Policy 5.1.1:** Broaden the City's tax base by attracting businesses which will contribute to the City's economic growth and employment opportunities while ensuring compatibility with other General Plan goals and policies.
  - **LUE Policy 5.1.2:** Coordinate efforts between the City's Chamber of Commerce and Economic Development Commission to actively market Brawley to prospective industries.
  - **LUE Policy 5.1.3:** Work in conjunction with the Chamber of Commerce to inventory the available resources which lend themselves to attracting business.
- **LUE Objective 5.2:** Provide for an adequate amount of industrial land uses to serve the needs of Brawley residents, providing a full range of industrial activity and employment opportunities for City residents.
  - **LUE Policy 5.2.1:** Establish standards for the location of industrial areas within the City of Brawley.
  - **LUE Policy 5.2.2:** Encourage industrial development in areas that have readily available rail and truck access.
  - **LUE Policy 5.2.3:** Encourage agriculturally related industrial land uses to be located in the Brawley Industrial Park.
  - **LUE Policy 5.2.4:** Maintain sufficient flexibility in the types of uses allowed in industrially designated areas, provided these uses are environmentally safe and do not endanger the surrounding population.

LUE Goal 6: Development Coordinated with Public Facilities and Services

- **LUE Objective 6.1:** Ensure that necessary public facilities and services are available to accommodate City needs.
  - **LUE Policy 6.1.1:** Provide a wide range of accessible public facilities and community services including fire and police protection, flood control and drainage, educational, cultural and recreational opportunities and other governmental and municipal services.
  - **LUE Policy 6.1.2:** Define needs and deficiencies in public facilities and services provided by the City and introduce priority projects into the City's budget process.
  - **LUE Policy 6.1.3:** Coordinate and collaborate with regional agencies providing public utility service to Brawley, such as the Imperial Irrigation District and the Southern

California Gas Company, to define area-wide and regional needs, projects and responsibilities.

- **LUE Policy 6.1.4:** Coordinate the construction of all public utilities to minimize disruption of vehicular traffic and negative impacts on roadways.
- **LUE Policy 6.1.5:** Continue to make incremental improvements to the flood control and drainage system.
- **LUE Policy 6.1.6:** Encourage planned improvements to electricity, natural gas, and communication service systems.
- **LUE Policy 6.1.7:** To ensure an orderly extension of essential services and facilities, and preservation of a free-flowing circulation system, continue to require provision of essential facilities and services at the developer's expense where these systems do not exist or are not already part of the City's financed capital improvement program.
- **LUE Policy 6.1.8:** Maintain and improve, where necessary, the City's infrastructure and facilities.
- **LUE Policy 6.1.9:** Concentrate government legislative and administrative offices in or near the central business district to facilitate public access, public interaction among City agencies, and interaction among agency staff.
- **LUE Policy 6.1.10:** Ensure adequate paramedical, fire, and police facilities/personnel needed to service the entire City.
- **LUE Policy 6.1.11:** Include standards for storm drains, sewer lines, and water lines in the City's Subdivision Ordinance.
- **LUE Policy 6.1.12:** Development in the County-designated Urban Area surrounding the City will require the extension of City infrastructure and provision of public service. Coordinate the extension of infrastructure and the provision of public services to new development in the Urban Area with the appropriate agencies including but limited to Imperial County and the Imperial County Local Area Formation Commission.
- **LUE Policy 6.1.13:** Encourage "joint use" facilities for future parks and schools. New school and park facilities should share land when feasible and when the time frame for development is within three (3) years.
- **LUE Policy 6.1.14:** Require school districts requesting development mitigation to establish use standards and determine facility capacities and student generation yield rates so that the need for new facilities can be projected in advance of development.
- **LUE Policy 6.1.15:** Require school districts and other public agencies requesting development mitigation to identify current areas of the City which are inadequately served by their facilities and services or which may be inadequately serviced in the future.
- **LUE Policy 6.1.16:** Encourage the City, school districts and other public agencies to seek ways to reduce facility costs and to use alternative financing sources in order to encourage and accommodate new development.
- **LUE Policy 6.1.17:** Encourage the use of assessment districts, Mello-Roos districts, and

other techniques for financing improvements serving existing and new development.

- **LUE Policy 6.1.18**: Encourage the Brawley School District and the Brawley Union High School District to seek additional and alternative funding for their capital outlay needs as a means of reducing the level of development fee exactions required by the districts.
- **LUE Policy 6.1.19**: Ensure the orderly construction of adequate permanent school facilities within the jurisdictions of the Brawley School District and the Brawley Union High School District in order to accommodate student enrollment generated from new development.
- **LUE Policy 6.1.20:** The City shall assist in coordinating school facility planning and siting efforts with local school districts and developers.
- **LUE Policy 6.1.21:** The City shall work closely with school authorities regarding funding mechanisms for new school facilities or to allow school districts to negotiate with project developers to minimize project impacts on the school districts.

LUE Goal 7: Conservation of Agricultural Lands and Open Space

- **LUE Objective 7.1:** Identify and encourage conservation of prime agricultural lands adjacent to the City of Brawley.
  - **LUE Policy 7.1.1:** Include a soils capability map in the General Plan showing the classifications of soils in and around the City and their value for agricultural uses.
  - **LUE Policy 7.1.2:** Restrict uses on agriculturally designated land to agricultural uses, accessory uses, and appropriate conditional uses, where feasible, recognizing that the City could not substantially grow without removing some agricultural land from production.
  - **LUE Policy 7.1.3**: Establish regulations to reduce conflicts between agricultural and adjacent or nearby non-agricultural uses resulting from the use of agricultural machinery, agricultural product or by-product processing, pest control techniques, etc., which does not conflict with the County's Right to Farm Ordinance.
  - **LUE Policy 7.1.4:** Rezone non-urban reserve agricultural land for non-agricultural uses only after urban reserve lands have been developed. Agricultural lands should be developed only as a means of providing needed urban development land for City growth needs and to allow for a minimum five-year supply of developable land.
- **LUE Objective 7.2:** Designate appropriate locations and adequate acreage for nonagricultural open spaces.
  - **LUE Policy 7.2.1:** Encourage common open space areas in planned developments (PDs).
  - **LUE Policy 7.2.2:** Require new common open space areas in planned developments and new residential subdivisions to be privately maintained.
  - **LUE Policy 7.2.3:** Public open spaces should be developed for multiple purposes to the extent that is economically, physically, and environmentally practical. Active recreation, wildlife habitat, and passive recreation are examples of such open space uses.

SOURCE: City of Brawley Final General Plan Update, 2030 (dated September 2008) www.brawley-ca.gov/cms/kcfinder/upload/files/planning/Final_GP_Master-PDF.pdf

4.10.6. Official Land Use Map

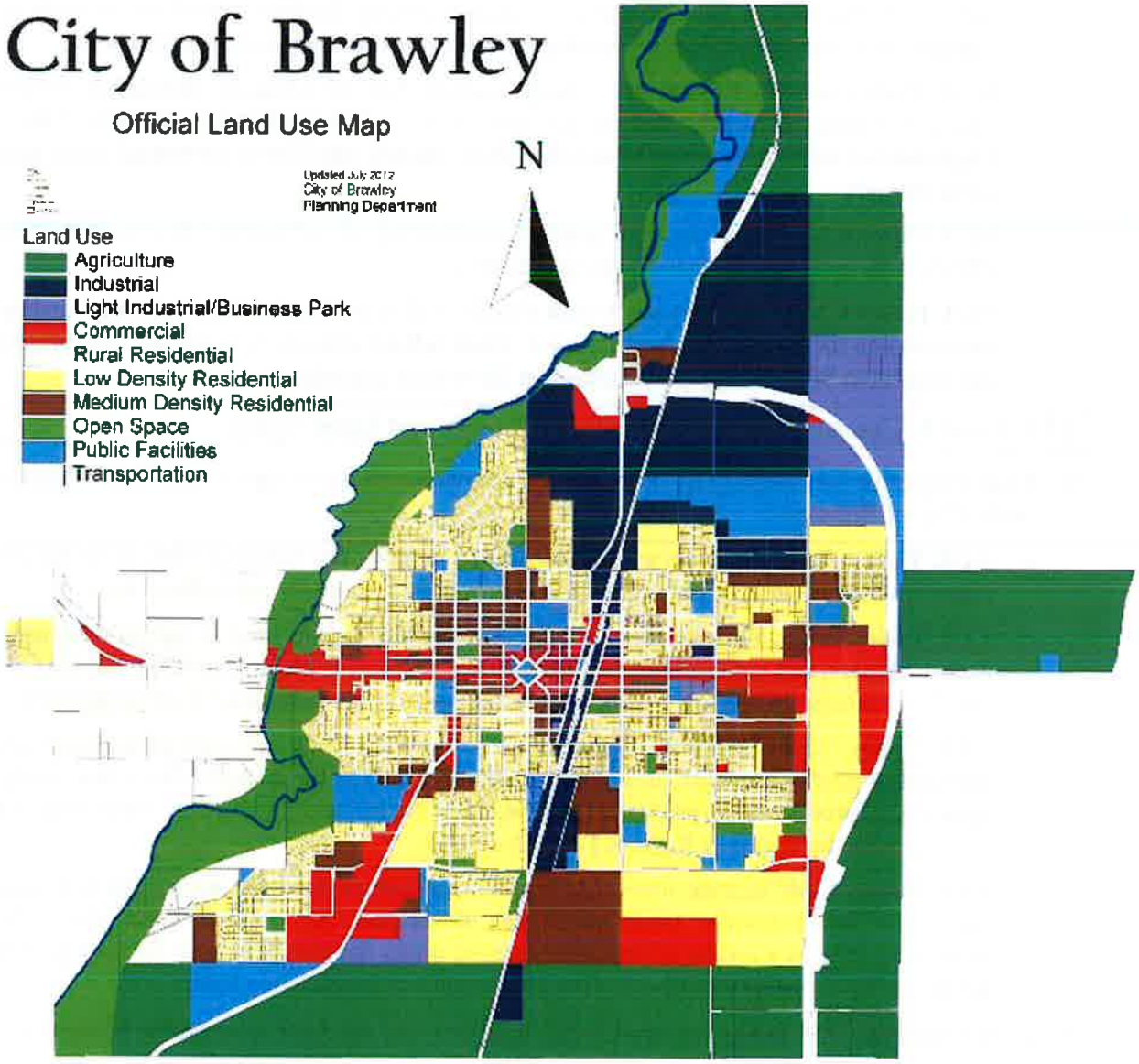


Figure 13. City of Brawley Official Land Use Map

SOURCE: City of Brawley, Official Land Use Map (updated June 2014) http://www.brawley-ca.gov/cms/kcfinder/upload/files/planning/Brawley_Land_Use_June_2014_Update.pdf

4.11. Calexico Area Land Use Plan

The Land Use Element is a guide to future land use within Calexico and affects many of the issues addressed in the other General Plan elements. The Land Use Element identifies the type and location of future land uses within the City. The specific land uses and their location within the community in turn affect the remaining General Plan elements. For example, the location and type of land uses outlined in the Land Use Element affect the circulation system that is identified in the Circulation Element. Likewise, the land uses identified in the Land Use Element reflect the community's goals and vision for its future form and character.

In addition to land uses, the Land Use Element also addresses how growth will occur, with special attention given to the public services and facilities and how they will be funded. Implementation of the Land Use Plan will also assist in creating a balance between jobs and housing within the City. A balance between jobs and housing allows people to live and work within the same community, and often within the same neighborhood.

Calexico is affected by several forces that are unique to its location adjacent to the international border with Baja California, Mexico. The City continues to relate to Mexicali, just across the border, as a boon to commercial activity in Calexico, but now is feeling the pressure of commuters who bring their children to private schools in Calexico, wealthy Mexican residents who are buying homes in Calexico because of safety concerns in Mexicali, and trucking and the potential for commercial trade due to the enactment of the North American Free Trade Agreement (NAFTA).

In addition to impacts associated with Mexico, Calexico and other cities in the Imperial Valley are now experiencing unprecedented growth due to the higher cost of housing in San Diego and other counties along coastal California. The City of Calexico has approximately 2,060 acres of existing residential, 290 acres of commercial uses, 255 acres of industrial uses, and the remaining acreage within the City consist of vacant, parks, schools and agricultural/open space uses. Urban development and agricultural production in Calexico is entirely dependent upon water imported from the Colorado River. As the population of the southwest continues to grow, the competition for limited water supplies will escalate.

The City of Calexico Zoning Ordinance establishes setbacks which provide for safe access around buildings associated with all types of land uses. The General Plan includes policies addressing local street design and appropriate access on major streets. The plan for streets is based on providing adequate cross sections of streets to accommodate through traffic. All new development is subject to these policies and standards. In older areas of the City where such requirements are substandard, the City is working to correct and improve less than ideal access.

4.11.1. Land Use Goal, Objectives, and Policies

Land use policies are fully detailed below and throughout the text of the General Plan and are applied on a citywide basis unless otherwise noted.

4.11.2. Land Use Goal

Land use should be planned and located to promote and retain the highest level of urban/rural-residential character of Calexico by continuing to provide quality urban-level services and uses in the developed areas while providing well planned development direction for the rural areas of the City. All development should be provided with adequate public services and facilities.

4.11.3. Distribution of Land Use

Objective 1: Land use distribution should be accomplished in a manner that protects the existing urban and rural areas of Calexico while meeting the goals, objectives, and policies of the General Plan; the land use distribution should be such that the integrity of the existing land use is maintained and/or enhanced, and the new land use is distributed to encourage the development of safe, efficient residential and employment uses.

Policy 1

a. Appropriate densities shall be established for new development projects so that they will be compatible with the existing surrounding development and future expected development.

b. New urban development shall be adjacent to existing urban development. Where questions of adjacency exist, it shall be determined by the City Council upon recommendation of the Planning Commission.

c. New rural residential development shall be adjacent to existing rural development. Where questions of adjacency exist, it shall be determined by the City Council upon recommendation of the Planning Commission.

d. New industrial land uses should be located such that trucks avoid the City center and in response to the eastern commercial border crossing.

e. Schools and parks should be located in proximity to the residents served. Final school locations must be reviewed and approved by the local school district in accordance with state law.

4.11.4. Land Use Compatibility

Objective 2: Land use distribution should create a pattern which organizes land uses in order to maximize compatibility with adjacent land uses.

Policy 2

a. Where land uses may result in conflicting activities, traffic, noise levels, visual character, etc., there shall be adequate buffering and/or setbacks required.

b. The Land Use Compatibility Matrix (Table LU-G) shall be used to determine general levels of compatibility.

c. In the event a question of compatibility exists between two uses/intensities, the lower intensity use shall take precedent.

d. The City Council, upon recommendation of the Planning Commission, shall make the final determination in those areas of questionable land use compatibility.

4.11.5. Public Services and Facilities

Objective 3: Land use pattern and population of Calexico should be consistent with the capabilities of existing and planned public services and facilities.

Policy 3

a. The number of dwelling units in the City shall be limited to those which can be adequately served by public services and/or facilities.
b. The City shall maintain current information concerning the capacities of the public services and facilities it provides.
c. The City shall encourage other public service agencies to keep their capacity information current.
d. Land uses and development review applications that are inconsistent with the capability of any public service agency to provide cost-effective service shall not be approved.
e. Major extensions of services or utilities to facilitate land use change shall not be approved without a thorough review of all social, economic, and environmental factors with appropriate mitigation measures implemented, if necessary.
f. The City's Service Area Plan shall be updated every 5 years.

4.11.6. Natural Hazard Constraints

Objective 4: The distribution and intensity of land uses should consider the health, safety, and welfare of the community in regard to man-made and natural hazards.

Policy 4

a. Floodways shall be kept free and clear of any structure or other obstructions.
b. Development that encroaches into a floodplain shall meet the Federal Emergency Management Administration (FEMA) requirements.
c. Inappropriate existing land uses within a land use compatibility zone as defined by the Imperial County Airport Land Use Compatibility Plan, shall not be expanded or enlarged beyond the requirements permitted in the zone.
d. Future land uses within land use compatibility zone A or B as defined by the Imperial County Airport Land Use Compatibility Plan, shall meet the guidelines of the zone. Future land uses located in zone C shall be reviewed for compatibility by the City prior to approval.
e. Future residential land uses shall not be located immediately adjacent to the railroad tracks.

4.11.7. Rural Character

Objective 5: The rural character of the outlying areas of Calexico should allow for the development of rural residential homes as a means of preserving some of the rural history of the area and to provide housing for the upper income limits.

Policy 5

a. In the development of the outlying land use in Calexico provisions shall be made in the development plans for large lot rural residential housing.

b. The keeping of farm or ranch animals shall be restricted to the rural residential areas and any continuation of farm or ranching activity is strongly discouraged within the City limits.

4.11.8. Rural Residential

Objective 6: Rural Residential land use shall be provided for in the development of projects within the outlining areas of Calexico as part of a master plan or planned community development.

Policy 6

a. Development of rural residential units shall be appropriately buffered from adjacent land uses so as not to cause problems from any keeping of farm or ranch animals.

b. Existing rural residential land use areas shall be encouraged to provide the City with a conformance schedule for the elimination of the farm or ranch activity upon annexation into the City limits.

c. One half acre lots shall be the minimum parcel size in rural residential areas.

d. Neighborhood commercial activities may be located on the border of rural residential and urban land uses.

e. Lots created as a result of a planned residential development shall not be further subdivided.

f. Mobile homes certified under the provisions of the National Mobile Home Construction and Safety Standards may be allowed on permanent foundations in single-family residential areas where the mobile homes will be compatible with existing or future single family homes. Standards of placement on lots should be developed as specified in California State Law (Government Code Section 65852.3).

g. Manufactured housing units may be allowed in rural residential areas.

4.11.9. Single-Family Residential

Objective 7: Low and medium density single-family residential land uses should be encouraged, in new and in-fill areas, to provide family oriented housing in a wide range of sizes and costs.

Policy 7

a. Single-family residential land uses shall be located in areas adjacent to equivalent densities in in-fill situations.

b. New single-family residential projects shall be encouraged to have a variety of housing types and styles.

c. Manufactured housing units may be allowed in single-family residential areas.

d. Mobile homes certified under the provisions of the National Mobile Home Construction and Safety Standards may be allowed on permanent foundations in single-family residential areas where the mobile homes will be compatible with existing future single family homes. Standards for placement on lots should be developed as specified in California State Law (Government Code Section 65852.3).

e. Lots created as a result of a planned residential development (PRD) shall not be further subdivided.

f. Lots in Low Density single-family residential areas shall be a minimum of 6,000 square feet.

4.11.10. Multiple-Family Residential

Objective 8: Multiple-family residential of varying types and densities are encouraged where compatible with existing land uses and the provision of public services.

Policy 8

a. Multiple-family residential land uses shall be located in areas where compatible with existing land uses and in close proximity to circulation, transit availability, commercial areas, and provision of public services and facilities.

b. Multiple-family residential projects should provide sufficient open space to balance the developed areas of the site.

c. Multiple-family residential projects should provide recreational uses and activities such as playgrounds, picnic areas, and pools.

d. Adequate parking based upon the number of bedrooms in individual units shall be provided as approved by the City Planning Department.

e. Adequate access should be provided onto improved, City maintained roadways that can accommodate increased traffic.

f. Condominium projects shall be limited to density not to exceed 20 dwelling units per gross acre. Approval of projects at the maximum density of this category shall be made on the basis of the findings by the Planning Commission and their recommendation to the City Council that the project under consideration meets and exceeds the standards of the General Plan and the zone.

g. Condominium projects shall include enhanced design features such as garages, increased number of parking spaces, and recreational facilities such as pools, spas, and ball courts.

h. Apartment projects shall be limited to 20 dwelling units per acre excepting provisions for affordable income housing as noted. Approval of the projects at the maximum density of this category shall be made on the basis of the findings by the Planning Commission and their recommendation to the City Council that the project under consideration meets and exceeds the standards of the General Plan and the Zoning Ordinance.

i. A density bonus of up to 30 dwelling units per acre may be granted subject to affordability requirements and the granting of a Conditional Use Permit, in accordance with City policy. Apartment projects eligible for a density bonus of up to 30 units per acre shall be no less than one (1) acre in size.

j. Multiple-family residential developments above 20 dwelling units per gross acre shall be for rental only and shall not be converted to units for sale. Approval of projects at the maximum density of this category shall be made on the basis of the findings by the Planning Commission and their recommendation to the City Council that the project under consideration meets and exceeds the standards of the General Plan and the zone.

k. Apartments should be designed to accommodate both families and singles.

l. Senior citizen apartments in the Multiple-Family Residential category may receive a bonus of up to 5 units per gross acre, to a maximum of 35 units per gross acre. Approval of projects at the maximum density of this category shall be made on the basis of the City Council that the project under consideration meets and exceeds the standards of the General Plan and the Zoning Ordinance.

m. Multiple-family residential complexes may be eligible for a density bonus as a result of providing low and moderate income housing (see Housing Element Program).

4.11.11. Planned Residential Developments

Objective 9: Planned residential developments (PRD) may be used for any size property where design flexibility is desired and/or necessary and for the mitigation of on-site adverse physical conditions pursuant to Zoning Ordinance Section 17.09.200.

Policy 9

a. The density allowed in planned residential development land use areas shall be set by conditional use permit or specific plan and shall be based upon the density of existing surrounding land uses, site conditions, and the availability of public services.

b. The density of any planned residential development land use shall not exceed 20 dwelling units per net acre.

c. Useable open space is desirable and shall comprise at least 30 percent of the total site area, excluding private yards, parking lot islands, and road medians.

4.11.12. Mobile Home Parks

Objective 10: Mobile home parks are encouraged in the Medium Density land use category where compatible with existing land uses and public services to provide alternative housing arrangements.

Policy 10

a. Mobile home park land uses should be located in areas with similar existing uses and densities or in specific plan areas with appropriate design considerations included.

b. Mobile home park land uses shall be located in close proximity to circulation, transit availability, commercial areas, and the provision of public services and facilities.

4.11.13. Commercial

Objective 11: Commercial land use that is balanced in regard to size and distribution of goods with the current and future needs of the City should be encouraged.

Policy 11

a. Neighborhood commercial centers should be designed and located in such a manner so as to compliment and not conflict with adjoining residential areas.

b. Specialty commercial uses such as swap meet sites, although typically transient in nature, should provide standard amenities such as paved parking lots, restroom facilities, shade structures, and food vendors if allowed to operate for longer than one week.

c. The City should adopt an ordinance which would require a certain percentage of swap meet admission fees to the City's general fund.

d. Highway commercial uses along Highway 111/Imperial Avenue should encourage roadway oriented retail activity such as automobile sales, shopping centers, hotels and restaurants.

e. Retail uses within the highway commercial zone should be located within retail centers having centralized ingress and egress points and/or frontage road access in order to minimize curb cuts along Highway 111 and Highway 98.

4.11.14. Industrial

Objective 12: Industrial land uses that provide a full range of industrial and manufacturing services are encouraged where they are compatible with existing and other planned land uses.

Policy 12

a. Industrial parks are encouraged within a specific plan area or planned development within a planned community.

b. Industrial uses shall be located so as to not create adverse impacts on surrounding land uses and/or the City circulation system.

c. Heavy industrial land uses should be primarily designed for manufacturing, assembly, packaging, processing, fabrication, and storage. Retail sales should be limited to 25 percent of overall floor area.

d. Industrial land uses shall be adequately screened to reduce glare, noise, dust, and vibrations.

e. Noise attenuation measures such as buffer zones or noise attenuation walls shall be used to reduce outside noise levels when existing residential developments are adjacent to new or existing industrial developments. Outside noise levels at the property line should be 65 dBA CNEL or less.

f. All outside storage shall be completely screened from view with permanent walls or landscaping.

g. Light industrial land uses shall be approved through a planned development within a planned community.

h. The industrial park environment should blend well designed and functional buildings with landscaping.

i. The types of activities allowed in industrial park land uses include: light industrial uses, office and administration facilities, research and development laboratories, warehousing, as well as support commercial services.

j. Industrial and manufacturing uses should be located adjacent to the railroad to take advantage of transportation links and maquiladora businesses. Other than rail-served uses, industrial development should be discouraged west of the railroad tracks.

k. Industrial uses should be located along the Cole Road and Heber Road corridors to encourage truck traffic to avoid other streets within the City.

4.11.15. Business Park

Objective 13: Business Parks shall be encouraged within the City to increase the diversity of employment opportunities and discourage heavy truck traffic.

Policy 13

a. Business parks are encouraged within a specific plan of land use or planned development within a planned community.

b. Business park uses shall be located so as to not create adverse impacts on surrounding land uses and/or the City circulation system.

c. Business park uses should be designed for light manufacturing, assembly, packaging, fabrication, on-site sales, services, and offices with less need for trucking or distribution. Commercial and restaurant uses shall be allowed to support the needs of the businesses and employees. Warehousing shall be prohibited.

d. Business parks should be developed in a well landscaped setting, with buildup not to exceed 50 percent lot coverage.

4.11.16. Airport Land Use

Objective 14: The City shall work with the Airport Management to encourage and attract compatible users and uses in and around the airport to promote airport safety and consider potential airport related noise.

Policy 14

a. In the event that Airport Management receives a substantial number of complaints regarding increases in noise levels, the City of Calexico may request noise abatement procedures be established and implemented.

b. Significant changes in land use in and around the airport (within 2 miles) shall be referred to the Imperial County Airport Land Use Commission for their comment and consideration.

4.11.17. Land Use and Circulation

Objective 15: Land use should not overburden the City circulation system (see also the Circulation Element).

Policy 15

a. No land use should be approved that will increase the traffic on a City roadway above the roadway's existing design capacity at Level of Service "C."

b. The City should continuously monitor the impact and intensity of land use on circulation to ensure that the circulation system is not overburdened.

c. The land use pattern should encourage the use of public transportation by City residents and visitors.

d. Schools should have direct access to collector streets or larger, but not to state highways. Local residential streets should not serve as the primary drop off and pick up location unless off-street drop off and pick up zones are provided.

4.11.18. Agricultural Development

Objective 16: The City should support and promote the continuation of ongoing agricultural uses which provide economic return to the City directly or indirectly.

Policy 16

a. The City should encourage agricultural uses on vacant lands master planned for other land uses, as an interim use.

b. The City should periodically evaluate the viability of the economics to continuing the agricultural use.

c. Through the City's review process, any proposed non-agricultural projects near existing agricultural areas shall require an assessment to determine potential impacts to agricultural production and potential impacts to the proposed land use.

d. Agricultural land should not be annexed into the City until development is eminent. Agricultural uses should cease no later than 2 years after annexation of the property into the City of Calexico.

4.11.19. Regional Land Use Planning

Objective 17: The City should support and promote the efforts made to provide a reasonable regional land use planning program.

Policy 17

a. The City should support and participate in the Southern California Association of Governments' (SCAG) regional land use planning programs.

b. The City should evaluate the impact on regional land use planning when considering major changes to its land planning program.

4.11.20. Intergovernmental Coordination

Objective 18: The City should encourage the coordination of land use planning programs among local, regional, state, and federal jurisdictions.

Policy 18

a. The City should evaluate the land use planning programs of neighboring jurisdictions when considering changes to its land use program.

b. The City should notify affected jurisdictions of changes to the City's land use planning programs that may affect them.

c. The City should cooperate with adjoining jurisdictions through review and comments on changes to land use plans that may affect Calexico.

d. The City should work with Caltrans and the County of Imperial to identify, post, and enforce truck routes through and around the City. The completion of the SR098 realignment/bypass will encourage truck traffic to bypass the City interior.

e. The City should coordinate with the railroads and Imperial Irrigation District regarding trails adjacent to their rights of way and use of abandoned rights of way.

f. The City should work with the Calexico Unified School District, Heffernan Hospital Board, and other entities that provide public services to coordinate joint use, emergency services, etc.

g. The City shall work with the Imperial Irrigation District to provide adequate land for substations that need to be located within the City.

4.11.21. Sphere of Influence

Objective 19: Through the update of the City's Service Area Plan, the City should review its current sphere of influence area at appropriate intervals (a minimum of once every 5 years) to assure that the sphere continues to delineate the logical areas of future City growth.

Policy 19

a. The City sphere of influence shall be the logical extension of the areas of future City growth.

b. The City should work with the Local Agency Formation Commission (LAFCO) and the County of Imperial to maintain and establish sphere of influence boundaries.

c. Sphere of influence boundaries should have physical or topographic boundaries easily discernible on the landscape.

d. Expansion of the sphere of influence boundaries shall take into consideration the logical extension of Calexico's public services such as water, sewer, police protection, fire protection, schools, and commercial services.

4.11.22. Implementation and Funding

Objective 20: The City shall assure that funding for infrastructure and services needed to provide for the health, welfare and safety of the residents of Calexico is available.

Policy 20

a. The City shall require developer fees that shall be reviewed every 5 years to assure adequate funds are being collected to service new development.

b. The City should encourage the use of Community Facilities Districts to assist with funding and place the burden of infrastructure and services needed for new development on the residents and businesses located therein.

4.11.23. Infill Development

Objective 21: The City shall encourage infill and adjacent new development to provide for the efficient use of existing infrastructure, avoid "leap frog" new development and to reduce impacts to agriculture.

Policy 21

a. The extension of water and sewer service facilities such as transmission lines or pumps to accommodate new development projects should be limited to one-quarter mile across an undeveloped area.

b. The City should consider developing a policy to reduce certain development fees for infill projects consistent with the General Plan and Zoning Ordinance located on parcels that are surrounded by existing development.

4.11.24. Cultural Resources and the Arts

Objective 22: To identify and preserve significant structures, sites and life stories containing historic or cultural value for the enrichment and enjoyment of future generations.

Policy 22

a. Identify historic sites through historic landmark plaques and, where appropriate, seek applicable designation with the proper State and/or federal historic preservation agency.

b. Support private efforts to reinvest in and restore historic or architecturally significant structures and to continue their use in the community.

c. Protect significant archaeological resources in accordance with the California Environmental Quality Act ("CEQA").

d. Encourage the use of the Mills Act (tax abatement program for owners of historic structures) to assist private owners in preserving and rehabilitating historic structures.

e. The City should consider the development of a cultural center for the arts, possibly in an existing historic structure.

f. The City shall continue to work with the Cultural Arts Commission and private parties to establish a museum. (See also policies related to public art in the Parks and Recreation and Economic Development Elements.)

4.11.25. City of Calexico Land Use Maps

The City of Calexico's Land Use Maps are provided below:

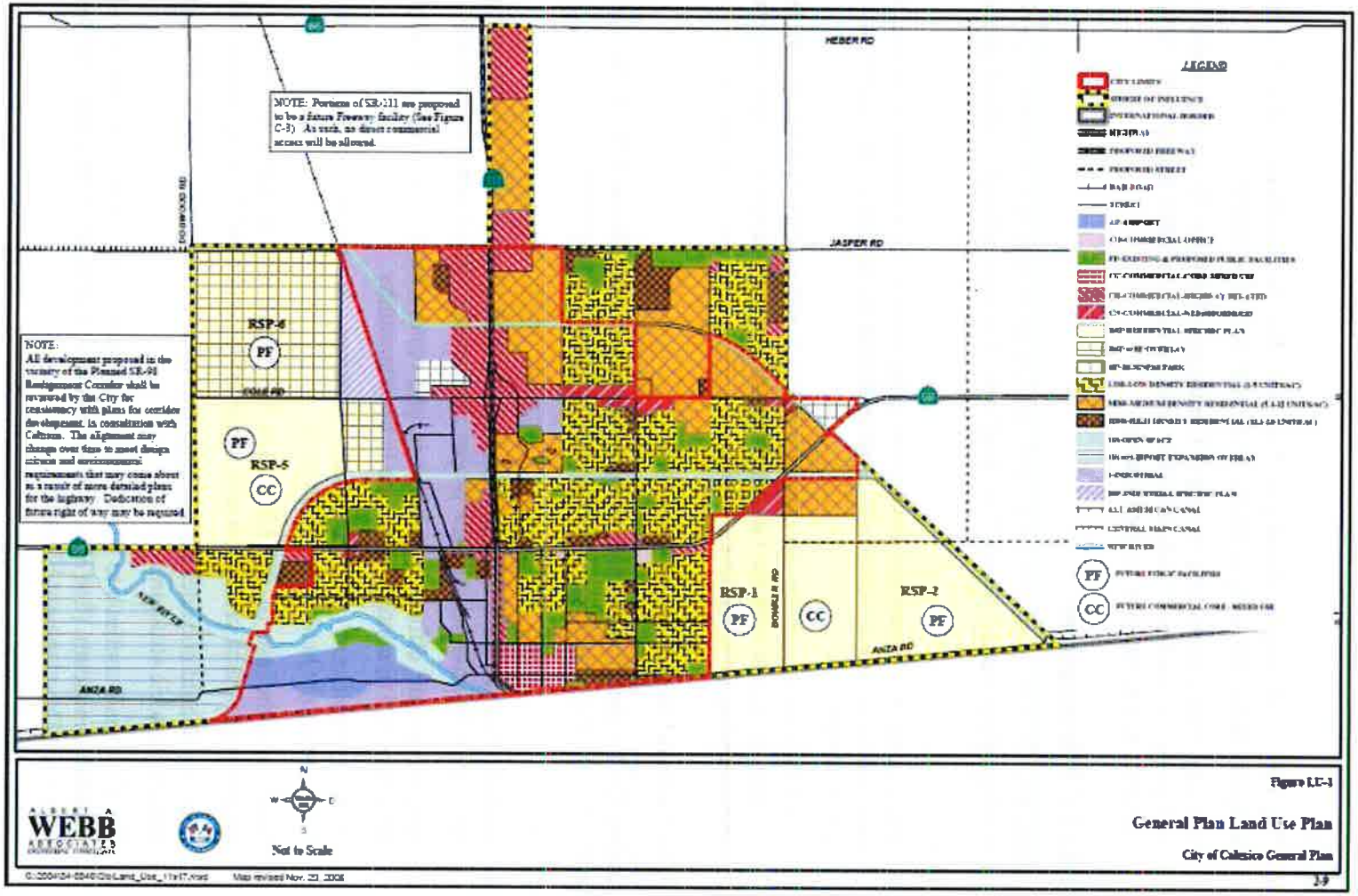


Figure 14. City of Calexico General Land Use Plan Map

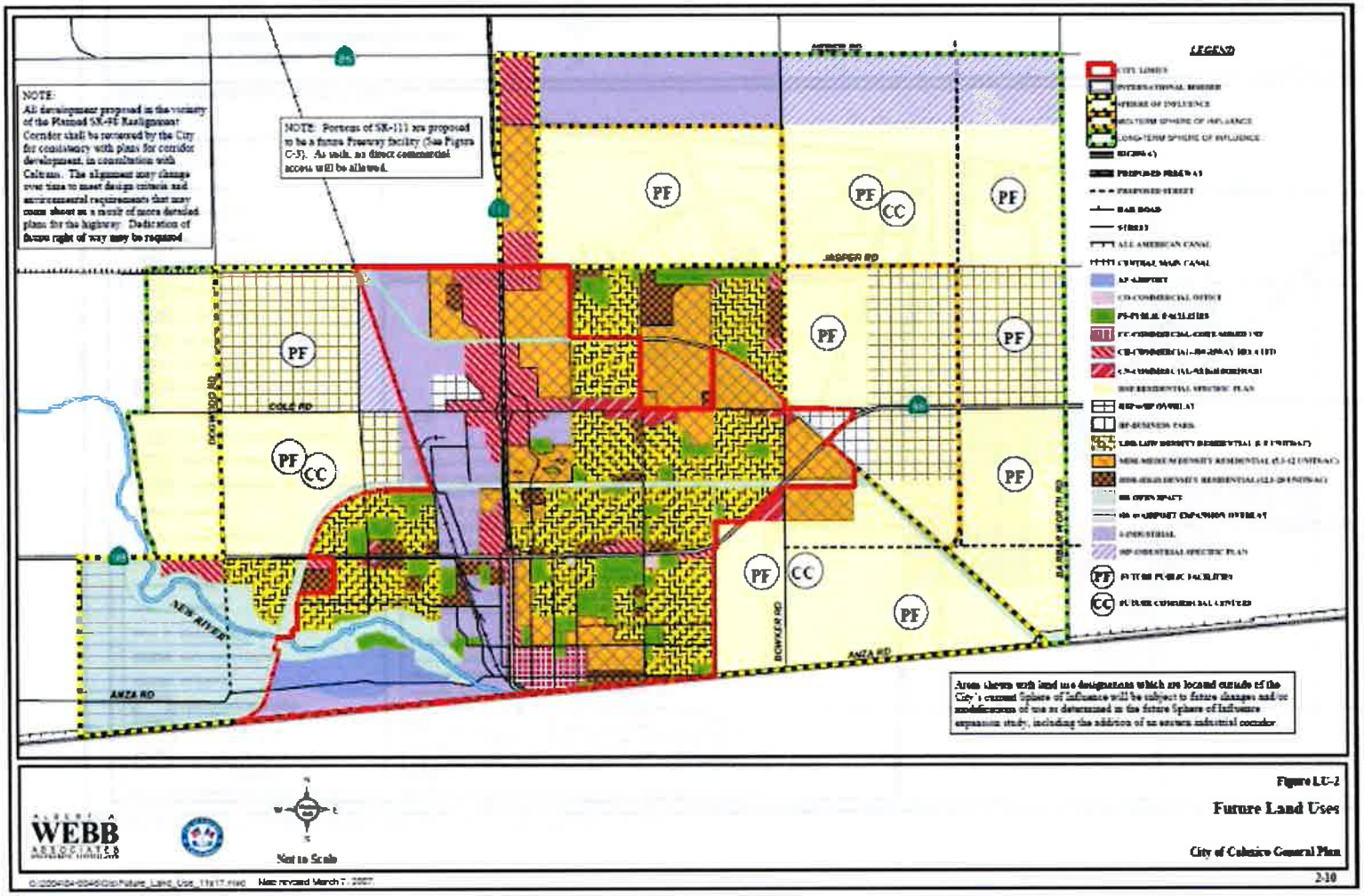


Figure 15. City of Calexico Future Land Uses

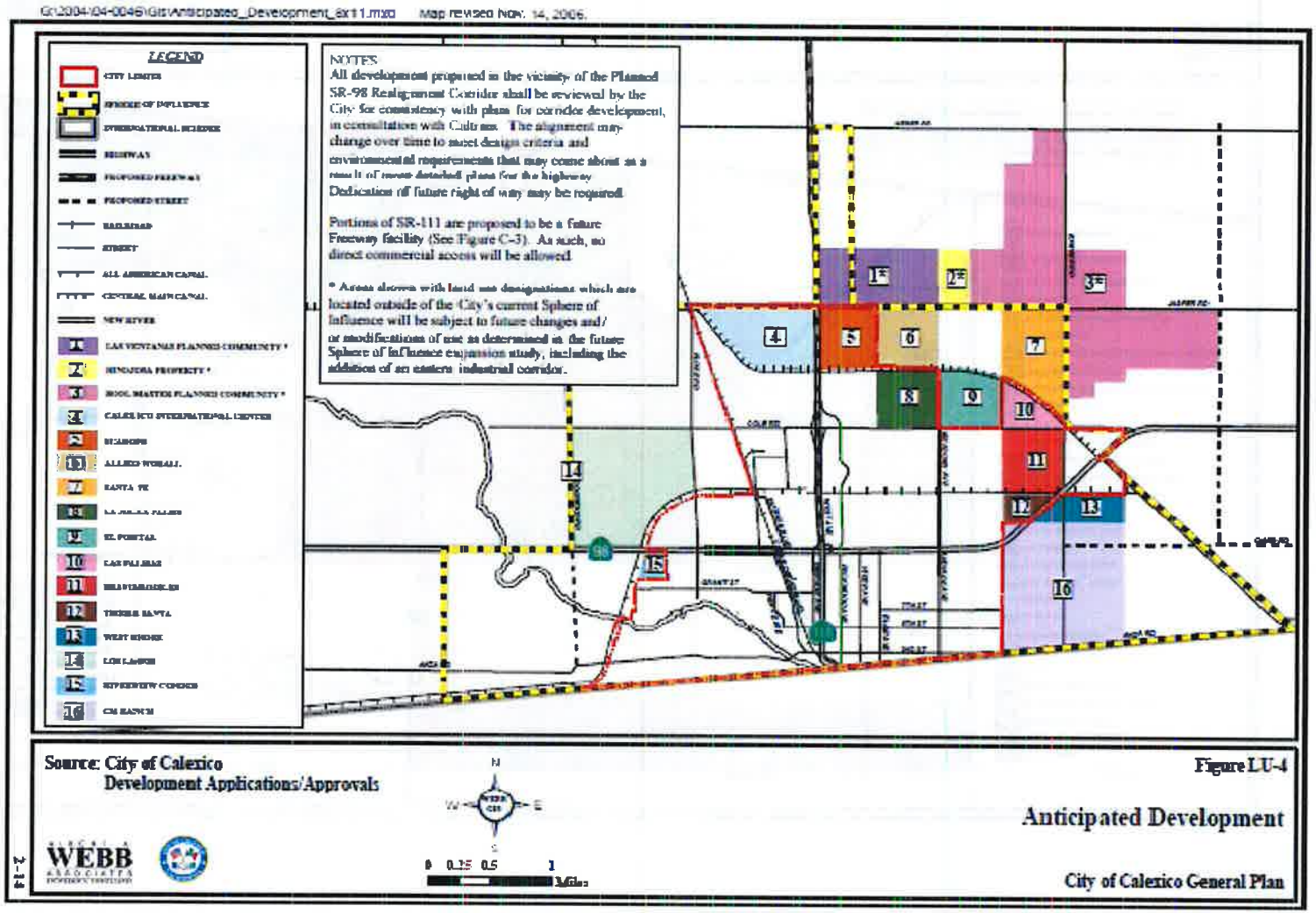


Figure 16. City of Calexico Anticipated Development

4.12. Calipatria Area Land Use Plan

The City of Calipatria is located in rural Imperial County and has a population of approximately 7,800 residents (including 4,372 inmates at the State prison). The City's last comprehensive General Plan update was in 1992. Since that time, a decline in agricultural opportunities has adversely affected the economy and the community. Calipatria has experienced little economic growth, high unemployment rates (approximately 20%), and a high poverty rate (approximately 33%).

Calipatria encompasses about 3.7 square miles on a predominantly flat stretch of land in northern Imperial County just southeast of the Salton Sea. Two non-contiguous parcels are under city jurisdiction: the Calipatria State Prison site and the wastewater treatment facility. The Cliff Hatfield Memorial Airport occupies 200 acres in the northwest corner of the city. Calipatria is surrounded on all sides by agricultural land. While there are no agricultural lands within the city limits, agriculture lands surround the City and are a primary land use throughout Imperial County. The City is situated in one of the finest agricultural areas in the world. The reason for the agricultural success of the region is the large quality of water which is transported from many miles east via the All-American Canal and subsequently distributed to farm lands by similar canals. Calipatria is located on the gently sloping Imperial Valley floor, situated on a very deep alluvial fill deposited over many thousands of years from the Colorado River and other streams originating in the Superstition and Chocolate Mountains. Calipatria is approximately 180 feet below sea level.

Since its incorporation, the City of Calipatria has had a rich, eighty three year old history and developed as a semi-rural community with farming as its major industry. The City of Calipatria is an exciting gateway for NAFTA and is ideally situated within an ever-growing corridor of commerce between Los Angeles and Mexico. Calipatria has excellent transportation opportunities and a projected growth that make it the premier place to do business.

According to the Southern California Association of Governments' (SAG's) 2012 Regional Transportation Plan/Sustainable Communities Strategy the City of Calipatria is forecasted to add just over 1,900 residents in 379 households from 2012 to 2035. Jobs in the City are forecasted to more than double, from the current 2,300 to an estimated 5,000 by 2035.

Calipatria's vision is to promote social equality amongst all residents, infill development, a jobs/housing balance and increased economic development opportunities. Based upon this vision, the following land use goals, policies and implementation measures have been developed and sited into one of three categories: General Land Use, Downtown District, and Economic Development.

4.12.1. General Land Use – Goals and Policies

Goal LU-1 Facilitate development of vacant and under-utilized land.

- Policy LU-1.1 Allow for flexibility with respect to land use so as to not discourage development and redevelopment of vacant and underutilized land.
- Policy LU-1.2 Use the City's Zoning Code and applicable residential, commercial, and open space design standards to guide the character of development and ensure compatibility with existing residential, commercial, and agricultural uses.
- Policy LU-1.3 Confine new growth to those areas that have adequate infrastructure to service new development or ensure concurrent infrastructure development.

Goal LU-2 Provide an adequate mix of low, medium, and high density residential land uses to house people of all socioeconomic levels.

- Policy LU-2.1 Encourage new residential development and the construction of a variety of housing types (such as single-family residential, townhomes, duplexes, etc.), including affordable housing, throughout the City to meet the needs of all existing and future Calipatria residents.
- Policy LU-2.2 Encourage development of a range of housing types that:
  - Are visually attractive and compatible in intensity, dwelling unit size, and structural design with the need to protect the surrounding natural environment
  - Meet the needs and suit the small town and rural lifestyles of present and future residents
  - Are located in close proximity to jobs and services

Goal LU-3 Improve air and water quality and reduce energy consumption and greenhouse gas emissions.

- Policy LU-3.1 Promote land development practices that reduce energy and water consumption, air and water pollution, greenhouse gas emissions, and waste, incorporating such techniques as:
  - Concentration of uses and design of development to promote walking and use of transit in lieu of the automobile
  - Capture and re-use of stormwater on-site for irrigation
  - Orientation of buildings to maximize opportunities for solar energy use, daylighting, and ventilation
  - Use of permeable paving materials
  - Shading of surface parking and walkways
- Policy LU-3.2 Encourage new development to use "green" building technologies in accordance with a green building standard, such as Leadership in Energy and Environmental Design (LEEDTM), or other equivalent.
- Policy LU-3.3 Develop land uses that enhance the existing transportation network, minimize

the impacts of vehicles in the City, and encourage the use of alternative modes of transportation.

- Policy LU-3.4 Require that new development include pedestrian access to enhance the community's pedestrian character and pedestrian linkages between the urban center, residential neighborhoods, and open spaces.

Goal LU-4 Protect natural resources and agricultural lands.

- Policy LU-4.1 Minimize disruption of agriculture by maintaining a compact urban form and by directing new growth to areas containing the least productive agricultural land.
- Policy LU-4.2 Avoid disturbances of sensitive habitats and species by directing new growth to areas where native habitats are not present.

4.12.2. Implementation Actions

- Update the City's Zoning Code to reflect the Land Use map and policies of the General Plan Land Use Element (Implements Policies LU-1.1 through LU-4.2).
- Increase allowable housing densities throughout all residential zones as specified by the General Plan (Policy LU-1.2, 2.1, and 2.2).
- Require new development to demonstrate incorporation of techniques that reduce energy and water consumption, air and water pollution, greenhouse gas emissions, and waste (Policies LU-3.1 through 3.4).

4.12.3. Downtown District – Goals and Policies

Goal LU-5 Make Calipatria's Downtown District an economically successful part of the community by enhancing commercial uses and providing new residential opportunities.

- Policy LU-5.1 Make revitalization of the Downtown District a high priority.
- Policy LU-5.2 Permit high density and intensity development on vacant and underutilized properties in the Downtown District.
- Policy LU-5.3 Concentrate "mixed-use" type development in the Downtown District.
- Policy LU-5.4 Integrate multi-family housing into office and/or retail projects that are compatible with residential uses.

Goal LU-6 Revitalize and improve the physical quality of the Downtown District while maintaining its historic character.

- Policy LU-6.1 Enhance the streetscape in the Downtown District to increase the area's attractiveness and foster private investment in the area.
- Policy LU-6.2 Require new development within the Downtown District to adhere to existing architectural themes and/or design standards identified in the Zoning Code.

- Policy LU-6.3 Require new development in the Downtown District to be pedestrian oriented, including pedestrian-oriented storefronts, entrances toward pedestrian ways, landscaping such as shade trees, benches, and other pedestrian amenities.

4.12.4. Implementation Actions

- Establish a Downtown District zone along Highway 115/Main Street near Highway 111 and update the Zoning Code to allow high density residential and "mixed-use" development in the Downtown District (Implements Policies LU-5.1 through LU-5.4).
- Pursue a variety of funding approaches, including grants, impact fees, transportation funds, and other programs to fund Downtown District enhancement and beautification, which may include streetscape improvements and landscaping, in order to increase the area's attractiveness and foster private development (Policies LU-6.1 through LU-6.3).
- Develop incentives, such as expedited permitting or financial incentives if available, for projects that would revitalize and improve the physical quality of the Downtown District, such as business loans, façade improvement and public improvement projects (Policies LU-6.1 through LU-6.3).

4.12.5. Economic Development – Goals and Policies

Goal LU-7 Strengthen the community's economy and provide employment opportunities for Calipatria residents.

- Policy LU-7.1 Pursue new developments and businesses that add to the City's economic base, particularly those that general sales tax and transient occupancy tax.
- Policy LU-7.2 Pursue economic development opportunities from new and emerging industries such as alternative energy and tourist services.
- Policy LU-7.3 Promote the retention of existing and attraction of new commercial, office, light, and heavy industrial business and afford opportunities for their growth and expansion.

Goal LU-8 Promote manufacturing and industrial development that takes advantage of the railroad through the City.

- Policy LU-8.1 Allow for job-generating industrial uses near the railroad, provided that these uses are environmentally safe and do not endanger the surrounding population.

Goal LU-9 Promote commercial and mixed-use development that takes advantage of the highways passing through the City.

- Policy LU-9.1 Allow for retail and other commercial uses along Highway 111/Sorenson Avenue and Highway 115/Main Street to provide services such as shops, food/grocery stores, gas stations, and restaurants (including to-go type restaurants) to residents, travelers passing through, and to attract visitors/tourists.

Goal LU-10 Promote compatible job-generating businesses in the Airport Overlay District.

- Policy LU-10.1 Allow business park development and commercial uses in the airport area that is compatible with and complimentary to airport uses.

Goal LU-11 Capitalize on opportunities to attract tourists to Calipatria.

- Policy LU-11.1 Promote opportunities to enhance retail services and agritourism and attract tourists to recreational and natural attractions, such as the Salton Sea, Alamo River, Weist Lake, Finney Lake, and Ramer Lake.

4.12.6. Implementation Measures

- Cooperate and coordinate business outreach programs with the Chamber of Commerce and other community organizations, and actively encourage business owners to engage City departments to address the business community's needs (Implements Policies LU-
- 7.1 and LU-7.3).
- Identify opportunities and incentives for new and emerging industries such as solar or geothermal energy industries (Policy LU-7.2).
- Revise the Zoning Code to allow high density industrial uses in sites adjacent to or in close proximity to the Southern Pacific Railroad tracks (Policy LU-8.1).
- Revise the Zoning Code to allow high density commercial development along Highways 111 and 115 and to allow for mixed-use development in the Downtown District (near the intersection of Highway 111/Sorenson Avenue and Highway 115/Main Street) (Policy LU-9.1).
- Revise the Zoning Code to define industrial and commercial development in the airport area, consistent with airport safety guidelines (Policy LU-10.1).
- Promote tourism opportunities related to retail, the City's historic character and cultural resources, farm operations, recreation, and natural attractions by promoting cultural, historical and agricultural resources with posted signs and information on the City's website (Policy LU-11.1).

4.12.7. City of Calipatria Land Use Maps

The City of Calipatria's Land Use Maps are provided below:

Figure 17. City of Calipatria General Plan Map 1

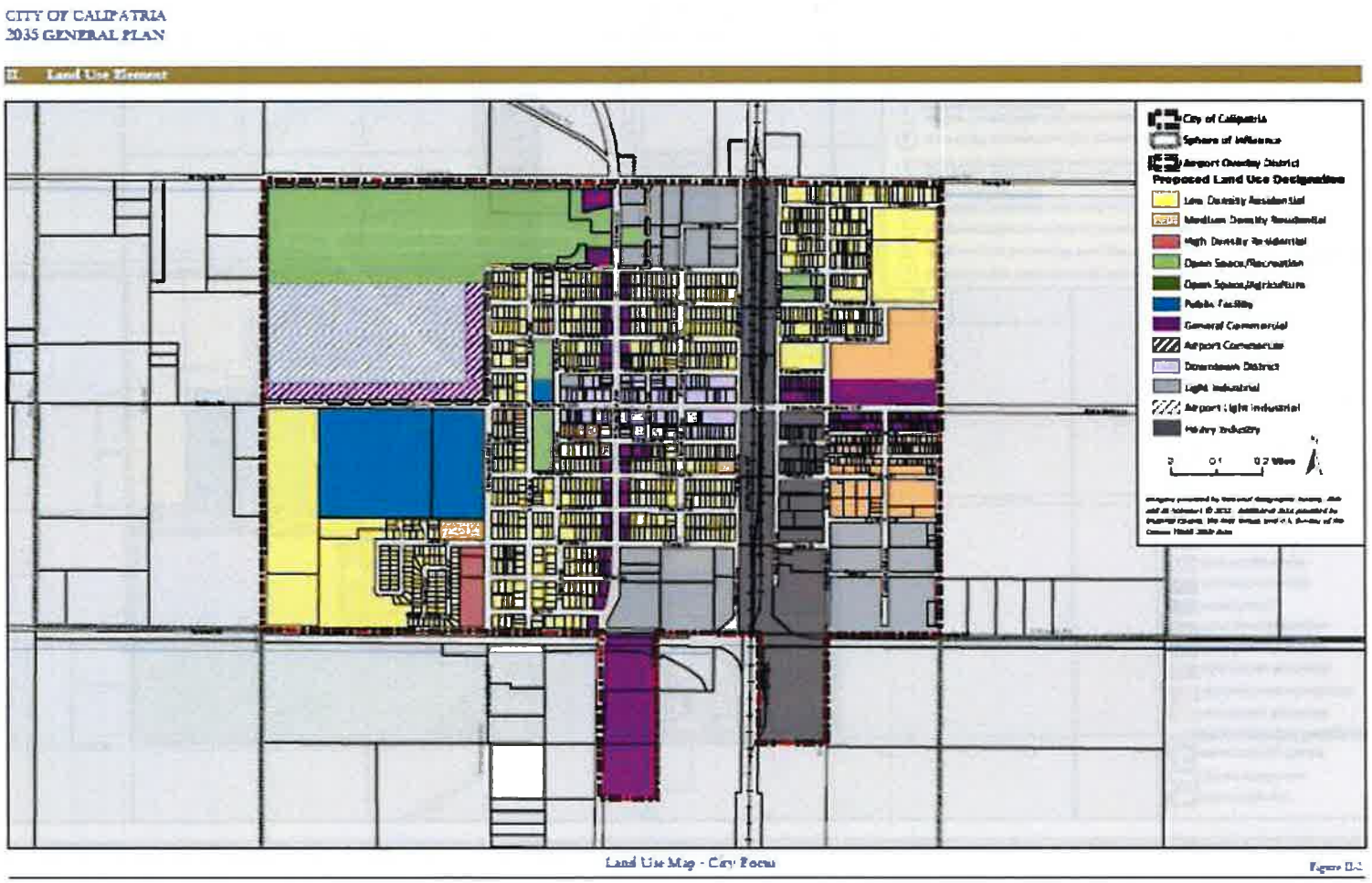


Figure 18. City of Calipatria General Plan Map 2

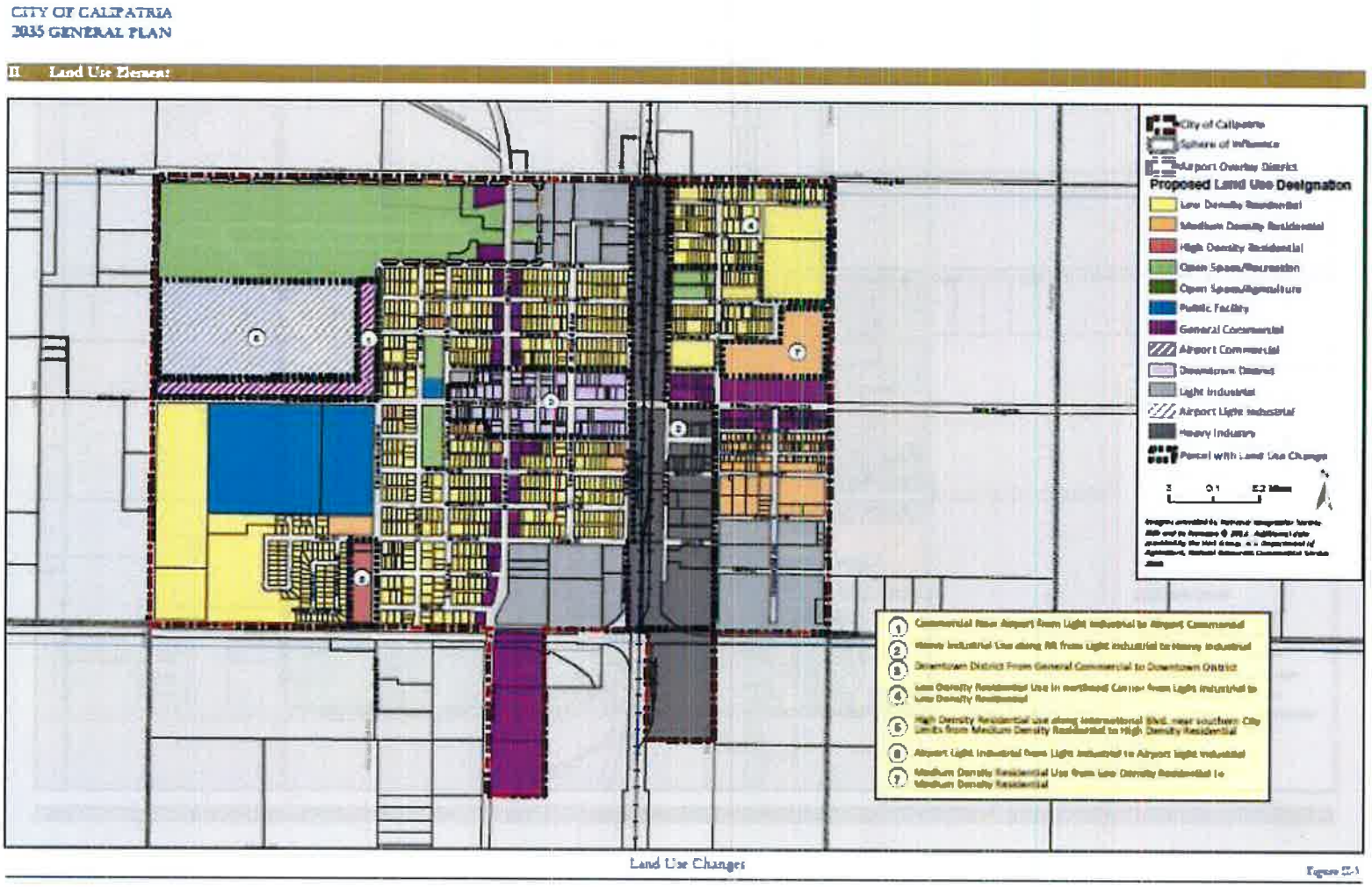


Figure 19. City of Calipatria General Plan Map 3

4.13. El Centro Area Land Use Plan

The Land Use Element is a guide to land use planning within the City of El Centro and directly relates to many issues addressed in other General Plan elements. The Land Use Element identifies the type and location of future land uses within the City. The specific land uses and their location within the community in turn affect the remaining General Plan elements. For example, the location and type of land uses outlined in the Land Use Element affect the circulation system that is identified in the Circulation Element, and the open space facilities identified in the Land Use Element affect the Conservation/Open Space Element policies. The land uses identified in the Land Use Element also reflect the community's goals for its future form and character.

With a strong agricultural base, El Centro's Land Use Plan has been designed to protect agricultural lands by concentrating growth within the current sphere of influence, as well as ensuring a healthy economy and good quality of life within El Centro to support the agricultural industry. The Land Use Plan has been designed to locate compatible land uses adjacent to each other, such as lower density residential uses next to existing lower density neighborhoods and using industrial and commercial uses to buffer residential area from potentially hazardous or noisy uses, such as the railroad and steam plant.

The Land Use Plan focuses on the location of various land uses, as well as growth management techniques, and community design. The other elements within the General Plan expand on how the Land Use Plan will be implemented to create a compact and livable community.

El Centro contains a fairly balanced mixture of land uses. While the City requires revenue generated by commercial and industrial uses to support the needs of the existing community, these non-residential land uses must be compatible with the existing community. Land uses such as open space areas can be used to buffer residential areas from non-residential uses. Land use designations can also limit the types of industrial and commercial activities to those which are most compatible with residential areas.

El Centro, as well as the surrounding region, has experienced considerable growth over the past

25 years. New development brings change and a changing community character. While recognizing that change is inevitable, the community is still able to plan and guide future development so that it complements the existing community, and enhances the existing character found in El Centro.

The City restricts land uses in areas determined to be subject to seismic hazards and adequate environmental review and mitigation measures for development proposed within a geological hazard area are required in the City. Additionally, the City will identify all earthquake-prone public buildings and buildings housing critical public functions and require these buildings to be upgraded and structurally retrofitted. In order to reduce the risk of impacts from seismic hazards, proper development engineering, building construction, and retrofitting is required of proposed development and redevelopment.

Understanding that growth will occur in the future, directing how and where growth will occur is important, as it will have a great impact on the quality of life and economic well-being of the community as a whole. To prepare for population increases in the next 20 years, El Centro will continue to direct and control growth in the City and Sphere of Influence through the application of the City's Urban Development Program to create a community that is compact and pedestrian and transit-oriented, avoids removing from production more valuable agricultural land than necessary, and is able to meet the public service and infrastructure needs of existing and future residents.

The City will control and direct growth so that new development is compatible with existing development and occurs in appropriate locations where adequate public services and facilities are available. Additionally, future development in areas impacted by aircraft operation is consistent with the applicable Airport Land Use Plans.

4.13.1. Issues, Goals and Policies Balance of Land Uses

El Centro contains a fairly balanced mixture of land uses. While the City requires revenue generated by commercial and industrial uses to support the needs of the existing community, these non-residential land uses must be compatible with the existing community. Land uses such as open space areas can be used to buffer residential areas from non-residential uses. Land use designations can also limit the types of industrial and commercial activities to those which are most compatible with residential areas.

Land Use Goal 1: Provide planning and strategies for physical land use to create a healthy and aesthetically pleasing environment that balances the social and economic needs of the community.

4.13.2. General

- Policy 1.1: Ensure that new development is consistent and compatible with the existing character of the community and meets City development standards.
- Policy 1.2: Prevent the intrusion of incompatible land uses into existing developments, such as incompatible non-residential development in residential areas.

4.13.3. Residential

- Policy 1.3: Ensure that new residential development is compatible with surrounding existing residential development.

4.13.4. Commercial

- Policy 1.4: Achieve a balance of commercial uses that provides for the retail, business, professional and other service needs of City residents and which will attract customers from the greater Imperial Valley and other areas.

- Policy 1.5: Balance new commercial development elsewhere in the City with the need to maintain a financially viable downtown.
- Policy 1.6: Allow for commercial uses on the first floor and residential uses on the second floor in the downtown district on a project-by-project basis if the project will:
  - Be compatible with the surrounding area;
  - Provide appropriately designed entrances for the commercial and residential uses; and
  - Comply with other requirements set forth by the City's conditional use permit.
- Policy 1.7: Encourage the development of neighborhood convenience shopping centers to serve the needs of adjacent residential neighborhoods.
- Policy 1.8: Improve the relationship between commercial areas and adjacent non-commercial uses through the use of landscape buffers and masonry walls for separation.

4.13.5. Industrial

- Policy 1.9: Prevent the intrusion of all incompatible uses that would negatively affect industrial areas and opportunities for industrial growth.
- Policy 1.10: Use lower intensity industrial uses as a transition between heavier industrial use and non-industrial use.
- Policy 1.11: Require new industrial development to provide adequate circulation and access that does not negatively impact adjacent residential areas. Where needed, industries should have access to railroad lines.

4.13.6. Community Facilities

- Policy 1.12: Ensure that facilities and services of public agencies are coordinated with City growth in their timing, location, and levels of service.
- Policy 1.13: Develop and expand public facilities in a manner that is compatible with existing and planned development.
- Policy 1.14: Continue to use the Parks and Recreation Facilities Master Plan as a guide for improvement of existing facilities and for the development of new facilities.
- Policy 1.15: Require new development adjacent to open drains and canals to underground these facilities to ensure the public safety. The undergrounding of facilities shall be done in concordance and coordination with the Imperial Irrigation District.

4.13.7. Direct and Control Growth

El Centro, as well as the surrounding region, has experienced considerable growth over the past 25 years. New development brings change, and a changing community character. While recognizing that change is inevitable, the community is still able to plan and guide future development so that it complements the existing community and enhances the existing character and found in El Centro.

Land Use Goal 2: Control and direct growth so that new development is compatible with existing development and occurs in appropriate locations when adequate public services and facilities are available.

- Policy 2.1: Continue to direct and control growth in the City and sphere of influence through the application of the City's Urban Development Program.
- Policy 2.2: Ensure that development corresponds with the provision of public facilities and services.
- Policy 2.3: Coordinate with the County and LAFCO during review and development of projects within the City's sphere of influence to ensure that compatible development occurs and adequate public facilities are provided.
- Policy 2.4: Ensure that future development in areas impacted by aircraft operation is consistent with the airport land use plan to allow for the continued operation of local airports.
- Policy 2.5: Encourage infill development to occur within the urbanized community before expanding new development onto agricultural lands surrounding El Centro.

4.13.8. Community Design

In an effort to enhance the City's beauty and assure the quality and appearance of future development, adherence to urban design principles is necessary. El Centro's buildings and structures are primarily in good physical condition; however, a number of residential and commercial structures are in need of rehabilitation or replacement.

Land Use Goal 3: Improve the visual appearance of the community by targeting areas in need for rehabilitation and beautification.

- Policy 3.1: Develop and implement a city-wide enhancement plan that identifies target areas for beautification, enhancement, maintenance, and redevelopment.
- Policy 3.2: Encourage the improvement and maintenance of older residential areas in order to prevent decay, blight, and decline in property values.
- Policy 3.3: Promote and encourage an overall improvement in visual appearance for all commercial and industrial areas.

4.13.9. Related Goals and Policies

The goals and policies found in the Land Use Element are related to and support subjects included in other General Plan elements. Likewise, many goals and policies from other elements are supportive of the subjects included in the Land Use Element.

4.13.10. City of El Centro Land Use Policy Map

The City of El Centro's Land Use Policy Map is provided below:

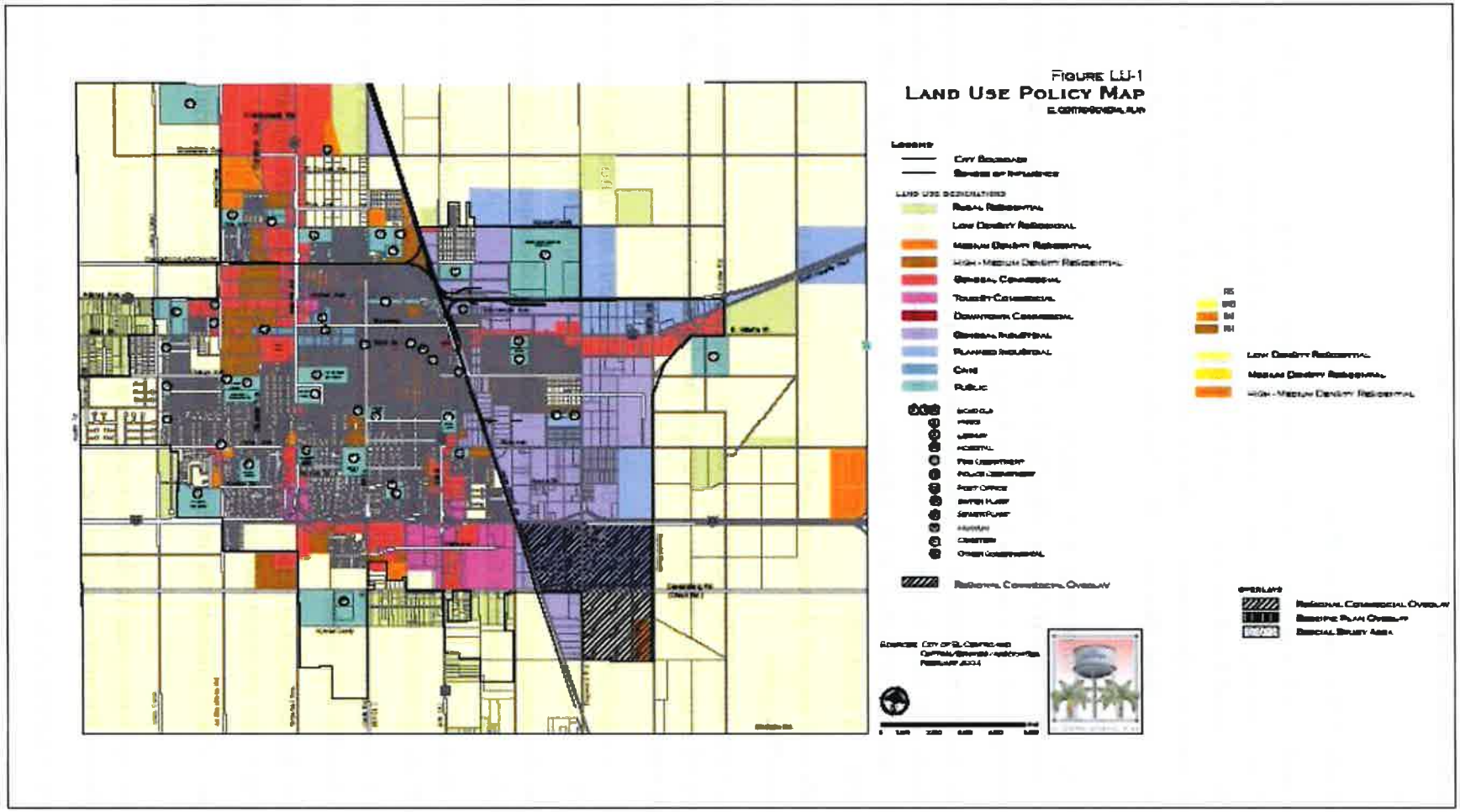


Figure 20. City of El Centro Land Use Policy Map

4.14. Holtville Area Land Use Plan

This approximately 4,080 acre area surrounds the incorporated City of Holtville. It is bounded on the west by State Highway 115, Zends Road and Country Club Road, on the north by Kamm Road, on the east by Towland Road, and on the south by Haven Road, the Ash Main Canal, and Edwards Road for a distance of approximately 3,300 feet east of Orchard Road, thence north to a line 1,320 feet south of Haven Road then east 3,660 feet then north to Haven Road and east to Towland Road.

The City of Holtville is surrounded by a mixture of small and large parcels of land under the direct regulatory control of Imperial County. The City is committed in promoting economic development in the community. Following are the Land Use Goals of the City of Holtville:

- Ensure that development in the unincorporated area surrounding the City is compatible and consistent with the City of Holtville and its long range plan for said areas. Furthermore, that these areas be provided with adequate services that are consistent with the City's development standards.
- Provide and support downtown land uses complimenting economic, redevelopment, and General Plan goals.
- Change the natural obstruction to a cultural, recreational, and economic attraction that is beneficial to the City, and also encourages development expansion to the south as well as to the west.
- To provide comprehensive, clear, development, standards and guidelines for the entire City as well as its Sphere of Influence (Planning Area) where applicable.
- Ensure that development within this area is consistent and compatible with the General Plan and plan for annexation of the area.
- Encourage the development of a variety of desirable and compatible land uses within this area as designated within the General Plan.
- Ensure that sufficient residential planned areas for all economic sectors are available for growth of the City to the north and east.
- Ensure that sufficient commercial and industrial planned areas are available for growth of the City to the southeast and west.
- Encourage and promote the utilization of the currently vacant industrial land within the City.
- Ensure that some areas to the south and west within the Sphere of Influence when annex, are planned for rural residential uses.
- Provide a variety as well as a range of industrial sites and encourage the development of a broad range of industrial and manufacturing activities that are both economically feasible,

environmentally acceptable, and provide employment in an attractive and convenient manner.

- Ensure that the local as well as County systems/facilities are not adversely affected or overburdened by regional pressures brought about by out-of-county forces.
- Encourage and promote conservation, recycling, reuse and other environmentally desirable measures to provide for a cleaner and healthier environment.

4.14.1. City of Holtville Land Use Policy Map

The City of Holtville's Land Use Policy Map is provided below:

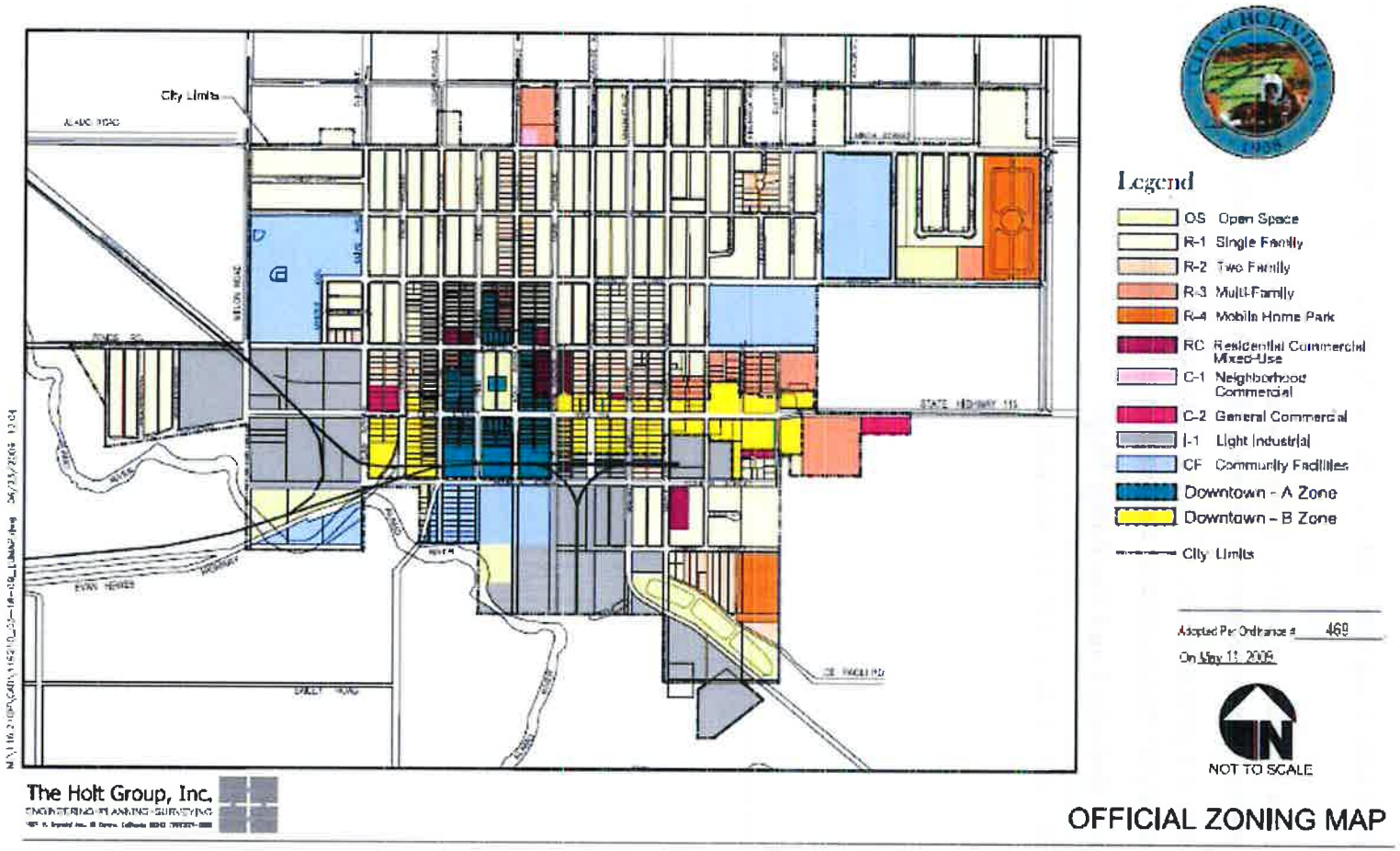


Figure 21. City of Holtville Land Use Policy Map

4.15. Imperial City Area Land Use Plan

This approximately 8,480 acre area surrounds the incorporated City of Imperial. It is bounded on the west by Austin Road, on the north by Ralph Road, on the east by Dogwood Road, and on the south by the Central Drain.

The rural character of Imperial is significantly influenced by the fact that approximately 50% of the City is developed in residential units, with a large percentage of the remaining land within the corporate limits being owned by public entities. Following are the Land Use Goals of the City of Imperial:

- Land uses should be planned and located to promote and retain the urban/rural residential character of Imperial through continuing to provide urban level services and uses in the developed areas, while providing development direction and growth management for the rural areas of the City. All development should be provided with adequate public services and facilities which promote the character of the area.
- Appropriate mixes of land uses should be provided to ensure that adequate land is available for needed future development, and to ensure that the City plans for the projected 19,500 population in the year 2015, by encouraging the production of affordable housing and the creation of new jobs.

The City of Imperial has recently embarked on redevelopment project aimed to enhance Downtown Imperial. Led by the Downtown Redevelopment and Gateway Beautification Committees, the Downtown Imperial Redevelopment Master Plan will provide urban design guidelines for Downtown Imperial through a community-driven process.

4.15.1. City of Imperial's Land Use Maps

The City of Imperial's Land Use Maps are provided below:

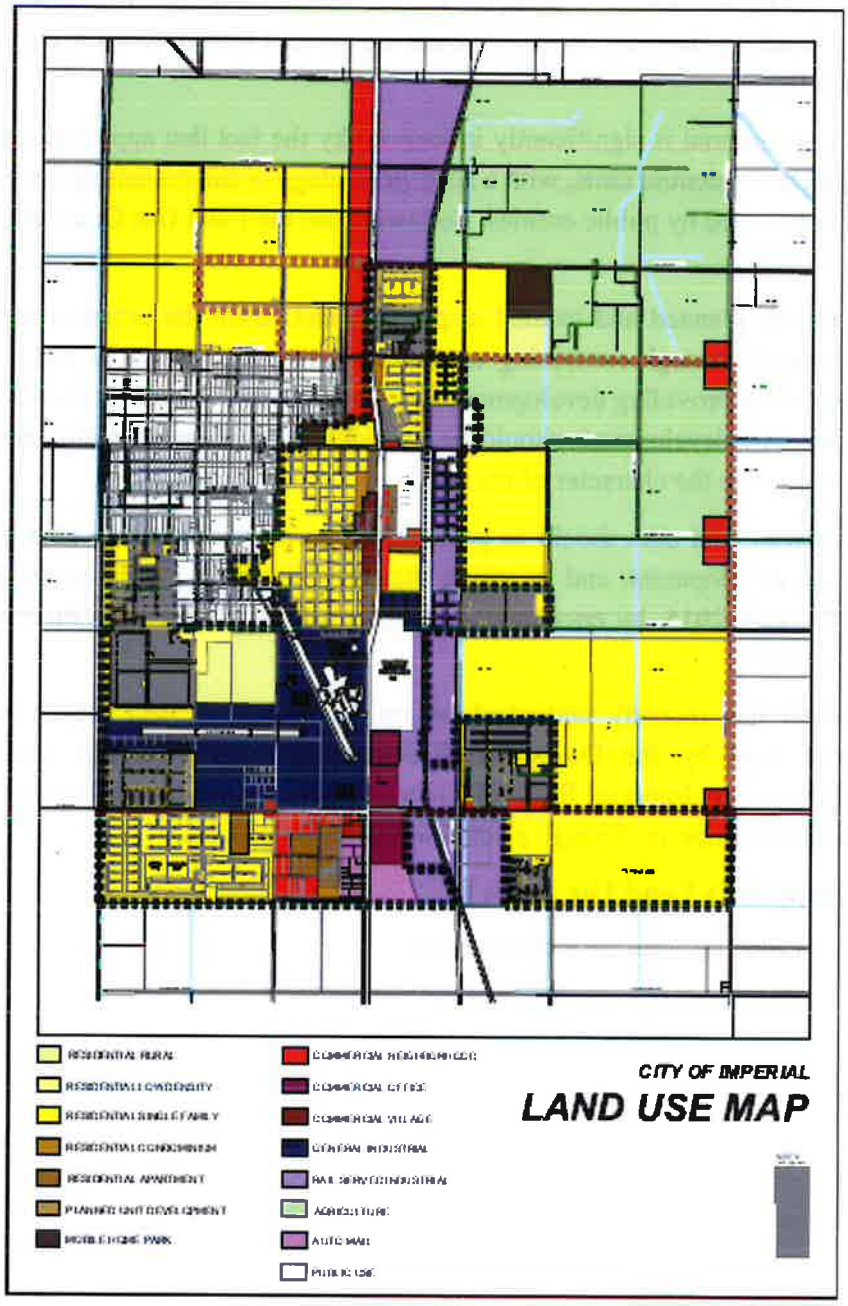


Figure 22. City of Imperial Land Use Map

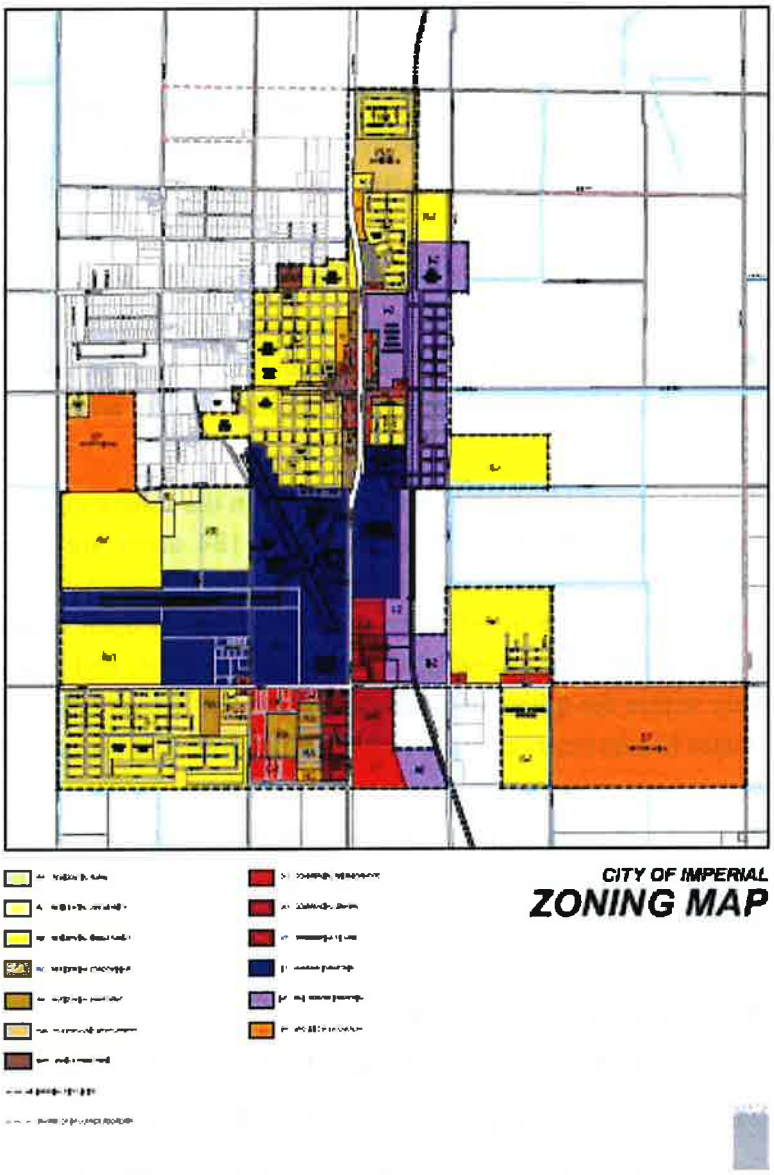


Figure 23. City of Imperial Zoning Map

4.16. Westmorland Area Land Use Plan

The City of Westmorland is located in northwestern Imperial County in the southeast corner of California. Imperial County is bordered on the north, south, west and east by Riverside County, the U.S./Mexico International Border, San Diego County, and Arizona's western boundary respectively. Westmorland is located on State Highway 86 and is approximately 30 miles from the U.S./Mexico International Border. It is expected to experience significant growth in the future mainly due to the volume of commercial trucking traffic that flows through the city to and from Calexico.

Located on the U.S. Mexico Border near Mexicali is Gateway of the Americas, an industrially/commercially concentrated complex designed to sustain and maximize the activities of the International Port of Entry. As development of business and industry grows within Gateway of the Americas, so will the demand for housing and public facilities in the areas surrounding it, such as Westmorland.

Land designated for residential use outside the city limits but within the sphere of influence is the most abundant, with approximately 784 acres. Approximately 184 acres are designated for commercial use, 215 acres have been designated for industrial use, and approximately and 18 acres in the northwestern quadrant of the sphere of influence are designated for open space. There are three major blocks of land designated for industrial use to the north, west, and east of the city. Residential areas exclusively within the sphere of influence are situated in every direction outward from the city limits, with major blocks reserved at the northeast, southwest and southeast quadrants of the sphere of influence.

Westmorland's entire sphere of influence consists of approximately 2,463 gross 1,410 acres of land. About 210,272 acres are located within the city limits, and 2,191 gross 1,200 acres are located outside the city limits.

4.16.1. Land Use Goals, Objectives, and Policies

Following are the Land Use Goals, Objectives and Policies of the City of Westmorland:

Goal #1: Maintain the rural small town atmosphere of the City of Westmorland.

Objective 1.1: Provide a community where residential uses are predominantly low density and non-residential uses are predominantly low intensity.

- Policies:
  - 1.1.1 Low density residential areas shall have a population density of 0-4 dwelling units per acre.
  - 1.1.2 Medium density residential areas shall have a density not to exceed 12 units per acre.
  - 1.1.3 High density residential areas shall have a density not to exceed 25 units per acre.
  - 1.1.4 Commercial and Industrial designated areas shall have a maximum lot coverage of eighty

percent (80%) and a floor area ratio (FAR) of 1.2.

Goal #2: Plan and create an efficient urban form that maintains and promotes complementary relationship between the varying land uses.

Objective 2.1: Encourage non-residential development to occur in and around activity centers and transportation corridors along Center Street and Highway 86.

- Policies:

  2.1.1 Provide opportunities for various commercial activities which include retail sales and service oriented uses such as restaurants, banks, dry cleaning, etc.

  2.1.1.1 Encourage and provide opportunities for future and existing commercial markets to serve the residential neighborhoods, especially along Center Street.

  2.1.1.2 Restrict regional commercial activity (e.g. gas service stations, fast-food restaurants, etc.) to areas along Highway 86.

Objective 2.2: Ensure community facilities that will provide for the basic services needed by the residents of the City of Westmorland. Community facilities shall include but not be limited to senior citizens center, playgrounds, City Hall, library, youth hall, fire station, etc.

- Policies:

  2.2.1 Provide opportunities for various neighborhood commercial activities, which include retail sales and service oriented uses, along and around Center Street and Highway 86.

  2.2.2 Restrict regional, general commercial, activities to higher traffic volume areas along Highway 86.

  2.2.3 Provide opportunities for light industrial activities away from the central business district, but along Highway 86 and any extension of City limits thereof.

Objective 2.3: Encourage new-residential development to occur on the South sector of the City near schools and other community facilities.

- Policies:

  2.3.1 City shall pre-zone Sphere of Influence areas to the South of the City for residential uses prior to annexation.

  2.3.2 The City's Sewer Collection and Water Distribution Master Plans should address improvements/extensions of water and sewer mains to the South of the City.

Goal #3: Establish and maintain a balanced distribution of public facilities to address the needs of the community.

Objective 3.1: Maintain and improve the existing community facilities that provide for the basic services needed by the current and projected population in the Westmorland community.

- Policies:

  3.1.1 The City shall seek funding opportunities for the construction of a locally operated and

maintained Fire Station.

3.1.2 The City shall continue to improve and rehabilitate, while financially feasible, all existing City owned public buildings including the Senior Citizen Center, City Hall, Police Station, Youth Hall, and City Pool.

Objective 3.2: The availability of public services and facilities should be consistent with the existing projected populations.

- Policies:

3.2.1 The number of dwelling units allowed in the City shall be limited to those which can be adequately serviced by the existing planned public services and facilities.

3.2.2 The City shall maintain current information concerning the capacity of the public services and facilities it provides.

Goal #4: Promote and encourage economic development for all sectors of the community.

Objective 4.1: Ensure availability of land for commercial and industrial land uses to support the projected demands.

- Policies:

4.1.1 Prohibit and discourage residential land uses along the main transportation corridors.

4.1.2 Pre-zone Sphere of Influence land for commercial or industrial uses along Highway 86 and Forrester Road prior to annexation.

4.1.3 Improve and extend water distribution and sewer line at adequate standards to support new development or expansion within designated commercial and industrial zones.

4.1.4 Encourage the orderly conversion of legal, nonconforming land uses within commercial and industrial zones to commercial or industrial land uses.

Objective 4.2: Encourage businesses that cater to visitors and travelers along the Central Business District (Highway 86) in an effort to capture maximum tax revenue.

- Policies:

4.2.1 The City shall continue to provide, through Community Development Block Grants, business loans for expansion or start-up within the Central Business District.

4.2.1 Development standards off of the primary corridors shall be flexible while maintaining good planning practices.

4.16.2. City of Westmorland Land Use Map

The City of Westmorland's Land Use Map is provided below:

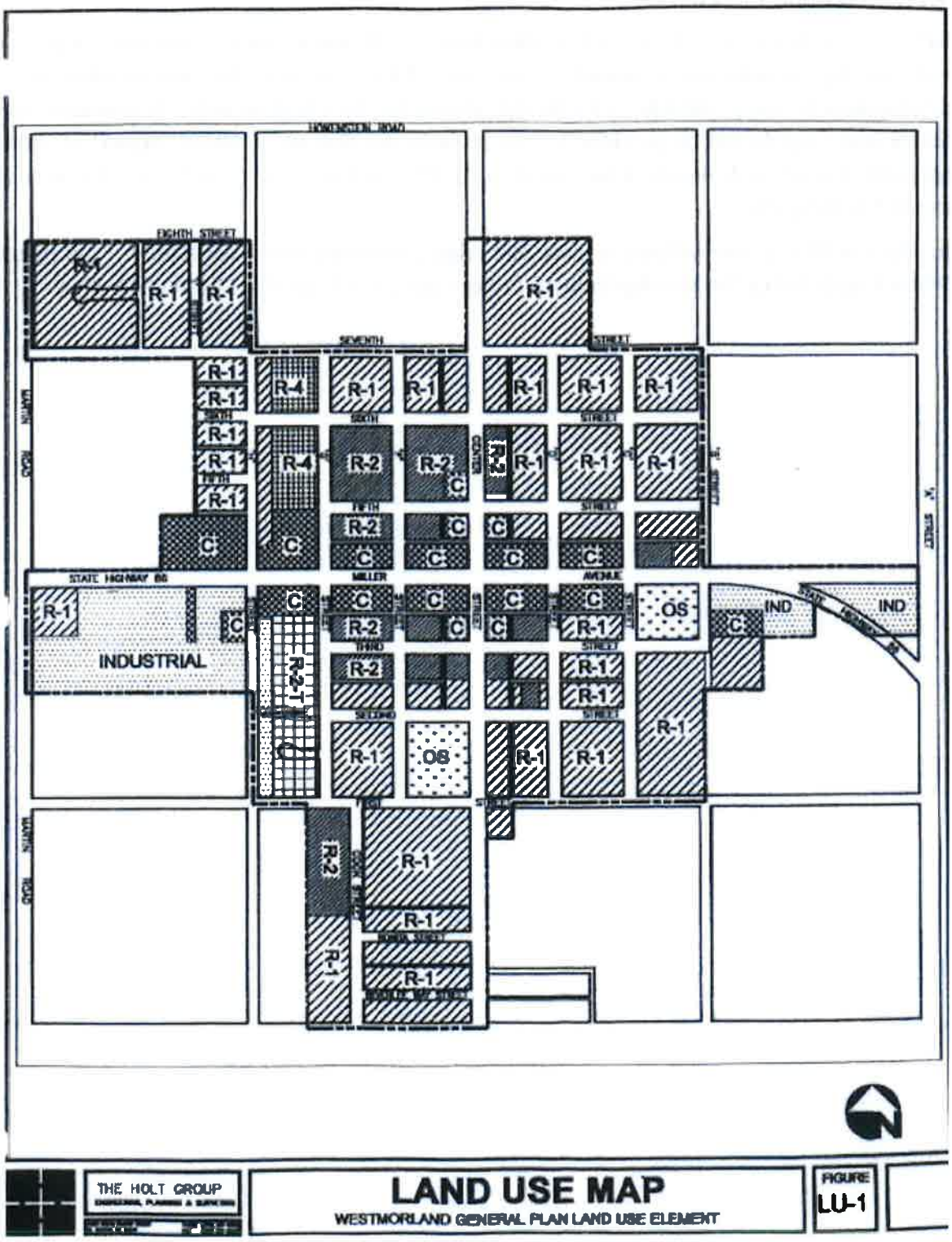


Figure 24. City of Westmorland Land Use Map

4.17. IID Land Use Policies

IID has the authority to manage the Colorado River supply and evaluate changes in the place of water use, type of water use, or amount of water use. The County and Cities land use planning and development review process provides the opportunity for coordination with IID to ensure that a secure water supply can be provided to new projects and that any potential impacts to current agricultural users of Colorado River supplies, to IID facilities, and/or to the environment are avoided or mitigated.

In addition, IID has two policies in place that relate to land use and water supply: 1) an Interim Water Supply Policy for Non-Agricultural Projects and 2) an Equitable Distribution Plan.

Section 5. Hazards Facing Imperial County

5.1. Identification of Hazards

With its varying topography; mix of urban and rural areas; rapidly growing permanent, transient, and recreational populations, Imperial County is subject to potential negative impacts from a broad range of hazards and threats. There are three broad categories of hazards that threaten the County, namely:

- Natural hazards
- Technological hazards
- Domestic security threats

Natural hazards include:

- Earthquakes
- Floods
- Extreme Weather (thunderstorms/windstorms/sudden heavy rain/hailstorms/tornados/ extreme temperatures)
- Wildfire
- Pest Infestation/Non-Vectors of Human Diseases
- Naturally Occurring Biological Threats
- Volcanos and Mud Pots

Technological hazards include:

- Dam Failure
- Hazardous Materials (Hazmat) Incidents

Domestic security threats include:

- Terrorism (CBRNE)
- Chemical
- Biological
- Radiological
- Nuclear
- Explosive
- Cyber

The following table describes how and why the hazards listed above were identified by Imperial County in preparing its MHMP.

Table 12. Rationale for Hazards Included in MHMP

Hazard	How and Why Identified
Earthquakes	History of events; presence of fault lines and geologic activity
Flooding	History of events
Extreme Weather	History of events
Wildfire	History of events
Dam Failure	History of events; presence of dams
Pest Infestation/Non-Vectors of Human Diseases	History of events
Hazardous Materials (Hazmat) Incidents	History of events
Naturally Occurring Biological Threats	History of events; heightened sense of awareness since the start of the COVID-19 Pandemic in early 2020
Volcanos and Mud Pots	History of events
Terrorism	Heightened sense of awareness since September 2001

Following are the identified hazards faced by Imperial County and the participating jurisdictions as identified by the Hazard Mitigation Working Group. The hazards also indicate the risk probability and severity assessment identified by the Hazard Mitigation Working Group as related to the County and participating communities.

For the rating of "**probability**" of occurrence, for each of the following hazards, the participants in the workshop for the Imperial County MHMP were asked to provide ratings of the likelihood that an event would occur in the future. The ratings that were used were:

- Very High (almost certain the event will occur)
- High (80% chance the event could occur)
- Medium (50% chance the event could occur)
- Low (20% chance the event could occur)
- Very Low (unlikely the event could occur)

These were subjective, order-of-magnitude ratings that participants could relate to whether they were highly skilled in a hazards area (e.g., members of a fire department) or not. This approach facilitated utilizing a consensus approach with the participating group.

For the rating of "**severity**", the participants in the workshop for the Imperial County MHMP were asked to provide ratings of the likely severity of an event, assuming one occurred in the future. The ratings that were used were:

- Very High (catastrophic impact)
- High (severe impact)
- Medium (large impact, but plans are in place to handle)
- Low Impact (manageable impact)
- Very Low (no significant impact)

These were subjective, order-of-magnitude ratings that participants could relate to whether they were highly skilled in a hazards area (e.g., members of a fire department) or not. This approach facilitated utilizing a consensus approach with the participating group.

5.2. Hazard: Earthquakes

5.2.1. Jurisdictions Affected by Earthquake

Earthquake risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 13. Earthquake Probabilities and Severities by Jurisdiction

Imperial County Probability: Very High	**Imperial County Severity: High**
Brawley Probability: Very High	**Brawley Severity: High**
Calexico Probability: Very High	**Calexico Severity: High**
Calipatria Probability: Very High	**Calipatria Severity: High**
El Centro Probability: Very High	**El Centro Severity: High**
Holtville Probability: Very High	**Holtville Severity: High**
Imperial City Probability: Very High	**Imperial City Severity: High**
Westmorland Probability: Very High	**Westmorland Severity: High**
Imperial Irrigation District Probability: Very High	**Imperial Irrigation District Severity: High**
Office of Education Probability: Very High	**Office of Education Severity: High**

5.2.2. Hazard Definition

Earthquakes are the result of an abrupt release of energy stored in the earth. This energy is generated from the forces which cause the continents to change their relative position on the earth's surface, a process called "plate tectonics." The earth's outer shell is composed of a number of relatively rigid plates which move slowly over the comparatively fluid molten layer below. The boundaries between plates are where the more active geologic processes take place. Earthquakes are an incidental product of these processes.

The major form of direct damage from most earthquakes is damage to construction. Bridges are particularly vulnerable to collapse, and dam failure may generate major downstream flooding. Buildings vary in susceptibility, dependent upon construction and the types of soils on which they are built. Earthquakes can destroy power lines, telephone lines, gas mains, sewer mains, and water mains, which, in turn, may set off fires and/or hinder firefighting or rescue efforts. The hazards of earthquakes vary from place to place, dependent upon the regional and local geology. Ground shaking may occur in areas 65 miles or more from the epicenter (the point on the ground surface above the focus). Ground shaking can change the mechanical properties of some fine grained, saturated soils, whereupon they liquefy and act as a fluid (liquefaction).

Where earthquakes have struck before, they will strike again. Earthquakes can strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking. Much of the damage in earthquakes is predictable and preventable.

With increasing magnitude (i.e., larger earthquakes), ground motions are stronger, last longer, and are felt over larger areas. Earthquake "intensity" refers to the effects of earthquake ground motions on people and buildings. Earthquake intensity is often more useful than magnitude when discussing the damaging effects of earthquakes. The most common intensity scale is the Modified Mercalli Intensity (MMI) scale, which ranges from I to XII.

Earthquake Seismic Swarms are a series of minor earthquakes occurring in the same area and time, none of which may be identified as the main shock. [1]

This definition can best be understood as a distinction between a classic mainshock-aftershock sequence and a swarm. Seismologists study the characteristic patterns of seismicity to help understand the underlying behavior of earth structures and the forces generating earthquakes. From this, various empirical rules have been determined which describe, for example, the magnitude, number and rate of events during aftershock sequences, and this helps us to understand stresses within the earth. The clearest way to show the comparison is by seeing plots of events over time for a classic mainshock-aftershock sequence and a swarm (Bombay Beach 2016). The following

chart shows the cumulative event rate for the September 2016 Brawley Swarm.[2]

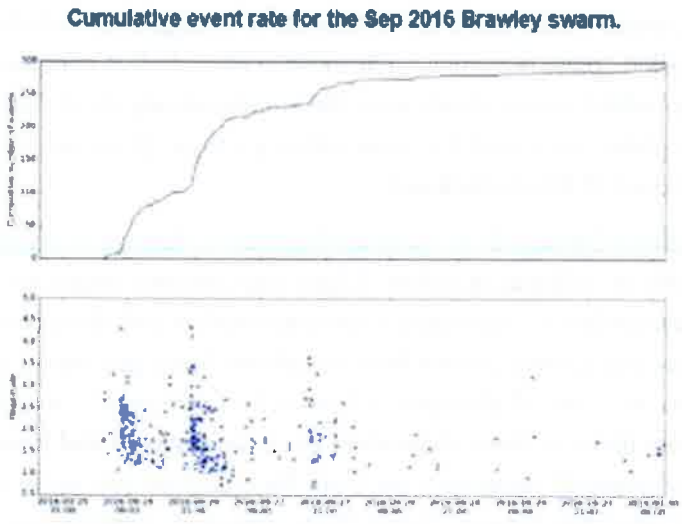


Figure 25. Cumulative Event Rate for the September 2016 Brawley Swarm

5.2.3. History

Earthquakes are the principal geologic activity affecting public safety in Imperial County. They are a triggering event which permits the force of gravity to operate and create many secondary hazards from ground shaking, including:

- differential ground settlement, soil liquefaction, rockslides and mudslides, ground lurching, and avalanches;
- ground displacement along the fault;
- floods from dam and levee failure, and seiches;
- fires; and
- various adverse results of disruption of essential facilities and systems - water, sewer, gas, electricity, transportation, and communication and, notably in Imperial Valley, irrigation and drainage systems.

The Imperial Valley is a broad, flat, alluviated area that lies partly below sea level, cut off from the Gulf of California to the south by the Colorado River Delta. The valley, also known as the Salton Trough, is one of the most tectonically active regions in the United States. The eastern boundary is formed by branches of the San Andreas fault and the western boundary is formed by the San Jacinto - Coyote Creek and the Elsinore-Laguna Salada Faults. Consequently, the Valley is subject to potentially destructive and devastating earthquakes. The deep, sediment-filled geologic structure of the Trough makes the area particularly susceptible to severe earthquake damage. More small to

moderate earthquakes have occurred in the Imperial Valley area than along any other section of the San Andreas Fault system. Over the last 100 years, the area has experienced eleven earthquakes of magnitude 6.0 or greater on the Richter scale with the strongest being a magnitude of 7.2 in 2010.

The 7.2 earthquake of April 4, 2010 caused extensive damage to the Imperial County Administration Center and its equipment, when the suspended ceiling system collapsed. Had the building been occupied at the time of the earthquake, there is a high likelihood that injuries and/or deaths would have occurred.

The Cities of Brawley, Imperial, El Centro, and Calexico have experienced damage from the movements of major faults in the San Jacinto fault zone, which includes the Imperial and Superstition Hills Faults.

A moderate to severe incident with intense ground shaking in the populated areas of Imperial County could reasonably be expected to cause numerous casualties, extensive property damage, fire, road closures, disruption of rail systems, communication systems (particularly telephone systems), the County's extensive canal system, and utilities. In addition, health hazards would be posed by damaged sewer systems, waste treatment facilities, and the possible contamination of the County's potable water supply. Medical treatment facilities would most likely be overtaxed. Theft and looting would likely occur as well. The resultant disruption of the agricultural community would affect the local economy.

In 1940, an earthquake along the Imperial Fault registered 7.1 on the Richter scale. The epicenter was located east of El Centro. The ground was ruptured for 40 miles from Volcano Lake in Baja California to a point near the City of Imperial. Seven deaths occurred and property loss was in excess of $5 million. Eighty percent of the buildings in Imperial were destroyed; fifty percent of Brawley's structures were damaged. Indirect damage to crops was substantial due to the subsequent disruption of drainage and the occurrence of flooding. Horizontal displacement across the completed but unfilled International Canal was 14 feet, 10 inches and the U.S.- Mexico boundary was permanently changed. The Alamo Canal in Baja California was also offset, and a local flood resulted from water spilling out of the broken channel.

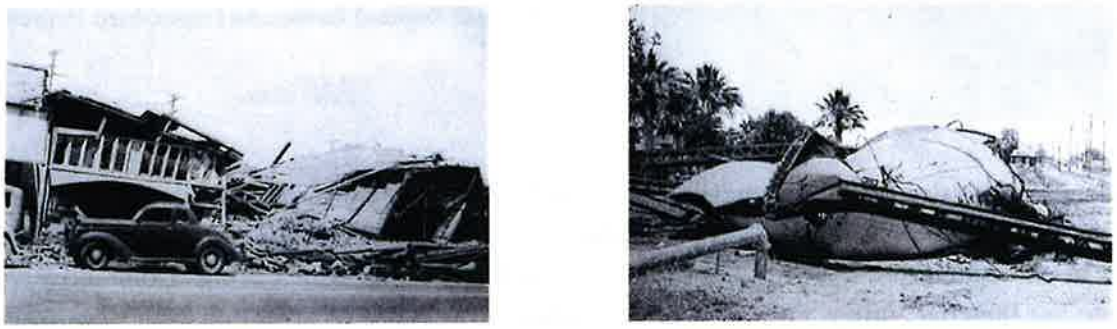


Figure 26. City of Imperial: Collapse of Walls and the 100,000-Gallon Water Tank (Photos: USCGS)

The most conspicuous area of surface rupture was on State Highway 98 eight miles east of Calexico. The roadway was broken by a four-foot scarp, and rows of trees in an orange grove south of the highway and west of the Alamo River Bridge were offset almost 10 feet. The maximum horizontal displacements of the earthquake, which were approximately 29 feet, were measured in the area just south of the orange grove.

The 6.6 Imperial Valley Earthquake of October 15, 1979 was felt over approximately 128,000 square kilometers and caused an estimated $30 million in property damage. The worst damage occurred in southern Imperial County and northeastern Baja California where eleven businesses and two homes were destroyed. Four hundred forty commercial buildings and 1,565 homes were damaged. Although there were no deaths, ninety-one people were reported injured, mainly by flying glass or falling objects.

The greatest single structural loss was to the Imperial County Services Building in El Centro. The six-story reinforced concrete frame and shear wall structure was completed in 1971 at a construction cost of $1.87 million and was designed to be earthquake resistant under the 1967 provisions of the California Uniform Building Code. However, during the earthquake, the concrete at the base of the support columns was shattered and the vertical reinforced bars were severely bent allowing the eastern portion of the building to sag about 30 centimeters. Replacement costs were estimated at $7 million. Non-structural damage included damage to bridge abutments that were cracked and roadbeds that shifted due to slumping or faulting. Other property damage caused by this earthquake at El Centro, Brawley, and Calexico and at Mexicali, Mexico, is typical of MM intensity VII, which is the highest intensity assigned to any location except the Imperial County Services Building which was MM intensity IX.

Figure 27. Earthquake of Oct. 15, 1979 in Imperial Valley (Picture 1)

The unreinforced brick wall at the Brawley Theater collapsed. Most of the building damage in the business district of Brawley occurred between the 500 and 900 blocks. Unreinforced brick structures are particularly vulnerable to earth shaking. Photo Credit: Bay Area Regional Earthquake Preparedness Project

The agriculture industry incurred damage to canals and irrigation ditches and damage to subsurface drain tiles which were disturbed by the movement along the Imperial Fault. The worst damage incurred by the agriculture industry was to the All-American Canal which brings Colorado River water into the Imperial Valley. Ground shaking caused the collapse of levees on both sides of the canal along a 13 kilometer stretch of the canal east of Calexico. Extensive lateral slope failure

occurred along this and other canals. In some places, canal banks settled by more than one meter.

Figure 28. Earthquake of Oct. 15, 1979 in Imperial Valley (Picture 2)

Earthquake of October 15, 1979 in Imperial Valley. A fault trace crosses a cultivated field near El Centro. The surface rupture on the Imperial Fault extended from about 2.5 miles (4 km) north of the International Border to about 2.5 miles south of Brawley. Maximum lateral displacement was about 22 inches (55 cm) in Heer Dunes and the maximum vertical displacement was 7.5 inches (19 cm) southeast of Brawley. Photo Credit: University of Colorado

In the Westmorland Earthquake of April 26, 1981, 12 buildings were severely damaged, 10 beyond repair, and an additional 30 buildings sustained minor damage. Seventy percent of the town's 900 homes, many of which were built of adobe and brick, were damaged, and five homes were condemned. Six mobile homes were knocked off their foundations and nine homes sustained minor damage to foundations, porches, and walls. Electrical service was interrupted for one hour, and the water supply was interrupted for 10 hours. The sewage plant sustained an estimated $40,000 in damages. Total damage was estimated at $1.5 million. Subsidence was reported on several rural roads in the area. Liquefaction caused scores of "mud pots" and oozing soil in nearby fields. One county road west of Westmorland collapsed, producing a two-foot drop-off. In rural areas, $100,000 in damages was incurred when unreinforced, concrete-lined irrigation canals were broken.

Figure 29. Westmorland Earthquake of April 1981

Left photo: View of a two-story building partially collapsed in earthquake. Note the undamaged one-story building on the left. Twelve buildings were severely damaged and an additional 30 sustained minor damage. City officials ordered the demolition of 10 downtown buildings that were damaged beyond repair. Right photo: View of partially collapsed adobe building in Westmorland. Seventy percent of the 900 homes in Westmoreland were damaged. Most, like this structure, were constructed of adobe and/or brick. Photo Credit: Bay Area Regional Earthquake Preparedness Project

Other seismic activity includes a Magnitude 4.0 earthquake in Brawley on May 23, 2003, and seismic activity in the Brawley Seismic Zone from August 31, 2005 through September 2, 2005. Renewed seismic activity in the Brawley Seismic Zone began late on August 28, 2005 but reached a sustained higher level of activity with back-to-back M4.6 and M4.5 events at 3:47 p.m. and 3:50 p.m., respectively, on August 31, 2005. The swarm then intensified, with an M5.1 event on September 1, 2005. A total of eight events of M 4.0+, 29 additional events of magnitude between 3.0 and 4.0, and 175 events between magnitude 2.0 and 3.0 were also recorded. In all, 554 events of M 1.0+ occurred in the swarm.

The activity is reminiscent of similar swarms that occurred in the Brawley Seismic Zone throughout the 1970s and 1980s, during which time the zone was among the most active areas in all of California. The Brawley Seismic Zone is a north-striking zone of northwest and northeast-striking faults that extends from the southern end of the San Andreas Fault to the northern end of the Imperial Fault. The pattern of the Brawley swarms of the 1970s was a large number of very small earthquakes (sometimes exceeding 10,000 events) with up to a dozen moderate events of Magnitude 4.0 or so, but no clear main shock larger than the other events. The 1970s swarms would be highly active for a few days and then taper off over the next week or two. In 1999 and 2001, two other smaller swarms occurred on northeast-striking faults in the Salton Sea. Compared to those two sequences, the 2005 swarm had significantly more events, but also is located significantly farther away from the San Andreas Fault.

The Bombay Beach Swarm that occurred in September 2016 is significant because these events are the largest to date. Starting on September 26, 2016, the swarm included more than 290 events in just three days in the magnitude range M0.7 to M4.3, 17 events with a magnitude greater than M3, and 97 events with magnitudes greater than M2. This is the same area where two previous swarms occurred in 2009 and 2001. Prior to 2001, no swarms had been recorded with an M4.0 or greater intensity (with records going back to 1933).

Events in the 2016 swarm show a NE-SW trend, consistent with the 2009 and 2001 swarms. This trend is in alignment with the faults located in the northern Brawley Seismic Zone, and orthogonal to the San Andreas fault. Before 2001, there were few events that had occurred in the northern Brawley Seismic Zone. The southern Brawley Seismic Zone is much more active, with events occurring on a regular basis.

The following map shows the events for the September 2016 swarm shown with the swarms from 2001 and 2009 ("relocated" through analysis of data). [3, 4]

Relocated events for the Sep 2016 Brawley swarm shown with the swarms from 2001 and 2009.

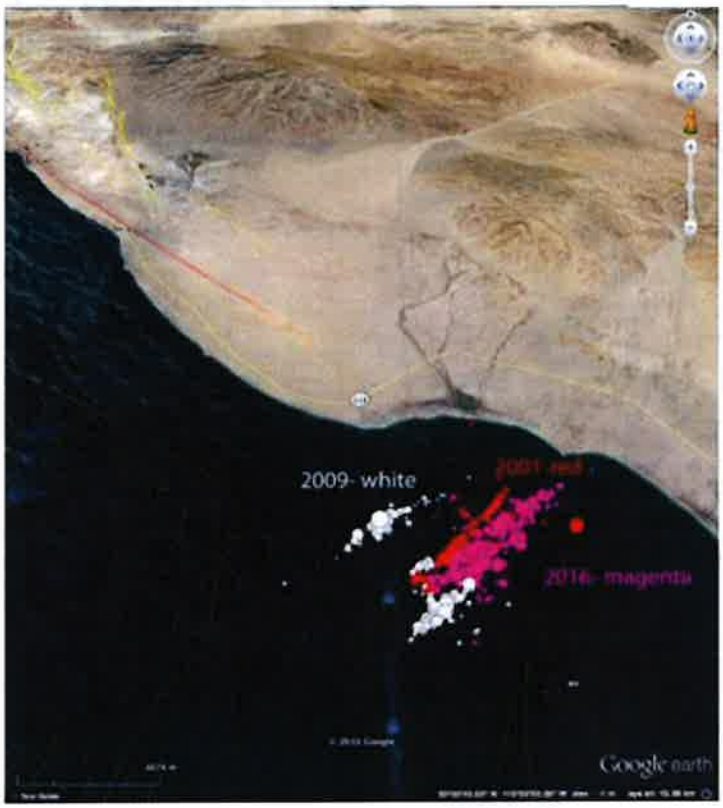


Figure 30. Relocated Events for Brawley Swarms of 2016, 2009, and 2001

There are two historically active earthquake epicenters located within a four-mile radius of the City of El Centro. One had an estimated magnitude of 6.3 on the Richter Scale in 1915. The other epicenter just southeast of the City has had 26 earthquakes recorded with a magnitude equal to or less than 7.1 on the Richter Scale since 1915. Within a 20-mile radius of the City of El Centro, there are approximately 45 epicenters all with recorded earthquake magnitudes ranging between 4.0 and 5.9 on the Richter Scale. Several of these epicenters have had many recorded earthquakes.

The map on the following page illustrates California State and Federal Declared Earthquake Disasters, 1950 – December 2009. During that period, there were three earthquake State of Emergency Proclamations for Imperial County. [5]

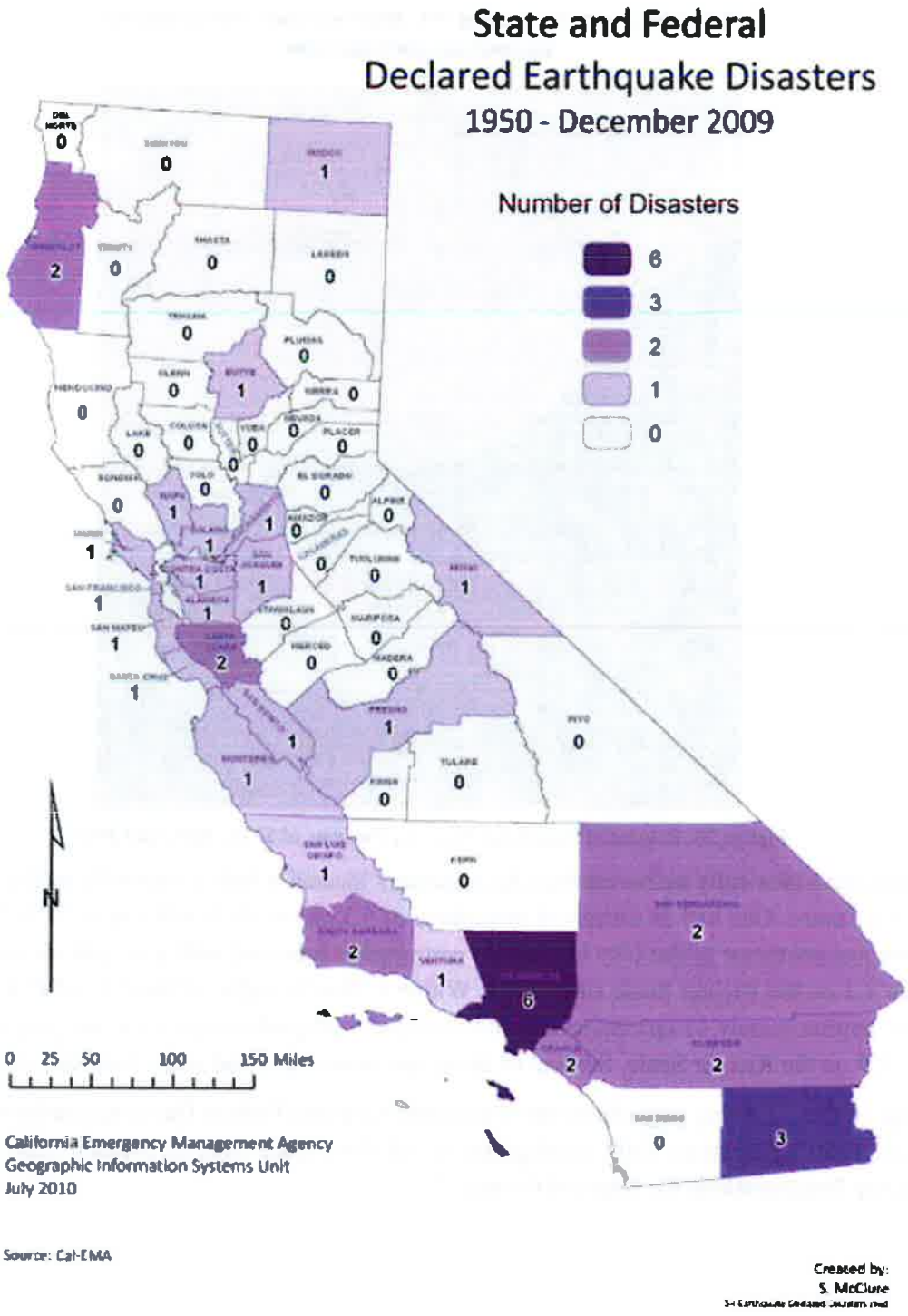


Figure 31. State and Federal Declared Earthquake Disasters, 1950 – 2009

Following is a list of historical earthquakes affecting Imperial County over the last century, with a magnitude of **5.0** or more occurring in or near the County.

Table 14. Historical Earthquakes Affecting Imperial County

Date	Mag.	Location Felt/Origin	Damage
08/26/2012	5.5	Brawley	The swarm began on Saturday evening with six events of M<2.0, and activity picked up at 8:30 am with three M2.5 events in a few minutes. As of 12:00 pm on 8/28/2012, CISN recorded more than 550 events. The largest two are M5.3 at 12:31 pm and a M5.5 at 1:57 pm. There have been eight events ranging between M4.0 and M5.0, and a total of 57 events M 3.0 or larger have occurred. A field visit on 8/27/12 found no evidence of surface rupture nor evidence of liquefaction. Some light cosmetic damage was found on some older buildings in downtown Brawley.
02/18/2011	5.1	SSE of Calexico	Unknown [6]
12/30/2010	5.8	El Centro	Unknown [6]
09/14/2010	5.0	SE of Calexico	Unknown [6]
04/04/2010	7.2	Northern Baja California, Sierra Cucapah Mountains	El Mayor-Cucapah Earthquake (also known as the Easter Sunday Earthquake). A magnitude 7.2 occurred and there have been 758 events at least M3.0 or larger. More than one million people were exposed to shaking equal to or exceeding VI intensity. This is strong shaking with light damage to resistant structures (reinforced concrete, wood-framed homes, etc.), and moderate damage or greater to vulnerable buildings (non-reinforced masonry, brick, cinder-block without reinforcement, etc.). [7]
12/30/2009	5.8	Mexicali, US- Mexico Border	A magnitude 5.8 earthquake struck southeast of Mexicali, Mexico, about 35 km south of the US-Mexico border, at 10:48 a.m. Pacific time (PST); it was widely felt in Mexico, southern California, and southwest Arizona.
11/20/2008	5.0	SSE of Calexico	Unknown [6]
02/11/2008	5.1	SSE of Calexico	Unknown [6]
09/02/2005	5.1	Salton Sea, Imperial County	This earthquake was part of a swarm of temblors that have hit the same region in Imperial County for four days. The earthquake shook buildings as far away as San Diego. It was centered about one mile east-southeast of Obsidian Butte – 16 miles north of El Centro and 100 miles east of San Diego. The tremor was part of what seismologists are calling the Obsidian Butte Earthquake Swarm of August-September 2005.

Date	Mag.	Location Felt/Origin	Damage
01/25/1988	5.3	Imperial County, Baja California	A large earthquake struck Baja California, Mexico, shaking some Californians awake but triggering no immediate damage reports either north or south of the border, officials said. The earthquake registered 5.3 on the Richter Scale and was centered in a sparsely populated area about 45 miles east of the resort city of Ensenada. There were no reports of damage in Imperial County.
11/23/1987 11/24/1987	6.0 and 6.3	Calexico, Westmorland, U.S. Naval Reservation	Two strong earthquakes, which registered 6.0 and 6.3 on the Richter Scale, caused widespread damage, but few injuries were reported. The Calexico area was apparently the region hit hardest by the trembler, which was centered near Westmorland. Two bridges, on Forrester Road over the New River and on Worthington Road over the New River, were damaged according to the County Public Works Department. The California Highway Patrol also reported that Keystone Road between Forrester and Highway 86 closed because of bridge damage.
11/24/1987	6.6	Superstition Hills	Unknown [6]
02/06/1987	5.6	Imperial County, Mexicali	A strong earthquake shattered windows and disrupted power in Mexicali and briefly interrupted phone service in the Imperial Valley, but there were no reported injuries. The trembler registered 5.6 on the Richter Scale and was centered 19 miles southeast of Mexicali. The earthquake was felt as far east as Yuma, about 60 miles from the epicenter and as far west as San Diego.
07/13/1986	5.3	Imperial County, Oceanside	A 5.3 earthquake with an epicenter 28 miles southwest of Oceanside in the Pacific Ocean was felt as far away as Yuma, Arizona, 160 miles east of San Diego. No damage or injuries in Imperial Valley were reported.
07/08/1986	5.9	Imperial County, Palm Springs	An earthquake struck 12 miles northwest of Palm Springs, measuring 5.9 on the Richter Scale. Damage was estimated at $5.75 million, and 40 people were injured. Numerous aftershocks, some measuring as high as 4.0 on the Richter scale, occurred.
05/08/1985	5.2	Calexico, Mexico	An earthquake measuring 5.2 on the Richter Scale rocked a large uninhabited area of the Mexican desert 65 miles southwest of Calexico, but there were no reports of damage or injuries. The earthquake was followed by a series of aftershocks, including one that registered 4.3 on the Richter Scale.

Date	Mag.	Location Felt/Origin	Damage
04/26/1981	6.3	Imperial County, Westmorland	Intensity VII. There was more damage to Westmorland than resulted from the October 1979 quake. Several commercial buildings and 16 homes were substantially damaged. The water tower and the water and sewage treatment plants incurred over $500,000 damage. A quarter mile of the concrete-lined Vail Canal was broken up. An eight-inch crack opened in Lack Road. There were no injuries nor significant damage reported elsewhere in the valley. The swarm of 30 quakes (seven between 3.0 and 4.1) occurred over a 12-hour period three days before the main quake. More than three dozen quakes (over 3.0) occurred in the 24 hours afterwards. This quake apparently ruptured underground gasoline storage tanks, which was revealed months later by fumes and seepage into surface waters.
10/15/1979	6.6	Imperial County, Mexicali	The epicenter was on the Imperial Fault approximately 12 miles south of the Mexican border and 12 miles east of Mexicali. It was widely felt throughout Southern California. The earthquake occurred at 4:16 p.m., and two aftershocks of 5.0 or greater occurred by 9:00 p.m. Approximately 100 persons were reported injured; two were hospitalized. The six story County Services Building, the largest building ever built in Imperial County, suffered the most notable damage, resulting in its subsequent demolition and total loss. It was occupied by 400 persons at the time of the earthquake. None were seriously injured. Commercial damage was widespread, particularly in the older sections of Imperial, Calexico, Brawley, El Centro, and Mexicali. Sixty percent of the commercial buildings in Imperial were subsequently condemned. One hundred and three (103) mobile home units in El Centro were knocked from their piers, two homes were destroyed, and 1,565 homes were damaged. There were 15 ruptures of water mains in El Centro and a temporary loss of ninety percent of firefighting capability. The Southern Pacific Railroad tracks were offset nine inches where they cross the Imperial Fault. Sewage treatment plants in El Centro, Brawley, and Imperial were seriously disrupted. The All American Canal suffered major slumping to its embankments on both sides for an eight mile stretch in the vicinity of the Imperial Fault. Total loss was estimated at $30,000,000.
09/30/1971	5.1	Superstition Hills, U.S. Naval Reservation	No known effects.

Date	Mag.	Location Felt/Origin	Damage
04/09/1968	6.5 and 5.2	South of Ocotillo Wells, Calexico, El Centro	Minor ground cracking and displacement occurred on the Coyote Creek Fault, and Highway 78 was cracked adjacent to Ocotillo Wells. Ground cracking, minor building damage, and power disruption occurred in some areas of Imperial Valley. A 200-foot long, 2-inch wide crack occurred in a road six miles west of Imperial. Minor damage was also sustained at Calexico, El Centro, Los Angeles, San Diego, and Yuma, Arizona. The earthquake had a magnitude 6.5 and was Intensity VII. Later, an aftershock of magnitude 5.2 was widely felt. The significant feature of this earthquake was the triggering of minor ground ruptures on neighboring Superstition Hills Fault, Imperial Fault, and the Banning Mission Creek portion of the San Andreas Fault. A 4.7 aftershock at Calexico knocked down plaster. A 4.4 event, listed as an aftershock, occurred at Salton City on May 22.
06/11/1963	5.8	Imperial County, Baja California	Event in Baja was felt widely in Imperial Valley.
11/30/1958	5.8	Calexico, Seeley	Main shock of a series caused minor damage at Calexico and Seeley. Intensity VII.
04/25/1957	5.2	Salton Sea, El Centro, Brawley, Westmorland	South end of Salton Sea. Slight damage in El Centro, Brawley and Westmorland. Intensity VII.
12/16/1955	5.4	Imperial County, Brawley	Intensity VII
11/12/1954	6.3	Imperial County, Baja California	Event in Baja was strongly felt in the Imperial Valley.
06/13/1953	5.5	Brawley, Westmorland, U.S. Naval Reservation, Imperial County	Landslides at Tamarack Road and the New River. Windows broken and plaster cracked. First event and aftershock of 5.5, Intensity VII.
01/23/1951	5.8	Calipatria, U.S. Naval Reservation, Calipatria	Near Calipatria. Cracked Westside Main canal. Intensity VII.
07/27/1950 07/28/1950 07/29/1950	5.4	Calipatria, Westmorland, Niland, Verdant, Calipatria	Series of shocks centering near Calipatria on July 27, 28 and 29, with the strongest measuring magnitude 5.4. $50,000 in damage resulted, chiefly from merchandise being thrown from the shelves in the Calipatria, Niland, and Westmorland areas. In Calipatria, concrete standpipes broke and a small railroad bridge shifted six to eight inches. There was considerable plaster damage. In the outskirts, sand boils appeared and irrigation ditch banks sloughed. In Westmorland, reinforced concrete walls of the post office building cracked and windows broke at City Hall and the Food Center Building. Also felt at Parker and Yuma, Arizona. A 4.7 aftershock on August 1 caused sand boils and ground fissures around the North End Dam.

Date	Mag.	Location Felt/Origin	Damage
01/08/1946	5.4	Imperial County/ South of Borrego	No damage reported.
10/21/1942 10/22/1942	5.0+	Imperial County	A landslide damaged the SD&AE railroad bridge in Carrizo Gorge. Cracked plaster was reported throughout Imperial Valley.
05/18/1940	7.1	Imperial County/ El Centro	Nine people were killed. Eighty percent (80%) of the buildings in Imperial County were damaged to some degree. In the business district of Brawley, all structures were damaged and about 50 percent had to be condemned. The shock caused 40 miles of surface faulting on the Imperial Fault, part of the San Andreas system. Total damage has been estimated at about $6 million. About 48 aftershocks occurred through the end of 1940, including several on May 23 that caused more damage in Brawley.
12/30/1934 12/31/1934	6.5 and 7.1	Calexico, Calipatria, El Doctor, Baja California, South of Calexico	Two separate main events occurred. The first was magnitude 6.5, and the second was magnitude 7.1. It was difficult to determine which event caused what damage. Railroad bridges were damaged, and tracks were twisted. Surface cracks appeared. Water appeared in dry riverbeds. Adobe houses were damaged, and a large water tower was thrown down. Irrigation ditches were damaged, roads buckled, and communication systems disrupted. Shocks were felt strongly in Tijuana. Chimneys and walls collapsed in Calipatria. Intensities were XI and X in Baja, VI and VII in Imperial Valley.
02/25/1930	5.0	Imperial County/ Westmorland	Walls cracked, chimneys collapsed, and inferior buildings were damaged. Mud craterlets were found a few miles east of Westmorland. Several fore shocks and many aftershocks occurred.
01/01/1927	5.75 and 5.50 (two earthquakes occurring one hour apart)	Calexico, Mexicali, Heber, El Centro, Imperial, Brawley	Two heavy shocks about an hour apart began a long earthquake series. In Calexico and Mexicali, many buildings were damaged, water mains broke, and some fires ignited. Between 15 and 20 persons were injured. In Heber, El Centro, and Imperial, slight damage was reported. Telephone service was interrupted in Heber. Hundreds of aftershocks occurred.
11/07/1923	NA	Imperial County/ Baja California	An Intensity VII earthquake occurred on November 7 with an epicenter in Baja California, south of Calexico. This earthquake had been preceded by a smaller shock on November 5. Damage caused by the earlier shock was compounded and one fire occurred.
11/20/1915	7.1	Calexico, Imperial County, Volcano Lake	A shock, revealed by seismograms to have been considerably greater than that of June 23 (see next entry below), occurred in the Volcano Lake region, south of the Mexican boundary. In Imperial Valley, the highest intensity was at Calexico; at Volcano Lake, levees and damp ground were cracked.

Date	Mag.	Location Felt/Origin	Damage
06/23/1915	6.25 and 6.25	El Centro, Calexico, Mexicali (two earthquakes occurring one hour apart)	Two destructive shocks occurred, nearly 1-hour apart. Heavy damage (about $900,000) in southern Imperial Valley was caused as much by poor quality buildings as by the intensity of shock. In El Centro, well-constructed buildings merely suffered cracks. At Mexicali, Mexico, people returned to buildings after the first shock; six were killed and many were injured by the second earthquake. Though a few cracks were formed in the alluvium, the irrigation ditches and works were damaged very little. The unstable banks of the New and Alamo Rivers slid down in many places. Several farmers observed that after the shocks, one-third more water was required for irrigation because of the cracks in the soil. Despite the rather high local intensity, the total energy was moderate.
04/19/1906	6.2	Brawley	Chimneys fell. Banks of the New River collapsed; water tanks were destroyed at Cocopah in Baja California. The published information is very limited, but H. O. Wood, on the basis of verbal information, reported this to be a very severe shock. It came just hours after the great San Francisco quake and most probably was related.
01/23/1903	7.0+	Imperial County/ Baja California	A strong earthquake, centering in the uninhabited region south of Imperial Valley, was felt throughout southern California, southern Nevada, and western Arizona. A similar shock under present conditions in the Imperial Valley would cause damage. Recorded by distant seismographs.
02/24/1892	7.8	Imperial County/ Baja California	The intensity of this shock probably reached X near the epicenter, which was apparently in the uninhabited region of northern Baja California. It was felt strongly along the Pacific Coast of Baja California, as far as San Quentin, Mexico and as far north as Visalia, California. At Carrizo, all adobe buildings were destroyed; at Jamul, walls of stone kilns cracked. At Campo, there were 155 shocks in 12 hours. Aftershocks were numerous for several days.
11/15/1875	6.2	Imperial Valley to Colorado River	Unknown
11/1852	6.5	Northern Salton Trough	Unknown

5.2.4. Existing Faults in Imperial County

There are nine fault zones, primarily northwest-trending, within Imperial County: San Andreas, Imperial, Algodones Sand Dunes, Calipatria, Boundary, Superstition Hills, Superstition Mountain, Laguna Salada, and Elsinore. The most significant fault within the County is the San Andreas, which extends from Mexico into northern California, and the maximum earthquake intensity predicted for this fault is a magnitude 8.3. This fault is located about 28 miles east of the Imperial Fault Zone.

The geologic strain pattern in the Imperial Valley region is clearly defined. The primary strain features are the northwest-trending high-angle faults developed along the San Andreas, San Jacinto, and Elsinore Zones. Movements along these faults are predominantly right lateral, with relative south-eastward displacements of the northeast blocks, and vertical movements are local or only apparent.

The cities of Brawley, Imperial, El Centro, and Calexico have, within the last 35 years, received damage from the movements of major faults in the San Jacinto Fault Zone. These are the Imperial and Superstition Hills Faults.

In relation to the City of El Centro, the Imperial Fault is located approximately five miles to the east. It is a historically active fault associated with an earthquake of major proportions in 1940 and again in 1966, both of which have well-documented reports indicating surface faulting. The May 18, 1940 Imperial Valley Earthquake exposed the exact line of the Imperial Fault, which is the only known section of the San Andreas system near the U.S./Mexico border.

Within a few miles to the north of El Centro, there are several faults which have been active historically. Some of these are associated with the recorded 1951 earthquake involving the Superstition Hills fault, a well-documented quake, showing surface faulting.

Thirteen official maps of new and revised Alquist-Priolo Earthquake Fault Zones were released on September 21, 2012 to Imperial, Alameda, Riverside, San Diego, and Ventura counties and the cities of Hayward, Oakland, and San Leandro by the California Geological Survey (CGS). These maps were released under the authority of the Alquist-Priolo Earthquake Fault Zoning (AP) Act that was passed following the 1971 San Fernando earthquake. The AP Act is a state law designed to reduce the hazard from surface fault rupture during an earthquake.

In accordance with the Alquist - Priolo Special Studies Zone Act (Chapter 7.5, Division 2, Public Resources Code, State of California, effective May 4, 1975), the Office of State Geologist delineated Special Study Zones which encompass potentially and recently active traces of four major faults (San Andreas, Calaveras, Hayward, and San Jacinto). These Special Study Zone Maps depicting active fault traces are available for public review at the Imperial County Planning Department and the Imperial County Public Works Department. The Alquist - Priolo Special Study Zone Act is enforced by the County to assure that homes, offices, hospitals, public buildings, and other structures for human occupancy which are built on or near active faults, or if built within special study areas, are designed and constructed in compliance with the County of Imperial Codified Ordinance.

The following maps depict the locations of known earthquake fault zones in Imperial County.[8, 9]

Figure 32. Earthquake Fault Zone Map

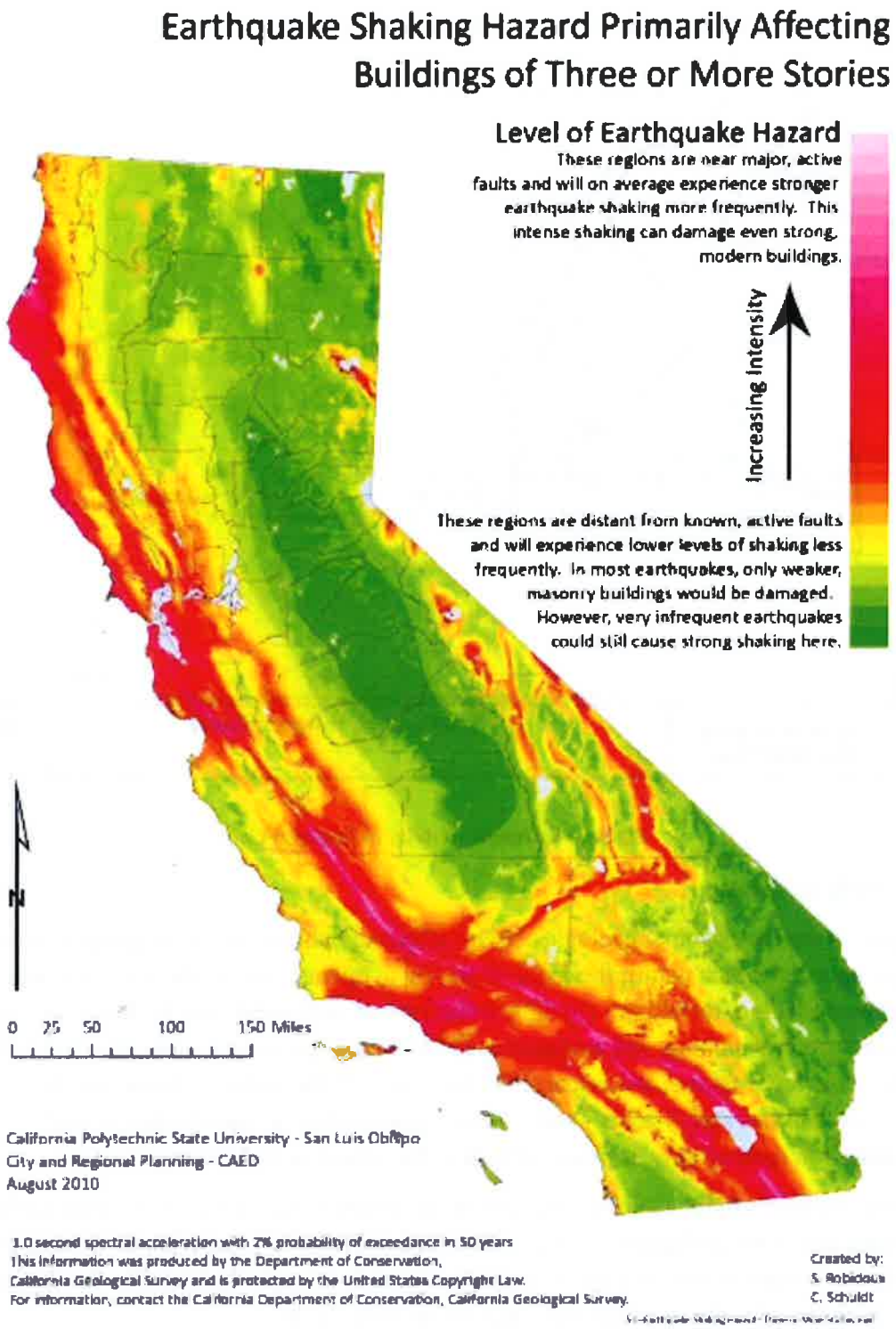


Figure 33. Earthquake Shaking Hazard Affective Buildings of Three or More Stories

The following map shows Seismic Activity in Imperial County: [10]

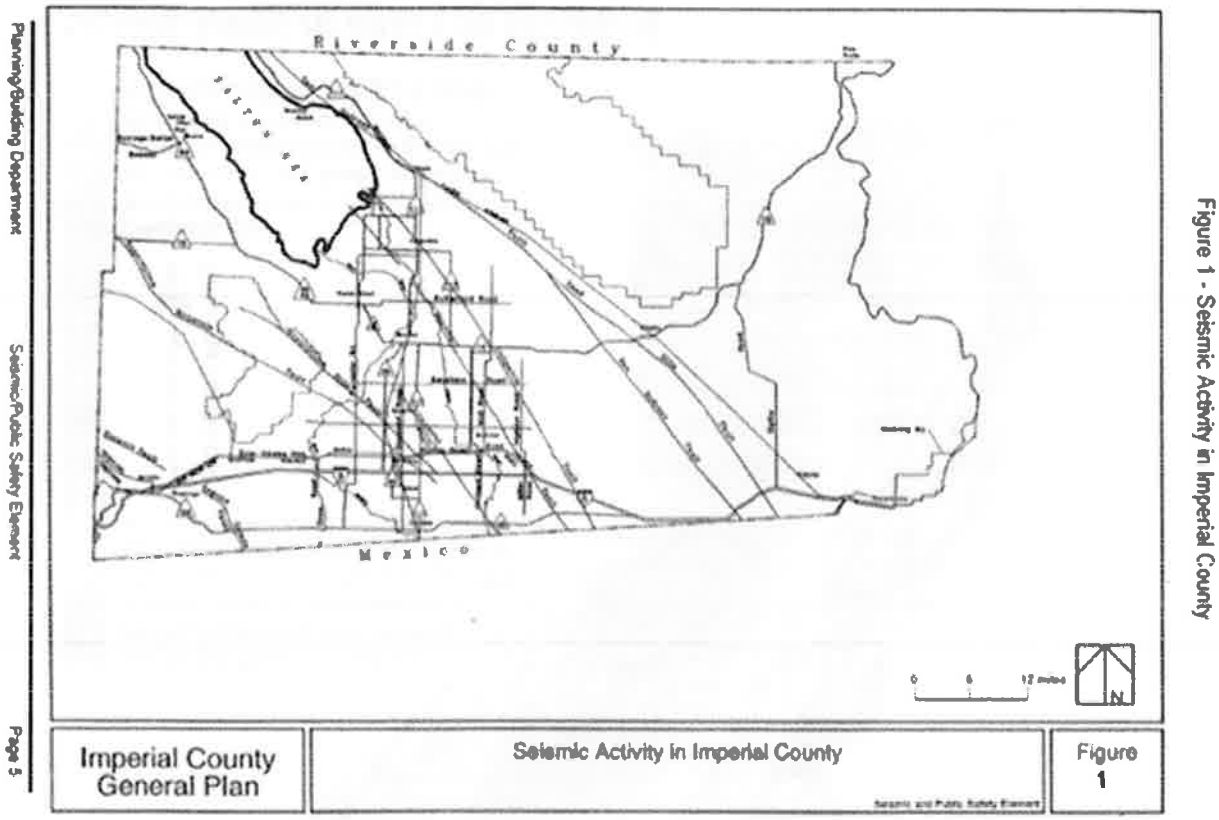


Figure 34. Seismic Activity in Imperial County

5.2.5. Risk Assessment

Earthquakes are the principal geologic activity affecting public safety in Imperial County. They are a triggering event which permit the force of gravity to operate and create many secondary hazards from ground shaking, including: (1) differential ground settlement, soil liquefaction, rock and mudslides, ground lurching, and avalanches; (2) ground displacement along the fault; (3) floods from dam and levee failure, and seiches; (4) fires; and (5) the various adverse results of disruption of essential facilities and systems - water, sewer, gas, electricity, transportation, and communication (and notably in Imperial Valley, the irrigation and drainage system).

The deep, sediment-filled geologic structure of the Imperial Valley makes the area particularly susceptible to severe earthquake damage. The Cities of Brawley, Imperial, El Centro, and Calexico have experienced damage from the movements of major faults in the San Jacinto fault zone, which includes the Imperial and Superstition Hills Faults.

It is difficult to predict the severity of casualties and property damage that could result from an

earthquake. The severity of casualties and property damage depend on the intensity of the earthquake, location of the epicenter to populated areas, and the time of day of the occurrence.[10] A moderate to severe incident with intense ground shaking in the populated areas of Imperial County could reasonably be expected to cause numerous casualties; extensive property damage; fire; road closures; and disruption of rail systems, communication systems (particularly telephone systems), the County's extensive canal system, and utilities. In addition, health hazards would be posed by damaged sewer systems and waste treatment facilities, and the possible contamination of the County's potable water supply. Medical treatment facilities would most likely be overtaxed. Theft and looting may also be a problem. The resultant disruption of the agricultural community would affect the local economy. The community needs could exceed the response capability of the County's emergency management organization, requiring mutual assistance from volunteer and private agencies, the Governor's Office of Emergency Services, and the Federal Emergency Support Functions.

It is noteworthy that liquid petroleum products are delivered to, and are transported through, Imperial County via the twenty-inch Santa Fe Pacific Pipe Line. A six-inch branch line distributes gas to a storage facility south of Imperial and a four-inch line serves the Naval Air Facility (NAF) near Seeley. The maintenance staff for the Pipe Line anticipates no special problems from earthquakes or fault movement, and are unaware of such a situation occurring in California in past years. A major break is estimated to require one to two days to repair.

The petroleum storage facilities in Niland and Imperial are vulnerable to earthquakes. Storage capacity is 77,500 barrels at Niland and 289,000 barrels at Imperial. Storage tanks, however, are normally filled to 50 percent of capacity. The 1979 earthquake resulted in the rupture of one tank and a gasoline leak of 100 gallons per minute at the Imperial facility. The potential for a major disaster does exist; however, the probability of loss of all liquid petroleum in the County is low. Emergency service via tanker is readily available if required during an emergency situation.

Natural gas is delivered to Imperial County by the Southern California Gas Company via twin ten-inch lines which generally run south through the County. These lines serve Niland, Calipatria, Brawley, Imperial, El Centro, Heber, and Calexico and branch lines serve Holtville, Westmorland, Seeley, NAF, and Plaster City. Rural residents are served by lateral lines from the branch lines. The lateral lines typically do not exceed a quarter mile in length. Gas lines are less resilient to seismic stress than liquid lines, and the entire natural gas system is vulnerable to disruption. The lines were damaged from the 1979 earthquake. The north-south line was damaged in the area where it crossed the fault. The line suffered compressive stress, and a fitting buckled, resulting in a major leak. The leak was repaired without shutting down the line. The line to Holtville was stretched where it crossed the fault. The line did not break and was repaired without shutting down the line.

- **Effects on people and housing.** In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health by reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.
- **Effects on commercial and industrial structures.** After any earthquake, individuals are likely to lose wages due to the inability of agriculture and businesses to function because of damaged facilities and/or goods. With agricultural and business losses, Imperial County and the cities in Imperial County will lose revenue. Economic recovery from even a minor earthquake will be critical to the communities involved.
- **Effects on infrastructure**. The damage caused by both groundbreaking and ground shaking can lead to the paralysis of the local infrastructure: police, fire, medical and government services.
- **Effects on agriculture.** Earthquakes can cause loss of human life, loss of animal life, and property damage to structures and land dedicated to agricultural uses. The most significant long-term impacts on agriculture from earthquakes are those that arise from the cascading effects of fire and flood.

5.2.6. Risk Assessment Conclusion

Imperial County is clearly at high risk for a significant earthquake causing catastrophic damage and strains on response and mitigation resources. Both property and human life are at high risk. The County experiences hundreds of minor quakes and tremblers each month from the myriad of faults in the area.

As noted above, it is difficult to predict the severity of casualties and property damage that could result from an earthquake. The severity of casualties and property damage depend on the intensity of the earthquake, location of the epicenter to populated areas, and the time of day of the occurrence.

Since Imperial County is subject to frequent seismic events, there are concerns related to ground shaking, soil liquefaction, and rock and mudslides. The composition of geologic strata (bedrock and soil) determines what can be expected from an area as a result of ground shaking. It is therefore important to know the soil makeup in order to determine the appropriate design of structures proposed for an area. Since the County is generally flat, landslides are not considered a major hazard. However, bluff failure and mudslides may occur along slopes and embankments of the rivers and canals.

Existing information about earthquakes that have occurred in Imperial County suggest that earthquakes of equal intensity may occur within the future. The County can expect injuries,

casualties and property damage from earthquakes at some time in the future because of the past frequency of moderately high magnitude and intensity earthquakes, the distribution of active faults and epicenters, and the projected increase in population.

Since 1933, public schools have been constructed in accordance with the Field Act, which requires thorough reviews of construction plans, strict inspections, and quality control. By 1977, nearly all public schools in Imperial County that were built before the Field Act had either been retrofitted or were no longer being used for instructional purposes.

5.2.7. Relationship to Other Hazards – Cascading Effects

While ground shaking may be the predominant agent of damage in most earthquakes, fires following earthquakes can also lead to catastrophic damage depending on the combination of building characteristics and density, meteorological conditions, and other factors. Earthquakes occurring in Imperial County are a triggering event which permits the force of gravity to operate and create many secondary hazards from ground shaking in addition to fires, including:

- differential ground settlement, soil liquefaction, rock and mudslides, ground lurching, and avalanches;
- ground displacement along faults;
- floods from dam and levee failure, and seiches;
- various adverse results of disruption of essential facilities and systems, including water, sewer, gas, electricity, transportation, and communication (and, notably in Imperial County, the irrigation and drainage system).

5.2.8. Unreinforced Masonry (URM) Buildings

Unreinforced masonry (URM) buildings are made of brick, stone, or other types of masonry and have no reinforcing steel to keep them from falling down in earthquakes. Most URM buildings have features that can threaten lives during earthquakes. These include parapets, walls, and roofs that are poorly connected to each other. When earthquakes occur, inadequate connections in these buildings can allow masonry to fall. Floors and roofs can collapse, placing occupants and passersby in harm's way. The risk to life from URM buildings can be significantly reduced by the regulation of alterations to existing buildings and seismic retrofits.

Unreinforced masonry structures perform poorly under almost all earthquake conditions, and especially if located on poor ground areas. Nearby relatively small earthquakes can be very damaging because of the sharp motions they generate. Distant events, while more damaging to taller buildings, can also damage unreinforced masonry buildings because of the stresses caused by long-period motions.

Evidence from past earthquakes shows that wood frame structures properly tied to their

foundations perform very well, or if badly damaged, cause few injuries and loss of life even if located in poor ground areas. Older wood frame structures that have stone, brick, or cripple wall foundations, or that are not bolted to their foundations, do not perform well. Mobile homes generally perform very well because of their lightness, but failures of their weak foundation supports (usually flimsy metal stands or concrete blocks) can produce serious damage and economic losses. Older mobile homes are also considered serious fire hazards because of the non-fire resistant wall paneling and other materials.

The Imperial County Building Department established a list of unreinforced masonry buildings located throughout the County and have notified building owners regarding the unreinforced condition of these buildings. Following are the results of a 2006 Progress Report to the California Legislature regarding an Unreinforced Masonry Building Survey of City and County Mitigation Efforts by the State of California Seismic Safety Commission. [11]

Table 15. Progress Report on Unreinforced Masonry Building Survey

Jurisdiction								Survey Results (Number of URMs)							
Inventory Completed	Number Historic URM	Number Non-Historic URM	Mitigation Program Established	Replied to 2006 Survey	Uniform Code for Building Conservation (UCBC) Compliance	Compliance Jurisdiction Program	Partial Compliance/ Under Construction	Retrofit Permit Issued	Plans Submitted	Reduced Occupancy	Demolished	Slated for Demolition	Warning Placards Posted	No Mitigation Progress	Owners Notified
Imperial County															
Yes	0	0	N/A											2	
Brawley															
Yes	0	32	Yes	Yes		10	3				3	2		14	32
Mitigation Program Type: A Combination of a Mandatory Strengthening Program and a Voluntary Strengthening Program															
Technical Mitigation Standards: None															
Progress and Remarks: Mitigation Rate: 9 percent															

Jurisdiction								Survey Results (Number of URMs)							
Inventory Completed	Number Historic URM	Number Non-Historic URM	Mitigation Program Established	Replied to 2006 Survey	Uniform Code for Building Conservation (UCBC) Compliance	Compliance Jurisdiction Program	Partial Compliance/ Under Construction	Retrofit Permit Issued	Plans Submitted	Reduced Occupancy	Demolished	Slated for Demolition	Warning Placards Posted	No Mitigation Progress	Owners Notified
Calexico															
Yes	0	19	Yes	Yes		2	5	0	0	0	2	1	0	9	19
Mitigation Program Type: Notices to owners, structural reports, wall anchors, and demolition.															
Technical Mitigation Standards: "L.A. Model Ordinance"															
Progress and Remarks: Mitigation Rate: 11 percent															
Calipatria															
Yes	0	6	Yes												
Mitigation Program Type: Mandatory Strengthening															
Technical Mitigation Standards: 1988 Edition of the County of Los Angeles Chapter 96															
Progress and Remarks: Mitigation Rate: 0 percent															
El Centro															
Yes	0	55	Yes	Yes	5	7	13	0	1	0	6	6	0	17	55
Mitigation Program Type: Mandatory parapet bracing, additional strengthening at the time of remodel.															
Technical Mitigation Standards: 1991 Edition of the UCBC Appendix Chapter 1															
Progress and Remarks: Progress is slow, difficult to obtain financing. Construction cost is more than the value of the structures. Estimated cost of compliance was approximately $5,700,000 in 1993. 1989 Program: Owner notification. 1991 Program: Active/passive program based on occupancy. Mitigation Rate: 20 percent															
Holtville															
Yes	0	4	No	Yes	0	0	0	0	0		3	1	0	0	
Mitigation Program Type:															
Technical Mitigation Standards:															
Progress and Remarks: Mitigation Rate: 75 percent															

Jurisdiction								Survey Results (Number of URMs)							
Inventory Completed	Number Historic URM	Number Non-Historic URM	Mitigation Program Established	Replied to 2006 Survey	Uniform Code for Building Conservation (UCBC) Compliance	Compliance Jurisdiction Program	Partial Compliance/ Under Construction	Retrofit Permit Issued	Plans Submitted	Reduced Occupancy	Demolished	Slated for Demolition	Warning Placards Posted	No Mitigation Progress	Owners Notified
City of Imperial															
Yes	0	0	N/A												
Mitigation Program Type:															
Technical Mitigation Standards:															
Progress and Remarks: Mitigation Rate: percent															
Westmorland															
Yes	0	2	Yes												
Mitigation Program Type: Mandatory strengthening															
Technical Mitigation Standards: 1988 Edition of Chapter 96 of the Los Angeles County Code.															
Progress and Remarks: Mitigation Rate: 0 percent															

5.2.9. HAZUS Analysis

As part of the update of this MHMP, an earthquake scenario was created in HAZUS-MH, the FEMA-approved software program for estimating potential losses from disasters. For the HAZUS analysis scenario, a magnitude 7.0 earthquake on the Imperial County/Mexicali border was simulated. [12]

A report of the HAZUS results begins on the following page.

Hazus: Earthquake Global Risk Report

Region Name:	ImperialCounty2
Earthquake Scenario:	Mag 7 on ImperialCo Mexicali border
Print Date:	June 26, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

FEMA

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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 700.32 square miles and contains 25 census tracts. There are over 43 thousand households in the region which has a total population of 150,213 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 40 thousand buildings in the region with a total building replacement value (excluding contents) of 12,264 (millions of dollars). Approximately 94.00 % of the buildings (and 80.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 4,355 and 12,158 (millions of dollars), respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 40 thousand buildings in the region which have an aggregate total replacement value of 12,264 (millions of dollars). Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 82% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 268 beds. There are 72 schools, 12 fire stations, 10 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 1 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 16,513.00 (millions of dollars). This inventory includes over 386.49 miles of highways, 167 bridges, 6,307.54 miles of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	167	298.7365
	Segments	99	3121.9828
	Tunnels	0	0.0000
	Subtotal		3418.6923
Railways	Bridges	30	171.6206
	Facilities	3	7.9690
	Segments	119	200.5850
	Tunnels	0	0.0000
	Subtotal		380.1946
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	0	0.0000
	Subtotal		0.0000
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	0	0.0000
	Subtotal		0.0000
Airport	Facilities	4	40.2736
	Runways	6	516.1949
	Subtotal		556.4685
	Total		4,355.40

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Table 2: Utility System Lifeline Inventory

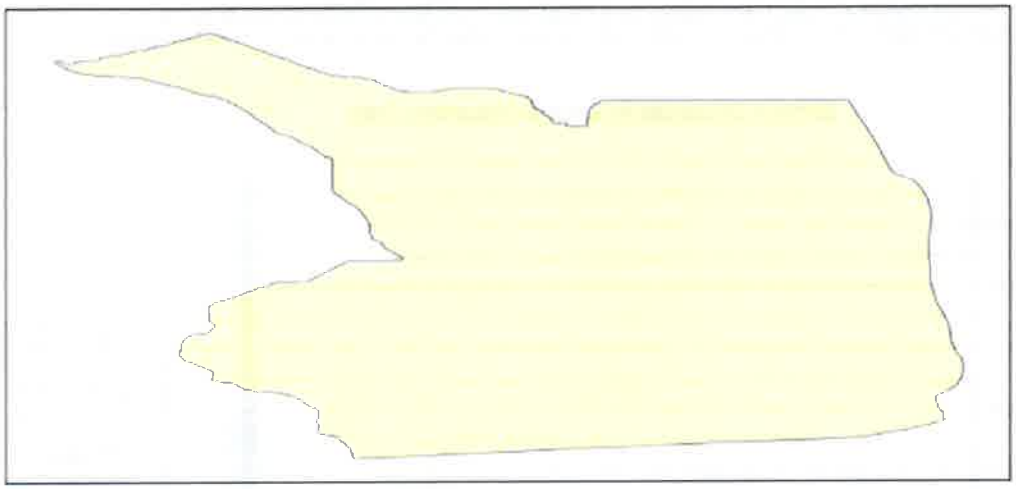
System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	126.0688
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	126.0688
Waste Water	Distribution Lines	NA	75.8413
	Facilities	26	4253.9048
	Pipelines	0	0.0000
		Subtotal	4329.5461
Natural Gas	Distribution Lines	NA	50.4275
	Facilities	0	0.0000
	Pipelines	2	51.6806
		Subtotal	102.1081
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	14	7599.3641
		Subtotal	7599.3641
Communication	Facilities	11	1.2980
		Subtotal	1.2980
		Total	12,158.40

HAZUS

FEMA

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	Mag 7 on ImperialCo Mexicali border
Type of Earthquake	Source
Fault Name	bb imperial
Historical Epicenter ID #	25
Probabilistic Return Period	NA
Longitude of Epicenter	-115.36
Latitude of Epicenter	32.68
Earthquake Magnitude	7.00
Depth (km)	0.00
Rupture Length (Km)	42.66
Rupture Orientation (degrees)	0.00
Attenuation Function	West US, Extensional 2008 - Strike Slip

HAZUS FEMA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 8,646 buildings will be at least moderately damaged. This is over 21.00 % of the buildings in the region. There are an estimated 663 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

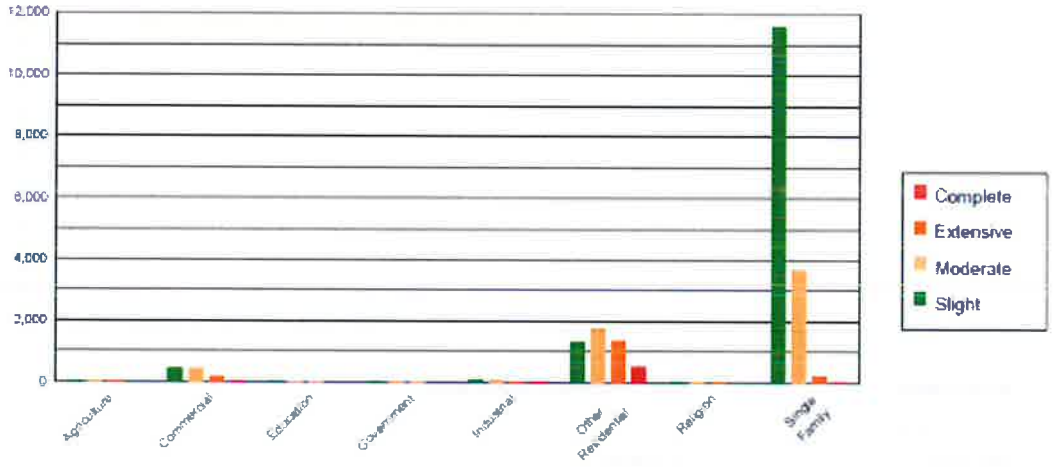


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	100.50	0.54	56.08	0.41	40.04	0.66	14.47	0.76	4.91	0.74
Commercial	656.47	3.52	441.44	3.26	442.16	7.26	186.60	9.85	56.33	8.50
Education	36.96	0.20	22.19	0.16	15.84	0.26	5.58	0.29	1.43	0.22
Government	31.69	0.17	20.17	0.15	19.92	0.33	9.78	0.52	3.44	0.52
Industrial	100.17	0.54	72.81	0.54	82.11	1.35	38.98	2.06	13.94	2.10
Other Residential	1372.09	7.36	1344.04	9.92	1788.24	29.37	1387.27	73.22	519.36	78.33
Religion	67.60	0.36	42.50	0.31	35.06	0.58	15.02	0.79	4.62	0.70
Single Family	16284.62	87.32	11554.70	85.25	3665.68	60.20	237.00	12.51	59.00	8.90
Total	18,650		13,554		6,089		1,895		663	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	17172.03	92.07	12244.37	90.34	3881.80	63.75	248.42	13.11	67.48	10.18
Steel	177.18	0.95	124.18	0.92	174.95	2.87	87.29	4.61	27.17	4.10
Concrete	214.88	1.15	149.14	1.10	124.65	2.05	60.66	3.20	20.14	3.04
Precast	170.49	0.91	117.55	0.87	142.32	2.34	59.83	3.16	16.14	2.43
RM	480.46	2.58	198.35	1.46	204.95	3.37	85.92	4.53	15.55	2.35
URM	52.14	0.28	43.32	0.32	47.36	0.78	22.34	1.18	11.28	1.70
MH	383.12	2.05	677.02	4.99	1513.03	24.85	1330.23	70.21	505.26	76.21
Total	18,650		13,554		6,089		1,895		663	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 268 hospital beds available for use. On the day of the earthquake, the model estimates that only 159 hospital beds (59.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 86.00% of the beds will be back in service. By 30 days, 97.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	3	0	0	2
Schools	72	0	0	55
EOCs	1	0	0	1
PoliceStations	10	0	0	8
FireStations	12	0	0	9

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Transportation Lifeline Damage

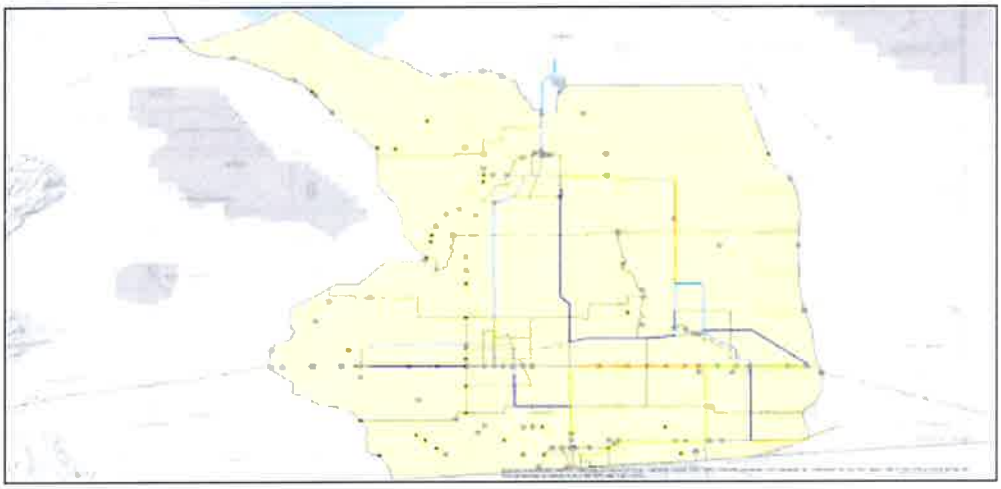

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Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	99	0	0	99	99
	Bridges	167	7	0	160	162
	Tunnels	0	0	0	0	0
Railways	Segments	119	0	0	119	119
	Bridges	30	0	0	30	30
	Tunnels	0	0	0	0	0
	Facilities	3	0	0	3	3
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	4	0	0	4	4
	Runways	6	0	0	6	6

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

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Table 7 : Expected Utility System Facility Damage

System	Total #	# of Locations With at Least Moderate Damage	# of Locations With Complete Damage	# of Locations with Functionality > 50 % After Day 1	# of Locations with Functionality > 50 % After Day 7
Potable Water	0	0	0	0	0
Waste Water	26	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	14	0	0	0	0
Communication	11	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	3,917	0	0
Waste Water	2,350	0	0
Natural Gas	41	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water						
Electric Power						

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Induced Earthquake Damage

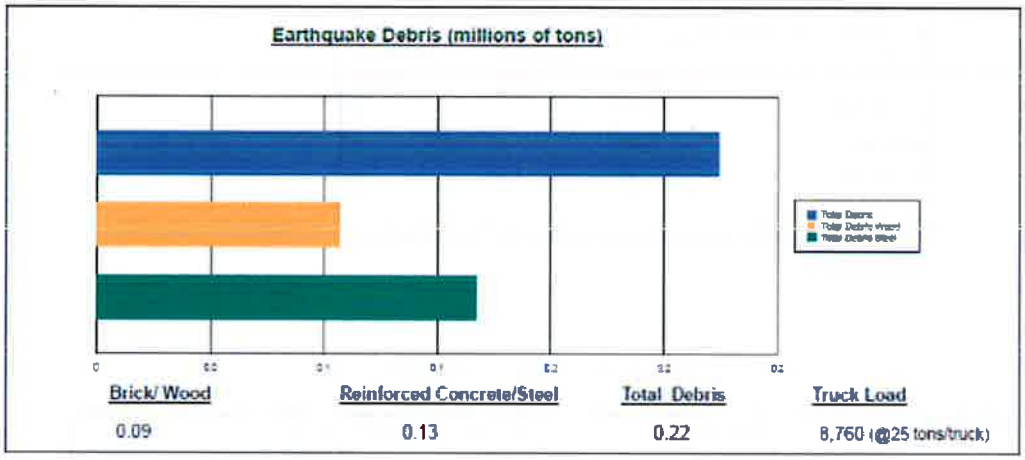
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 1 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 219,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 39.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 8,760 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



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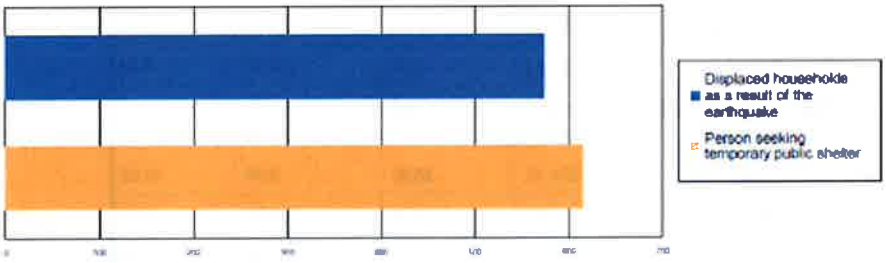
Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 574 households to be displaced due to the earthquake. Of these, 615 people (out of a total population of 150,213) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
574	615

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

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Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	3.71	0.92	0.14	0.27
	Commuting	0.03	0.04	0.07	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.05	0.74	0.10	0.20
	Other-Residential	156.31	32.24	2.46	4.37
	Single Family	71.64	8.23	0.34	0.58
	Total	235	42	3	5
2 PM	Commercial	234.71	58.09	8.69	17.02
	Commuting	0.30	0.36	0.66	0.13
	Educational	105.90	26.16	3.96	7.78
	Hotels	0.00	0.00	0.00	0.00
	Industrial	22.47	5.44	0.77	1.49
	Other-Residential	35.24	7.27	0.58	1.02
	Single Family	16.80	1.97	0.09	0.14
	Total	415	99	15	28
5 PM	Commercial	172.99	42.80	6.43	12.46
	Commuting	4.36	5.22	9.53	1.81
	Educational	10.74	2.64	0.40	0.78
	Hotels	0.00	0.00	0.00	0.00
	Industrial	14.04	3.40	0.48	0.93
	Other-Residential	56.66	11.73	0.92	1.63
	Single Family	27.29	3.20	0.15	0.23
	Total	286	69	18	18

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Economic Loss

The total economic loss estimated for the earthquake is 1,068.43 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

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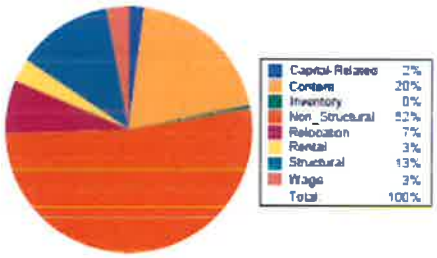
Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1,036.24 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 60 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

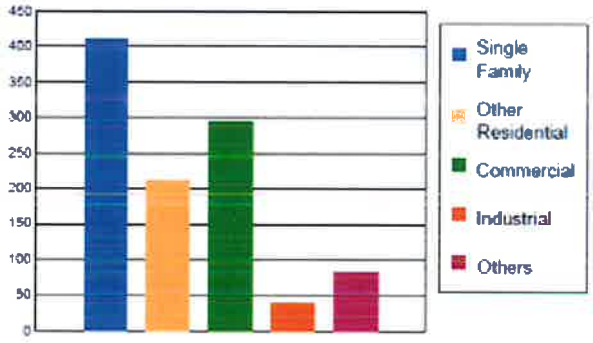


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.8555	26.0847	0.7277	2.3903	31.0582
	Capital-Related	0.0000	0.7918	19.3451	0.4307	0.5493	21.1169
	Rental	7.2861	7.9920	13.6253	0.2429	1.1818	30.3281
	Relocation	25.9278	12.8236	22.5656	1.2922	8.4936	71.1230
	Subtotal	**33.2139**	**23.4631**	**81.6407**	**2.6935**	**12.6150**	**153.6262**
Capital Stock Losses							
	Structural	43.9069	28.1340	41.1108	4.9558	13.0910	131.1985
	Non_Structural	246.3788	130.4198	112.2189	17.6276	36.6154	543.2605
	Content	86.9088	29.4593	56.6041	11.4099	19.5313	203.9134
	Inventory	0.0000	0.0000	1.8840	1.8967	0.4586	4.2393
	Subtotal	**377.1945**	**188.0131**	**211.8178**	**35.8900**	**69.6963**	**882.6117**
	Total	**410.41**	**211.48**	**293.46**	**38.58**	**82.31**	**1036.24**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	3121.9528	0.0000	0.00
	Bridges	296.7395	17.7622	5.99
	Tunnels	0.0000	0.0000	0.00
	Subtotal	3418.6923	17.7622	
Railways	Segments	200.5850	0.0000	0.00
	Bridges	171.6206	2.4494	1.43
	Tunnels	0.0000	0.0000	0.00
	Facilities	7.9890	1.9487	24.39
	Subtotal	380.1946	4.3981	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Airport	Facilities	40.2736	10.0279	24.90
	Runways	516.1949	0.0000	0.00
	Subtotal	556.4685	10.0279	
	Total	4,355.36	32.19	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	126.0688	0.0000	0.00
	Subtotal	126.0688	0.0000	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	4253.9048	0.0000	0.00
	Distribution Lines	75.6413	0.0000	0.00
	Subtotal	4329.5461	0.0000	
Natural Gas	Pipelines	51.6806	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	50.4275	0.0000	0.00
	Subtotal	102.1081	0.0000	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	7599.3641	0.0000	0.00
	Subtotal	7599.3641	0.0000	
Communication	Facilities	1.2980	0.0000	0.00
	Subtotal	1.2980	0.0000	
	Total	12,158.39	0.00	

Appendix A: County Listing for the Region

Imperial,CA

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Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Imperial	150,213	9,778	2,486	12,264
Total Region		**150,213**	**9,778**	**2,486**	**12,264**

SOURCES:

[1] USGS Glossary, Seismic Swarm Definition. https://volcanoes.usgs.gov/vsc/glossary/seismic_swarm.html
[2] Southern California Seismic Network (SCSN)
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[10] County of Imperial, Planning/Building Department, Seismic and Public Safety Element of the General Plan
http://www.icpds.com/CMS/Media/Seismic-and-Public-Safety-Element.pdf
[11] California Seismic Safety Commission https://ssc.ca.gov/
original link: http://www.seismic.ca.gov/pub/CSSC%202006%20URM%20Report%20Final.pdf
[12] Federal Emergency Management Agency, Earthquake Global Risk HAZUS Report for Imperial County, June 2020, Generated by Bluecrane, Inc. https://www.fema.gov/hazus

5.3. Hazard: Flooding

5.3.1. Jurisdictions Affected by Flooding

Flooding risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 16. Flooding Probabilities and Severities by Jurisdiction

Imperial County Probability: High	**Imperial County Severity: High**
Brawley Probability: High	**Brawley Severity: High**
Calexico Probability: High	**Calexico Severity: High**
Calipatria Probability: Very High	**Calipatria Severity: Very High**
El Centro Probability: Low	**El Centro Severity: Low**
Holtville Probability: High	**Holtville Severity: Medium**
Imperial City Probability: High	**Imperial City Severity: High**
Westmorland Probability: High	**Westmorland Severity: High**
Imperial Irrigation District Probability: High	**Imperial Irrigation District Severity: High**
Office of Education Probability: High	**Office of Education Severity: High**

5.3.2. Hazard Definition

A flood is defined as an overflowing of water onto an area of land that is normally dry. Floods generally occur from natural causes, usually weather-related, often in conjunction with a wet or rainy spring or with sudden and very heavy rainfalls. Floods can, however, result from human causes as a dam impoundment bursting. Dam break floods are usually associated with intense rainfall or prolonged flood conditions.

Dam failure may also be caused by faulty design, construction, and operational inadequacies. The cause can also be due to a flood event or earthquake larger than the dam was designed to accommodate. The degree and extent of damage depend on the size of the dam and circumstances of failure. A small dam retaining water in a stock pond may break resulting in little more damage than the loss of the structure itself. In contrast, a dam break could result in the loss of irrigation water for a season, causing extreme financial hardship to many farmers. An even larger dam failure might bring about considerable loss of property; destruction of cropland, roads, and utilities; and loss of life. Other consequences can include loss of income, disruption of services, and environmental devastation. Dam failure as a primary hazard will be assessed in Section 5.6 of this MHMP.

Floods are generally classed as either slow-rise or flash floods. Slow-rise floods may be preceded by a warning time lasting from hours to days, or possibly weeks. Evacuation and sandbagging for a slow rise flood may lessen flood-related damage. Conversely, flash floods are the most difficult for which to prepare due to the extremely short warning time, if there is any at all. Flash flood warnings usually require immediate evacuation. On some occasions in the desert areas, adequate warning may be impossible.

5.3.3. History

Imperial County is located in the southeastern corner of California and was organized in the wake of disastrous floods and water-control projects along the Colorado River in 1905 and 1907 that diverted waters into the then-dry Salton Sink and created the Salton Sea. Where not irrigated, most of Imperial County is barren, sandy, low desert, stretching east to the State's border along the Colorado River. Today, the Imperial Valley at the south end of the Salton Sea is a rapidly growing agricultural region, and some consider the Sea to be "the heart and soul" of Imperial County. The Salton Sea is largely below sea level and is the largest inland body of water in California. From north to south, the Sea is 35 miles long, with over 2/3 of the Sea in Imperial County and the northern end in Riverside County.

Although the County is located in a desert with very low precipitation, it is sometimes subject to heavy rains and subsequent flooding. The entire County is subject to various degrees of flooding in the form of flash floods or slow floods caused by heavy precipitation. Flash flooding is not infrequent in desert areas. Such flooding occurs when sudden downpours over the mountains and/or desert tend to create instantaneous peak flows which roughly follow empty stream beds and

mountain washes.

Flooding could occur either in floodplains or floodways. Floodplains are generally located adjacent to rivers and other bodies of water and in low-lying areas near a water source. The external boundary of floodplains is defined by the predicted extent of inundation that would result from the most intense storm that occurs once every 100 years. Floodways are defined by discernible drainage channels. 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 Myer Creek (through Ocotillo) and within the levees along the Colorado River.

Flooding could also result from damage to the All-American Canal and associated transmission aqueducts. A few hazardous waste facilities are located in the County and accidents could dangerously pollute air and water.

In July 2012, heavy rain and sheet inundation created stormwater flash flooding and caused heavy damage in Calipatria and inundated areas from Ocotillo to Holtville. Many roads, including Interstate 8 and State Highways 98 and 111, were closed and canals were damaged.

A series of storms struck Southern California beginning January 4, 1995. Imperial County was declared a disaster area on January 10 by President Clinton. The Salton Sea continued to rise because of high rates of rainfall. A trailer park at Desert Shores had 134 lots flooded. Water in this area was also seeping into the underground electrical system and caused power outages. It also caused problems with the sewage treatment operations. Seawalls were crumbling and falling down. The Salton Sea Beach was submerged. Some existing dikes, owned by Imperial Irrigation District, were raised to prevent further flooding, including sixteen miles of dikes that were raised two or more feet.

From August 15 – 17, 1977, Tropical Storm Doreen swept through Imperial Valley, the second "100-year storm" to occur within a two-year period. The County was declared a disaster area. Thunderstorms brought four-to-five inches to the desert areas. Severe flooding resulted in flooding to agricultural lands, causing widespread damage ($15 million) to crops, utilities, roads, and structures. The storm ravaged 300 homes and destroyed portions of Interstate 8. The Westside Main Canal was rendered unusable in Westmorland, and irrigation systems were destroyed by flooding in Niland. In Holtville, the sewer plant was badly damaged and a house was flooded. In Calexico, streets were flooded and two feet of water flooded the City Council's chambers. In El Centro, roads, sewers, and homes were flooded. In Calipatria, a ditch overflowed and the city was flooded with two feet of water. Sixteen houses in Calipatria were flooded with mud and water up to five inches. Interstate Highway 8 west of Ocotillo was damaged.

On September 9, 1976, Tropical Storm Kathleen came ashore and brought about 10 inches of rain to some desert areas. San Felipe creek overflowed and caused extensive damage to 3,390 acres of agricultural land, irrigation works, and roads. Carrizo Wash washed out roads and rail lines. In the small town of Ocotillo, the south section was flooded by Myer Creek. Then the creek shifted, and

the north end of town flooded. This flooding left behind one-to-three feet of silt and mud, and damaged many homes and structures. Three fatalities occurred in the Ocotillo area. Two people were swept to their deaths on Interstate 8 when it washed out. Interstate 8, State Highway 98, and the San Diego and Arizona Eastern Railroad lines suffered major flood damage. The bridge at Myer Creek washed out. Six homes were destroyed. Fifty five (55) homes and one business were damaged. A railroad trestle bridge at Coyote Wash washed out. Coyote Wash and Yuma Wash overflowed and damaged 2,000 acres of agricultural lands. Pinto Wash and Westside Main Canal Break overflowed and caused extensive damage to 1,750 acres of agricultural lands of cotton, alfalfa, and sudan grass. Damages from this flood event have been estimated at $20,231,000.00.

Imperial County Planning and Development Services has listed maps of the various flood zones on their website to help locate local flood areas.[13] The New River and Alamo River flow from Mexicali in Baja California, Mexico, through the Colorado Desert and Imperial Valley, to the Salton Sea. Residential areas located near the rivers are at risk for flooding, including several communities in Imperial County (Brawley, Calexico, Calipatria, City of Imperial, El Centro, Holtville, and Westmorland) as it traverses the 60 miles between the International Boundary and the Salton Sea.[14]

5.3.4. Summary of Flood Hazard Locations

Within the County jurisdiction, the communities of Bombay Beach and Ocotillo are considered to be the most likely to experience significant flooding. In El Centro, the Gillett/Cannon Roads area receives the heaviest flooding. It is at a low elevation east of El Centro and south of East Evan Hewes Highway. Bombay Beach is located in a pocket created by the Salton Sea on the west and the Chocolate Mountains on the east. Severe flooding could isolate the community. In the event of a major flood, approximately 300 to 1,000 residents would have to be evacuated.

The communities of Ocotillo and Nomirage are at risk due to their location at the base of an alluvial fan originating at the base of Myer Creek. More specifically, Myer Creek is located in the southwestern part of Imperial County and flows in a northeasterly direction through the townsites of Ocotillo and Nomirage, draining over 21.8 square miles. Seeley has suffered road and shoulder structural damage on each side of its streets due to flooding. When it rains, water drains toward the center of the streets and accumulates in the streets. The flooding causes hazards for pedestrians and drivers, and causes severe damage to the roads.

Five (5) County roads which are prone to flooding include: 1) Azure Road between Treadwell and Coombs, 2) Azure Road north of Marina Drive, 3) Noffsinger Road, 4) Stallard Road at Palo Verde Road, and 5) Wilkins Road north of Beal Road. Ogilby Road experiences some of the most severe flooding of road locations in Imperial County. Because it is a Federal Highway Administration (FHWA) road, Ogilby is not eligible for FEMA HMGP funds. The County continues to seek funding opportunities for drainage improvements for this road.

The following Table, developed by the Imperial County Flood Management Plan Working Group

in a Flood Management Plan workshop, illustrates the areas in the County that are particularly at risk to flood hazards, and the potential impact and potential losses if flooding should occur.

Table 17. Areas of County Particularly at Risk from Flooding

Flood Prone Area	Cause	Potential Impact	Potential Losses
Brawley	New River overtopping	Localized flooding	More than $1,000,000
Calexico	New River overtopping	Localized flooding	More than $1,000,000
Calipatria	Alamo River overtopping	Localized flooding	Less than $100,000
El Centro	Overflowing of Gillett/Cannon Roads drains	Localized flooding	Less than $100,000
Ocotillo	Myer Creek overflow	Evacuation of approximately 300 to 1,000 residents	Less than $100,000
Within the levees along the Colorado River	Levee breach	Severe wide-area flooding	More than $10,000,000
Bombay Beach	High winds and water	Localized flooding	Less than $100,000
Nomirage	Myer Creek overflow	Localized flooding	Less than $100,000
Desert Shores	High winds and water	Localized flooding	Less than $100,000
Salton Sea Beach	High winds and water	Localized flooding	Less than $100,000
Bard-Winterhaven area	Dam inundation	Severe wide-area flooding	More than $10,000,000

The County has proclaimed four states of emergency due to flooding and one state of emergency due to rain and high winds since 1958 (California State OES). Eight federal declarations have been issued since 1950. Residents have submitted $762,416.00 in flood insurance claims since 1978 (FEMA NFIP Statistics, 2006). The County has experienced damage to roadways, culverts, utilities, pipelines, man-made canals, irrigation ditches, and agricultural soils.

The following map shows the California flood disaster declarations from 1950 – December 2009. Imperial County has had 14 declared flooding disasters.[15]

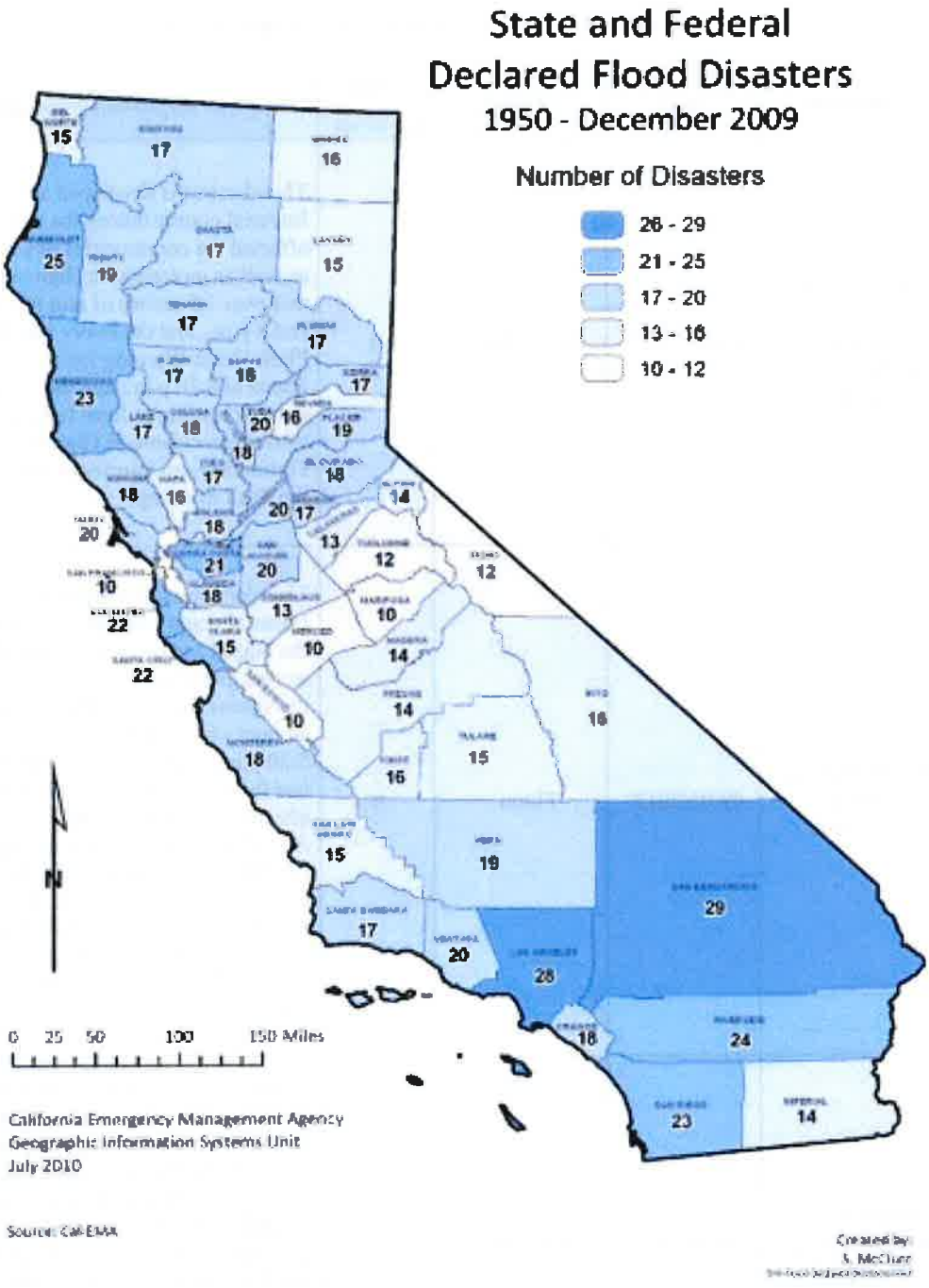

Figure 35. State and Federal Declared Flood Disasters 1950 - 2009

5.3.5. Flood Events in Imperial County

The following table depicts a history of flood events in Imperial County.[16]

Table 18. History of Flood Events in Imperial County

Location	Date	Type	Death/ Injuries	Reported Property Damage
Central Imperial Valley, Alamora, Calipatria, Brawley	09/09/2012	Flash Flood	0	Thunderstorms developed across portions of central Imperial county during the evening hours. They affected the communities of Calipatria and Brawley, as well as motorists on Highway 78. Radar indicated that over 1.5 inches of rain fell near Weist between 7 and 8 p.m., and the heavy rain led to flash flooding. A Flash Flood Warning for central Imperial county was issued at 8:10 p.m., and the warning continued past 11 p.m. According to local law enforcement, the flooding caused the closure of Highway 78 east of Brawley. Fortunately, no injuries or accidents occurred due to the flash flooding.
Eastern Imperial County, Palo Verde	09/05/2012	Flood	0	Thunderstorms developed across portions of eastern Imperial county during the afternoon hours. Due to the humid and unstable nature of the atmosphere, the storms generated locally heavy rainfall. In addition, the storms were slow moving, which enhanced the amount of rain with the stronger thunderstorms. At 5:30 p.m., radar estimated that over one inch of rain had fallen southwest of Palo Verde, and shortly afterward a Small Stream Flood Advisory was issued. At 6:15 p.m., the California Highway Patrol reported flooding across State Route 78 approximately three miles southwest of Cibola. Additionally, lane closures were reported near Mitchells Camp Road south of Palo Verde. No accidents or injuries were reported with the flooding, and no swift water rescues were needed.
Southwest Imperial Valley, Mt. Signal	08/30/2012	Flash Flood	0	Scattered thunderstorms developed across portions of southwest Imperial county, primarily south and west of El Centro, during the late morning hours on August 30th. Due to the very humid and unstable nature of the atmosphere, thunderstorms produced excessive rainfall with peak rain rates in excess of two inches per hour. Heavy rains prompted the issuance of a Flash Flood Warning for southwest Imperial County, running from 11:25 a.m. until 1:30 p.m. At 11:45 a.m., local law enforcement personnel reported a road closure at State Route 98 and Drew Road. Water was swiftly flowing across the highway, posing a significant hazard to motorists. No injuries or water

Location	Date	Type	Death/ Injuries	Reported Property Damage
				rescues were reported, however.
Imperial County, Dixieland, Seeley, Plaster City	07/30/2012 07/31/2012	Flood	5 Injured	Scattered thunderstorms developed across southwest Imperial County during the afternoon hours on July 30. Due to the very humid and unstable nature of the atmosphere, the storms produced locally heavy rainfall with rain rates well in excess of one inch per hour. A Flash Flood Warning was issued at about 4:30 p.m., which led to road closures west of El Centro, in the area near Seeley and Dixieland. Thunderstorms persisted into the evening, and additional rainfall led to areas of flooding along Interstate 8, Evan Hewes Highway and Highway 98. According to the California Highway Patrol, at approximately 9 p.m. flooding caused the closure of Interstate 8 in both directions between Drew Road and Dunaway Road. At 8:30 p.m., local law enforcement reported the evacuation of five homes on Evan Hewes Highway due to a bank collapse along the Westside main canal. Heavy rain from earlier storms led to the collapse of the canal bank, and canal water then spread into the homes just west of Seeley. Overflow from the Westside canal eroded Evan Hewes Highway west of Westside road, and 100 feet of the highway were washed away. As a result, Evan Hewes Highway was closed from Dunaway to Westside road. In addition, Dunaway road was damaged beyond repair due to the flooding. Several minor injury traffic accidents were reported during the heavy rain and flooding, as rains limited visibility and made roads very slick. The breach of the canal resulted in no access to the Centinela State Prison. At 7:30 p.m. the Flash Flood Warning was replaced by an area Flood Warning which continued through 4:30 a.m. on July 31.

Location	Date	Type	Death/ Injuries	Reported Property Damage
Imperial County, Calipatria, Holtville, Ocotioo, Salton City, Seeley, Niland, Plaster City, Calipatria	07/13/2012	Flash Flood	0	Heavy rainfall and flash flooding. Some locations picked up one to two inches of rain, and isolated spots saw rainfall in excess of three inches. The heavy rain also caused localized flooding and ponding of water that persisted well into the evening hours. California Highway Patrol reported the closure of State Route 78, west of the junction with highway 86, due to flooding. In addition, there were reports of several vehicles trapped in running washes as well as flooding across other area roadways. Scattered thunderstorms developed across Imperial county during the late morning and then continued well into the day on July 13. The storms generated heavy rain over central portions of the county, including Calipatria, and this led to area flooding of roads, washes and low lying areas. Between 4 and 5 p.m., a cluster of thunderstorms east of Calipatria produced two to three inches of rain based on radar estimates, highly increasing the threat of flooding. At approximately 10 p.m., Imperial County emergency management personnel reported flooding into agricultural fields between Calipatria and Niland due to overflowing canals. Water was reported to be coming in from the east. Flood waters were affecting 24 homes in the Calipatria area, and there was a report of damage to the Highline Canal. In addition, Blair road at the entrance into the Calipatria State Prison was flooded. The weather disturbance moving into a very moist and unstable atmosphere led to numerous showers and thunderstorms across Imperial County during the afternoon and evening hours on July 13. Radar indicated that between one and two inches of rain fell across portions of southwest Imperial County from 2:15 to 3:15 p.m., and a flash flood warning was issued for areas including the communities of Seeley and Plaster City. At 6 p.m., there was a water rescue of an irrigation district employee at the intersection of Drew Road and the railroad tracks, approximately one mile west of the town of Seeley.
Imperial County, Westmorland	08/08/2008	Flash Flood	0	Late afternoon thunderstorms produced winds over 50 mph and areas of blowing sand and dust. Water and debris were reported to cover the roadway in this area.

Location	Date	Type	Death/ Injuries	Reported Property Damage
Imperial County, Ocotillo	09/04/2007	Flash Flood	0	Showers and thunderstorms developed during the afternoon hours, resulting in very heavy rainfall and local flooding. In addition, gusty winds associated with these storms affected portions of Imperial County. Portions of Highway 80 and Interstate 8 near Imperial became flooded.
Imperial County, Ocotillo	08/26/2007	Flash Flood	0	Route 78 was flooded due to heavy rainfall near Ocotillo Wells. Other portions of Imperial County had locally heavy rain. State Route 78 was reported flooded.
Imperial County	08/09/2005	Flash Flood	0	Widespread strong thunderstorms with heavy rainfall caused rapid flooding of low lying areas and roadways throughout central Imperial County. A measured rainfall of 3.36 inches fell between 4 and 6 p.m. as reported by the Cahuilla Remote Automatic Weather Station. California State Route 78 at Mile Post 66 was washed out by flash flood waters.
Niland	12/28/2004	Flash Flood	0	Heavy rains resulted in flooded roads and running washes and creeks. Near Bombay Beach, on the north shore of Salton Sea, homes were flooded and at least three vehicles became stranded in water.
Glamis	08/11/2001	Flash Flood	0	Strong thunderstorms with very heavy rainfall caused washes and secondary roads to be flooded quickly. A campground near Senator Wash Reservoir flooded and campers moved to higher ground to escape the flood waters. State Highway 78, between Glamis and S34 Ogilby Road was closed due to flood waters.
El Centro	08/29/2000	Flash Flood	0	Heavy rain resulted in some road closures with flooded streets in town.
City of Imperial	09/10/1999	Urban/Small Stream Flooding	0	Considerable street flooding in and around Imperial as radar estimated amounts over 1.50 inches per hour.
City of Imperial	09/09/1998	Flooding, Thunderstorm, Winds at Mag 60 knots	0	Power lines and power poles downed across parts of Imperial and Niland. Numerous roofs were damaged. At least one billboard was toppled along Highway 86 south of town, and The Movies marquee was shattered. California Highway Patrol investigated a storm- related seven car pileup which occurred between 3:45 and 3:48 p.m. on Highway 111 just south of Aten Road. Some streets were flooded with about an inch reported at Imperial. Dense blowing dust reduced visibility to less than 1/8 mile before the

Location	Date	Type	Death/ Injuries	Reported Property Damage
				heavy rain began.
Imperial County	03/12/1995	Flooding	0	During the storms of 1995, the communities of Desert Shores, Bombay Beach, and Salton Sea Beach were affected by the high winds and water. Wind swept waves overtopped dikes along the southern portions of the Salton Sea causing several county roads to be flooded.
Imperial County	01/10/1995	Flooding	0	During the storms of 1995, the communities of Desert Shores, Bombay Beach, and Salton Sea Beach were affected by the high winds and water. Wind swept waves overtopped dikes along the southern portions of the Salton Sea causing several county roads to be flooded.
Imperial County	08/18/1977	Flooding (Tropical Storm Doreen)	0	Tropical storm Doreen swept through Imperial Valley, the second "100 year storm" in two years. Tropical Storm Doreen ravaged 300 homes, wiped out portions of Interstate 8, and caused three fatalities and $15 million worth of damage to crops. It produced flooding and damage to residences, businesses, and public property, including the following: severe flooding inundated agricultural lands; Westside Main Canal was out at Westmorland; in Calexico, streets and the city council chambers were flooded. in El Centro, roads, sewers, and homes were flooded; in Calipatria, a ditch overflowed, and the city was flooded with two feet of water. Sixteen houses were also flooded; damage occurred in Imperial and Brawley.

Location	Date	Type	Death/ Injuries	Reported Property Damage
Imperial County	09/07/1976	Flooding (Tropical Storm Kathleen)	6 drowning	California received record rainfall as a result of Tropical Storm Kathleen. Flooding caused catastrophic destruction to Ocotillo. Because Ocotillo is situated atop an alluvial fan, the path of the raging floodwaters was wide and changing, with over half of the town being totally destroyed. The waters piled a layer of sand that was over three meters high in some places. Six people drowned in the mud and waters there. Other parts of Imperial County experienced severe flash flooding. Flooding disrupted transportation routes. Part of Interstate 8 along the San Diego and Imperial County border was washed out. Agriculture was disrupted throughout the area. The area covered by the Salton Sea increased. Parts of California were declared a disaster area. Damage estimates ranged from $40 to $160 million.
Bombay Beach	01/1976	Flooding (Tropical Storm)	0	In January 1976, tropical storms threatened the existence of Bombay Beach as water levels rose several feet. A sump and water pump were located on the corner of Fifth Street and Isle of Palms, the lowest point in town. However, the Salton Sea continued to rise and, as a result, 536 lots south of Fifth Street were inundated, sinking a popular mobile home park, and permanently affecting the development of the town.
Imperial County	08/27/1951	Flooding (Tropical Storm)	0	A hurricane moving north northwestward, just off the west coast of Baja California moved northeastward into northern Baja California and dissipated. Moisture from this tropical cyclone resulted in rainfall of two to five inches in the mountains and deserts of southern California from May 27 – 29. Many roads were washed out in the Imperial Valley. This occurred during the El Niño of 1951-52.

Location	Date	Type	Death/ Injuries	Reported Property Damage
Imperial County	09/5-7/1939	Flooding (Tropical Storm)	0	Four storms affected southern California during the month of September 1939, including the only storm on record designated as actually hitting California as a tropical storm. All of these storms occurred during the El Niño of 1938-39. Imperial County received more rain than would normally fall in two years. The city of Brawley's Main Street flooded curb-to-curb. Three bridges were destroyed north of Brawley by the floods, and five more had serious damages. The County jail flooded with 1½ ft. of water, and public schools were closed. Most of the damage was done to agricultural lands and irrigation works such as canals and delivery systems, including damage to the All American Canal and drainage systems. The estimated cost of damages to irrigation works was $110.000. Debris from the storm was deposited on Highway 98.

5.3.6. National Flood Insurance Program (NFIP)

Imperial County and the participating jurisdictions are participants in the NFIP, a federal program administered by FEMA. Participants in the NFIP must satisfy certain mandated floodplain management criteria. As a desired level of protection, the National Flood Insurance Act of 1968 sets an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of one in 100 years, although such a flood may occur in any given year. Imperial County and the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland are occasionally audited by the California Department of Water Resources (DWR) to ensure the proper implementation of FEMA floodplain management regulations.

The standard references for establishing the location of flood hazards are the Flood Insurance Rate Map (FIRM) designated floodplains, part of a national insurance system maintained under the NFIP program. The FIRM maps not only identify the flood hazard zones for insurance and floodplain management purposes, but also provide a statement of probability of future occurrence. For example, a 500- year flood has a 0.2 percent chance of occurring in any given year; a 100-year flood has a 1 percent chance, a 50-year flood has a 2 percent chance, and a 10-year flood has a 10-percent chance of occurrence. Although the recurrence interval represents the long-term average period between floods of specific magnitude, significant floods could occur at shorter intervals or even within the same year. The 100-year flood, which is the standard used by most federal and state agencies, is used by the NFIP as the standard for floodplain management and to determine the need for flood insurance.

Imperial County and the participating city jurisdictions' FIRM of the NFIP indicates that these areas fall within Flood Zone "C" or "X". These zones are defined by FEMA as "areas of minimal

or moderate flood hazards, areas between the limits of the base flood and the 0.2 percent-annual-chance (or 500 year) flood." Following are FEMA's NFIP Policy Statistics as of January 31, 2015 for Imperial County and the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, and Imperial: [17]

Table 19. NFIP Policy Statistics

Community Name	Policies In-force	Insurance In-force Whole $	Written Premium In-force
Imperial County *	59	$8,956,100	68,472
Brawley	1	$350,000	414
Calexico	2	$700,000	828
Calipatria	2	$560,000	780
El Centro	2	$700,000	898
Holtville	1	$28,000	129
Imperial	1	$350,000	414

*Unincorporated areas of county only

As special districts, IID and ICOE are not eligible for the NFIP, nor do they have repetitive loss properties; thus, no statistics on NFIP participation for these two special districts are included here.

Imperial County, the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland are not eligible to participate in the Community Rating System (CRS) which has been developed to provide incentives in the form of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. [18]

5.3.7. Historical Repetitive Loss Data

A Repetitive Loss property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period since 1978. A Repetitive Loss property may or may not be currently insured by the NFIP.

Currently there are no historical data of repetitive flood losses for Imperial County and the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, or Westmorland.

Following is FEMA's FIRM Flood Zone Designation map, identifying components of the 100-year floodplains. [19]

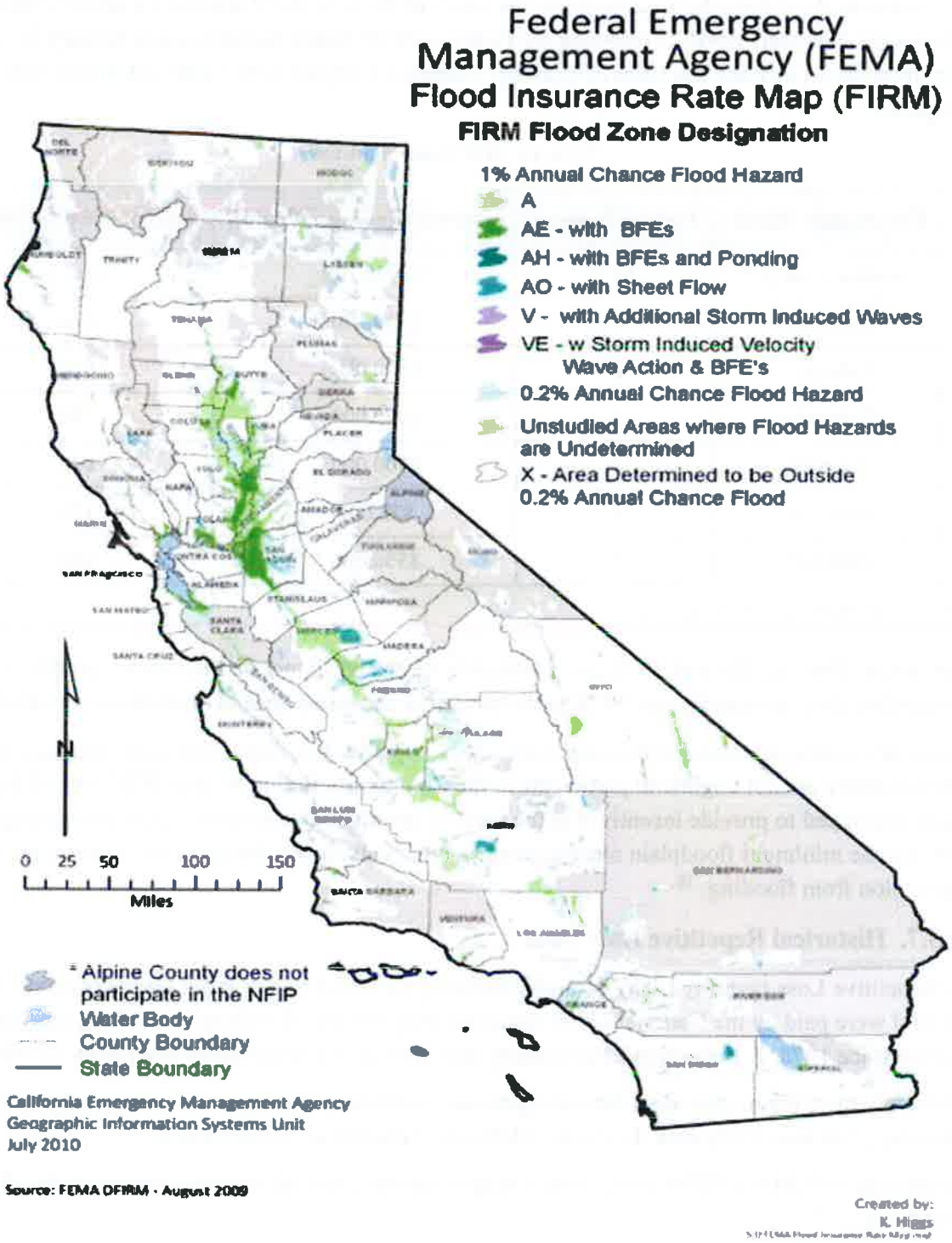

Figure 36. FEMA Flood Insurance Rate Map

5.3.8. Flood Risk Management

Flood Risk Management is a strategy specifically intended to enhance flood protection. It includes projects and programs that assist individuals and communities to manage flood flows and to prepare for, respond to, and recover from a flood. This strategy is a key element of integrated flood management, a comprehensive approach to flood management that considers land and water resources at a watershed scale within the context of integrated regional water management, employs both structural and nonstructural measures to maximize the benefits of floodplains and minimize loss of life and damage to property from flooding, and recognizes the benefits to ecosystems from periodic flooding

Flood management is the key component to effective flood control within Imperial County and the participating jurisdictions. The Federal Insurance Administration delineates areas of special flood hazards, the risk premium zones, and floodways through official maps, namely, the Flood Insurance Rate Map (FIRM) and the Flood Boundary and Floodway Map. These maps form the basis for Imperial County's Flood Ordinance which is intended to be applied to those areas which are subject to periodic flooding and accompanying hazards. These official maps show all canals, drains, and rivers, and at a scale of 1 inch equals 1000 feet are useful reference maps.

Imperial County is an agency with statutory authority for water management. The County manages groundwater and has a Groundwater Management Ordinance, has the power and authority to regulate land use, develop general plans, establish zoning and review, and approve new development proposals in unincorporated areas.

Imperial County is also the lead for floodplain management through the Flood Management Plan, General Plan and County ordinance. The County has developed a Flood Management Plan (FMP) that identifies the County's known flood problem areas; established goals, objectives, policies, and implementation programs to reduce flooding and flood related hazards; and ensures the natural and beneficial functions of the floodplains are protected. The FMP provides guidance to agencies and the public responsible for and interested in protecting life, property, and agriculture; involved in land use planning, including regulating new constructions in Special Flood Hazard Areas (SFHAs); responsible for administering the FEMA National Flood Insurance Program (NFIP) if necessary; and responsible for responding to flood emergencies within Imperial County.

Imperial County; the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland; the Imperial County Office of Education (ICOE); the Imperial Irrigation District (IID); and the Salton Community Services District provided input into, and participated in the development of, the FMP.

Imperial County; cities of Brawley, Calexico, El Centro, Holtville, Imperial, and Westmorland; IID; and the Calexico New River Committee have adopted a resolution supporting the Imperial Integrated Regional Water Management Plan (IRWMP) which is the result of stakeholders, who represent a wide array of interests, working together to formulate and support implementation of

long-term water management solutions, which include flood management.

The IRWMP is also a resource the Imperial Region can use to define its long-term needs and priorities for water infrastructure and match these needs to available state and federal funding. The purpose of the IRWMP is to ensure that the Imperial Region qualifies for funding available from the State of California by meeting IRWMP standards established by State Legislature and managed by the California Department of Water Resources.

County, city, and IID policies require on-site retention at the time of development, and the developer is responsible for mitigating stormwater impacts. The County does have an ordinance requiring retention basins to empty a 100-year storm within 72 hours; however, the basins rarely drain in the allotted time due to factors that include tight soils with slow percolation, a high water table (just below the agricultural tile drain system), and insufficient capacity to discharge into IID drains (one 12" pipe for every 160 acres). The County and participating jurisdictions have general plans, building codes, and drainage management requirements to retain stormwater consistent with the requirements of SFHA, IID, Imperial County, and/or the state as listed in local and state ordinances and regulations related to flooding.

The County Department of Public Works and IID are also planning drainage improvements throughout the County to increase the capacity of storm drains in the West and North End of the County to reduce the possibility of damage and loss due to area flooding events.

5.3.9. Risk Assessment

Flooding is a natural hazard present in Imperial County due to the County's geography, geology, and climate. Floods that affect Imperial County can be attributed to three different types of storm events, namely:

- A general winter storm that combines high-intensity rainfall
- A tropical storm out of the southern Pacific Ocean
- A summer thunderstorm, particularly in the desert areas

There are three principal types of flood hazards that may affect Imperial County, namely:

- Stream flooding (including bridge scour and stream erosion)
- Flash flooding (including debris and mud flows)
- Sheet flow flooding (including alluvial fan flooding)

Storms with high volumes of precipitation in a short period of time have occurred in the County causing flash floods. In addition, land that has been stripped of foliage and trees due to fire or human activity can experience serious erosion. Excessive precipitation can inundate soil in slopes causing mudslides and landslides. This activity can destroy homes, block highways, and destroy power lines. Imperial County is vulnerable to this type of flood damage. Heavy storms also can strand individuals playing near or crossing streams, rivers, flood control channels, and

intersections.

Areas subject to flooding are located throughout the County. The topography of the County varies from several thousand feet above sea level to areas below sea level. Areas subject to flooding drain either naturally into flood controls or into rivers, washes, and creeks. Most can handle normal flows. In the desert areas, flooding can be rapid and quite severe during the period of July and August. Winter rains are generally more widespread in the desert, but flashflood potential is less due to steady-state rain fall. Winter rains are nonetheless flood-prone but may be slightly more predictable. There is a danger to motorists who may attempt to drive through flooded washes. Most flooding in areas other than the desert is predictable and will provide time for evacuation and mitigation measures such as sandbags.

- **Effects on people and housing.** Direct impacts of flooding can include injuries and loss of life, damage to property, and health hazards from ruptured sewage lines and damaged septic systems. Secondary impacts include the cost and commitment of resources for flood fighting services, clean-up operations, and the repair or replacement of damaged structures.
- **Effects on commercial and industrial structures.** Depending on the geographic area involved and the economic and demographic characteristics of the area, the effects on industry and commerce may be significant.
- **Effects on infrastructure.** A slow-rising flood situation will progress through a series of stages, beginning with minor rainfall and potentially evolving to a major event such as substantial flooding. Once flooding begins, personnel will be needed to assist in rescuing persons trapped by flood waters, securing utilities, cordoning-off flood areas, and controlling traffic. These actions may overtax local agencies, and additional personnel and resources may be required. It is anticipated that existing mutual aid resources would be used as necessary to augment local resources. Flooding can cause damage to roads, communication facilities, and other infrastructure.
- **Effects on agriculture.** Flooding can cause damage to vegetation, crops, livestock, and dairy stock. In addition to the obvious impacts on animals and crops, flooding can have deleterious effects on soil and the ability to reinvigorate agricultural activities impacted once the flood waters recede.

5.3.10. Relationship to Other Hazards – Cascading Effects

Although the County is located in a desert with very low precipitation, it is sometimes subject to heavy rains and subsequent flooding. Flooding could also result from damage to the All American Canal and associated transmission aqueducts. A few hazardous waste facilities are located in the County and accidents could dangerously pollute air and water. Fire can break out as a result of dysfunctional electrical equipment. In many instances during a flood, the drinking water supply will be contaminated.

Flooding, erosion, and debris flows can also occur in the months and years following large fires

since wildfires greatly reduce the amount of vegetation, which in turn reduces the amount of rainwater absorption, allowing excessive water runoff.

A flood incident could also result in a landslide. A very rapid landslide could result in casualties and devastating property damage, while a slow landslide could, for example, cause the nuisance of having a fence slowly pulled apart.

In addition, there is the possibility of subsidence, which is the gradual, local settling or sinking of the earth's surface with little or no horizontal motion. Subsidence from earthquakes can disrupt drainage systems and cause localized flooding.

5.3.11. Risk Assessment Conclusion

Flooding is a natural hazard present in Imperial County due to the County's geography, geology, and climate. There are various facets to flooding; all of which are relevant to Imperial County. Flood hazards include natural floodplains, seiches, and dam failure. Flooding due to heavy precipitation or dam failure is a potential hazard in Imperial County with the resultant possibilities for damage to property and loss of life. Severe flooding can be particularly costly.

In a relative sense, flooding due to precipitation does not present the degree of danger posed by other hazards such as major earthquakes. On the other hand, if there is flooding due to dam failure, the danger could be cataclysmic. Flooding, due to dam failure, is a factor which could seriously affect eastern Imperial County; however, inundation of communities is considered unlikely and hazard analysis suggest that dam failure would likely occur only if heavy precipitation was coupled with significant seismic activity near the dam.

The Imperial Region may be vulnerable to climate change which may increase the frequency and severity of flood events due to changes in precipitation and runoff patterns. As stream flows and velocities change, erosion patterns will also change, altering channel slopes and depths. A regional approach to flood control and stormwater management helps the Imperial Region plan for and adapt to climate change.

5.3.12. Plans and Programs

Throughout the region, most of the streams with flood control infrastructure have been designated as floodways. This limits what can be constructed in the floodways for specific storm events (e.g., 100-year event). Imperial County requires a permit for construction below the negative 220-foot contour near the Salton Sea. The county and three of its incorporated cities also regulate construction on the New and Alamo rivers and El Centro Drain floodplains

On average, the Imperial Valley receives just over three inches of precipitation annually and the potential for major flooding is low. Nonetheless, intense storms occasionally result in local flooding and damage to IID canals and drains. These flood events typically are short in duration.

Imperial County developed the Imperial County Flood Management Plan (FMP) (Imperial County, 2007) to review flood history; identify the County's known flood problem areas; establish goals,

objectives, policies, and implementation programs to reduce flooding and flood related hazards; and ensure that natural and beneficial functions of the floodplains are protected.

Imperial County continues to plan and implement solutions for flooding conditions. In an effort to reduce costs associated with flood hazard mitigation and flood insurance, the Imperial County FMP identifies flood hazards within Imperial County and proposes potential mitigation measures. The Imperial County FMP is a future-oriented approach to planning in flood risk areas. It is a pre-disaster planning approach that is required by the Federal Emergency Management Agency (FEMA) as a condition of the County's continued participation in the National Flood Insurance Program (NFIP). Imperial County and the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland all participate in the NFIP Program. The Imperial County General Plan Seismic and Public Safety Element sets the overall flood control goals and objectives for the County.

Imperial County and the Cities' land use plans and local ordinances require development to mitigate for stormwater impacts. The County FMP summarizes the City policies. IID Rules and Regulations (IID, 2007) do not require pre- and post- development runoff flows to be the same. The IID Developer Project Guide (IID, 2008) contains standard drawings for connecting to IID facilities and an explanation of the process by which these facilities are authorized (planning phase, design phase, construction phase, and close-out), but does not specify pre- or post- development runoff requirements.

IID coordinated development of the Drainage Master Plan that investigated regional options for flood control and stormwater management. This document was a comprehensive study of drainage issues and possible solutions. Projects that were identified included development of procedures for analyzing and designing storm drainage systems, identification of capital improvements to mitigate flooding problems, development of water quality criteria for handling storm drainage, evaluation of steps required to finance the improvements, and the outline of an organizational structure needed to implement the plan. The study identified facilities and improvements (both regional and stormwater related) at a conceptual level. The study focused on planning and engineering efforts that would need to be conducted before proceeding to construction.

As noted above, county, city, and IID policies require on-site retention at the time of development, and the developer is responsible for mitigating stormwater impacts. The County has an ordinance requiring detention basins to empty a 100-year storm within 72 hours; however, the basins rarely drain in the allotted time due to factors that include tight soils with slow percolation, a high water table (just below the agricultural tile drain system), and insufficient capacity to discharge into IID drains (one 12" pipe for every 160 acres). The Cities have general plans, building codes, and drainage management requirements to retain stormwater consistent with the regional requirements of IID, Imperial County, and/or the State.

IID also has a Drain Water Quality Improvement Plan (IID, 2005) which was approved by the Regional Water Quality Control Board, and a Vegetation Management Plan to minimize drain

water quality degradation during system maintenance. A number of cities in the Imperial Region are working to develop master drainage plans, but such plans are reliant on improvement to regional flood conveyance. The County has developed master drainage plans for Heber (Nolte, 2006) and Niland (Nolte, 2007).

The Statewide Flood Management Planning (SFMP) program is led by the California Department of Water Resources (CDWR) through the FloodSAFE Initiative. The SFMP program developed a report titled, "Flood Future: Recommendations for Managing California's Flood Risk" (Flood Future Report) that identifies flood risks, challenges, and opportunities along with recommendations for improving and financing integrated flood management. The state is exploring financial, institutional, legislative, and policy options to help improve local and regional flood management systems.

CDWR is collaborating with local, state, and federal agencies and tribes throughout California and has met with representatives in the Imperial Region. The SFMP helps guide the state's decisions and inform federal decisions about policies and financial investments related to Integrated Flood Management (IFM) throughout California, including the Imperial Region. IFM is an approach to dealing with flood risk that recognizes the connection of flood management actions to water resources management, land use planning, environmental stewardship, and sustainability. IFM evaluates opportunities and potential impacts from a system perspective and promotes coordinating across geographic and agency boundaries.

Floodplain management is the key component to effective flood control within Imperial County. As already noted, the Federal Insurance Administration delineates areas of special flood hazards, the risk premium zones, and floodways through official maps. These maps form the basis for Imperial County's Flood Ordinance which is intended to be applied to those areas which are subject to periodic flooding and accompanying hazards. Most of the irrigated valley is designated Zone "C" – indefinite minor flooding – reflecting the flat terrain and the existing canal system.

Since the publication of the original 2009 MHMP, the Imperial County Department of Public Works has developed Master Drainage Plans for the unincorporated communities of Seeley, Niland, and Heber. Because of localized flooding additional projects planned include:

- Drainage improvements for the Township of Seeley. This project will consist of construction of drainage infrastructure to convey storm water away from the Community. Over past storm events, Seeley has suffered road and shoulder structural damage on each side of its streets due to flooding. When it rains, water drains toward the center of the streets and accumulates in the streets. The flooding causes hazards for pedestrians and drivers and causes severe damage to the roads. The estimated cost of the project is $1,916,795. The County has made it a top priority to obtain funding for this project and has applied for HMGP funds. The most recent attempt to gain funding was an application for Proposition 84 funds through the Imperial Integrated Regional Water Management Plan (IRWMP).

- Various Road Infrastructure Improvements for Flood Hazard Mitigation. This project includes storm water crossings for five (5) County roads: 1) Azure Road between Treadwell and Coombs, 2) Azure Road north of Marina Drive, 3) Noffsinger Road, 4) Stallard Road at Palo Verde Road, and 5) Wilkins Road north of Beal Road. The estimated total project cost is $2,109,650. The County has applied for HMGP funds and has thus far been unsuccessful. The project remains a priority and the County will continue to seek funding for these much-needed improvements.
- Storm Crossing Improvements to Ogilby Road. Ogilby Road experiences some of the most severe flooding of road locations in Imperial County. Because it is a Federal Highway Administration (FHWA) road, Ogilby is not eligible for FEMA HMGP funds. The County continues to seek funding opportunities for drainage improvements for this road.

5.3.12.1. Imperial County

The Imperial County General Plan includes the following Flood Hazards mitigation measures.

Flood Hazards Programs and Policies:

1. Provide technical and policy information regarding flood hazards to developers, interested parties, and the general public.
2. Regulate and restrict development near major water courses and floodplains through application of appropriate land use measures.
3. Both the ground floor elevation of any building for human occupancy and the driving surface, if designated evacuation routes within the 100-year floodplain, shall be constructed above the projected profile of a 100-year flood event.
4. Require all new development for human occupancy within the 100-year floodplain to be adequately flood-proofed.
5. Establish technical design criteria which minimizes or mitigates impacts associated with crossing of floodplains by development. Unless such engineering alternatives are implemented, development in floodplains is to be restricted or prohibited.

5.1.1.1. City of Brawley

Although the City of Brawley is located within an arid climate, flooding of the New River can occur during intermittent heavy rains. As growth occurs in Brawley, new development will increase the amount of impervious surface, resulting in greater surface water run-off and the need for an adequate flood control system. The risk of flood damage in the City can be reduced through proper land use planning and actions related to new development and redevelopment of land.

Following are the City of Brawley's Flooding Hazards Goal and Policies.

Goal #1: Promote policies and programs that reduce the risk to the community's inhabitants from flood hazards.

- Policy 1.1: Identify flood hazard areas and provide appropriate land use regulations for areas subject to flooding.
- Policy 1.2: Coordinate with the appropriate agencies to assure that existing bridges are constructed according to accepted standards to avoid damage by flooding.
- Policy 1.3: Consider participating in the National Flood Insurance Program.
- Policy 1.4: Cooperate with the Imperial Irrigation District to plan for and make needed improvements to drainage infrastructure depositing runoff in the New River.
- Policy 1.5: Require detention basins as a flood control measure where applicable to reduce the risk from flood hazards.
- Policy 1.6: Design future development located near water storage facilities to minimize damage caused by leak, rupture, or flooding from a water storage facility.
- Policy 1.7: Establish open space required to protect the public from flood hazards.
- Policy 1.8: Coordinate with Caltrans and road builders to ensure proper roadway design for drainage purposes.
- Policy 1.9: Prevent cross-lot drainage between and within developments. Policy 1.10: Prepare a master plan of drainage for the planning area.
- Policy 1.11: New development within the Planning Area must contain onsite 100% of the stormwater run-off of a 100-year storm.

The City of Brawley is designated Flood Zone X (areas of moderate or minimal hazard subject to flooding from severe storm activity or local drainage problems). Following is the Flood Insurance Rate Map of Brawley.

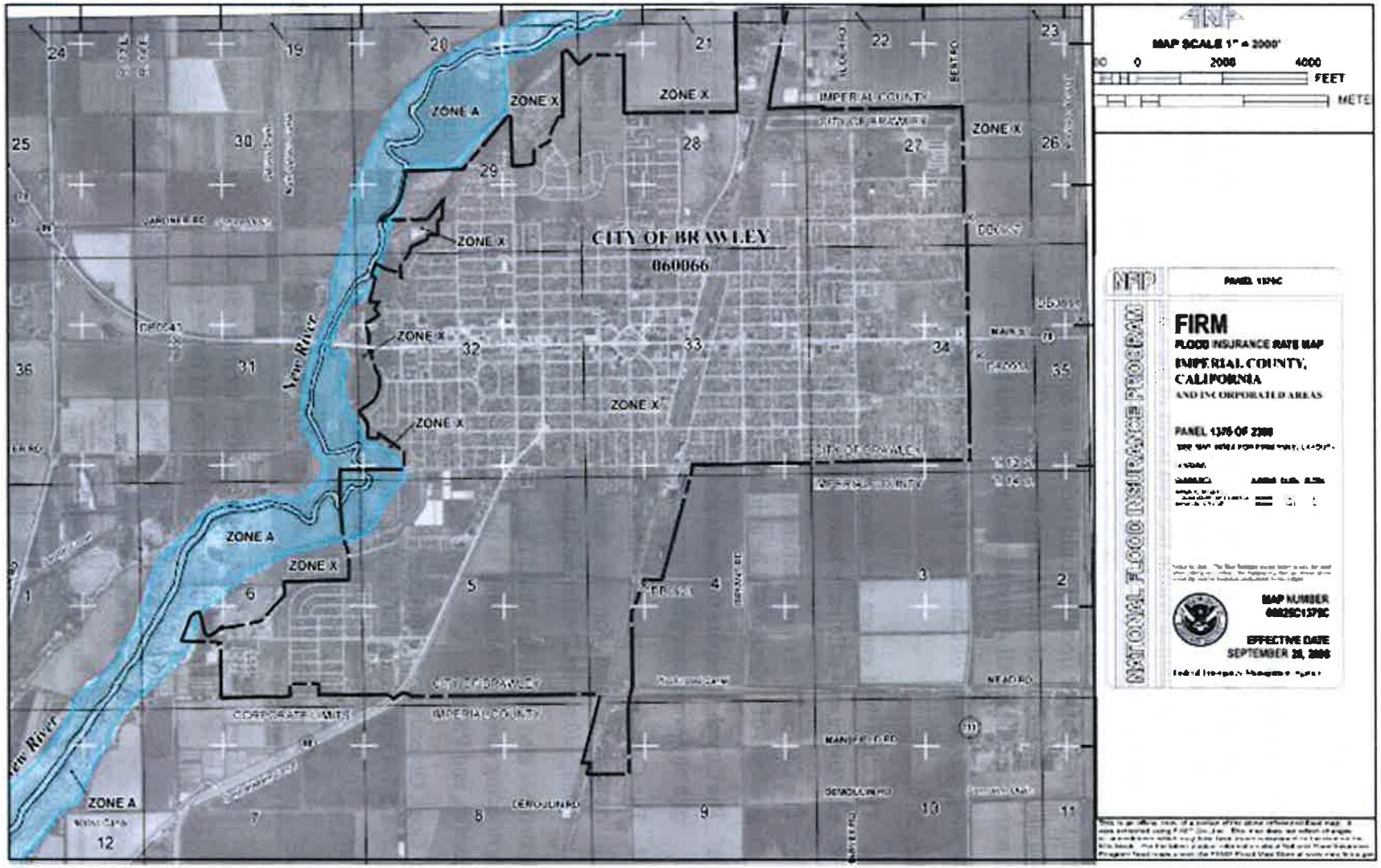

Figure 37. City of Brawley Flood Insurance Rate Map

5.1.1.2. City of Calexico

Flooding is unlikely to affect the City of Calexico under normal rain and run-off conditions. The FEMA hazard area map of the Calexico area shows that the 500-year floodplain of the New River within the City is contained within the area north of the Calexico International Airport that is currently zoned as "Open Space" land. Conditions upstream in Mexico affect the river. As the Mexicali area has become more urbanized, very little has been done to control urban runoff there. Thus, the potential for flooding could increase in downstream areas such as Calexico. Flooding could also result from seismic damage to a major IID canal. The City of Calexico is traversed by two major canals, the All American and the Central Main.

Following are the City of Calexico's Flood Hazards Goals, Objectives, and Policies:

Policy 3

a. The City shall ensure the adequacy of existing emergency preparedness plans to handle effectively and efficiently known hazards and emergencies.

b. The City shall review evacuation procedures to make sure that in case of an evacuation, the residents of Calexico will be quickly notified and that the evacuation will be orderly.

c. The City shall require the heads and staff of each department to participate in the maintenance of a city-wide emergency preparedness plan.

d. The City shall cooperate with the Imperial Irrigation District (IID) to prepare or update an emergency plan for the rapid removal and repair of downed power lines and/or damaged/breeched water facilities in the event of an earthquake.

Calexico has also adopted a Flood Damage Prevention Code to address safety issues associated with flooding directly. Following is the City of Calexico's Emergency Preparedness Goal, Objective, and Policies:

8.5 Goal, Objectives, and Policies

8.5.1. Goal: To identify and minimize, to the extent possible or feasible, the risks to persons and property caused by natural and human-induced hazards.

8.5.1.1. Levels of Risk

Objective 1: To maintain acceptable risk levels when conducting land use planning.

Policy 1

a. The Scale of Acceptable Risk for New Structures shall continue to be used to determine the type and location of future land use.

b. Land uses should not be subjected to greater risk than the level the scale suggests unless no other alternative exists.

8.5.1.3. Emergency Preparedness

Objective 3: Minimize the potential hazards to public health, safety, and welfare and prevent the loss of life and property damage from natural and human induced

phenomena.
Policy 3

a. The City shall ensure the adequacy of existing emergency preparedness plans to handle effectively and efficiently known hazards and emergencies.

b. The City shall review evacuation procedures to make sure that in case of an evacuation, the residents of Calexico will be quickly notified and that the evacuation will be orderly.

c. The City shall work with the Calexico Water Department to ensure that an adequate supply of water will be available in the event of an emergency and to help create and maintain an emergency water supply.

d. The City shall require the heads and staff of each department to participate in the maintenance of a city-wide emergency preparedness plan.

Following is the Flood Insurance Rate Map of Calexico.

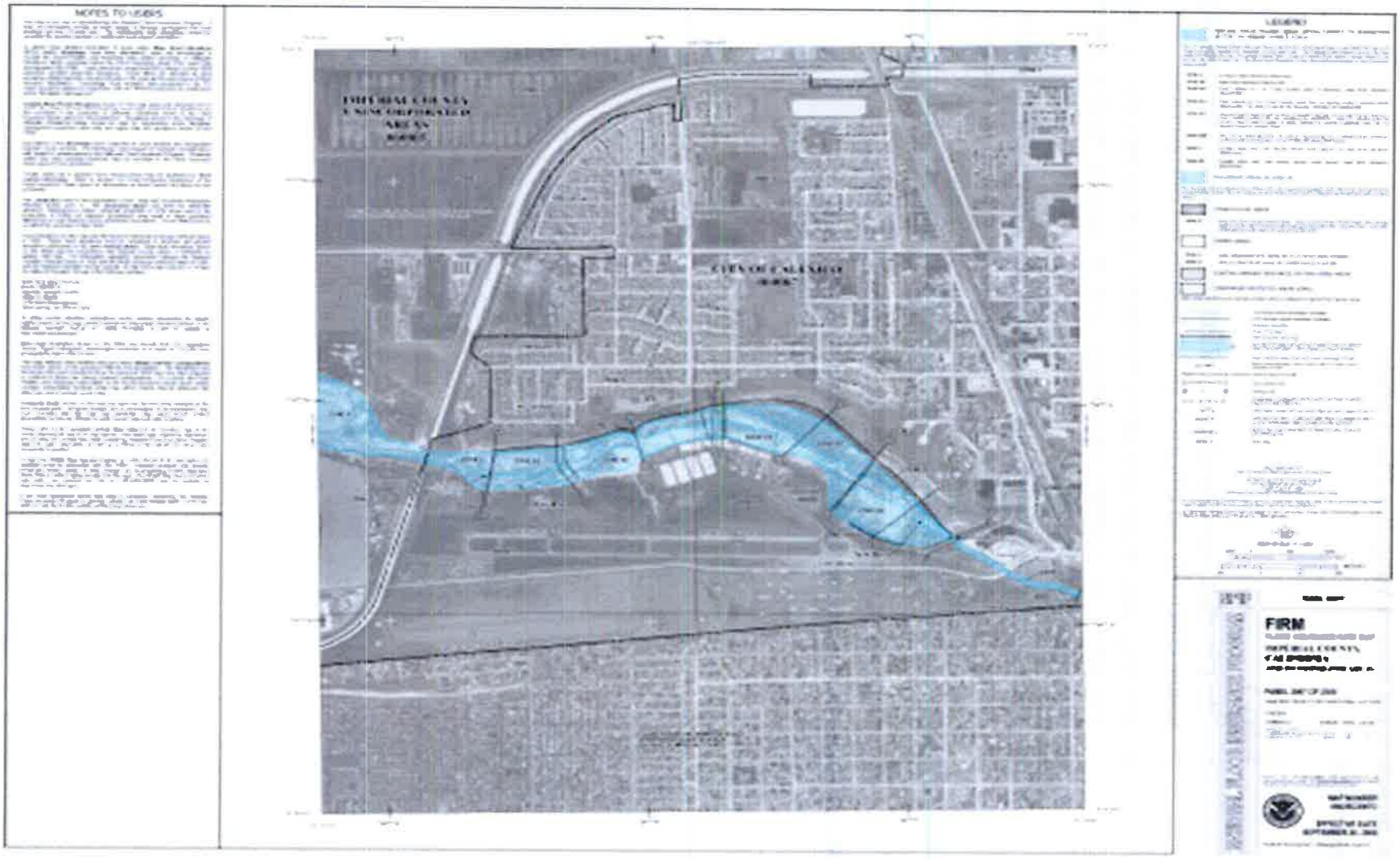

Figure 38. City of Calexico Flood Insurance Rate Map

5.1.1.3. City of Calipatria

On July 14, 2012, the eastern edge of Calipatria was flooded as a result of an irrigation canal levy that had breached and flooded the low lying areas on Main, Alamo, Bonita, and Bonita Place streets. Normally the only area within the vicinity of Calipatria that is identified as a floodplain is along the Alamo River, located approximately one mile west of the city limits

Localized flooding of streets within the City occurs during periods of severe storms. However, floodwaters are generally contained within the streets and typically do not affect structures such as residential units or commercial buildings. In addition, the City requires building pads for new structures to be at least 16 inches above the top of the adjacent curb. This requirement is intended to ensure that if floodwaters breach existing curbs, they will not impact the interior of residential units. All new projects within the City are also required to have grading and drainage plans approved by the City Engineer prior to the issuance of permits in order to ensure adequate control of floodwaters. Despite this, there is a localized flood concern on the eastern portion of the City (east of the railroad tracks). The cause of flooding is not completely known and occurs when substantial water from the mountains flows eastward towards the city and combines with agriculture water. Streets and some residential structures have been damaged as a result of flooding in the eastern portion of the City.

Following are the flooding hazard mitigation Goals and Policies of the City of Calipatria:

Goal S-2: Minimize the potential for loss of life, physical injury, property damage, and social disruption resulting from flooding.

> Policy S-2.1 Ensure that new development projects evaluate potential flooding hazards and incorporate design elements, such as storm drains, catch basins, and retention basins, to minimize or eliminate flooding hazards, as necessary.
>
> Policy S-2.2 Encourage the formation of a Countywide Flood Control District to manage County-wide flooding issues.
>
> Policy S-2.3 Promote multi-jurisdictional emergency coordination and planning for flood events.
>
> Policy S-2.4 Determine the cause of localized flooding in the eastern portion of the City and implement infrastructure improvements to alleviate the flooding concern.

Following are the City of Calipatria's Implementation Actions for the adopted policies:

- Continue to enforce the local, state, and federal regulations regarding the construction of buildings within flood hazard areas (Implements Policies S-2.1).
- Comply with the Imperial County Flood Management Plan and participate in the planning and development of future flood management plans (Policy S-2.2).

- Continue to participate in the planning and development of the Imperial County Multi-Hazard Mitigation Plan and comply with the mitigation goals and strategies therein (Policy S-2.3).
- The City shall work with the Imperial Irrigation District, Imperial County Public Works Department, and Caltrans to determine the cause of localized flooding in the eastern portion of the City, to identify infrastructure improvements to reduce the likelihood of flooding, and to implement the infrastructure improvements (Policy S-2.4).

The majority of the area within the city limits is within FEMA Flood Zone X, which is characterized by a minimal risk of flooding and located outside the 100-year flood hazard area. While the area within the city limits is located in Zone X, the area surrounding the Alamo River to the southwest and west of the City is located in Zone A, which is an area subject to inundation by a 100-year flood.

Following are Flood Insurance Rate Maps of Calipatria.

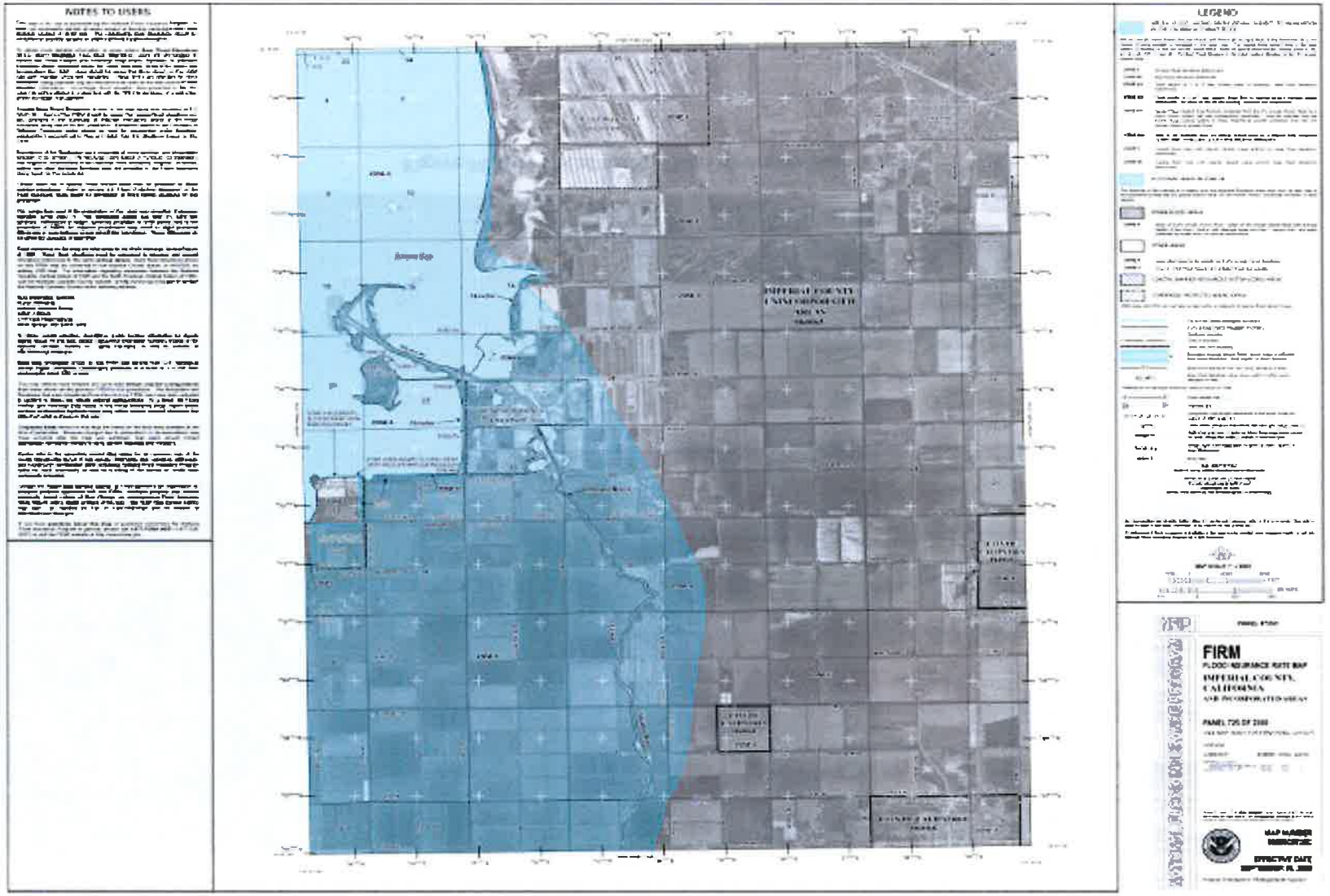

Figure 39. City of Calipatria Flood Insurance Rate Map 1

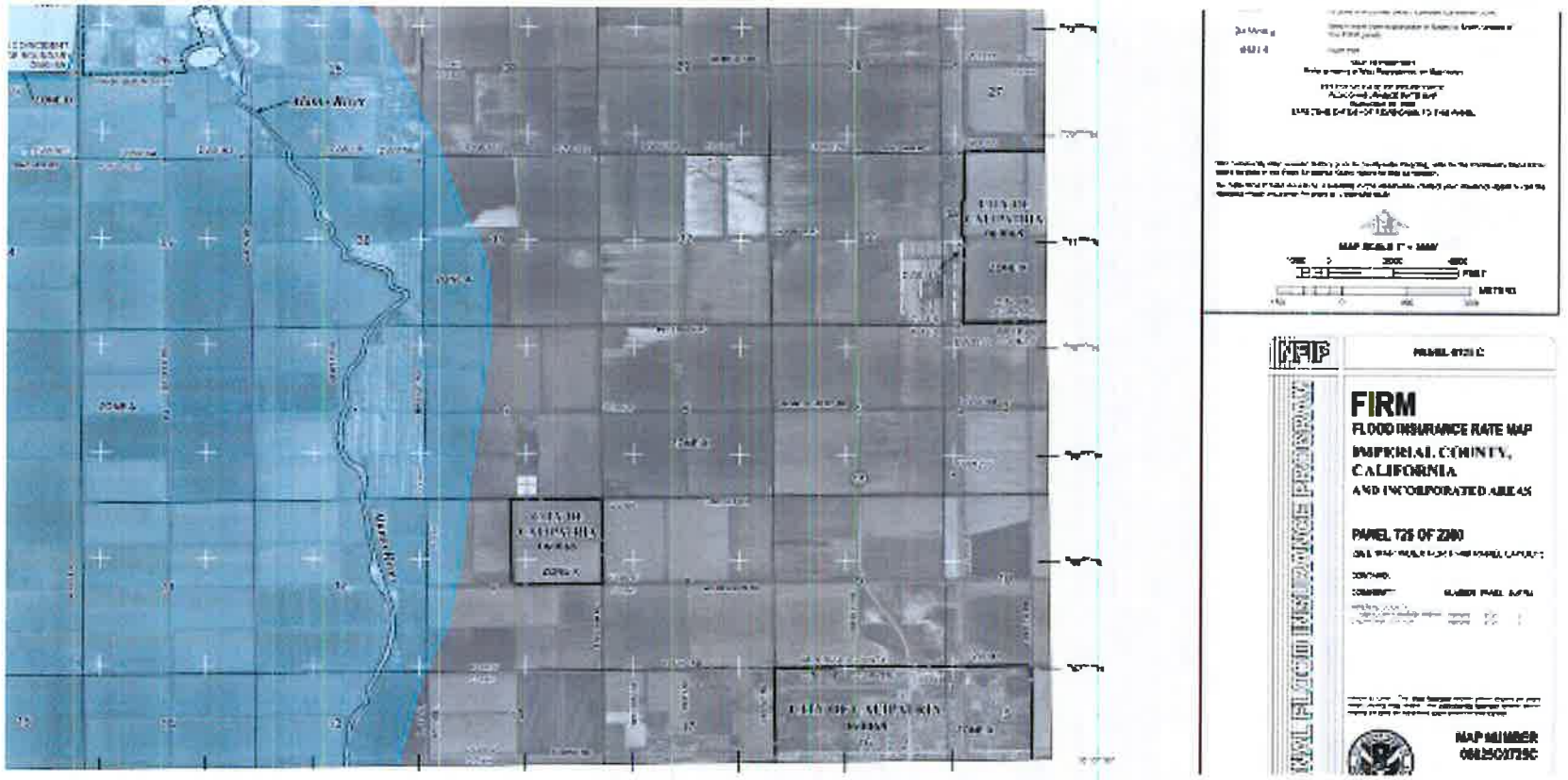

Figure 40. City of Calipatria Flood Insurance Rate Map 2

5.1.1.4. City of El Centro

Floodplains located in and around El Centro present a potential natural hazard to the City. Proper land use planning can limit the risk of exposure. The City plans to continue to fund needed infrastructure improvements, identify new funding sources as necessary, and also promote programs and actions that educate the public about flood hazards and reduce the risk of flood losses.

Following are El Centro's Safety Goal and Policies related to Flooding Hazards:

Safety Goal 2: Promote programs and actions that educate the public about flood hazards and reduce the risk of flood losses.

Policy 2.1: Identify and evaluate potentially hazardous flood risks in the community and educate the public about how best to minimize the safety hazards associated with these risks.

Policy 2.2: Maintain all drainage and flood control facilities so that they function correctly.

Policy 2.3: Improve drainage ways and flood control facilities to lessen recurrent flood problems and include necessary improvements in the City's Capital Improvement Program.

Policy 2.4: Review all new proposed development to ensure that it will not aggravate poor drainage conditions and will, to the extent possible, improve poor drainage conditions.

Policy 2.5: Require all proposed development projects to submit a hydrological analysis of a project's expected runoff that will enter the City's drainage system, as well as the cumulative impact of the project and surrounding development (existing and planned) on the drainage system and flood prone areas.

Policy 2.6: Avoid new development that would create runoff volumes or velocities that may cause the City's existing drainage system to exceed its design capacity until appropriate site design and mitigation steps are taken.

Policy 2.7: Continue to fund needed infrastructure improvements, identifying new funding sources as necessary.

Following are the City of El Centro's Implementation Program to implement the adopted policies:

S-5: Flooding Risk Reduction: Reduce the risk to the community from hazards related to flooding by requiring feasible mitigation of such impacts on existing, new development and redevelopment. Assess development proposals for potential hazards pursuant to the California Environmental Quality Act. Require measures to mitigate all identified significant public safety hazards.

Responsible Agency/Department: Development Services Public Works

Funding Source: Project proponent

Time Frame: Ongoing Related Policies: 2.4, 2.5, 2.6

S-6: Storm Drainage Facilities: Enforce the City's Public Works Standards, which give specific requirements for design of drainage facilities to ensure that they are properly sized to handle storm runoff and flash floods. Require new development to provide adequate flood control facilities, if needed, to control runoff generated by the project. Identify new public and private funding sources to fund needed improvements.

Responsible Agency/Department: Public Works

Funding Source: Project proponent, General Fund Time Frame: Ongoing

Related Policies: 2.2, 2.3, 2.4, 2.5, 2.6, 2.7

S-7: Flood Hazard Education: Promote programs and actions that educate the public about flood hazards and how to reduce the risks and losses associated with flooding.

Responsible Agency/Department: Development Services, Public Works
Funding Source: Project proponent
Time Frame: Ongoing Related Policies: 2.4, 2.5, 2.6

Following is the Flood Insurance Rate Map of El Centro.

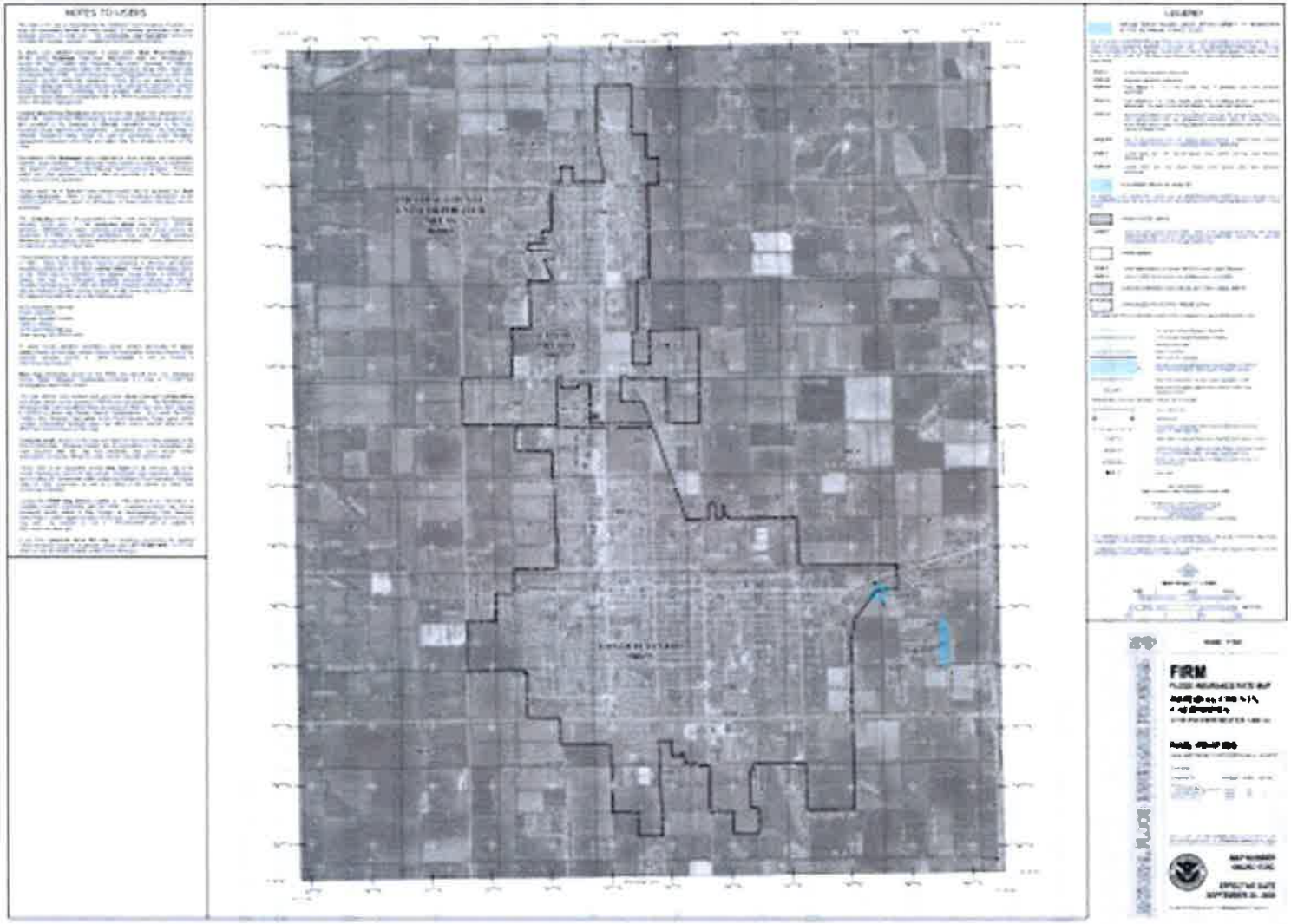

Figure 41. City of El Centro Flood Insurance Rate Map

5.1.1.5. City of Holtville

Alamo River, near Holtville, has very little development near the floodplain. The wide floodplain at the bottom of the gorge is, however, a potential area of development in the future.

While the City of Holtville has generally not experienced substantial adverse flooding impacts, the City acknowledges that it should be prepared for disasters resulting from floods.

Local flooding areas include:

- IIolt & 10th
- 8th & Melon
- 9th & Melon
- 7th & Walnut

The City of Holtville has identified the following programs:

- Conduct City-wide drainage study to identify anticipated problem areas and mitigation measures.
- Encourage continued efficiency with the Public Works Department and support the expansion and maintenance of all sewer, water and drainage facilities.
- Maintain and improve all drainage and flood control facilities to be sure that they function as required; and mitigate or disallow development that increases the City's drainage system to exceed design capacity, unless mitigation steps are implemented by the developer.
- Identify and evaluate hazardous flood locations, inform the public, and particularly proposed developers.

The majority of the Holtville area is designated Flood Zone X (areas of moderate or minimal hazard subject to flooding from severe storm activity or local drainage problems). However, there are a few areas zoned AE (base flood elevations determined) as shown on the following Flood Insurance Rate Maps.

Figure 42. City of Holtville Flood Insurance Rate Map 1

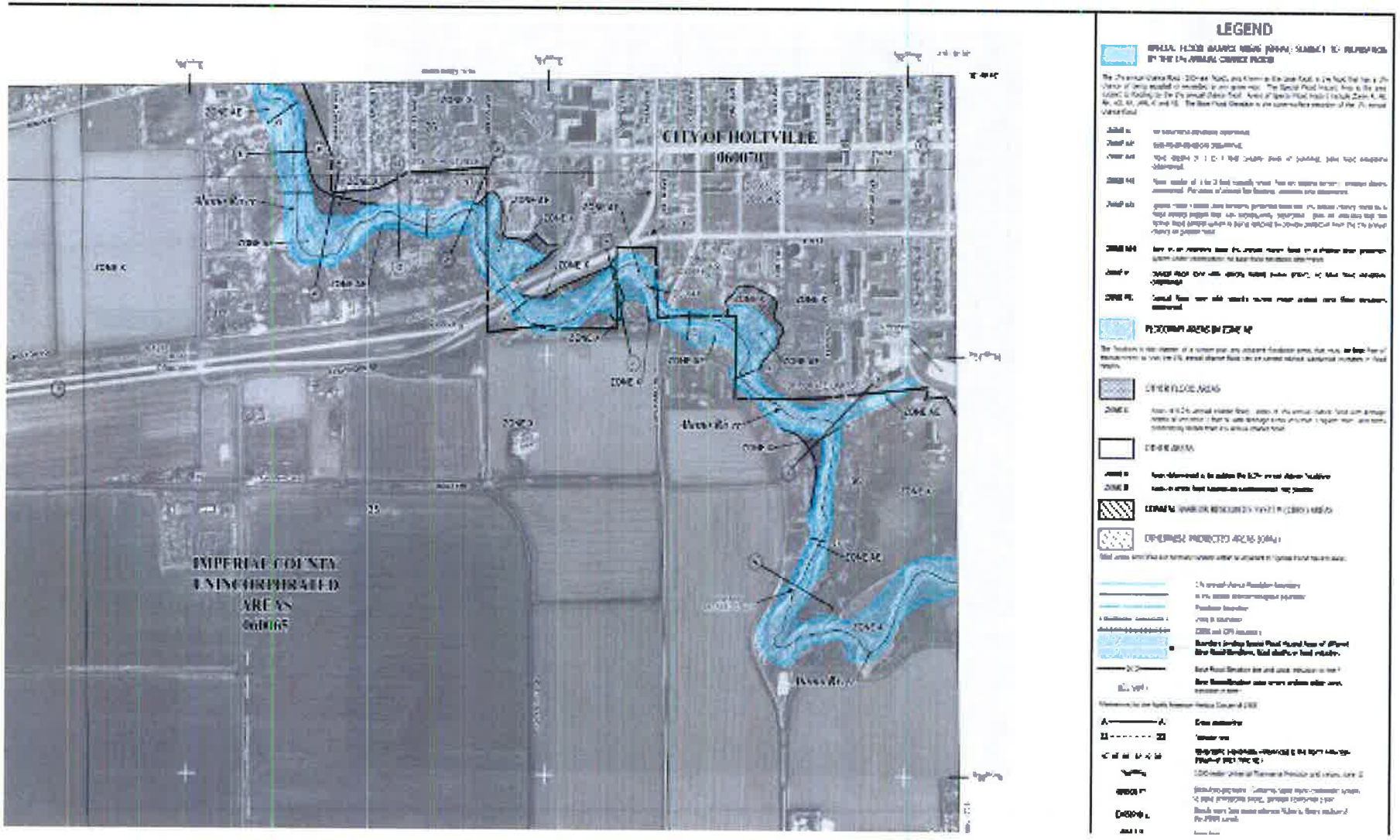

Figure 43. City of Holtville Flood Insurance Rate Map 2

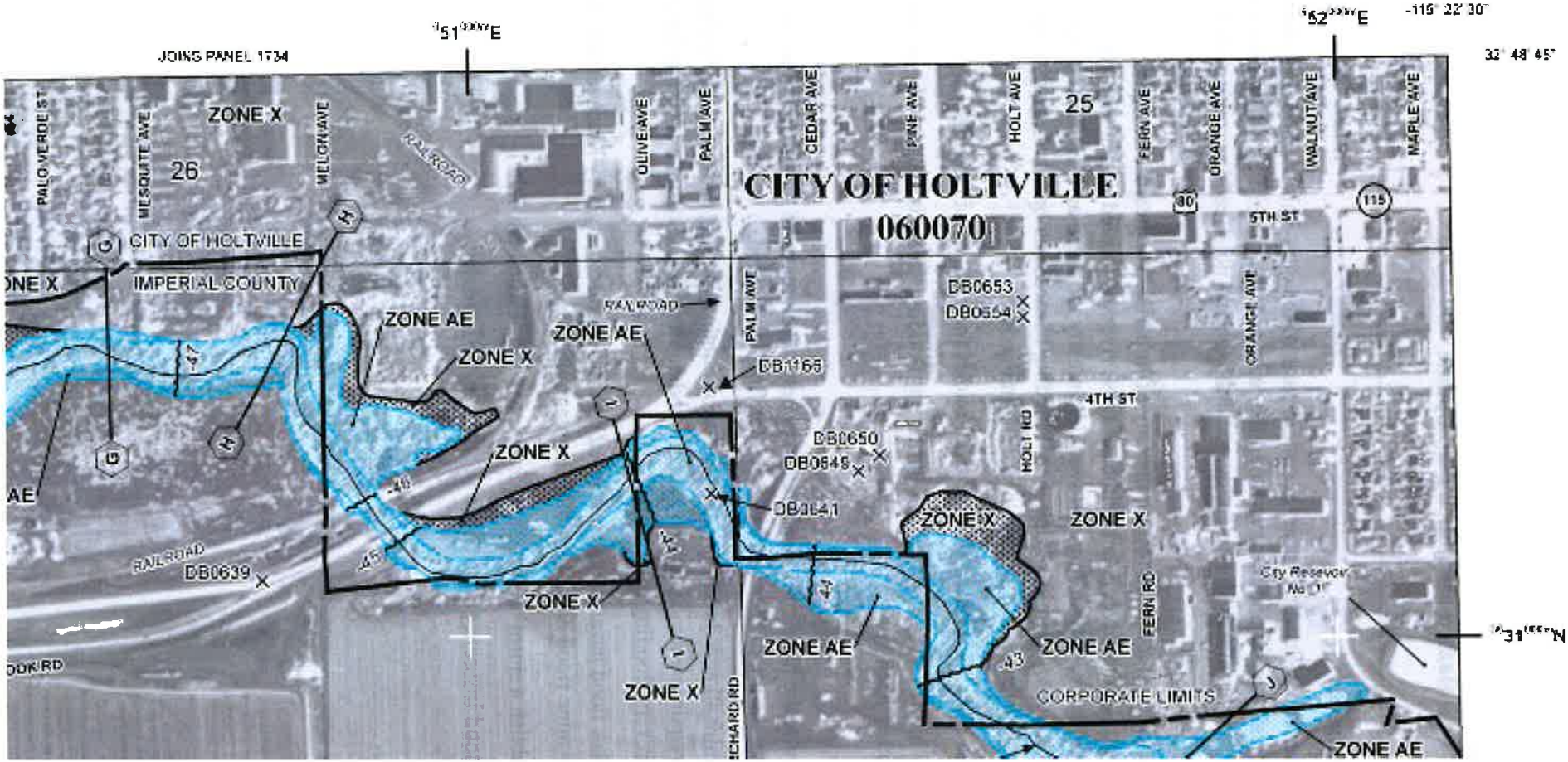

Figure 44. City of Holtville Flood Insurance Rate Map 3

5.1.1.6. City of Imperial

The City of Imperial has flooding issues in certain parts of the city. This includes the central portions of Imperial Avenue and the area along the railroad tracks and M Street with the nearest cross of Barioni. This is mostly due to antiquated drainage and not meeting growing needs over many decades.

There are no identified floodplains within the City of Imperial. The nearest floodplains are located along the New and Alamo Rivers, and neither of these rivers is located within the City's planning area. Flooding within the City of Imperial would be mostly localized and would be concentrated in streets and intersections within low lying area. Flooding hazards can be minimized by ensuring adequate drainage systems are constructed and maintained.

Following are the Flood Hazards Objective and Policies for the City of Imperial:

Objective 7: Minimize exposure of the public to flooding hazards caused by severe storms, earthquakes or other phenomena.

Policy 7

A. Require the finished floor elevation of new structures to be built a minimum of 12 inches above the top of the adjacent curbs for flood protection.

B. Require all new development projects to contain a grading and drainage plan based upon the requirement to adequately accommodate storm waters from a 100 year flood in order to prevent flooding of structures.

C. Utilize flood hazard maps produced by the Federal Emergency Management Agency to determine flood hazards within the planning area.

D. Establish a storm drain system for flood control when feasible.

Following are Flood Insurance Rate Maps for the City of Imperial:

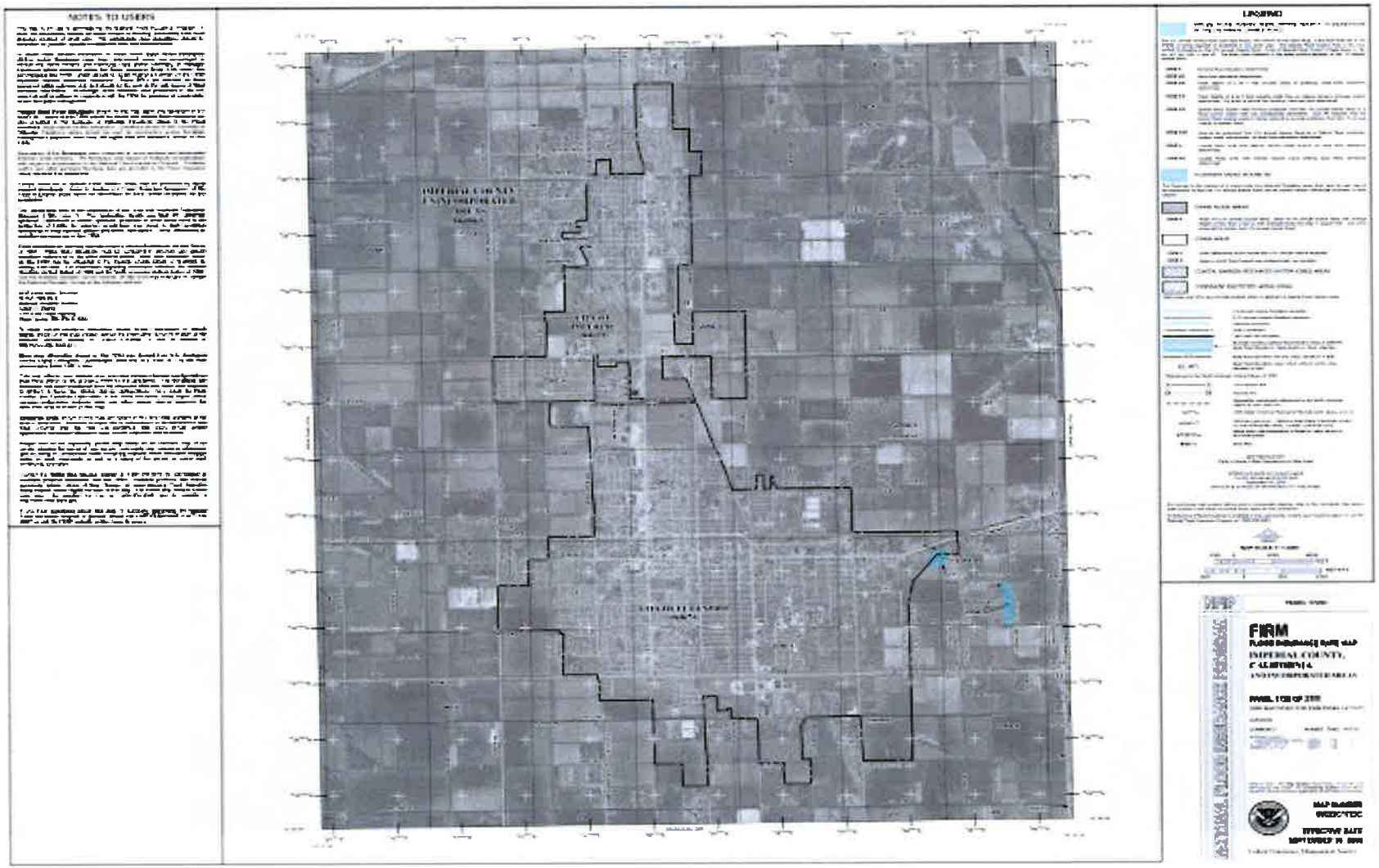

Figure 45. City of Imperial Flood Insurance Rate Map 1

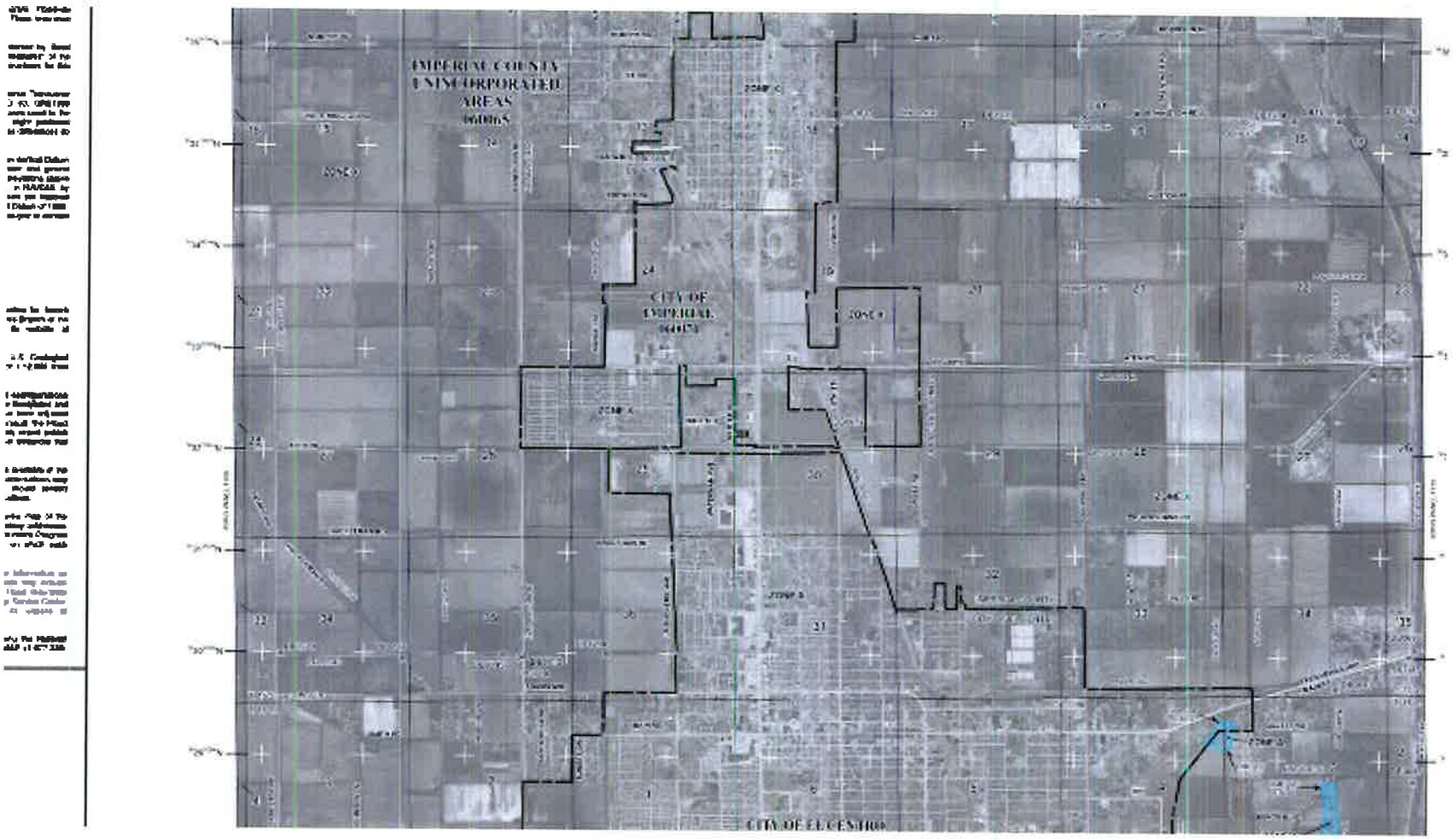

Figure 46. City of Imperial Flood Insurance Rate Map 2

5.1.1.7. City of Westmorland

The City of Westmorland is located a significant distance away from the Salton Sea and is not prone to annual changes in lake levels, however, failure of any of the dam systems (Imperial and Hoover) can result in flooding of Westmorland. Prolonged periods of heavy rain can also contribute to flooding conditions, but overall flood risk seems to be minimal, as the Alamo River and New River floodplains are located many miles east of the City.

Localized flooding of City streets will occur during periods of severe storms, but flood waters are mostly contained within the streets thus not impacting dwelling units.

Local flooding areas include:

- 3rd Street & South Center Street
- G Street & 3rd Street
- H Street & Highway 86
- 7th Street & North Center Street
- 7th Street & H Street

New construction projects are required to address grading and proper drainage of storm runoff, thereby minimizing flood water breach.

Following are the City of Westmorland's Flooding Hazards Goal, Objective, and Policies:

Goal #1: Protect the public from natural and man-made hazards. Objective 1.2: Ensure public safety from flooding hazards.

Policies:

1. Map flood hazard areas.
2. Prevent issuance of building permits for residences in flood hazard areas.
3. Require storm drains, catch basins, retention basins and other flood control facilities in new development to control flooding during periods of severe storms.
4. Encourage the formation of a Countywide Flood Control District to deal with Countywide flooding issues.

Following are Flood Insurance Rate Maps of Westmorland:

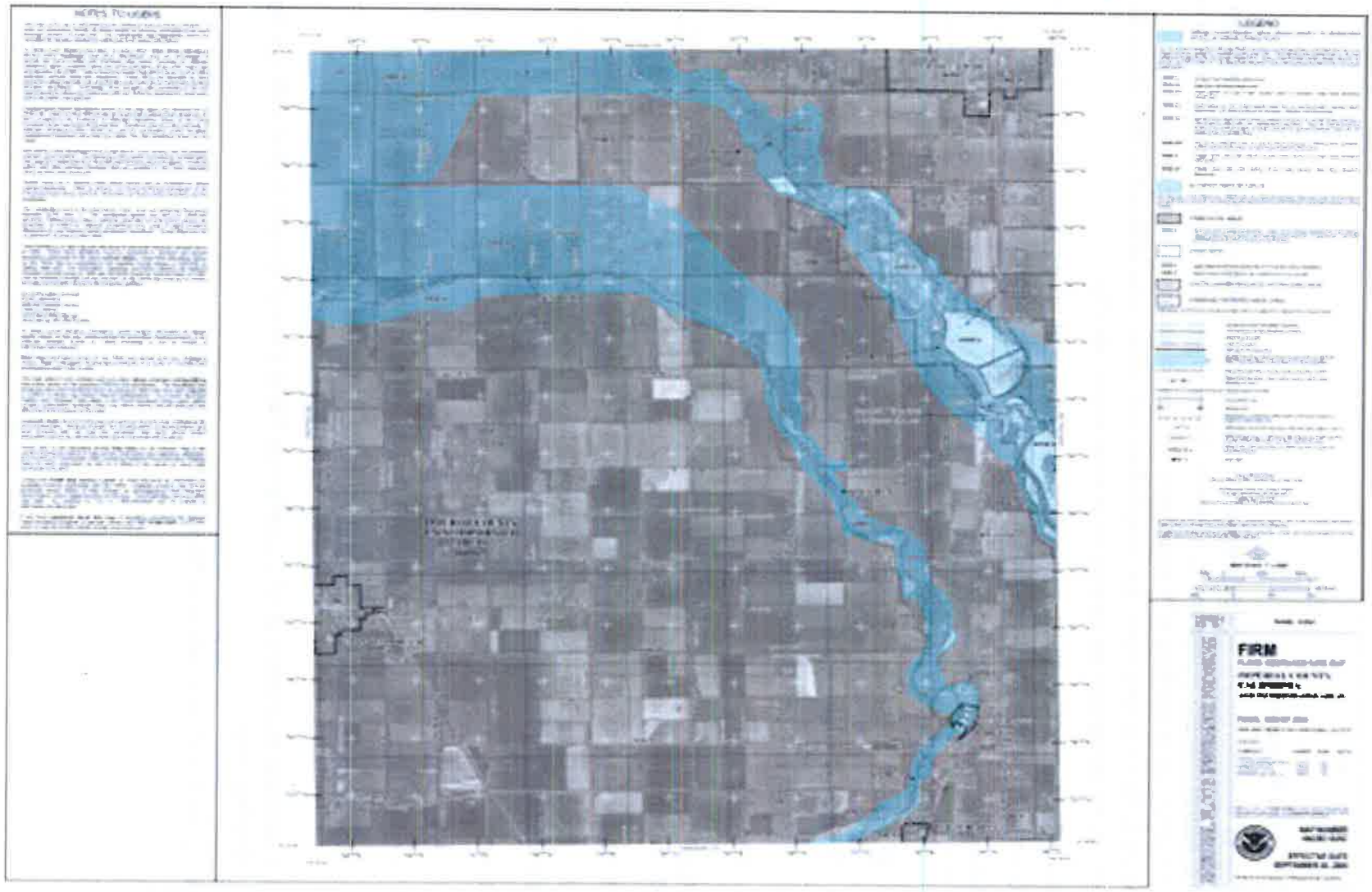

Figure 47. City of Westmorland Flood Insurance Rate Map 1

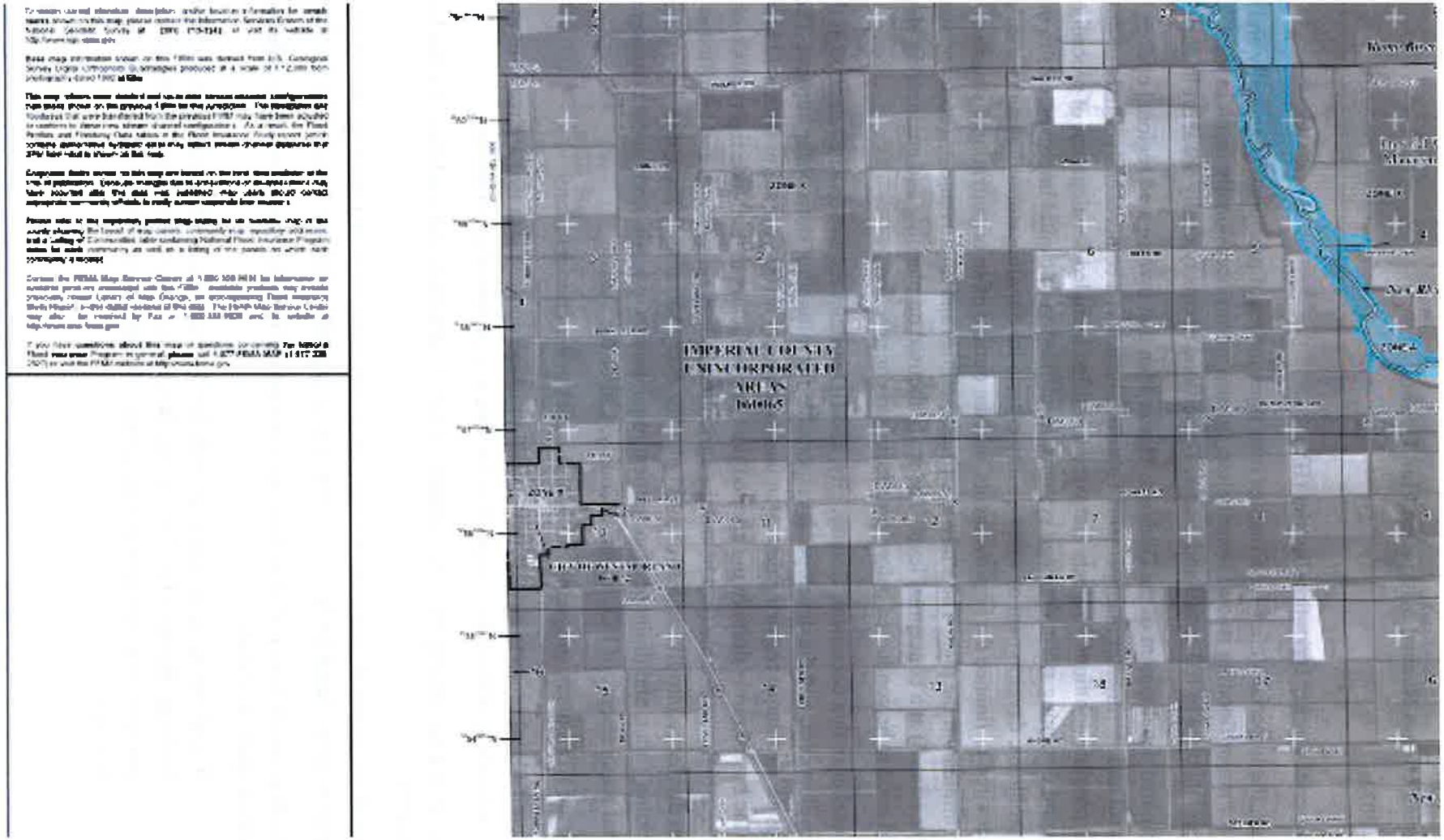

Figure 48. City of Westmorland Flood Insurance Rate Map 2

5.1.1.8. Imperial County Irrigation District (IID)

On average, the Imperial Valley receives just over three inches of precipitation annually and the potential for major flooding is low. Nonetheless, intense storms occasionally result in local flooding and damage to IID canals and drains. These flood events typically are short in duration.

IID coordinated development of the Drainage Master Plan that investigated regional options for flood control and stormwater management. This document was a comprehensive study of drainage issues and possible solutions. Projects that were identified included development of procedures for analyzing and designing storm drainage systems, identification of capital improvements to mitigate flooding problems, development of water quality criteria for handling storm drainage, evaluation of steps required to finance the improvements, and the outline of an organizational structure needed to implement the plan. The study identified facilities and improvements (both regional and stormwater related) at a conceptual level. The study focused on planning and engineering efforts that would need to be conducted before proceeding to construction.

As noted earlier in this document, County, city, and IID policies require on-site retention at the time of development, and the developer is responsible for mitigating stormwater impacts. The County has an ordinance requiring detention basins to empty a 100-year storm within 72 hours; however, the basins rarely drain in the allotted time due to factors that include tight soils with slow percolation, a high water table (just below the agricultural tile drain system), and insufficient capacity to discharge into IID drains (one 12" pipe for every 160 acres). The Cities have general plans, building codes, and drainage management requirements to retain stormwater consistent with the regional requirements of IID, Imperial County, and/or the State.

Following are IID's plans, programs and opportunities under consideration:

- Identify local projects in City and County drainage master plans that are ready to proceed, have funding, and can be competitive for state and/or federal grant monies.
- Develop a regional hydrology manual to establish standards and guidelines for the Imperial Region.
- Adopt a regional drainage master plan, or at minimum, localized drainage master plans for specific areas slated for future development or experiencing stormwater runoff problems.
- Develop regional integrated stormwater management facilities that provide multiple benefits. Sample projects include:
    - A total storage approach to provide flood protection, as advocated in the Preliminary Drainage Master Plan. This would include on-site, in-city and off- site stormwater detention and retention ponds, along with flood/stormwater improvements to IID drainage.

  - Regional detention and retention ponds that have multiple beneficial uses, instead of development-specific detention ponds, which occupy acreage and reduce development potential.
  - Adapt IID drains to convey additional flow from increased urban runoff.
- Work with developers to identify specific areas where multiple benefits can be attained.
- Clarify regional roles and responsibilities, and consider formation of benefit assessment zones, special districts, or a joint powers authority to manage and fund implementation of flood master plans.

Following is a summary of plans and programs of the IID has recently undertaken to mitigate flooding risk within the County:

- Relocation of an Existing Headwall and Pipe: In order to raise the bank to build the dike, the west bank would need to be widened. The structure and pipe that connect to the D Drain to the E Drain needs to be moved east.
- Backflow preventer valves at Sump (S-477): In order to avoid rising water in the D Drain to go back into the field.
- Tail Ditch Berm: Place and compact approximately 4500 cubic yards of native fill material on Tail Ditch road. Native fill material to be obtained at the O Lateral pit. Road is approximately ½ mile long by 16' wide. Approximately 320 loads are needed.
- Calipatria Dike: Building a dirt dike approximately 3' tall, 16' wide for a total of approximately 1 ½ miles. The dike would start at the intersection of Southeast Avenue and Bowles Road and go north to State Highway, and then continue north along Northeast Avenue to Young Road, then head west along Young Road to the railroad tracks.
  - In the ½ mile between Bowles and State Highway, the dike would be built between the power lines and the fields.
  - In the ½ mile between the State Highway and Young Road, the dike would be built on top of existing west bank of the D Drain.
  - In the ½ mile along Young Road, between Northeast Avenue and the railroad tracks, the dike would be built on top of the existing south bank of E Drain.
  - A relocation of an existing headwall and pipe at the intersection of D and E Drain, pipe and box would need to be relocated in order to widen the west bank of D Drain.
  - Backflow preventer valves at Sump (S-477) in order to avoid rising water in the D Drain to go back into the field

SOURCES

[13] Imperial County Planning and Development Services, Flood Zones, Maps www.icpds.com/?pid=1927

[14] California Department of Finance Maps http://www.dof.ca.gov/

[15] California Governor's Office of Emergency Services (CalOES) fka: CalEma https://www.caloes.ca.gov/

[16] National Weather Service (NOAA) Storm Prediction Center, Severe Weather Events Archive https://www.spc.noaa.gov/exper/archive/events /

[17] Federal Emergency Management Agency, Community Status Book Report, CA Communities Participating in the National Flood Program https://www.fema.gov/cis/CA.html

[18] Federal Emergency Management Agency (FEMA), Small Community Rating System https://www.fema.gov/media-library/assets/documents/168876

[19] California Emergency Management Agency Geographic Information Systems Unit July 2010 Source: FEMA DFIRM, August 2009

5.4. Hazard: Extreme Weather

5.4.1. Jurisdictions Affected by Extreme Weather

Extreme Weather risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 20. Extreme Weather Probabilities and Severities by Jurisdiction

Imperial County Probability: Very High	**Imperial County Severity: High**
Brawley Probability: High	**Brawley Severity: High**
Calexico Probability: High	**Calexico Severity: High**
Calipatria Probability: High	**Calipatria Severity: High**
El Centro Probability: High	**El Centro Severity: High**
Holtville Probability: High	**Holtville Severity: High**
Imperial City Probability: Very High	**Imperial City Severity: High**
Westmorland Probability: High	**Westmorland Severity: High**
Imperial Irrigation District Probability: Very High	**Imperial Irrigation District Severity: Very High**
Office of Education Probability: Very High	**Office of Education Severity: High**

5.4.2. Hazard Definition

Extreme weather hazards in Imperial County include:

- **Temperature Extremes (Heat Waves/Freezes)**
    - **Heat Waves:** Heat waves are periods of abnormally hot weather lasting days to weeks. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornados, floods, or earthquakes—takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died.
    - **Freezes:** Prolonged exposure to the cold can cause frostbite or hypothermia, with infants and the elderly being the most susceptible. Extreme cold can freeze and burst pipes and impair communication facilities. Late or early freeze events can have a devastating effect on agriculture and the economy of the region. Freeze events in Kern County usually occur in the Central Valley and are becoming less exceptional as extreme weather conditions become more common due to climate change.
- **Windstorms/Thunderstorms –** Damaging winds are classified as those exceeding 60 mph. Damage from such wind accounts for half of all severe weather reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles. There are seven types of damaging winds:
    - **Straight-line winds**—Any thunderstorm wind that is not associated with rotation; this term is used primarily to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
    - **Downdrafts**—A small-scale column of air that rapidly sinks toward the ground.
    - **Downbursts**—A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually

associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.

- **Microbursts**—A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are both wet and dry microbursts. A wet microburst is accompanied by heavy precipitation. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front**—A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho**—A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of the boundary formed by horizontal spreading of thunderstorm-cooled air. The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo**—A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

- **Tornados –** Closely related to windstorms/thunderstorms, a tornado is a violently rotating column of air touching the ground, usually attached to the base of a thunderstorm. Tornadoes are nature's most violent storms. Spawned from powerful thunderstorms, tornadoes can cause fatalities and devastate a neighborhood in seconds. Winds of a tornado may reach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long. Strong downburst (straight-line) winds may also occur due to the same thunderstorm. Hail is very commonly found very close to the tornadoes, as the strongest thunderstorms that spawn tornadoes are formed under the atmospheric conditions that are also highly likely to make hail. Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Tornadoes develop extremely rapidly and may dissipate just a quickly. Most tornadoes are on the ground for less than 15 minutes. Before a tornado hits, the wind may die down and the air may become very still. A cloud of debris can mark the location of a tornado even if a funnel is not visible. Tornadoes

generally occur near the trailing edge of a thunderstorm. It is not uncommon to see clear, sunlit skies behind a tornado.

- **Hailstorms/Heavy Rain**
    - **Hailstorms:** Hail occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Super-cooled water may accumulate on frozen particles near the backside of a storm as they are pushed forward across and above the updraft by the prevailing winds near the top of the storm. Eventually, the hailstones encounter downdraft air and fall to the ground. Hailstones grow two ways: by wet growth or dry growth. In wet growth, a tiny piece of ice is in an area where the air temperature is below freezing, but not super cold. When the tiny piece of ice collides with a super-cooled drop, the water does not freeze on the ice immediately. Instead, liquid water spreads across tumbling hailstones and slowly freezes. Since the process is slow, air bubbles can escape, resulting in a layer of clear ice. Dry-growth hailstones grow when the air temperature is well below freezing, and the water droplet freezes immediately as it collides with the ice particle. The air bubbles are "frozen" in place, leaving cloudy ice. Hailstones can have layers like an onion if they travel up and down in an updraft, or they can have few or no layers if they are "balanced" in an updraft. One can tell how many times a hailstone traveled to the top of the storm by counting its layers. Hailstones can begin to melt and then re-freeze together, forming large, irregularly-shaped, damaging hail.
    - **Heavy Rain:** "Heavy rain" is generally defined as precipitation that exceeds 0.3 inches per hour. "Very heavy rain" is generally defined as precipitation that exceeds 2.0 inches per hour.

All jurisdictions within Imperial County are vulnerable to the foregoing extreme weather "sub-hazards." All areas are subject to heat wave, with historical events described below that have had countywide effects. Similarly, freezes are a countywide threat. The extensive farmland areas within the county have high economic vulnerability from freeze events. All jurisdictions in the county are vulnerable to windstorms/thunderstorms and tornados. Similarly, all jurisdictions are subject to hailstorms/heavy rain, even desert areas in certain times of the year.

5.4.3. History

Thunderstorms, heavy winds, heavy rainfall, extreme heat, and tornados have all caused damage to Imperial County in the past and will no doubt occur again in the future.

5.4.4. Extreme Weather Hazards

Imperial County has had a history of extreme weather hazards.

Freeze: There have been four state and federally declared freeze disasters for Imperial County since 1950.

Heat Waves: Heat waves do not cause damage or elicit the immediate response that floods, fires, earthquakes, and other disasters do. They have, however, claimed many lives in comparison with other disasters. According to the 2018 California State Hazard Mitigation Plan (SHMP), the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave is said to have resulted in 946 deaths. The 2018 SHMP also states that the July 2006 heat wave in California caused the deaths of about 650 people over a 13-day period.

Another source, the Spatial Hazard Events and Loss Data for the United States (SHELDUS)[20], estimates that approximately 47 heat events occurred in California between the years 1960 and 2008. These events were responsible for 325 injuries and 121 deaths. Adjusted to 2008 dollars, SHELDUS reports that severe heat events in California caused roughly $1.8 million in property damage and $531.7 million in crop damage.

The following tables depict the most extreme weather incidents occurring in Imperial County.

Table 21. Historical Extreme Weather Incidents in Imperial County

Location	Date	Type	Reported Property Damage/Description
Imperial County	08/08/2017	Storm system producing high winds, heavy rain, and lightning.	Emergency Proclamation (IID Resolution No. 18-2017, dated 8/12/2017) Extreme Weather on August 8, 2017 A storm system producing high wind, heavy rain and lightning caused conditions of extreme peril to the safety of persons and property in Imperial County, which included several outages. The storm damaged critical district infrastructure and other property, including major transmission lines, distribution lines and power poles. Approximately 85 power poles, wire and hardware sustained minor damage.
Imperial County	08/03/2017	Storm system producing high wind, heavy rain and lightning	Emergency Proclamation (IID Resolution No. 16-2017, dated 08/09/2017) Extreme Weather on August 3, 2017 A storm system producing high wind, heavy rain and lightning caused conditions of extreme peril to the safety of persons and property in Imperial County, to include several outages. The storms damaged critical infrastructure and other property, including major transmission lines, distribution lines and power poles. Approximately 40 power poles, wire and hardware sustained major damage.

Location	Date	Type	Reported Property Damage/Description
Imperial County	07/31/2017	Storm system producing high wind, heavy rain and lightning	Emergency Proclamation (IID Resolution No. 15-2017, dated 08/09/2017) Extreme Weather on July 31, 2017 A storm system producing high wind, heavy rain and lightning caused conditions of extreme peril to the safety of persons and property in Imperial Count, included several outages. The storms damaged critical infrastructure and other property, including major transmission lines, distribution lines, power poles. Approximately seven power poles, wire and hardware sustained major damage.
Northern Imperial County (into Southern Riverside County)	08/06/2015	Thunderstorm, high winds, substantial precipitation, lightning strikes, and flooding	Local Emergency (IID Resolution No. 13-2015) dated 8/11/2015) Extreme Weather on August 6, 2015 A thunderstorm swept across northern Imperial County into southern Riverside County bringing extremely high winds, substantial precipitation, lightning strikes and flooding. This storm caused harm to people and property by damaging public facilities, forcing the evacuation of residents and requiring the opening of emergency shelters. Transmission power poles, distribution power poles, wire, hardware and underground piping sustained major damage. The circumstances of the storm damage, by reason of its magnitude, are or are likely to be beyond the control of the services, personnel, equipment and facilities of the Imperial Irrigation District and require the combined forces of contract and/or mutual aid. The IID is positioned to receive reimbursement monies from the California Office of Emergency Services and/or Federal Emergency Management Agency for hours worked and material to repair and replace all of the damaged energy system.
Imperial County, Palo Verde	09/04/2012	Thunderstorm Wind	Thunderstorms developed across portions of eastern Imperial county during the afternoon hours on September 4th. Due to the very humid and unstable nature of the atmosphere, the storms generated both locally heavy rain and strong gusty winds. According to a trained weather spotter located in the town of Palo Verde, strong wind gusts estimated as high as 60 mph generated dense blowing dust at 5 p.m. The visibility did not drop low enough to warrant a dust storm warning, however. Fortunately, no damage occurred as a result of the strong wind gusts.

Location	Date	Type	Reported Property Damage/Description
Imperial County (except the lower Colorado River Valley), Calexico, Heber	08/13/2012	Thunderstorm Wind and Dust Storms	Due to the excessive heat and dry conditions, the storms were able to generate strong, gusty and damaging outflow winds. The strong winds spread to the north and into the southern portion of Imperial county, including the towns of Calexico and Heber. Trees downed that blocked roads. Winds estimated to be 50 mph. The strong winds also created dust storm conditions, which lowered visibility to near zero in dense blowing dust. No accidents or injuries were reported.
Imperial County, Meloland, El Centro	10/03/2011	Thunderstorm Wind	Isolated thunderstorms near El Centro generated strong and gusty outflow winds during the afternoon hours on October 3rd. The California highway patrol reported that power poles and live power lines were blown down along Bowker road near Interstate 8. The poles were blown down by the outflow winds which were estimated to be at least 60 knots.
Imperial County, Holtville, Bonds Corner, Ceriaco Summit. Desert Center	09/13/2011	Thunderstorm Wind	Thunderstorms with damaging microburst winds moved through Imperial county during the afternoon hours on September 13th. Law enforcement personnel reported that part of a building, an older structure, was blown onto the road near the intersection of Orchard and Bailey, in the community of Holtville. The winds were estimated to be at least 65 knots. Fire Department personnel reported that a 20 by 40 foot patio cover at the fire station was ripped by strong winds. The winds, estimated to be in excess of 50 knots, also knocked down several palm fronds. The fire station was located just to the northeast of the Desert Center airport.
Imperial County, Bard	08/27/2011	Thunderstorm Wind	Scattered thunderstorms developed across eastern Imperial county during the late evening hours on August 27th. The storms generated strong and gusty outflow winds. The Squaw Lake RAWS weather station, located 4 miles southwest of Martinez Lake, measured a wind gust of 66 mph at approximately 1030 pm. No damage was reported in association with the strong winds.

Location	Date	Type	Reported Property Damage/Description
Imperial County, Calexico	07/07/2011	Thunderstorm Wind	A strong thunderstorm with damaging microburst winds moved across the community of Calexico, south of Imperial, during the late afternoon on July 7th. Law enforcement and emergency management personnel reported that a number of trees were downed, and there was transformer damage as well. In addition, winds with gusts estimated to 70 knots damaged 30 homes, and two homes were destroyed by falling trees. As reported by law enforcement personnel, wind gusts estimated to be at least 60 knots toppled at least 6 power poles. The winds also knocked over several trees in central Calexico. In addition, heavy rain associated with the thunderstorm caused street flooding in town.
Imperial County	09/30/2010 - 10/02/2010	Heavy rains Lightning Strong Winds	Widespread flooding and wind damage, along with destroyed utility infrastructure, including power poles, transformers and irrigation canals resulted in $1 million in damages.
Imperial County, Brawley, Bard. El Centro	08/27/2010	Thunderstorm Wind, Hail	Severe storms moved northward throughout the Imperial Valley with damaging winds and large hail. Several large eucalyptus trees blown down and an empty water tank rolled 100 feet. Severe storms moved northward throughout the Imperial Valley with damaging winds and large hail. A trained storm spotter in the town of Brawley reported golf-ball sized hail. Winds uprooted about 26 date palms, and damaged buildings in Bard and Winterhaven. Approximately half of the roof of a local community center in Bard collapsed, in addition to the roof of a business called the Old Bard Store. Hail to ping pong ball size was reported by the public in El Centro.
Imperial County, Winterhaven Salton City	01/19/2010	Heavy Rain	The heaviest rainfall and strongest winds of the week hit the deserts on Thursday...with brief torrential rains that left streets flooded and water in the streams and rivers. At Imperial over two inches of rain fell between the 18th and the 22nd, with 1.10 inches on the 21st. Winds resulted in damage to many areas...and record low barometric pressure. Heavy rains in the afternoon resulted in considerable standing water in local schools. Two inches of rain was reported during a three hour period in Salton City.

Location	Date	Type	Reported Property Damage/Description
Imperial County (except the lower Colorado River Zone), El Centro	09/05/2009 09/06/2009	Thunderstorm Wind, Dust Storm	Severe storm with high winds and heavy rains caused a disruption to the water supply and electric power systems, damaged roadways and disturbed other life-line services. Damages estimated to exceed $2.6 million. State of Emergency declared by the Governor of California. Thunderstorms generated winds that kicked up dust across much of Imperial County. Sheriff's office reported two power poles down at Aten Road and route 86. Blowing dust reduced the visibility to 1/4 mile at El Centro. Wind gusts of 53 mph were recorded.
Imperial County, Westmorland, Brawley	09/11/2008	Thunderstorm Wind	Strong winds, lightning and heavy rain moved through the Imperial Valley during the afternoon. Power outage reported in Westmorland and Brawley.
Imperial County (except the Lower Colorado River Valley), Plaster City	08/08/2008	Funnel Cloud	Thunderstorms developed during the afternoon hours and caused widespread strong winds and heavy rains. Strong winds, generally between 40 and 50 mph caused widespread areas of visibility less than 1/4 mile. Late afternoon thunderstorms produced winds over 50 mph and areas of blowing sand and dust. Two brief funnel clouds were spotted in Plaster City.
Imperial County, Sandia	08/07/2008	Hail	Large hail (1.75 inch) was reported by employees at the Imperial Irrigation District.
El Centro	07/2008	Extreme Heat	High temperature reading of 118 degrees in El Centro broke all past records on electrical power used as a heat wave continued. Local Cool Centers have been opened in all communities and local public health officials are providing the public with information on precautions that can take when temperatures rise and locations where individuals can go to cool down.
Imperial County	Winter 2007	Freeze	Declared a Freeze Disaster. $1.3 billion in crop damages over 23 counties.
Imperial County, Palo Verde	09/15/2007	Thunderstorm Wind	High intensity windstorm with heavy rainfall that damaged critical infrastructure and other property. Damages include a fire station ($10 million), 30 homes and a church ($3.6 million). Electricity down for several days. Shelter for 300 people set up at local fairgrounds. State of Emergency declared by the Governor of California. Severe thunderstorms developed over parts of Imperial County and moved rapidly northeast during the evening hours. By far, the most damage to structures and trees occurred in Palo Verde, in far northeast Imperial County. Very strong, straight line winds caused significant damage to many homes and businesses including a fire station. The storm motion was toward the northeast. Power lines and poles

Location	Date	Type	Reported Property Damage/Description
			were downed and many trees were uprooted. Storm survey data indicated the most significant damage was about 6:51 p.m. PDT.
Imperial County, El Centro, Coyote Wells, Ocotillo	09/04/2007	Thunderstorm Wind, Hail, Flood	Showers and thunderstorms developed during the afternoon hours, resulting in very heavy rainfall and local flooding. In addition, gusty winds associated with these storms affected portions of Imperial County. Power poles were reported down in Imperial, and winds gusted to 53 mph at El Centro NAS. Large hail was reported along Interstate 8 near Imperial. Portions of Highway 80 and Interstate 8 near Imperial became flooded in Ocotillo.
Westmorland	09/08/2006	Thunderstorm Winds	Strong winds took out power to parts of Imperial County as winds were estimated to be exceeding 60 mph near Westmorland. Near the Salton Sea, the Sheriff's Office reported dense blowing dust.
Imperial County	09/2006	Extreme Heat	The U.S. Department of Agriculture issued a disaster declaration for Imperial County because of a two-week heat wave in July and August. The extreme heat, which in Imperial County topped 120 degrees, killed at least hundreds of cattle locally. Temperatures also cause surviving cattle to eat less, which further cut into the ranchers' revenue.
Imperial County	07/15/2006	Extreme Heat	Six Imperial Valley residents have died of heat-related illnesses because of extreme temperatures. The Imperial Irrigation District saw power use soar to an unprecedented record of nearly 1,000 megawatts as temperatures in the desert reached 117 degrees. While IID officials maintain there is no concern about rolling blackouts, the district was forced to purchase more energy.
Imperial, El Centro	01/25/2006	Dense Fog	Visibility reduced to less than a quarter mile for a two-hour period in Imperial-El Centro area.
El Centro	10/16/2005	Lightning	A three-alarm haystack fire in rural El Centro was sparked by lightning late Sunday night, forcing four families from their homes. The storm system also dropped nearly an inch of rain on Imperial County along with reports of hail in Imperial and Holtville. Power was knocked out in Imperial for about two hours.
Niland	02/19/2005	Hail	Thunderstorms and brief heavy rain/hail spread across parts of Imperial County.
Imperial	12/09/2004	Dense Fog	Dense fog was reported over much of Imperial County, with several hours of low visibility in the Imperial-El Centro area.

Location	Date	Type	Reported Property Damage/Description
Glamis	08/13/2004	Thunderstorm Winds, Magnitude 51 kts.	None Reported
Imperial	08/13/2004	Dust Storm	Gusty thunderstorm winds caused considerable blowing of dust along Interstate 8, about five miles south of El Centro and reduced visibility to less than 30 feet in vicinity of Brawley.
Glamis	08/14/2003	Thunderstorm Winds, Magnitude 55 kts.	Winds measured at Cahuilla RAWS site.
Imperial County	Summer 2002	Drought	$12,100 in crop damage among 12 counties.
Imperial	10/24/2001	Dense Fog	Dense fog reduced visibility to less than 100 feet between Imperial and Brawley.
Winterhaven	08/17/2001	Thunderstorm Winds Magnitude 60 kts.	A large thunderstorm complex which had developed a gust front up to 60 miles long in south central Arizona moved to the southwest into Yuma County Arizona and eastern Imperial County, California. As the gust front moved west across the Colorado River into Winterhaven, about 30 large trees were uprooted.
Ogilby	08/11/2001	Thunderstorm Winds, Magnitude 60 kts.	Severe thunderstorm wind gusts uprooted trees.
Imperial	08/07/2001	Thunderstorm Winds	$10K property damage. Severe thunderstorm wind gusts blew down several power poles.
El Centro	02/27/2001	Thunderstorm Winds, Hail	Thunderstorms moved through much of central Imperial County producing small hail and high winds. El Centro received half-inch diameter hail that covered the ground in places.
Glamis	10/09/2000	Heavy Rain	News program reported a train derailment near Glamis due to water undercutting the tracks.
El Centro	08/04/1999	Thunderstorm Winds, Magnitude 60 kts.	$20K in property damages. Strong winds, heavy rain and small hail accompanied storms that moved through the El Centro area. The winds blew down four power poles in south El Centro and blew out store front windows.
El Centro	07/28/1999	Thunderstorm Winds, Magnitude 59 kts.	Peak wind gust of 59 mph reported at El Centro Naval Air Station. Nearby wind damage included power lines and poles down and a roof blown off a house in Brawley.
Westmorland	07/14/1999	Thunderstorm Winds, Magnitude 65 kts.	Power poles and lines down. Roof from a house blown onto a road.

Location	Date	Type	Reported Property Damage/Description
El Centro	07/12/1999	Thunderstorm Winds, Magnitude 60 kts.	About 50 power poles knocked down in parts of the county, leaving at least 2,000 customers without power.
El Centro	07/08/1999	Thunderstorm Winds, Magnitude 60 kts.	Trees and power lines down. Brief heavy rain and lightning also struck most of the city.
Imperial	05/03/1999	Dust Storm	$10K property damage. Dense blowing dust along with strong winds lowered visibility over much of Imperial County. Numerous traffic accidents ensued and Interstate 8 was closed for several hours. At least two semi-tractor rigs were blown over.
Imperial	09/09/1998	Thunderstorm Winds, Magnitude 55 kts.	Measured peak wind gust at the Imperial Airport.
Imperial	09/09/1998	Thunderstorm Winds, Magnitude 60 kts.	Power lines and power poles downed across parts of Imperial and Niland. Numerous roofs were damaged. At least one billboard was toppled along Highway 86 south of town, and The Movies marquee was shattered. California Highway Patrol investigated a storm-related seven car pileup which occurred between 3:45 and 3:48 p.m. on Highway 111 just south of Aten Road. Some streets were flooded with about an inch /.98 reported at Imperial. Dense blowing dust reduced visibility to less than 1/8 mile before the heavy rain began.
Salton City	09/94/1998	Thunderstorm Winds, Magnitude 60 kts.	Large tree uprooted, power poles downed and awnings blown off of structures in the Salton Sea Beach area.
El Centro	08/31/1998	Thunderstorm Winds, Magnitude 52 kts.	Much of Imperial County affected by high winds, heavy rain.
Imperial	09/25/1997	Tropical Storm	$4.5M in crop damage. Periods of rain associated with Tropical Storm Nora caused extensive crop damage in the County. Most places in Imperial Valley received more than an inch of rain, with one rain gage measuring 2.38 inches. Crops suffered damage from carrots to cotton.
Seeley	09/05/1997	Thunderstorm Winds, Magnitude 50 kts.	Power poles were knocked down.
El Centro	04/02/1995	Dry Microburst	High-based thunderstorms generated a dry microburst which tore limbs off trees in El Centro and blew down trees along State Route 111 between Calipatria and Niland.
Imperial	10/23/1992	Hail, .75 inches	None Reported
Imperial	08/14/1990	Hail, 1.75 inches	None Reported

Location	Date	Type	Reported Property Damage/Description
Imperial	08/09/1989	Thunderstorm Winds, Magnitude 52 kts.	None Reported
Imperial	07/27/1989	Thunderstorm Winds, Magnitude 57 kts.	None Reported
Imperial	08/28/1988	Thunderstorm Winds, Magnitude 52 kts.	None Reported
Imperial	08/05/1983	Thunderstorm Winds, Magnitude 60 kts.	None Reported
Imperial	08/12/1981	Thunderstorm Winds	None Reported
Imperial	07/26/1975	Thunderstorm Winds, Magnitude 54 kts.	None Reported
Imperial	08/20/1973	Thunderstorm Winds, Magnitude 59 kts.	None Reported
Imperial	08/19/1955	Thunderstorm Winds	None Reported
Imperial	08/11/1957	Thunderstorm Winds	None Reported
Imperial	08/10/1955	Thunderstorm Winds	None Reported

Tornados. Wind speeds in tornados range from values below that of hurricane speeds to more than 300 miles per hour. Tornados are often confined to extremely small areas and vary substantially over very short distances. Tornados are measured by the Fujita Tornado Scale (F0-F12) which classifies tornados by intensity categories, based on the maximum winds occurring within the funnel.

Imperial County has a history of chronic tornados. The following table describes events dating back to 1965. The most significant event occurred in 1992, causing between $500 thousand and $5 million in property damage. [21.22]

Table 22. Historical Tornado Events in Imperial County

Location	Date	Type	Death/ Injuries	Reported Property Damage
Glamis	08/30/2000	Tornado Length – 3 miles Width – 50 yards Magnitude F0	0	Motorist reported a tornado near Glamis, lasting about 15 minutes before it roped out and dissipated.
Glamis	02/20/1998	Funnel Cloud	0	None Reported

Location	Date	Type	Death/ Injuries	Reported Property Damage
Seeley	09/24/1997	Tornado Length – 2 miles Width – 25 yards Magnitude F0	0	A tornado touched down near the Forester Exit of Interstate 8 and skipped along to the northwest for approximately 1.5 miles. In its path, 16 power poles were destroyed, with some having been snapped or pulled from the ground, large trees were knocked down, outhouses were blown down, and tarps were lifted from haystacks.
Calipatria	08/29/1993	Tornado Width – 10 yards Length - .01 Magnitude F1	0	A small tornado was reported which knocked down power lines and tore part of the roof off a school building.
Imperial	05/05/1992	Tornado Width – 10 yards Length - .02 Magnitude F0	0	$500K-$5M Property Damage
Imperial	06/07/1972	Tornado Width – 10 yards Length – 0.1 Magnitude F0	0	None Reported
Imperial	07/05/1965	Tornado Width – 10 yds Length – 0.1 Magnitude F0	0	<$50
Imperial	07/05/1965	Tornado Length – 2 miles Width – 33 yds Magnitude F1	0	<$50

5.4.5. Risk Assessment

- **Effects on people, housing, commercial and industrial structures, and infrastructure.** As noted above, extreme weather incidents can cause extensive and costly damage to housing, commercial and industrial structures, and infrastructure, and even injury or loss of life. The danger is multiplied by the risks of power line downing, floods, and landslides/mudslides. Heat waves do not cause damage or elicit the immediate response that floods, fires, earthquakes and other disasters do. They have, however, claimed many lives in comparison with other disasters. As temperatures rise, there is a greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress cause by extreme heat.
- **Effects on agriculture.** Severe weather can have adverse effects on agriculture up to and including destruction of crops and even animals. As the historical events in Imperial County illustrate, damages can run into millions of dollars.

5.4.6. Risk Assessment Conclusion

Thunderstorms, heavy winds, heavy rainfall, and tornados have all caused damage to Imperial County in the past and will no doubt occur again in the future.

Situational and physical characteristics help to identify vulnerable populations that may not comfortably or safely access and use disaster resources. Specifically, when discussing heat-related emergency preparedness, the following groups could be considered vulnerable or at greater risk in a heat emergency:

- Infants and small children under age three
- Women who are pregnant
- Elderly people (age 65 and older)
- The obese
- The bedridden
- Mentally ill
- Those with cognitive disorders
- Those with medical conditions (e.g., heart disease, diabetes, high blood pressure)
- Those requiring life-saving medications (e.g., high blood pressure, depression, insomnia)
- Individuals with drug or alcohol addictions
- Those with mobility constraints
- People who are non-ambulatory
- Those under extreme working conditions
- The poor
- People who are socially isolated
- Non-English speakers who may not have access to information

The California Office of Emergency Services (Cal OES) is predicting more extreme weather and severe storms among the future natural hazard challenges in California due to climate change. According to the California Climate Adaption Strategy (CAS), California is getting warmer, leading to increasing frequency, intensity, and duration of heat waves, and increased mortality.

The following map illustrates the statewide temperature increase trends. [23]

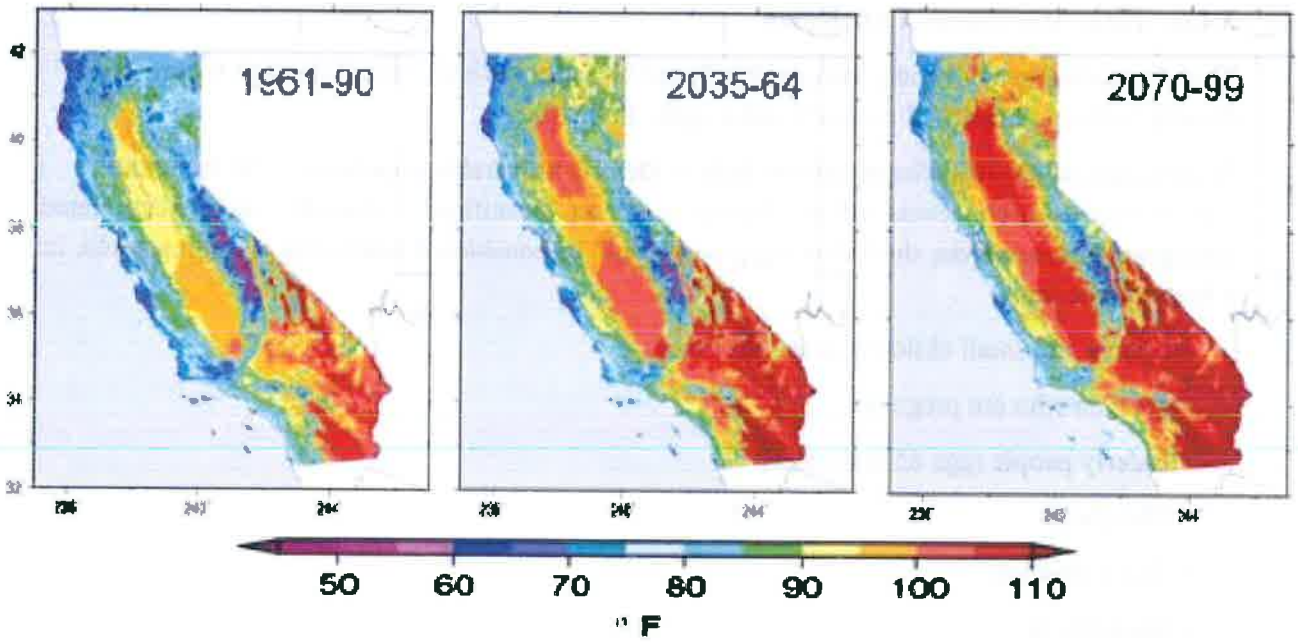

Figure 49. Statewide Temperature Increase Trends

Animals, including domestic pets, livestock, and poultry are also susceptible to extreme heat. For example, dogs and cats are in danger of heat stroke in temperatures of 110°F. The California heat wave of 2006 resulted in 15 reported pet deaths and more than 25,000 cattle, and 700,000 fowl heat-related deaths.

5.4.7. Relationship to Other Hazards – Cascading Effects

Thunderstorms, heavy winds, heavy rainfall, and tornados carry the risks of floods, power and communications outages, and landslides and mudslides, as well as the possibility of wildfire ignitions from downed power lines.

Extreme temperatures carry the risks of power outages due to excessive use of public utilities.

SOURCES

[20] Arizona State University, Spatial Hazard Events and Losses Database for the United States (SHELDUS) https://cemhs.asu.edu/sheldus/reports#Losses

[21] NOAA National Climatic Data Center, U.S. Department of Commerce https://www.noaa.gov/research

[22] Tornado History Project, Tornadoes in Imperial County, California www.tornadohistoryproject.com/tornado/California/Imperial/table

[23] California Natural Resources Agency, California's Climate Adaptation Strategy: Safeguarding California Plan: 2018 Update, January 2018 https://resources.ca.gov/CNRALegacyFiles/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf

5.5. Hazard: Wildfire

5.5.1. Jurisdictions Affected by Wildfire

Wildfire risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 23. Wildfire Probabilities and Severities by Jurisdiction

Imperial County Probability: Medium	**Imperial County Severity: Medium**
Brawley Probability: Medium	**Brawley Severity: Low**
Calexico Probability: Medium	**Calexico Severity: Low**
Calipatria Probability: Medium	**Calipatria Severity: Low**
El Centro Probability: Very Low	**El Centro Severity: Very Low**
Holtville Probability: Medium	**Holtville Severity: Low**
Imperial City Probability: Low	**Imperial City Severity: Medium**
Westmorland Probability: Medium	**Westmorland Severity: Low**
Imperial Irrigation District Probability: Medium	**Imperial Irrigation District Severity: Low**
Office of Education Probability: Medium (However, some schools near crop production/haystack fire areas may have a High Probability rating)	**Office of Education Severity: Medium** (However, some schools near haystack fire areas can cause severe consequences and may have a High Severity rating)

5.5.2. Hazard Definition

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property. Wildfires can occur in undeveloped areas and spread to urban areas where structures and other human development are more concentrated (wildland-urban interface [WUI] fire).

Fires that occur within the urban-wildland interface areas affect natural resources as well as life and property. This type of fire is described as "a fire moving from a wildland environment, consuming vegetation for fuel, to an environment where structures and buildings are fueling the fire" (California Resources Agency, 1996).

While some wildfires start by natural causes, humans cause four out of every five wildfires. Wildfires started by humans are usually the result of debris burns, arson, or carelessness. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on state and national forest lands. The predominate dangers from wildfires are:

- the destruction of timber, property, wildlife; and
- injury or loss of life to people living in the affected area or using the area for recreational facilities

5.5.3. History

The potential for wildfire or a major fire in the unincorporated areas of Imperial County is generally low. Fire hazards exist, however, at two different sites in the County, namely, the fuel storage farms located south of the City of Imperial and east of Niland.

In the event of a fire, assistance from various fire departments within the County would be required. The threat of fire spreading and causing major problems to other areas of the County are minimal due to the isolated locations of the fuel storage farms.

The only area that shows a wildfire potential in Imperial County is a small area west of Ocotillo where San Diego and Imperial County merge. This area has very minimum risks, because it is isolated and not near any residences. All other areas of the County have medium risks due to brush, but not wildfire areas containing large timber that present large scale disaster incidents that occur in other areas of Southern California.

The impact to Imperial County from the San Diego fires of 2003 and 2007 (see list below) was evacuation to and/or sheltering in the County of people and large animals displaced by the fires. The Cedar Fire significantly impacted Imperial County because the people in the affected areas were relocated temporarily to motels, shelters, and/or parking lots where they stayed for multiple days. There were also animals that were transported to Imperial County for shelter/storage after the fire spread through the areas where they were housed in San Diego County.

Table 24. Historical Fire Events that Impacted Imperial County

Location	Date	Acres Burned
Cedar Fire	October 2003	280,278
Paradise Fire	October 2003	57,000
Otay Fire	October 2003	46,291
Roblar (Pendleton) Fire	October 2003	8,592
Witch Creek Fire	October 2007	197,990
Harris Fire	October 2007	90,440
Poomacha Fire	October 2007	49,410
Ammo Fire	October 2007	21,004
Rice Fire	October 2007	9,472

5.5.4. Fire Threat Areas within the IID Service Territory 60 Year Horizon

While all of California is subject to some degree of fire hazard, there are specific features that make some areas more hazardous. Fire Hazard Severity Zones (FHSZ) were developed using a computer model. They predict the physical damage a fire is likely to cause based on factors that influence fire likelihood and behavior. Many factors are considered such as fire history, existing and potential fuel (natural vegetation), flame length, blowing embers, terrain, and typical weather for the area. Fire Hazard Severity Zones are categorized into three categories:

1. **Moderate:** Wildland areas supporting areas of typically low fire frequency and relatively modest fire behavior or developed/urbanized areas with a very high density of non-burnable surfaces (including roadways, irrigated lawn/parks, and low total vegetation cover (<30%) that is highly fragmented and low in flammability).
2. **High:** Wildland areas supporting medium-to high-hazard fire behavior and roughly average burn probabilities or developed/urbanized areas with moderate vegetation cover and more limited non-burnable cover. Vegetation cover typically ranges from 30-50% and is only partially fragmented.
3. **Very High:** Wildland areas supporting high to extreme fire behavior resulting from climax fuels typified by well-developed surface-fuel profiles (e.g., mature chaparral) or forested

systems where crown fire is likely or developed/urban areas typically with high vegetation density (>70% cover) and associated high fuel continuity. This allows flames to spread over much of the area impeded only by isolated non-burnable areas.

Following are Fire Hazard Severity Zones (FHSZ) maps for Imperial County, including the participating jurisdictions. The first is the Local Responsibility Area (LRA) map, and the second is the State Responsibility Area (SRA) map. These maps have been created by the California Department of Forestry and Fire Protection's Fire and Resource Assessment Program (FRAP) using data and models describing development patterns, potential fuels over a 30-50 year time horizon, expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure (including firebrands) to new construction. FRAP assesses the amount and extent of California's forests and rangelands, analyzes their conditions, and identifies alternative management and policy guidelines.[24]

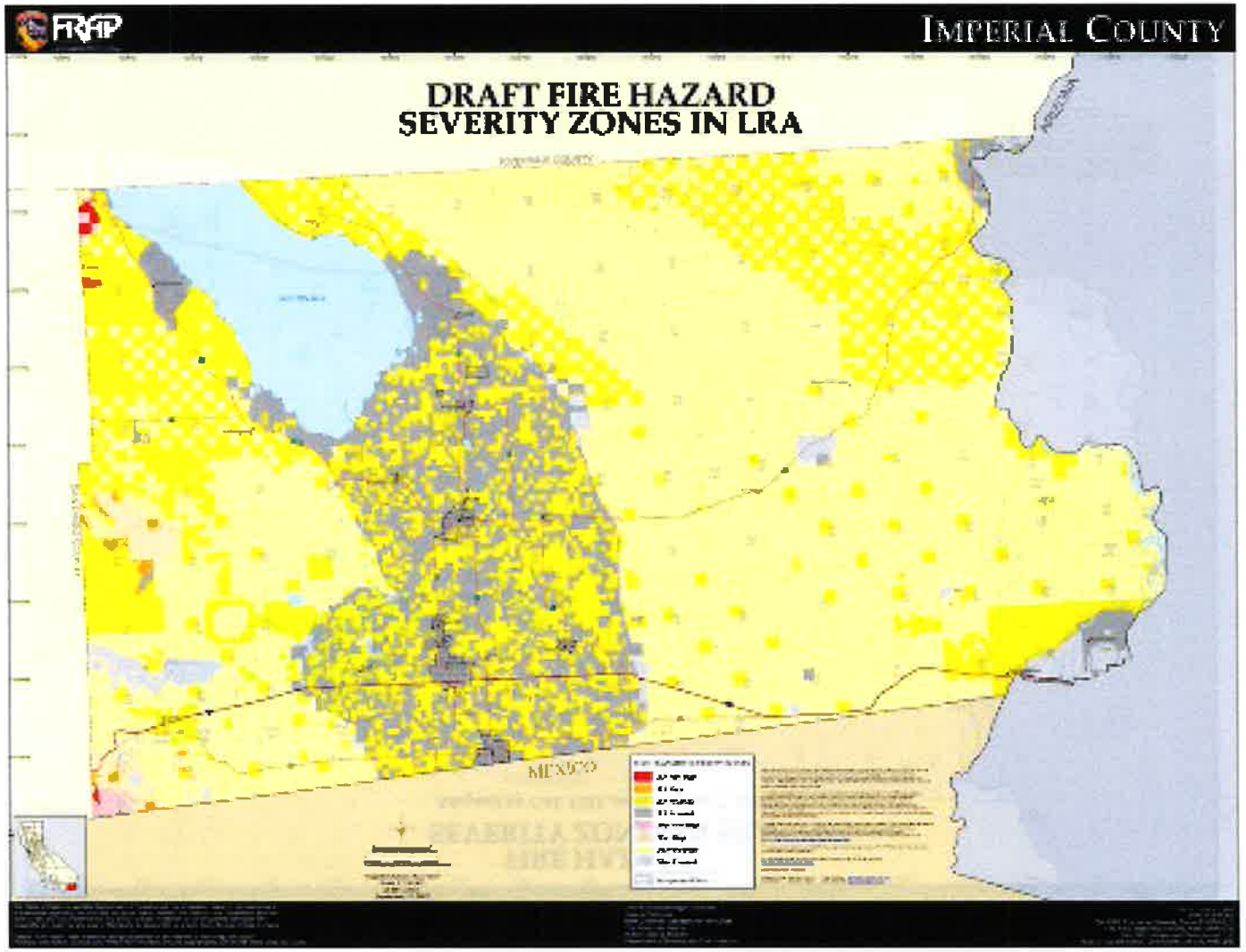

Figure 50. Imperial County Fire Hazard Severity Zones – Local Responsibility Area

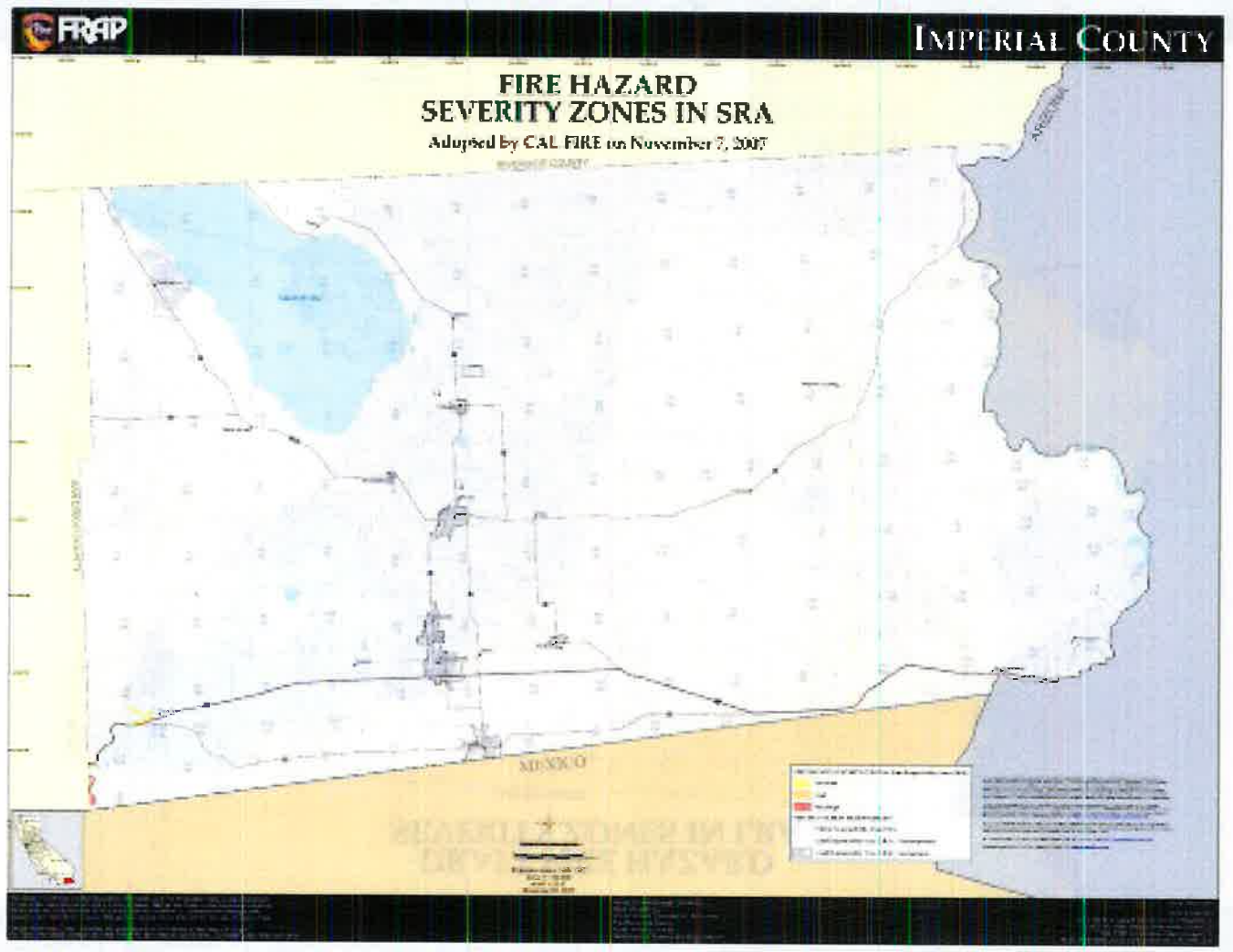

Figure 51. Imperial County Fire Hazard Severity Zones – State Responsibility Area

5.5.5. Risk Assessment

In the event of wildland fires impacting Imperial County, the County's Air Pollution Control District and the California Air Resources Board will immediately disallow and stop all agricultural and residential burning in Imperial County to ensure that no additional emissions are added to the emissions from the unwanted wildland fires.

- **Effects on people and structures.** In addition to damaging the natural environment and causing health hazards due to smoke, wildfires can injure and kill residents and firefighters, as well as damage or destroy structures and personal property.
- **Effects on infrastructure.** In addition to damaging residences and structures, and injuring and killing residents and firefighters, wildfires also deplete water reserves, down power lines, disrupt telephone service, and block roads. They can also indirectly cause floods, if flood control facilities are inadequate to handle an increase in storm runoff, sediment, and debris that is likely to be generated from barren, burned-over hillsides.
- **Effects on agriculture.** Effects on agriculture can be devastating. In addition to the obvious impacts on animals and crops, wildfire can have deleterious effects on soil and water that will impact agriculture for an extended period of time.

5.5.6. Risk Assessment Conclusion

The potential for wildfires in Imperial County is very low due to the desert and agriculture topography of the County. The potential for loss of life and property from urban fire hazards is greatest in places where large groups of people gather, such as offices, stores, hotels, and theaters. Uses which may suffer large monetary losses due to a major fire include businesses, factories, and shopping areas.

5.5.7. Relationship to Other Hazards – Cascading Effects

Flooding, erosion and air pollution. Major wildfires can completely destroy ground cover. If heavy rains follow a major fire, flash floods, heavy erosion, landslides, and mudflows can occur. Agricultural pesticides in storage that are affected by wildfire can cause severe consequences. Wildfires can also affect the air quality throughout the County. These cascading effects can have ruinous impacts on people, structures, infrastructure, and agriculture.

5.5.8. Plans and Programs

5.5.8.1. Imperial County

Government Code 51175-89 directs the California Department of Forestry and Fire Protection (Cal FIRE) to map areas of very high fire hazard within Local Responsibility

Areas (LRA) (see the map included above). Mapping of the areas, referred to as Very High Fire Hazard Severity Zones (VHFHSZ), is based on relevant factors such as fuels, terrain, and weather. VHFHSZ maps were initially developed in the mid-1990s but are now being updated based on improved science, mapping techniques, and data. The California Building Commission adopted the Wildland-Urban Interface codes in late 2005 to be effective in 2008. These new codes include provisions to improve the ignition resistance of buildings, especially from firebrands. The updated fire hazard severity zones will be used by building officials to determine appropriate construction materials for new buildings in the Wildland-Urban Interface. The updated zones will also be used by property owners to comply with natural hazards disclosure requirements at time of property sale and 100-foot defensible space clearance. It is likely that the fire hazard severity zones will be used for updates to the safety element of general plans.

The most significant regulatory codes from the standpoint of fire safety for Imperial County are fire prevention and building codes. The County implements the Uniform Building Code (UBC) and the Uniform Fire Code (UFC). These uniform codes are intended to serve only as minimum standards. Therefore, it is important that these minimum fire safety standards be strictly enforced by fire and building agencies in the unincorporated County.

The Imperial County Codified Zoning Ordinance also contains provisions which act to reduce fire hazards. The Zoning Ordinance is a tool that helps prevent the construction of incompatible or hazardous structures. For example, the ordinance separates industrial, commercial and residential uses and provides for the isolation of land uses that may create excessive fire exposure to other properties. It also limits the height and bulk of buildings, specifies setbacks and distances between buildings.

The Imperial County Subdivision Ordinance is also used to reduce the risk of fire by securing, as a condition of subdivision of land, water systems of adequate size and pressure for firefighting, and adequate roadway widths for emergency service vehicle access including maneuverability of fire trucks. As part of the review process, the Imperial County Planning Department seeks recommendations from Fire and Water Districts wherever the proposed subdivision is located.

The County of Imperial Fire Prevention and Explosives Ordinance, Section 53101-53300, contains provisions for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion. Such measures in this Ordinance include the following:

- Storage of flammable materials
- Storage of radioactive materials

- Permit required for sale and use of fireworks
- Abatement of weeds and other vegetation

The Fire Prevention Education Program encompasses a public information and education component that promotes public awareness of the significance of Fire/Safety prevention measures. This program enables the public to be better prepared when an emergency fire situation occurs.

5.5.8.2. City of Brawley

The City of Brawley is subject to both wildland fire and urban fire hazards which result from a number of causes, including arson, carelessness, home or industrial accidents, or from ignorance of proper procedures for home or business repairs. Fire is a potential hazard which requires adequate firefighting and fire protection services, and adequate water pressure. Potential fire hazards exist where water pressure is insufficient for firefighting, large areas of dry vegetation occur, and structural codes are not met. The potential for fires can be reduced through implementation of appropriate regulation, education, and cooperative fire protection measures.

Several types of fire hazards occur in Brawley. The agricultural fields surrounding the urbanized area are burned regularly. An uncontrolled field fire could threaten adjacent structures. Brush is a fire hazard in some parts of the Planning Area. In addition, some of the older structures of the City may be susceptible to fires due to systems that fail to meet current codes, (e.g., heating system, electrical system, roofing materials).

Following are the City of Brawley's Fire Hazards Goals, Objectives, and Policies:

PSNE Goal 4: Reduce the Risk to the Community's Inhabitants from Fires or Explosions

PSNE Objective 4.1: Promote policies and programs that reduce the risk to the community's inhabitants from fires or explosions

PSNE Policy 4.1.1: Work closely with the City Fire Department to continue to operate an education program regarding fire hazards for residential, commercial, industrial and agricultural uses.

PSNE Policy 4.1.2: Encourage the use of fire retardant roofing materials.

PSNE Policy 4.1.3: Establish and maintain mutual aid agreements with surrounding jurisdictions for fire protection.

PSNE Policy 4.1.4: Enforce building code requirements that assure adequate fire protection.

PSNE Policy 4.1.5: Study alternatives for upgrading emergency water line capacities in deficient areas.

PSNE Policy 4.1.6: Maintain service agreements with the Imperial County Fire

Department, if financially feasible.

PSNE Policy 4.1.7: Continue to enforce the weed abatement program.

Plan: The City will reduce fire hazards within new development through adoption and implementation of Uniform Fire Code provisions and amendments. The amendments shall address local topographic, geologic, climatic, and development conditions. Incorporation of the Uniform Fire Code in new development will result in structures that are more resistant to fire and maximize public safety in the event of a fire. During the development review process, the Public Works Department and the Fire Department will review water flow and distribution requirements for new development projects to ensure adequate water pressure for firefighting.

Education also plays an important role in fire safety. People must be made aware of the fire dangers in natural and open space areas, particularly in the fire season. The City will provide public education and information programs to disseminate information regarding potential fire hazards related to open space areas and residential, commercial, industrial, and agricultural uses. All education programs shall emphasize fire prevention measures to minimize risks.

5.5.8.3. City of Calexico

The City of Calexico has a low risk of damage from wildfires. The undeveloped areas around and outside of the City are either irrigated farmland or sparsely vegetated desert land. Therefore, there is little risk from wildfires due to lack of fuel. The City currently has two existing fire stations; of note is that these fire stations are located on either side of the Union Pacific railroad tracks. There is currently a proposal to build a new station.

The City of Calexico has a fire hazard rating of 5 from the ISO (Insurance Service Office) Commercial Risk Services, Inc. The rating is based on a 1 to 10 scale with 10 being the greatest risk and considers many factors, including adequate water pressure and supply (in addition to the City's maximum rate of consumption for purposes other than firefighting), fire equipment, personnel, response time, etc. Downtown Calexico is susceptible to fires because many of the structures were built in the early 1900's and are constructed of wood and some buildings lack space between them, thus increasing the chances that a fire could spread to numerous buildings.

Also, many of the buildings in downtown Calexico have not been retrofitted for seismic activity and do not contain sprinkler systems.

The City's emergency services providers, such as fire and police, are currently cooperating with the Imperial Valley Emergency Communications Authority (IVECA) and Regional Communications System (RCS) for the coordinated efforts valley-wide to integrate communications within Imperial County and between the County and San Diego County. The Calexico Fire Department is a member of the Imperial Valley Firefighters Strike Force which is responsible to respond to fire emergencies throughout California. The Department is also a member of the Imperial Valley Hazardous Materials Response Team and is available to respond to

hazardous materials emergencies throughout Imperial County. The Department also has a Fire Prevention Bureau headed by the inspector and administers inspections, occupancy permits, and various safety programs throughout the City. [25]

Goal 1: Wildfire: Vegetative Maintenance and Cleaning

Objective 1: Reduce the impact of wildland fire to infrastructures

Objective 2: To mitigate access issues and improve survivability

Following are the City of Calexico's Fire Hazards Objectives and Policies:

Objective 3: Minimize the potential hazards to public health, safety, and welfare and prevent the loss of life and property damage from natural and human induced phenomena.

Policy 3

a. The City shall ensure the adequacy of existing emergency preparedness plans to handle effectively and efficiently known hazards and emergencies.
b. The City shall review evacuation procedures to make sure that in case of an evacuation, the residents of Calexico will be quickly notified and that the evacuation will be orderly.
c. The City shall work with the Calexico Water Department to ensure that an adequate supply of water will be available in the event of an emergency and to help create and maintain an emergency water supply.
d. The Calexico Fire Department should review an update the need for additional fire hydrants and shall work with the Calexico Water Department to ensure that adequate water pressures for fire flows are maintained.
e. The City shall require the heads and staff of each department to participate in the maintenance of a city-wide emergency preparedness plan.

5.5.8.4. City of Calipatria

The California Department of Forestry and Fire Protection designates portions of Calipatria as moderate fire hazard zones, according to the Local Responsibility Area map. The Calipatria Fire Department provides fire suppression services to the City, as well as the unincorporated areas of Imperial County surrounding the City. The department renews its contract with the county each year to cover approximately 250 square miles of unincorporated county land. In addition, the department has aid agreements with El Centro and Niland Fire Districts. The department has established a minimum fire flow of 500 gallons of water per minute for all hydrants in the City. When new development projects are proposed, the water systems are reviewed by the City Engineer and Fire Chief. The developer must demonstrate that the water system can provide at least a 500 gallon per minute fire flow. Fire hydrants are required in all new development projects and water main systems are required to be looped to provide a steady pressure. Generally, 8-inch

water mains are required in all new developments. The Fire Department is also responsible for the identification and correction of fire hazards throughout the City.

Following are Calipatria's fire hazards Goals and Policies:

Goal S-3 Minimize the potential for loss of life, physical injury, property damage, and social disruption resulting from fires.

Policy S-3.1 Require all new development within Calipatria to comply with applicable provisions of the Uniform Fire Code and National Electrical Code.

Policy S-3.2 Require Fire Department review and approval of all new development projects within Calipatria to ensure minimum fire access and safety standards are met.

Policy S-3.3 Require that new development be supplied with adequate water supply and street dimensions are standardized to meet emergency access requirements.

Policy S-3.4 Monitor and measure fire-flow capability for Calipatria's water system and improve water availability to those sections of the City with inadequate fire flow protection.

Policy S-3.5 Continue and enhance as necessary the provisions of mutual aid agreements for fire protection.

Policy S-3.6 Require design elements in new development projects that enhance fire protection capability, such as sprinklers, fire resistive materials, and other appropriate features.

Policy S-3.7 Promote fire prevention as the City's preferred management strategy; facilitate programs that are aimed at the prevention of fires, such as monitoring abandoned and vacant structures/sites for excessive weeds, brush, trash, and other combustible materials.

Policy S-3.8 Promote multi-jurisdictional emergency coordination and planning for fire events.

Following are the City of Calipatria's Implementation Actions for the adopted policies:

- Work closely with Imperial County Division of Building and Safety during the development review process to ensure that any new and existing developments adhere to applicable provisions of the Uniform Fire Code and National Electrical Code, verifying that projects comply with requirements such as street widths, access areas, and maneuvering areas sufficient to allow fire protection and emergency vehicles access to structures (Implements Policies S-3.1, S-3.2, S-3.3, S-3.4, S-3.6 and S-3.7).
- Work closely with Golden State water Company to ensure that sufficient water supplies are available for protection of structures (Policies S-3.3, S-3.4, and S-3.6).
- Continue to participate in the planning and development of the Imperial County Multi-

Hazard Mitigation Plan and comply with the mitigation goals and strategies therein (Policies S-3.5 and S-3.8).

5.5.8.5. City of El Centro

The City of El Centro management of fire risks focuses on proper land use planning, enforcement of building standards, and public education.

Following are El Centro's Fire Hazards Goals and Policies: [26]

Safety Goal 3: Ensure that the Fire Department continues to protect the health, safety, and general welfare of the citizens of El Centro by educating the public about fire hazards and reducing the risk associated with fire hazards.

Policy 3.1: Identify and evaluate potentially hazardous fire risks in the community and educate the public about the safety hazard associated with these risks.

Policy 3.2: Maintain fire prone areas to lessen recurrent fire problems and include necessary improvements in the City's Capital Improvement Program.

Policy 3.3: Avoid new development that would create major increases in fire risk that may cause the City's existing firefighting capacity to be exceeded.

Policy 3.4: Maintain efficient, 24-hour fire protection by providing the Fire Department with adequate funding, facilities, equipment, and training, and identify new funding sources as necessary.

Following are the City of El Centro's Implementation Program to implement the adopted policies.

S-8: Fire Risk Reduction: Reduce the risk to the community from hazards related to brush and structural fires by requiring feasible mitigation of such impacts on existing development, new development and redevelopment. Assess development proposals for potential hazards pursuant to the California Environmental Quality Act. Require measures to mitigate all identified significant public safety hazards.

Responsible Agency/Department: Development Services, Fire Department

Funding Source: Project proponent

Time frame: Ongoing

Related Policies: 3.2, 3.3

S-9: Promote Fire Prevention: Promote Fire Prevention in El Centro in the following ways:

Direct the El Centro Fire Department to implement fire hazard education and fire prevention programs, including weed abatement programs;

- Coordinate with the City's Planning Department, Imperial Irrigation District; (IID), and the

El Centro Fire Department to *ensure* that water pressure for existing developed areas and sites to be developed is adequate for firefighting purposes;

- Adopt and implement the most recent Uniform Fire Code provisions and appropriate amendments to reflect the unique El Centro topography, vegetation and urban form; and
- Review and revise the Fire Department budget, as necessary, to ensure adequate protection.

Responsible Agency/Department: Fire Department, Community Services, IID Funding Source: General Fund

Time Frame: Ongoing

Related Policies: 3.1, 3.4

S-10: Signal Preemption Program: Continue to implement the signal preemption program allowing emergency vehicles to preempt signalized traffic lights in order to reduce response time to emergencies.

Responsible Agency/Department: Public Works

Funding Source: General Fund

Time Frame: Ongoing Related Policies: 3.4

5.5.8.6. City of Holtville

Although wildfires do not pose much of a risk to Holtville, residents are exposed to various structural fire hazards within the City. The City of Holtville Fire Department is responsible for providing all fire protection and emergency medical aid to the City and has a mutual aid agreement with surrounding cities. The Department operates out of one fire station located at 549 Fern Street.

The City of Holtville reviews funding levels for the Fire Department to ensure that an adequate level of service and facilities are provided to residents. In addition, the City coordinates with the Fire Department to educate the public about fire hazards and ways to reduce risks associated with fire hazards.

Fire damage and fire safety tend to be the most visible to the local citizens; therefore, the City of Holtville has established the following programs: [27]

- Identify and evaluate hazardous fire situations and hazardous locations. Make such information available to the public and/or property owners.
- Continue to identify and analyze fire department workload and efficiency.
- Provide 24 hour-per-day fire protection for all emergencies, to establish and maintain optimum fire insurance rating.
- Conduct a City-wide study of fire generation and response behavior near various disaster

conditions.

- Encourage and continue the efficiency of the fire department by upgrading equipment, facilities and training.
- Coordinate a joint-powers agreement between other emergency service providers and establish a well-coordinated emergency response program.
- Obtain special "hazardous material" handling training for all fire protection personnel.

5.5.8.7. City of Imperial

As noted above, fire hazards exist at two different sites in the County at the fuel storage farms located south of the City of Imperial and east of Niland. In the event of a fire, assistance from various fire departments within the County would be required. The threat of fire spreading and causing major problems to other areas of the County are minimal due to the isolated locations of the fuel storage farms.

Following are the City of Imperial's Wildland and Urban Fire Hazards Objectives and Policies. [28]

Objective 8: Minimize exposure to the public to wildland and urban fires and protect the public to the maximum extent possible when fires do occur. Ensure the City has adequate firefighting capability.

Policy 8

A. Establish and maintain an active fire hazard inspection program through the fire department.

B. Require property owners to keep vacant lots and land parcels within the City clear of excessive brush and other combustible debris.

C. Ensure new development projects contain adequate water systems and fire hydrants for fire protection.

D. Ensure abandoned buildings and structures are properly boarded up to prevent access and the possibility of fire.

E. Consider the need for a new fire station to serve areas of the City east of the Southern Pacific railroad tracks.

F. Maintain mutual aid agreements with other cities and agencies to help ensure adequate assistance to extinguish major fires.

G. Ensure that farmers burning agricultural fields within the City's planning area have the proper burn permit and personnel/equipment to control the fire and prevent hazards to the public.

H. Report illegal burning activities to the County Agricultural Commissioner and Air

Pollution Control Officer. Primary responsibility for this activity would be undertaken by the police department and/or fire department.

Objective 9: Ensure adequate road widths and clearances around structures to enable emergency vehicles to obtain fast and efficient access to all areas of the City during fires, earthquakes, and other emergencies.

Policy 9

A. Maintain a minimum design standard for residential streets that dictates a 40-foot street width, face of curb to face of curb.

B. Ensure cul-de-sac streets have an adequate radius to allow for maneuvering of fire trucks and other emergency vehicles.

C. Prohibit angle parking in cul-de-sacs and ensure all vehicles park parallel to the curb, thereby allowing adequate room for emergency vehicles.

D. Ensure that setbacks for structures on corner lots are at least 10 feet in order to provide adequate clearance for large fire fighting vehicles.

E. All multiple family development projects shall provide two unobstructed fire access lanes at least 12 feet in width with at least a 35-foot radius for all curb returns.

F. All multiple family development projects shall have direct access to a public street at least 40 feet in width to ensure adequate emergency vehicle access.

G. Ensure that cul-de-sac streets are a maximum length of 600 feet and that they are clearly delineated on the official City map provided to the police and fire departments.

H. All alleys within the City shall be kept free of obstacles and debris and shall provide at least a 12-foot unobstructed access for emergency vehicles.

5.5.8.8. City of Westmorland

Following are the City of Westmorland's Wildfires, Structure Fires and Other Fires Hazards Goal, Objective and Policies.

Goal #1: Protect the public from natural and man-made hazards.

Objectives 1.5: Protect the public from wildfires, structure fires and other fires.

Policies:

1. Implement zoning and subdivision regulations which require street widths, access areas and maneuvering areas sufficient to allow fire protection and emergency vehicles access to structures.

2. Implement fire-flow requirements for new developments and improve water availability to those sections of the City with inadequate fire flow protection.
3. Incorporate design elements in development projects that enhance fire protection capability. Such items would include smoke alarms, fire sprinklers, fire resistive materials and other appropriate features.
4. Continue and enhance as necessary the provisions of mutual aid agreements for fire protection.
5. Ensure that abandoned and vacant structures/sites are kept free from excessive weeks, brush, trash and other combustible materials thereby reducing fire hazards.
6. Vigorously enforce the provisions of the Uniform Fire Code and National Electrical Code to ensure structures do not become fire hazards.

5.5.8.9. Imperial Irrigation District

Catastrophic Wildfire Legislation

Catastrophic Wildfire Legislation, approved by the Governor and filed with the Secretary of State on September 24, 2016, established a new chapter in the Public Utilities Code that requires each electric utility, including local publicly owned utilities and electrical cooperatives to construct, maintain, and operate electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment. California Public Utilities Commission (CPUC) §8387 requires the governing board of the local publicly owned utility to determine, based on historical fire data and local conditions and in consultation with the fire departments or other entities responsible for control of wildfires, whether any portion of the geographical area within its service territory has a significant risk of catastrophic wildfire resulting from its electrical lines and equipment. Based on historical fire data and local conditions, IID staff determined there are no areas within the electrical service boundary that pose a significant risk of catastrophic wildfire due to the IID infrastructure. The IID constructs, maintains, and operates its electrical lines and equipment in a manner that minimizes the risk of catastrophic wildfire posed by those electrical lines and equipment. Separate and apart from the requirements of SB 1028, IID administers a Vegetation Management Program and adheres to an associated standard operation procedure related to vegetation and fire prevention. On July 25, 2018, IID signed Resolution No. 13-2018[29] in response to the State's Catastrophic Wildfire Legislation. It was found and determined that no geographical area within IID's service territory has been identified as a significant risk of catastrophic wildfire resulting from IID's overhead electrical lines and equipment.

Wildfire Mitigation Plan [30]

Senate Bill No. 901 modified multiple sections of California's Emergency Services Act, which

was enacted on August 31, 2018. The bill requires the governing board of local publicly-owned utility (such as IID) to complete a Wild Fire Mitigation Plan. The IID completed a wildfire service territory survey in June 2019 in addition to contracting with a qualified independent evaluator to assess the safe operation of electric infrastructure and to review and assess the comprehensiveness of the Plan. A report was prepared as mandated by Senate Bill No. 901, and after public review and comments, the Wild Fire Mitigation Plan was approved and adopted by the Board of Directors on November 18, 2018 and was activated on January 1, 2020.

Imperial Irrigation District SB 901 Wild Fire Mitigation Plan 2020-2021

A 93-page report dated September 23, 2019, was prepared by Max Fuentes Consulting in response to the mandates made in Senate Bill No. 901. Included in the report are the following topics:

1. Executive Summary
2. Purpose of the IID Wildfire Mitigation Plan
3. Authority to Implement the Plan
4. Imperial Irrigation District Overview (the organization and the description of the service territory
5. Objectives (also listed below)
6. Present Fire Ignition Risks
7. Future Fire Risk due to Climate Change
8. Service Territory Survey Findings
9. Existing Efforts
10. Planned Efforts
11. Managing the Plan
12. Roles and Responsibilities

The report includes a chart (Appendix 1) that compares the SB 901 requirements and how IID meets those requirements.[31]

Objectives of the Imperial Irrigation District Wildfire Mitigation Plan

5.1. Reduce the risk of fire ignitions caused by Imperial Irrigation District Power Infrastructure

5.2. Prevent the construction of new power infrastructure in or adjacent to CAL FIRE designated High or Extreme Fire Threat Areas

SOURCES

[24] California Department of Forestry and Fire Protection. http://frap.fire.ca.gov

[25] City of Calexico 2015 Draft General Plan Update https://www.calexico.ca.gov/index.asp?SEC=254C9C81-D449-44C7-B581-0B8070E31FF1&Type=B_BASIC

[26] City of El Centro, General Plan, Safety Element www.cityofelcentro.org/userfiles/file/Planning/General%20Plan/General%20Plan%20Upload/El%20Centro%20GP_Safety.pdf

[27] City of Holtville General Plan, June 2017 http://www.holtville.ca.gov/documents/pdf/General-Plan-Draft_Holtville_2017-6-13.pdf

[28] City of Imperial General Plan, Safety Element https://www.cityofimperial.org/public_docs/Docs/Planning/general.plan.1992/Chapter%203/SAFETY%20ELEMENT.pdf

[29] Imperial Irrigation District, Catastrophic Wildfire Legislation (Resolution No. 13-2018, dated July 25, 2018) https://www.iid.com/home/showdocument?id=17141

[30] Imperial Irrigation District (IID) (Resolution No. 37-2019, dated November 18, 2019) Acceptance of Wild Fire Mitigation Plan Pursuant to California Senate Bill 901 (Plan to be activated January 1, 2020) https://www.iid.com/home/showdocument?id=18079

[31] Imperial Irrigation District, SB 901 Mitigation Plan 2020-2022, dated September 23, 2019 https://www.iid.com/home/showdocument?id=17951

5.6. Hazard: Dam Failure

5.6.1. Jurisdictions Affected by Dam Failure

Dam Failure risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 25. Dam Failure Probabilities and Severities by Jurisdiction

Imperial County Probability: Medium	**Imperial County Severity: Very High**
Brawley Probability: Medium	**Brawley Severity: Very High**
Calexico Probability: Medium	**Calexico Severity: Very High**
Calipatria Probability: Medium	**Calipatria Severity: Very High**
El Centro Probability: Medium	**El Centro Severity: Very High**
Holtville Probability: Medium	**Holtville Severity: Very High**
Imperial City Probability: Medium	**Imperial City Severity: Very High**
Westmorland Probability: Medium	**Westmorland Severity: Very High**
Imperial Irrigation District Probability: Medium	**Imperial Irrigation District Severity: Very High**
Office of Education Probability: Medium	**Office of Education Severity: Very High**

5.6.2. Hazard Definition

A dam failure is the partial or complete collapse of an impoundment, with the associated downstream flooding. Flooding of the area below the dam may occur as the result of structural failure of the dam, overtopping, or a seiche. Dam failures are caused by natural and manmade conditions. The list of causes includes earthquake, erosion of the face or foundation, improper sitting, structural/design flaws, and prolonged rainfall and flooding. The primary danger associated with a dam failure is the swift, unpredictable flooding of those areas immediately downstream of the dam.

There are three general types of dams: earth and rock fill, concrete arch or hydraulic fill, and concrete gravity. Each of these types of dams has different failure characteristics. The earth and rock fill dam will fail gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete arch or hydraulic fill dam will fail almost instantaneously; with a very rapid build-up to a peak and then a gradual decline. A concrete gravity dam will fail somewhere in between instantaneous and gradual, with corresponding build-up of flood wave.

For risk mitigation planning, Imperial County expands the definition of "dam" to include "anything that holds water back" due to the fact that there are canal systems in and around every city in the County. While there are three major dams in Imperial County (Imperial, Laguna, and Senator Wash, located on the Colorado River), in the irrigated area, there are several large, earth fill impoundment reservoirs; hundreds of miles of above-ground-level earth levee canals, and hundreds of check dams, drops, and gates. The County believes it is important to consider all of these water management structures, which are potentially vulnerable to failure, as a part of the dam failure hazard.

5.6.3. History

Dam failure incidents have not been a problem in Imperial County; however, due to the seepage problems of the Senator Wash Reservoir, the dam could experience an incident. Seasonal flooding with failure of run-off storage reservoirs and canals could seriously compound the risks of dam failure and additional flooding. Although Dam Failure has been assessed as a medium probability, the severity of impact would be catastrophic.

The Imperial Dam was constructed between 1935 and 1938 as part of the Boulder Canyon Project Act of 1928. Prior to that, the Imperial Valley received water through the Alamo Canal. Without any dams along its course, the flow of the river varied widely between drought and flood conditions. The construction of the Imperial Dam and the All-American Canal brought life to Imperial Valley farmers and others suffering from the Great Depression, providing jobs and a reliable water supply protected from the devastating effects of flooding. The Imperial Dam has never failed; it is a diversion facility without the capacity to store and hold flows back. It is

designed to pass a maximum probable flood of 180,000 cubic feet per second. Currently, it is releasing about 8,000 cubic feet per second.

Figure 52. Imperial Dam

Imperial Dam is owned by the Department of the Interior but operated by the Imperial Irrigation District. The dam is near Yuma, Arizona. It diverts Colorado River water into three different canals and holds the river water until it can be directed into a desilting plant before being released into the All-American Canal, the Gila River, and the Yuma project aqueduct. As noted above, the Imperial Dam is a diversion facility without the capacity to store and hold flows back. It is a concrete slab and buttress type of structure with a floating overflow weir section 3,485 ft. long including the dike. The water level of the river is raised 23 feet at the dam.

Laguna Dam provides water to irrigate towns in Imperial County and Arizona. The Laguna Dam is located on the Colorado River 13 miles northeast of Yuma, Arizona, and about five miles downstream from Imperial Dam. When completed in 1909 the Laguna Dam diverted water from the Colorado River for irrigation of about 109,000 acres of desert. Since 1948, irrigation water has been diverted at Imperial Dam. Laguna Dam now serves to protect the toe of Imperial Dam and for partial regulation of river flows. This was the first dam on the Colorado River and has a structural height of 43 feet and contains 486,800 cubic yards of material.

Figure 53. Laguna Dam

Figure 54. Senator Wash Dam and Reservoir

Senator Wash Dam and Reservoir is located two miles above Laguna Dam. It is a 470-acre reservoir, with a usable capacity of 12,250 acre feet of water. Water levels are managed by the Bureau of Reclamation and operated by IID. Land-based recreational use is managed by the Bureau of Land Management. Due to seepage problems with the Squaw Lake face of the dam, the Senator Wash facility is being operated at lower than designed elevations. The Bureau of Reclamation has undertaken a 15-year study to resolve the issue.

The All American Canal/Desalting Works is located at Imperial Dam. Comprised of six settling basins, each 270 feet wide and 770 feet long, arranged in pairs, and provides for the removal of sediment from water as it leaves the dam, thus preventing silt from entering and clogging the canals.

The Colorado River is not a known seismically active zone and, to date, there have been no reported cases of earthquake damage to the dams there. Within the irrigated area, there have been a number of instances of levee failure from earthquakes and resultant flooding. The flooding hazard is not considered great because of the comparatively small volumes of water involved, a variety of options to check or divert flows in the canals, and the ubiquitous drainage network. Nevertheless, some hazard does exist and even minor flooding could be an incremental contribution to the other disruptions an earthquake might cause.

In addition to the dams described above, there is a state-regulated dam, which includes the El Centro Water Purification Plan, 2016.000 (CA1136). This structure is classified at a high hazard potential. The dam owner is the City of El Centro.

5.6.4. Risk Assessment

A flood inundation scenario by the Bureau of Reclamation as shown on the adjacent map, was developed for Hoover Dam, based on the inflow of the probable maximum flood (PMF). For this scenario, flood releases from Hoover Dam were designed in a way such that the dam would not be overtopped, and the maximum reservoir elevation in Lake Mead does not exceed 1232.0 feet, with releases through the dam's penstocks and spillway tunnels. Outflows from Hoover Dam based on PMF inflow are considered to be a worst-case operational scenario and these releases, described as a maximum operational release to prevent over-topping, would cause flood issues all the way down the Colorado River and impact the Imperial and Laguna dams.

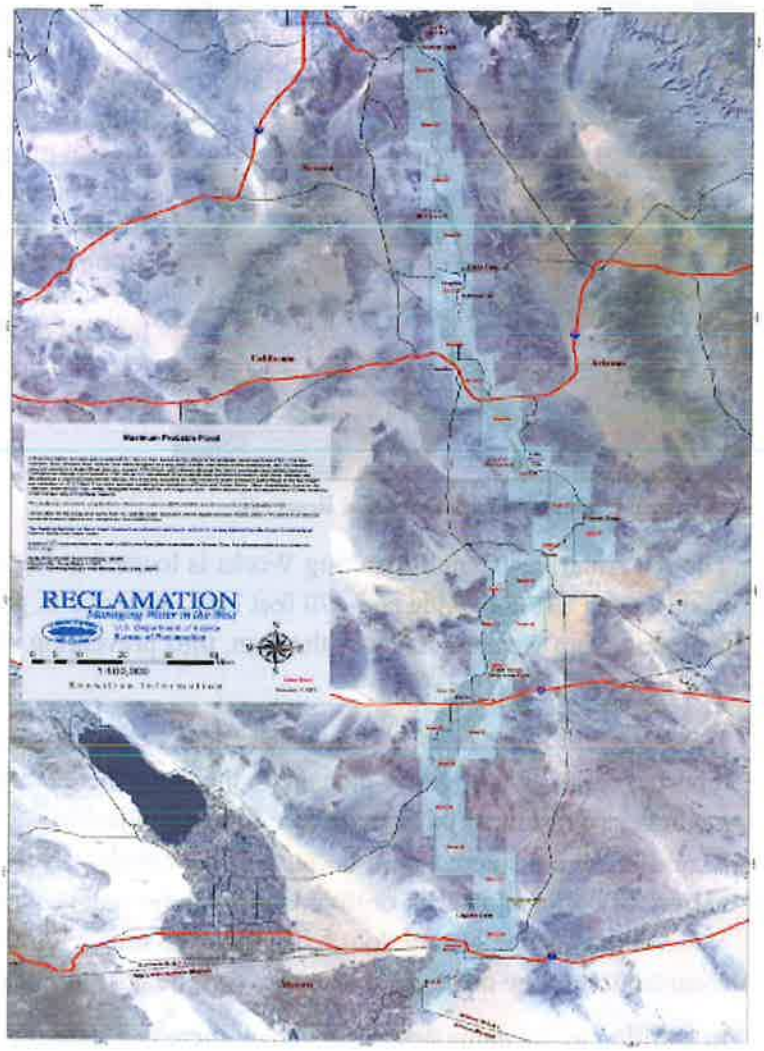

Figure 55. Flood Inundation Map for Hoover Dam

Flooding, due to dam failure, is a factor which could seriously affect eastern Imperial County. Cal OES is charged with keeping on file the "inundation map" and "dam failure response plan" for each dam in the State. Cal OES works with the California Department of Water Resources, Division of Safety of Dams which maintains inundation maps. The dam owner/operator is, however, responsible for map and plan preparation.

Failure of any of the dams in Imperial County would certainly cause inundation of the downstream shorelines, and all of the Bard-Winterhaven area would flush large quantities of water through Mexico into the New and Alamo Rivers. Inundation of the community, however, is considered unlikely. Hazard analysis suggests that dam failure would likely occur only if heavy precipitation was coupled with significant seismic activity near the dam. In such a scenario, there likely would

be major disruptions in power and communications systems, and warnings may not be received from dam or reservoir sites in time to initiate an organized evacuation or broadcast warnings via emergency radio stations. If a credible prediction is initiated, then preparation for a damaging earthquake could begin and residents and business owners within dam inundation areas could be directed to assembly areas to wait for official word regarding safe re-entry. This method of direction and control could substantially reduce potential loss of life if enough warning were available.

- **Effects on people and housing**. The effects on people and housing can be significant. Loss of life and loss of property are very real risks. The shelter requirements for displaced persons can be enormous.
- **Effects on commercial and industrial structures.** Similarly, commercial and industrial structures face risks running the gamut from significant damage to total loss.
- **Effects on infrastructure.** Dam failure may be a direct or indirect cause of power outages. These outages can be extensive in geographic area and numbers of persons affected.
- **Effects on agriculture.** Downstream flooding caused by dam failure can cause damage to vegetation, crops, livestock, and dairy stock. In addition to the obvious impacts on animals and crops, flooding can have deleterious effects on soil and the ability to reinvigorate the agricultural activities impacted once the flood waters recede.

5.6.5. Risk Assessment Conclusion

Dam failure incidents have not been a problem in Imperial County. However, due to the seepage problems of the Senator Wash Reservoir, the dam there could experience an incident. Seasonal flooding with failure of run-off storage reservoirs and canals could seriously compound the risks of dam failure and additional flooding. Although Dam Failure has been assessed as a medium probability, the severity of impact would be catastrophic.

5.6.6. Relationship to Other Hazards – Cascading Effects

Dam failure obviously causes downstream flooding. It may also lead to power failures and downed power lines. The secondary effects of dam failure can include the disruption of local and state economies by damage to agriculture, buildings and roads, the severance of communications, the disruption of supply and delivery mechanisms, additional welfare, and emergency aid to the recovering economy.

Earthquakes can endanger dams in several ways, including failure of the foundations or dams themselves due to ground failures, or through secondary effects such as seiches and landslides in the reservoir.

Normal operations of dam facilities can also cause failure if any part of the dam is not operating according to the original design specifications or due to aging of the site.

Any interruptions to water distribution and other water infrastructure could create a cascading effect and the disruption of local and state economies by affecting agriculture, buildings and roads, the severance of communications, the disruption of supply and delivery mechanisms, additional welfare, and emergency aid to the recovering economy.

5.7. Hazard: Pest Infestation/Non-Vectors of Human Diseases

5.7.1. Jurisdictions Affected by Pest Infestation/Non-Vectors of Human Diseases

Pest Infestation/Non-Vectors of Human Diseases risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 26. Pest Infestation/Non-Vectors of Human Disease Probabilities and Severities by Jurisdiction

Imperial County Probability: Very High	**Imperial County Severity: High**
Brawley Probability: Very High	**Brawley Severity: Medium**
Calexico Probability: Very High	**Calexico Severity: Medium**
Calipatria Probability: Very High	**Calipatria Severity: High**
El Centro Probability: Very High	**El Centro Severity: Medium**
Holtville Probability: Very High	**Holtville Severity: Medium**
Imperial City Probability: Very High	**Imperial City Severity: Medium**
Westmorland Probability: Very High	**Westmorland Severity: Medium**
Imperial Irrigation District Probability: Very High	**Imperial Irrigation District Severity: Medium**
Office of Education Probability: Very High	**Office of Education Severity: High**

5.7.2. Hazard Definition

Pest infestation occurs when an undesirable type of insect or other identified pest inhabits an area in a manner that causes serious harm to agriculture crops, livestock, or poultry; wildland trees, plants, waterways, animals; or humans. Countless insects live on, in, and around plants, animals, and humans in all environments. Many are harmless, while others can cause fatal damage. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks.

The major forms of insects are:

Chewing insects are defoliating insects. They generally strip plants of green matter such as leaves. Caterpillars and beetles make up the largest proportion of chewing insects. Under normal conditions, trees can usually bounce back from an attack of these defoliators, though repeat infestation will weaken a tree and can eventually kill it by starving it of energy.

Boring, or tunneling, insects cause damage by boring into the stem, roots, or twigs of a tree. Some lay eggs which then hatch and the larvae burrow more deeply into the wood, blocking off the water-conducting tissues of the tree. Boring insects generally feed on the vascular tissues of the tree. If the infestation is serious, the upper leaves are starved of nutrients and moisture, and the tree can die. Signs of borer infestation include entry/exit holes in the bark, small mounds of sawdust at the base, and sections of the crown wilting and dying.

Sucking insects do their damage by sucking out the liquid from leaves and twigs. Many sucking insects are relatively immobile, living on the outside of a plant and forming a hard, protective outer coating while they feed on the plant's juices. Quite often they will excrete a sweet, sticky substance known as honeydew which contains unprocessed plant material. Honeydew can cause sooty mold to form on leaves and can become a nuisance. Signs of infestation include scaly formations on branches, dieback of leaves, and honeydew production.

In conjunction with the above outlined problems, insects can carry and spread disease to plants, animals, and people. The vast majority of vector-borne diseases are found in tropical areas of the world. Malaria, Dengue Fever, Yellow Fever, Onchocerciasis, and Filariasis cause human suffering and death throughout the world. Although Imperial County has a more temperate climate, vector-borne diseases exist that can cause serious health problems. These diseases include Plague, Encephalitis, Lyme Disease, Hantavirus, and West Nile Virus. Monitoring and reacting to the presence of these diseases is vital to the protection of the health and well-being of our community.

The Imperial County Vector Control Program has been active in surveillance and control activities since 1992. The Department provides service to the unincorporated areas of Imperial County and the cities of El Centro, Brawley, Calexico, Holtville, Imperial, Calipatria, and Westmorland. Service calls are made concerning bees and mosquitoes. Informational pamphlets (Fact Sheets) are

available for other types of pests, including Aedes Aegypti, bed bugs, and West Nile Virus.[32]

5.7.3. Identified Pests

Hydrilla *(Hydrilla Verticillata)* is a plant menace, invisible that is until it fills the lake or river that it infests, "topping out" at the surface. Hydrilla can grow an inch a day. When Hydrilla invades, ecologically-important native submersed plants such as pondweeds (*Potamogeton* spp.), tapegrass (*Vallisneria americana*) and coontail (*Ceratophyllum demersum*) are shaded out by Hydrilla's thick mats, or are simply outcompeted, and eliminated. Hydrilla greatly slows water flow and clogs irrigation and flood-control canals and large mats of fragments collect at culverts and clog essential water control pumping stations. Dense Hydrilla infestations can alter water chemistry and oxygen levels.

Quagga mussels *(Dreissena Bugensis)* is an invasive freshwater mollusk found in all reservoirs, lakes and watersheds receiving raw Colorado River water. Quagga mussels accumulate organic pollutants within their tissues to levels more than 300,000 times greater than typical concentrations in the environment. The mussels' wastes significantly lower the oxygen levels, lowering the pH to an acidic level and generating toxic byproducts. The mussels have also been associated with outbreaks of botulism poisoning in wild birds. *Dreissena* species ability to rapidly colonize hard surfaces causes serious economic problems. These major biofouling organisms can clog water intake structures, such as pipes and screens, therefore reducing pumping capabilities for power and water treatment plants, costing industries, companies, and communities.

Fungi. Pathogens such as **fungi** can kill large stands of trees. For example, *Phytopthora ramorum*, the cause of Sudden Oak Death, which is devastating not only for oaks, but for many other species of trees as well, is spreading rapidly.

5.7.4. History

The number one industry in Imperial County is agriculture, which provides a very significant base to the County's economy. Imperial County ranks as one of the top 10 agricultural counties in the State of California.

The pink hibiscus mealybug (PHM) was first detected in Imperial Valley during August 1999. This represented the first North American record for the PHM. Population densities of PHM on mulberry, silk oak, hibiscus, and natal plum were determined to be high in several communities in southern Imperial Valley. A 100-square mile area in urban Imperial County was infested, including parts of El Centro and Calexico. The PHM feeds on both plants and crops, and it threatens nearly 30 different crops produced in Imperial County.

The citrus leafminer (CLM) is a small moth native to Asia. In California, CLM was found in backyard citrus in a few locations in January 2000 in Imperial County adjacent to the Mexican border. By the fall of 2001, CLM had spread to other areas of Imperial Valley and is now found from Winterhaven to Niland, attacking nursery stock; commercial groves of lemons, grapefruit,

and oranges; and backyard citrus. It is expected to move northward from Imperial County and eventually infest citrus in all areas of the State.

In 1991, silverleaf whitefly became a devastating pest of melon and squash crops, destroying 96% of Imperial County's fall melon crop and resulting in an estimated loss to growers of $12.5 million dollars. In succeeding years, the County's fall melon production dropped from approximately 12,000 acres annually to under 2,000 acres. In the late 1990's a related problem arose - a virus plant disease transmitted by the sweet potato whitefly resulted in $12.7 million crop damage.

Imperial County alfalfa growers occasionally suffer losses to spring and summer hay cuttings due to leafhopper infestations. Three species have been found damaging alfalfa in California: the southern garden leafhopper (*Empoasca solona),* the potato leafhopper *(E. fabae),* and the Mexican leafhopper (*E. mexara).* All three species cause identical injury. Plants may become stunted and have very short intermodes. Stunting and yellowing may persist into the next cutting cycle, even in the absence of leafhoppers. The prevalent species in the Imperial Valley are *E. solana* and *E. mexara* and damage may occur from May through September.

Hydrilla (*Hydrilla Vertcillanta)* was brought to the United States as an aquarium plant in the late 1950's. It continues to be sold through aquarium supply dealers and over the Internet, even though the plant is on the U.S. Federal Noxious Weed List.

Quagga mussels *(Dreissena Bugensis)* were discovered in Lake Mead in Nevada on January 6, 2007, and later throughout Lake Mead's lower basin. It was the first discovery of either of these mussels west of the Continental Divide. Subsequent surveys found smaller numbers of Quagga mussels in Lakes Mohave and Havasu in the Colorado River, and in the Colorado River Aqueduct System which serves Southern California.

5.7.5. Risk Assessment

The climate in Imperial County makes it possible for insects to reproduce with little natural hindrance to their proliferation. Probability of infestation is very high, across the board, because it is a constant occurrence as much of Imperial County is agricultural.

- **Effects of agriculture and commercial and industrial structures.** If a given insect is particularly hazardous to crops, livestock, forest, or property, it can cost the County millions of dollars in lost revenue in eradication and replacement.
- **Effects on waterways.** Other pest infestations (Hydrilla and Quagga Mussels) can affect waterways and water infrastructure causing disruption to water distribution flow and negatives affects to the overall quality of the water.

5.7.6. Relationship to Other Hazards – Cascading Effects

Insect infestation to wildland trees not only leaves dead stands of trees but, as a result, also increases the fuel available to wildfires, thereby exacerbating the negative effect on ecotourism.

5.7.7. Risk Assessment Conclusion

Insect and other pest infestation is an ongoing threat to agriculture and public health in Imperial County. The effects on people and property can be disastrous and costly.

5.7.8. Plans and Programs

In response to the Imperial Valley infestation, two parasitoid species were released at 10 infested sites in September of 1999. Approximately 3,000 parasitoids of each species from USDA insectaries were released. These initial releases were followed by additional shipments of parasitoids that were used for release and also the set-up of a PHM parasitoid rearing facility in Imperial Valley. The rearing facility, under the direction of the California Department of Food and Agriculture in cooperation with USDA and the Imperial County Agricultural Commissioner's Office began producing and releasing large numbers of parasitoids by late June of 2000. The two biological control agents released against the PHM have become widely established throughout infested areas of Imperial Valley, and at least one species has had considerable impact to date.

The Imperial County Vector Control Program [33] detects and reduces the spread of mosquito-borne disease through surveillance and control activities. The Vector Control Program also responds and investigates citizen complaints regarding bees and honeybee swarms. As needed or requested, the Department provides information to the public to assist in resolving problems with other insects or rodents of public health significance. Examples of specific activities include the following:

- Trapping of mosquitoes for number and type, detection of mosquito-borne disease agents. (West Nile Virus, St. Louis Encephalitis, Western Equine Encephalitis, etc.)
- Searching for new sources of mosquito breeding.
- Inspecting and treating of known mosquito sources.
- Eliminating honeybee swarms occurring in unsafe proximity to people. (Please note that bee nests must be referred to professional pest control companies that are licensed and equipped to handle aggressive bee colonies)
- Providing public outreach and education relating to prevention of mosquito breeding, protection from mosquito-borne diseases, prevention or elimination of rodent infestations, and other vector health issues.

Following are Imperial County's Plans and Programs related to Pesticide Use Enforcement; Pest Detection and Eradication and Quarantine; and Exclusion, Nursery, Seed and Phytos.

- Permitting and monitoring of pesticide use to ensure legal and safe use of products.
- Investigation of illnesses, environmental damage, and property damage caused by pesticides.
- Detection, control, and eradication of a wide variety of exotic pests that could impact agriculture, urban landscaping and gardens, and local residents. Current programs include

exotic fruit flies, red imported fire ants, Africanized honeybees, whitefly, noxious weeds, and cotton pests.

- Bee safety education.
- Growing season inspection of seed crops to facilitate foreign export of seed
- Work on a variety of biocontrol programs to control or eradicate weed and insect pest, such as puncture vine, silverleaf whitefly, and pink hibiscus mealybug, in both agricultural and urban areas.
- Help with a variety of urban landscape and garden problems, such as plant selection, planting instructions, plant care, identification and control of insect and disease pests.
- Identify and delimit new insect and disease pests that could affect local agriculture and urban landscaping and gardens.
- Fruit, vegetable, and egg quality control inspections.
- Quarantine and Pest Exclusion Inspections to keep out exotic pests that could impact local agriculture and urban landscaping and gardens.
- Nursery inspections to ensure quality and pest cleanliness of nursery stock.
- Seed certification services to limit seed-borne diseases, to maintain seed quality, and to facilitate export of seed.

SOURCES

[32] Imperial County Public Health Department, Environmental Health Fact Sheets www.icphd.org/environmental-health/bee---mosquitoes/fact-sheets/

[33] Imperial County Public Health Department, Environmental Health, Services Provided http://www.icphd.org/environmental-health/bee---mosquitoes/services-provided/

5.8. Hazard: Hazardous Materials (HazMat)

5.8.1. Jurisdictions Affected by Hazardous Materials

Hazardous Materials (HazMat) Incidents risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 27. Hazardous Materials Events Probabilities and Severities by Jurisdiction

Imperial County Probability: High	**Imperial County Severity: High**
Brawley Probability: High	**Brawley Severity: High**
Calexico Probability: High	**Calexico Severity: Very High**
Calipatria Probability: High	**Calipatria Severity: High**
El Centro Probability: High	**El Centro Severity: High**
Holtville Probability: Medium	**Holtville Severity: High**
Imperial City Probability: High	**Imperial City Severity: High**
Westmorland Probability: Medium	**Westmorland Severity: High**
Imperial Irrigation District Probability: High	**Imperial Irrigation District Severity: High**
Office of Education Probability: High	**Office of Education Severity: High**

5.8.2. Hazard Definition

Hazardous materials consist of substances that by their nature, lack of containment, and reactivity, have the capability for inflicting harm. Hazardous materials pose a threat to health and the environment when improperly managed and can be toxic, corrosive, flammable, explosive, reactive, an irritant, or a strong sensitizer. Hazardous materials substances also include certain infectious agents, radiological materials, oxidizers, oil, used oil, petroleum products, and industrial solid waste substances. Hazardous materials can pose a threat where they are manufactured, stored, transported or used. They are used in almost every manufacturing operation and by retailers, service industries, and homeowners.

A hazardous material accident could occur in Imperial County due to the agricultural economy, proliferation of fuel tanks and transmission facilities, intricate canal system, and the confluence of major surface arteries and rail systems. Although a hazardous material accident can occur almost anywhere, particular regions are more vulnerable. The potential for an accident is increased in regions near roadways that are frequently used for transporting hazardous material, and in regions with agricultural or industrial facilities that use, store, handle, or dispose of hazardous material.

Hazardous material incidents are one of the most common technological threats to public health and the environment. Incidents may occur as the result of natural disasters, human error, and/or accident.

Hazardous materials incidents typically take three forms:

1. **Fixed facility incidents:** It is reasonably possible to identify and prepare for a fixed site incident, because laws require those facilities to notify state and local authorities about what is being used or produced there.
2. **Transportation incidents:** Transportation incidents are more difficult to prepare for because it is impossible to know what material(s) could be involved until an accident actually happens.
3. **Pipeline incidents:** Pipelines carry natural gas and petroleum. Breakages in pipelines carry differing amounts of danger, depending on where and how the break occurs, and what is in the pipe.

5.8.3. History

The Union Pacific railway travels through many of the County's jurisdictions and its cargo at times consists of hazardous liquids. Interstate 8 also travels through the jurisdictions and the many semi-trucks cargo is hazardous. Liquid petroleum products are delivered to and are transported through the County via the twenty-inch Santa Fe Pacific Pipe Line. This line is generally located within the Southern Pacific Railroad right-of-way. The right-of-way follows the northwest to southeast trend of Imperial Valley and subsequently parallels the major faults. It passes near the east side of the Salton Sea and serves the storage facility at Niland. Southeast of Ogilby, the line turns east and

travels to Yuma. A six-inch branch line distributes gas to the storage facility south of Imperial and a four-inch line serves the Naval Air Facility near Seeley.

The maintenance staff for the line anticipates no special problems from earthquakes or fault movement and are unaware of such a situation occurring in California in past years. A major break would take one to two days to repair.

The petroleum storage facilities in Niland and Imperial are vulnerable to earthquakes. Storage capacity is 289,000 barrels at Imperial and 77,500 barrels at Niland. Storage tanks, however, are never full at any given time; they are typically filled to fifty percent of capacity. The 1979 earthquake resulted in the rupture of one tank and a gasoline leak of 100 gallons per minute at the Imperial facility. The potential for a major disaster does exist. The probability of loss of all liquid petroleum in the County is low. Emergency service via tanker is readily available if required during an emergency situation.

Natural gas is delivered by the Southern California Gas Company via twin ten-inch lines which generally run south through the County. These lines serve Niland, Calipatria, Brawley, Imperial, El Centro, Heber, and Calexico and branch lines serve Holtville, Westmorland, Seeley, NAF, and Plaster City. Rural residents are served by laterals from the branch lines. The lateral lines typically do not exceed a quarter mile in length.

The gas lines are less resilient to seismic stress than the liquid lines, and the entire natural gas system is vulnerable to disruption. The lines were damaged from the 1979 earthquake. The north-south line was damaged in the area where it crossed the fault. The line suffered compressive stress, and a fitting buckled and resulted in a major leak. The leak was repaired without shutting down the line. The line to Holtville was stretched where it crossed the fault. The line did not break and was repaired without shutting down the line.

The natural gas network is much more extensive than the liquid petroleum system. Leaks are more insidious. The risk of an explosion or fire is greater. The most serious potential hazards are at the customer service connections. Gas connections to hot water heaters are notably vulnerable to seismic shaking.[34, 35]

The use of pesticides in agriculture operations is a large source of hazardous materials since the County is surrounded by agricultural operations. Much of the most productive farmlands lie on the fringe of developing areas. Residential land uses adjacent to farmlands are potentially subject to health and safety conflicts. For example, unsupervised children often have easy access to the irrigation canals, and airborne drift of chemicals from pesticide and crop dusting may adversely affect the residential population. Although there is an increase in the number of organic farming operations in the area, which will help to reduce the total amount of pesticides used, residents will still be subject to hazards associated with pesticide use. The use, storage, and transport of pesticides are strictly regulated by the State of California. The County Agricultural Commission,

the California Environmental Protection Agency, and the Department of Pesticide Regulation are the major enforcement agencies responsible for controlling and monitoring pesticide use.

5.8.4. Largest Concentration of Hazardous Materials in Imperial County

Following is a summary of the largest concentrations of hazardous material and the obvious sources of potential massive leaks or spills in Imperial County.

Santa Fe Pacific Pipe Line Tank Farm. The Santa Fe Pacific Pipe Line Tank Farm is located at Aten Road and the Southern Pacific Railroad junction in the southeast quadrant of the City of Imperial. This facility is a component of the Santa Fe Pacific Pipe Line network that delivers gasoline, diesel, and jet fuel to Southern California and Arizona. The tank farm contains 16 storage tanks, in varying sizes, with a total storage capacity of approximately ten million gallons.

Naval Air Facility (El Centro). The Naval Air Facility (El Centro) is serviced by a four-inch fuel line directly from the Santa Fe Pacific Pipe Line Tank Farm. Safety devices include manual and automatic shutoff valves, as well as pressure regulators. The facility also stores one million gallons of fuel, which is predominantly jet fuel, in underground tanks. Munitions storage is limited to aircraft and small arms training ammunition.

ST Services. ST Services is located south of the Santa Fe Pacific Pipe Line Tank Farm and has the capacity to store 70,000 gallons of fuel.

Brea Agricultural Service. Brea Agricultural Service is located at 89 East Main Street in the City of Heber and serves as a chemical and fertilizer storage facility.

United Agriculture Products. United Agriculture Products is located at 2415 Clark Street in the City of Imperial. This facility handles hazardous wastes, chemicals, insecticides, and pesticides.

Puregro Company. The Puregro Company is located at 10th Street and River Drive in the City of Brawley. This facility handles chemicals and fertilizers.

Rockwood Chemical Company. Rockwood Chemical Company is located at 47 West Rutherford Road in Brawley. This facility handles chemical and fertilizers.

Helena Chemical Products. Helena Chemical Products is located at 101 East Carey Road in the City of Brawley. This facility handles chemicals, fertilizers, insecticides, and pesticides.

Wilbur Ellis Company. The Wilbur Ellis Company is located at 45 West Danenberg Road in the community of Heber. This facility handles chemicals, fertilizers, insecticides, and pesticides.

Pipelines. There are 89.92 miles of pipeline in Imperial County that transport hazardous material. Pipe sizes vary in size from 12 to 20 inches and the average size is 12 inches.

Pipelines are located adjacent to the Southern Pacific tracks from the Arizona border at Yuma to the Niland tank farm, north to the Riverside County Line, and south to the Imperial tank farm. The pipeline system has section fuel control valves.

The following map depicts hazardous material sites in Imperial County:

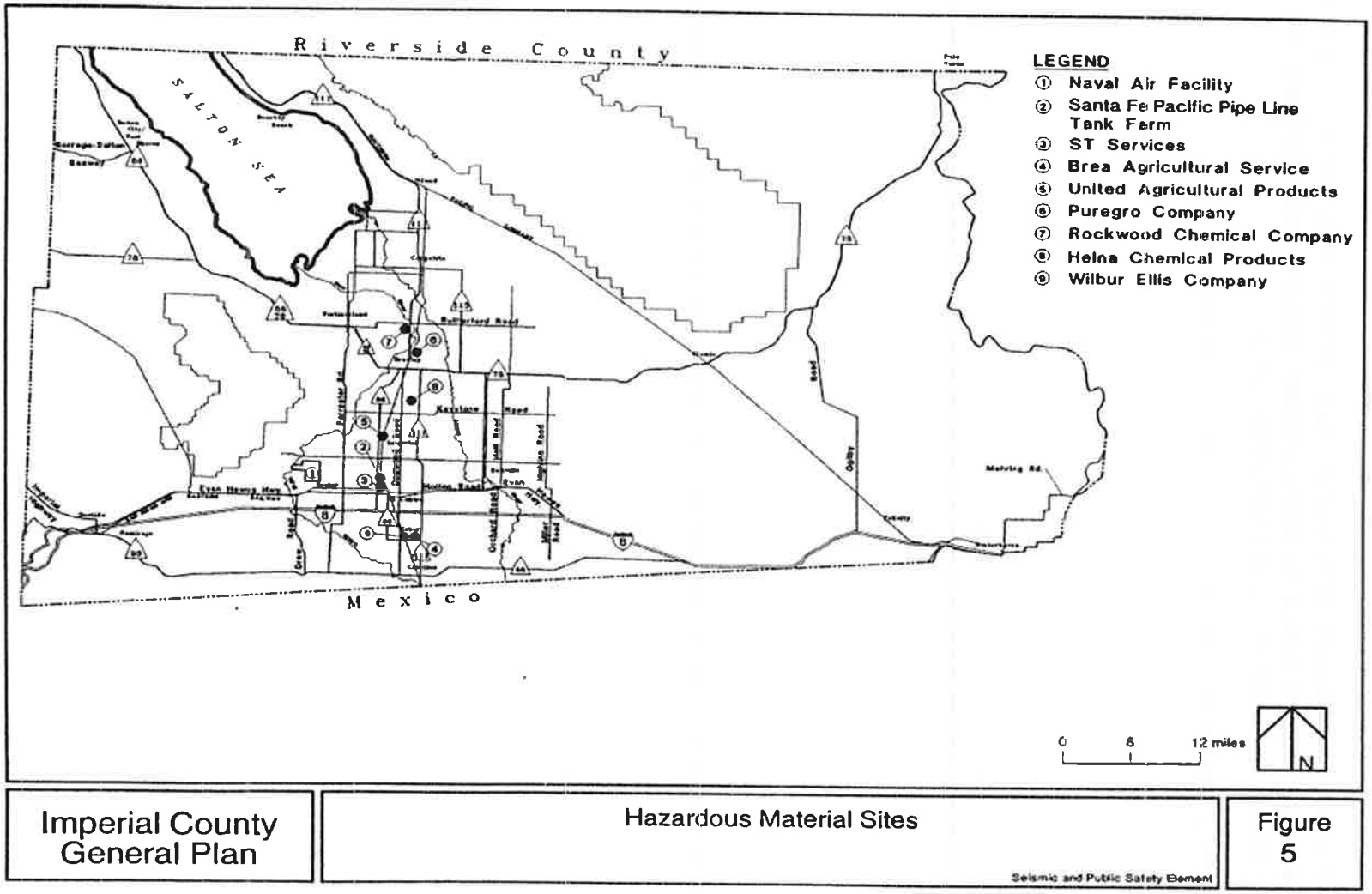

Figure 56. Hazardous Materials Sites in Imperial County

5.8.5. Risk Assessment

If a railway derailment or hazardous spill on the Interstate highway should occur, the County's concerns would be evacuation of the neighboring communities, water canal contaminations, and the containment of escaping gases or liquids. September 11 and subsequent news reports indicating that some terrorists in the United States have obtained drivers licenses for transporting hazardous materials, including hazardous wastes, called attention to a new form of hazmat threat unique to the border region. Increased wait times at ports of entry have resulted in increased vehicular emissions in border communities.

- **Effects on people and housing**. People may be evacuated when a Hazmat incident occurs. Relative to some of the other natural hazards assessed earlier in this MHMP, the numbers of people affected by Hazmat incidents are usually less.
- **Effects on commercial and industrial structures.** There may be economic consequences due to Hazmat incidents, but the damage is generally limited to clean-up of facilities and grounds, or simply interruption of business due to evacuation.
- **Effects on infrastructure.** Hazmat incidents involving transportation may result in downed power lines. Also, Hazmat materials may impact waterways and drainage systems, and incidents can lead to the evacuation of schools, business districts, and residential areas.
- **Effects on – and of - agriculture.** As noted previously, there is a long history of agricultural production in Imperial County. Agricultural activities typically include the storage and periodic application of pesticides, herbicides, and fertilizers, as well as the storage and use of toxic fuels and solvents. The infiltration of these substances may leach into local groundwater supplies, presenting an elevated risk of groundwater contamination.

5.8.6. Risk Assessment Conclusion

Accidents can occur in the production, use, transport, and disposal of hazardous materials. A hazardous material accident could occur in Imperial County due to the agricultural economy, proliferation of fuel tanks and transmission facilities, intricate canal system, and the confluence of major surface arteries and rail systems. Although a hazardous material accident can occur almost anywhere, particular regions are more vulnerable. The potential for an accident is increased in regions near roadways that are frequently used for transporting hazardous material, and in regions with agricultural or industrial facilities that use, store, handle, or dispose of hazardous material.

5.8.7. Relationship to Other Hazards – Cascading Effects

The release of hazardous material into the environment could cause a multitude of problems. The release of explosive and highly flammable materials has caused fatalities and injuries, required large-scale evacuations, and destroyed millions of dollars' worth of property. Toxic chemicals in gaseous form have caused injuries and fatalities among emergency response teams and passerby.

Serious health problems have occurred where toxins have entered either surface or groundwater supplies. Releases of hazardous chemicals have been especially damaging when they have occurred in highly populated areas, or along heavily traveled transportation routes. The decree of threat posed to life and property is dependent on the type, location, and concentration of the material released, in addition to prevailing weather conditions such as precipitation, wind speed, and wind direction.

5.8.8. Plans and Programs

The Laidlaw Environmental Services hazardous waste facility located west of Westmorland is unique in the sense that a major wash traverses the site. Substantial engineering design was utilized to minimize flooding, and channel maintenance requirements have been implemented. While the facility poses a potential risk, the continued monitoring and stringent design standards imposed on the facility have minimized the probability of a serious failure. Special reports on design requirements and risk concerns are on file at the Planning Department.

A second type of facility which is more predominant and more difficult to assess is chemical handling and storage facilities and includes distributors, transporters, and crop-dusting firms. These firms are not permitted to store various chemicals in open areas, or in buildings not adequately protected from flood conditions. During severe flooding, the potential for these chemicals to be mixed with the flood water can pose a potentially serious health concern.

The Governor's Office of Emergency Services (CalOES) Area Plan – Pesticide Drift Guidance[36] notes that Senate Bill 391 (2004) mandated that certain response protocols to "pesticide drift" incidents be incorporated into each Unified Program Agency's (UPA) area plan. These protocols help the first responder to a pesticide drift incident better identify the chemical of concern and respond to the health and safety needs of the affected population. SB 391 also establishes a mechanism for fee reimbursement to help with the cost of responding to pesticide drift incidents, and requires medical treatment of the exposed population, if requested. SB 391, in addition to other penalties, makes any person found to have violated provisions relating to pesticide drift incidents, liable for certain costs related to any and all resulting illness or injury. The updated area plan regulations that include the pesticide drift protocols became effective in May 2008. These regulations are found in the California Code of Regulations, Title 19, Division 2, Chapter 4, Article 1 and 3. [37]

The Area Plan program was established in 1986 as a planning tool for local government agencies to respond to and minimize the impacts from a release or threatened release of a hazardous material. It requires local implementing agencies called Unified Program Agencies (UPA), to create an Area Plan that:

- Identifies the hazardous materials which pose a threat to the community,
- Develops procedures and protocols for emergency response,

- Provides for notification and coordination of emergency response personnel,
- Provides for public safety including notification and evacuation,
- Establishes training for emergency response personnel,
- Identifies emergency response supplies and equipment, and
- Provides for the critique and follow-up after a major incident.

UPAs use information collected from the Hazardous Materials Business Plan (HMBP) and California Accidental Release Prevention (CalARP) programs to identify hazardous materials in their communities. This information provides the basis for the Area Plan and is used to determine the appropriate level of emergency planning necessary to respond to a release.

The Area Plans must include provisions for multi-agency notification, coordination, and emergency response. These agencies may include law enforcement, fire services, medical and public health services, poison control centers, and care and shelter services.

Pursuant to §25500 et seq. of the California Health and Safety Code, the Imperial County Health Services Department is designated as the "administering agency" responsible for maintaining a list of handlers/vendors of toxics within the County. In addition, they are required to maintain, for each handler/vendor, an inventory and business plan. This information is also available to the County Fire Marshal and City Fire Departments. The Imperial County Emergency Plan[40] lists the ten largest concentrations of toxics in the County as:

1. Santa Fe Pacific Pipe Line Tank Farm
2. Naval Air Facility El Centro
3. ST Services
4. Brea Agricultural Service
5. United Agriculture Products
6. Puregro Company
7. Rockwood Chemical Company
8. Helena Chemical Products
9. Wilbur Ellis Company
10. Pipelines (89.92 miles of fuel pipelines)

5.8.9. Mitigation Goals and Strategies

5.5.8.10. Imperial County

Through its membership in the Southern California Hazardous Waste Management Authority (SCHWMA), the County of Imperial has agreed to work on a regional level to solve problems involving hazardous waste. SCHWMA was formed through a joint-powers agreement between Santa Barbara, Ventura, San Bernardino, Orange, San Diego, Imperial, and Riverside Counties and the cities of Los Angeles and San Diego. Working within the concept of "fair share," each County has agreed to take responsibility for the treatment and disposal of hazardous waste in an amount that is at least equal to the amount generated within that County.

Imperial County has no direct authority to regulate the transport of hazardous materials on the Interstate/State highways and rail lines. Transportation of hazardous materials by truck and rail is regulated by the U.S. Department of Transportation (DOT). DOT regulations establish criteria for safe handling procedures. Federal safety standards are also included in the California Administrative Code. The California Health Services Department also regulates the haulers of hazardous waste but does not regulate all hazardous materials. These agencies ultimately have the responsibilities for ensuring hazardous materials transported through the County is safe.

Following are Imperial County's Hazardous Materials Goals, Objectives and Policies. [41]

Control Hazardous Materials

Goal 3: Protect the public from exposure to hazardous materials and wastes.

Objective 3.1 Discourage the transporting of hazardous materials/waste near or through residential areas and critical facilities.

Objective 3.2 Minimize the possibility of hazardous materials/waste spills.

Objective 3.3 Discourage incompatible development adjacent to sites and facilities for the production, storage, disposal, and transport of hazardous materials/waste as identified in the County General Plan and other regulations.

Objective 3.4 Adopt and implement ordinances, policies, and guidelines that assure the safety of County ground and surface waters from toxic or hazardous materials and wastes.

Protection of Water Resources from Hazardous Materials

Goal 4: The County will adopt and implement ordinances, policies, and guidelines that assure the safety of County ground and surface waters from toxic or hazardous materials and wastes.

Objective 4.1 The development and implementation of infrastructure and regulatory policies in the Republic of Mexico, which reduce contamination of the New River, Alamo River, and the Salton Sea.

Objective 4.2 The provision of safe and efficient community wastewater treatment facilities which adequately service the present and future needs of residential, commercial, and industrial development within the Imperial Irrigation District service area.

Policy

Adoption and implementation of ordinances, policies, and guidelines which assure the safety of County ground and surface waters from toxic or hazardous materials and/or wastes.

Programs

- The County of Imperial shall make every reasonable effort to limit or preclude the contamination or degradation of all groundwater and surface water resources in the County.
- All development proposals brought before the County of Imperial shall be reviewed for potential adverse effects on water quality and quantity and shall be required to implement appropriate mitigation measures for any significant impacts.
- The County of Imperial shall coordinate with the California Regional Water Quality Control Board and incorporated cities is to assure that discharge from community wastewater treatment plants meet or exceed applicable State and Federal standards.
- The County of Imperial shall play an active role in assuring the advance planning necessary to provide community and/or industrial wastewater treatment facilities which keep pace with continued urbanization in the County.
- The County of Imperial shall support the investigation of innovative methods of wastewater treatment which reduces discharge of contaminants into County surface waters, while enhancing the ruderal and riparian habitats of the County.
- The County of Imperial shall direct staff of the County Health Department, Planning/ Building Department, and other appropriate departments, as well as the County Agricultural Commissioner, to review existing ordinances, policies, and guidelines and determine their adequacy in protecting groundwater and surface water from contamination by hazardous materials and/or waste.
- The Imperial County Health Department, as the Local Enforcement Agency, shall continue monitoring operations at the various landfills across the County and shall periodically report on the impacts or potential impacts of these landfills on ground and surface water resources in the County.
- The County of Imperial shall confer and coordinate with the California Department of Health, Regional Water Quality Control Board, and the U.S. Environmental Protection Agency to assure that these agencies are taking active steps to protect and reclaim groundwater and surface waters from contamination.

5.5.8.11. City of Brawley

Hazardous materials used, stored, or transported through the City of Brawley represent potential hazards. A number of properties in the City are suspected of hazardous materials contamination. Exposure to hazardous and toxic materials can be avoided through proper land use planning and implementation of policy to reduce risks associated with the use, transport, and disposal of such materials.

Following are the City of Brawley's Hazardous and Toxic Materials Hazards Goal and Policies. [42]

IMP-PSNE Goal 3: Reduce the Risk to the Community's Inhabitants from Exposure to Hazardous Materials and Wastes

IMP-PSNE Program 3.1. Avoid Dangers Related to Hazardous Materials

To protect Brawley residents from dangers related to hazardous materials:

- Coordinate with the County and other responsible agencies to establish effective policies that specify conditions for safe transportation, storage, disposal, and use of hazardous materials;
- Implement applicable portions of the County's Hazardous Materials Area Plan and monitor future updates of the plan;
- Obtain copies of Business Plans prepared by local operations using hazardous materials pursuant to the state Emergency Right-to-Know Act. Use the information contained in the Business Plans to compile a data base for emergency situations;
- Identify and enforce specified transportation routes for the conveyance of hazardous materials; and
- Coordinate with railroad and truck operators to identify potential hazards from the transport of toxic materials and to develop and implement measures to reduce risks.

Responsible Agency: Economic and Community Development/Public Works/ Fire Department

Funding Source: City General Fund

Time Frame: Ongoing

Related Public Safety/Noise Element Policies: 3.1.3; 3.1.6-3.1.7; 3.1.10-3.1.13

IMP- PSNE Program 3.2. Household Hazardous Materials

To control the storage and disposal of household hazardous materials, adopt a Hazardous Household Waste Plan that addresses education of local residents, health hazards of household hazardous materials, and regular household hazardous waste disposal programs.

Responsible Agency: Public Works/Fire Department

Funding Source: Solid Waste Fees

Time Frame: Ongoing

Related Public Safety/Noise Element Policies: 3.1.5; 3.1.8

IMP- PSNE Program 3.3. Avoid Hazards from New Development

Attempt to ensure that commercial, industrial, and agricultural operations will not potentially affect public and environmental health by performing the following steps during the development review process:

- Develop and implement development standards for the storage of hazardous materials to minimize damage caused by leaks or ruptures in storage tanks;
- Ensure that required permits from responsible agencies are obtained for projects entailing the production, storage, transportation, use, or disposal of hazardous materials;
- Provide a safe distance between land uses involving the production, storage, transportation, use, or disposal of hazardous materials and other land uses that may be adversely affected by such activities;
- Require development projects to conform to the regulations of the National Pollution Discharge Elimination System Permits; and
- Where new residential development is proposed next to agricultural uses, assess the threat of resident exposure to agricultural materials, chemicals and require development designs to minimize exposure.

Responsible Agency: Economic and Community Development/Public Works/Fire Department

Funding Source: Project Review Fees

Time Frame: Ongoing

Related Public Safety/Noise Element Policies: 3.1.1-3.1.3

IMP- PSNE Program 3.4. Contaminated Sites

Report all suspected contaminated sites to the County Department of Health Services and the Regional Water Quality Control Board.

Responsible Agency: Economic and Community Development/Public Works/Fire Department

Funding Source: City General Fund

Time Frame: Ongoing

Related Public Safety/Noise Element Policies: 3.1.1; 3.1.13

5.5.8.12. City of Calexico

Hazardous materials are used in the City of Calexico for a variety of purposes including manufacturing, service industries, small businesses, agriculture, medical clinics, schools, and households. Hazardous materials pass through the City of Calexico en route to other destinations via the Interstate/State Highway system, rail, and surface street system.

Calexico is linked to other cities in Imperial Valley and to other parts of California by a freeway and a number of highways. Interstate 8 provides for east-west travel which is approximately three miles to the north of the City. Local highways include: State Highway 111, a north-south route from the Mexican border to Brawley, Calipatria and Niland; State Highway 98 runs east-west from Coyote Wells (west of Calexico) to Bonds Corner (east of Calexico) connecting to Interstate 8 at both ends.

One railway line serves the City of Calexico, namely, the Southern Pacific Railroad. This major line connects to the main line in Niland. The main line primarily serves the Los Angeles area. This line is used extensively for agricultural shipments. While train derailment can occur at any time, it is during an earthquake that a derailment and hazardous materials would pose the greatest risk to people and the environment in Calexico.

The New River. In many cities, the presence of a river can be a source of valuable open space, recreational opportunities, or development potential. The New River, however, is a threat to public health and safety. Despite extensive efforts in the U.S. and Mexico, water quality in the New River remains out of compliance with many U.S. water quality standards. Water pollution levels pose health and quality of life concerns in Calexico and the Imperial Valley, as well as being sources of pollution to the Salton Sea. Based on the most recent data available, the water quality impairments of the New River in the U.S. include low dissolved oxygen, toxicity, pathogens, trash, selenium, sediment/silt, chlordane, DDT, dieldrin, toxaphene, PCBs, HCB, nutrients, mercury, chlorpyrifos, diazinon, copper, and zinc. Health risks created by New River pollution include human contact with or the ingestion of the water, unpleasant odors, blowing foam, and the consumption of fish and wildlife that lived in the river. Also, there is the possibility that the mosquitoes (*Culex trsalis*) that live in the New River are vectors for encephalitis. In addition, the blight associated with the New River represents a missed opportunity to gain needed recreational lands in the City.

Following are the City of Calexico's Hazardous Materials Mitigation Measures.

Goal: Reduce the risk to the Calexico's day and nighttime populations from exposure to hazardous materials and waste.

> Objective: To ensure the health, safety, and welfare of residents and guests of Calexico through strict regulation and planning for the safe transport, storage, and usage of hazardous materials in the Calexico area.

Policies:

- Discourage the transport of hazardous materials through residential areas and critical facilities and limit transport through heavily developed areas as much as possible.
- Prohibit incompatible land used near sites that use, store, or produce hazardous materials.
- Cooperate with the County to implement applicable portions of the *County's Hazardous Waste Management Plan.*

Goal: Reduce the risk posed by the current conditions of the New River.

Objective: Protect residents from the potential hazards associated with the New River, including restricting access.

Policies:

- Cooperate with international, federal, state, and regional responsible agencies in projects aimed at cleaning up the New River through the implementation of the *New River Improvement Project Strategic Plan*
- Continue to restrict access to the river and maintain bilingual signs that warn of the dangers of contact with the water.
- Continue to seek county, state, or federal funds to cover costs incurred by the City for work done to restrict public access to the river or any other measure associated with the rive due to its pollution or risk to public safety.
- Prohibit land development near the New River in order to reduce exposure of people to the potential contact with the water, odors, and airborne foam.
- Adopt design set-back of a distance of 50 feet outside the shaded 500-year flood zone areas delineated on the FEMA maps for the New River.

5.5.8.13. City of Calipatria

Hazardous materials are not a substantial concern in Calipatria as there are no large-scale generators or users of hazardous materials in the City. Nevertheless, some industrial operations located along Industrial Avenue, agricultural operations in the vicinity of the City, and operations at the airport may utilize hazardous materials as part of daily operations. In addition, the City seeks to encourage additional industrial/manufacturing development in order to provide local jobs and take advantage of the regional transportation facilities (highways and railroad) that pass through the City.

Safety measures at these facilities and at other industrial and agricultural facilities in Calipatria are required to follow State and federal protocol. This includes adherence to Imperial County Air

Pollution Control District (APCD) Rule 216, which requires all owners and operators of stationary sources that emit hazardous air pollutants (HAPs) to install best available control technology for toxics (T-BACT) to any constructed or reconstructed major source. The APCD requires owners and operators of stationary sources that emit HAPs to obtain and maintain permits to operate. In addition, any future large-scale activities with the potential to generate or use hazardous materials in the City would be required to obtain a permit and comply with applicable federal, state, and local regulations.

Based on the age of many buildings in Calipatria, the presence of asbestos-containing materials (ACMs) and lead-based paint in structures is likely. Such materials could be disturbed by demolition and renovation activities on older structures; however, any activities with the potential to release asbestos or lead into the atmosphere would be required to comply with applicable federal, state, and local regulations.

The residential sector is a smaller-scale generator of hazardous wastes, such as paints, cleaners, oils, batters and pesticides that contain potentially hazardous ingredients and require special disposal care. Improper disposal of such household hazardous wastes can include pouring them down the drain, on the ground, into storm sewers, or in some cases putting them out with the trash. The dangers of such disposal methods might not be immediately obvious, but improper disposal of these wastes can pollute the environment and pose a threat to human health.

Following are the City of Calipatria's Hazardous and Toxic Materials Hazards Goal and Policies.

Goal S-4 Protect life and property from potential short- and long-term adverse effects associated with the transportation, storage, treatment, and disposal of hazardous materials.

Policy S-4.1 Ensure residential units are not constructed in close proximity to hazardous materials areas or sites.

Policy S-4.2 Require that a Conditional Use Permit be obtained for all land uses which may involve hazardous materials.

Policy S-4.3 Coordinate with the County Emergency Services Department to mitigate the effects of spills and for evacuation of residences.

Policy S-4.4 Identify toxic disposal or leakage sites and pursue expeditious cleanup of these sites through actions by appropriate County, State, and Federal agencies.

Policy S-4.5 Ensure that hazardous materials sites are appropriately buffered from sensitive uses (e.g., residences, schools, and daycare facilities) and are properly fenced to prevent access by unauthorized persons.

Policy S-4.6 Manage activities within Calipatria involving the transport, use, storage or disposal of hazardous materials in a responsible manner that protects public health, safety, and the environment.

Policy S-4.7 Promote the availability of safe and legal options for the management and disposal of hazardous wastes generated by businesses and households within Calipatria.

Policy S-4.8 Promote community education and understanding of sound management practices for the storage, handling, use and disposal of hazardous materials.

Following are the City of Calipatria's Implementation Actions for the adopted policies:

- Identify hazardous material areas and sites (Policies S-4.1, S-4.4, and S-4.5). Continue to enforce applicable federal, state and local regulations pertaining to the transportation, storage, treatment, and disposal of hazardous materials within Calipatria (Implements Policies S-4.4, S-4.5, S-4.6, and S-4.7).
- Develop and implement household hazardous waste collection and disposal programs (Policies S-4.6, S-4.7, and S-4.8).
- Require risk assessments for new or expanded users of large quantities of hazardous materials within the City (Policies S-4.2 and S-4.6).
- Develop an emergency response plan for hazardous materials spills (Policy S-4.3).

5.5.8.14. City of El Centro

Following are the City of El Centro's Implementation Program for Hazardous Materials. [43]

S-14: Hazardous Materials: Minimize public health risks and environmental risks from the use, transport, storage, and disposal of hazardous materials by:

- Cooperating with federal, state, and county agencies to effectively regulate the management of hazardous materials and hazardous waste;
- Cooperating with the County of Imperial to implement the applicable portions of the County Hazardous Waste Management Plan; Identifying roadway transportation routes for conveyance of hazardous materials (the City does not exercise jurisdictional over transportation of freight along railroad right- of-way or state highways);
- Implementing the City's Standardized Emergency Management System (SEMS) Multi-hazard Functional Plan for accidents involving hazardous materials; and
- Cooperating with the Certified Unified program Agency (CUPA) for El Centro and the El Centro Fire Department to administer Risk Management Plans for businesses within the City.

Responsible Agency/Department: Police Department, Fire Department, CUPA, County of Imperial

Funding Source: General Fund

Time Frame: Ongoing

Related Policies: 6.1, 6.2

5.5.8.15. City of Westmorland

Following are the Hazardous Materials Spills Goal, Objective and Policies. [44]

Goal #1: Protect the public from natural and man-made hazards.

Objective 1.4: Protect the public from injury due to hazardous materials spills.

Policies:

1. Develop and implement an emergency response plan for hazardous materials spills.
2. Map areas with potential for hazardous materials movement or storage.
3. Coordinate with the County Emergency Services Department to mitigate the effects of a spill and for evacuation of residences.
4. Ensure residential units are not constructed in close proximity to hazardous materials areas or sites.
5. Require that a Conditional Use Permit be obtained for all land uses which may involve hazardous materials.
6. Identify toxic disposal or leakage sites and pursuer expeditious cleanup of these sites through actions by appropriate County, State and Federal Agencies.
7. Ensure that hazardous materials used in business and industry are properly stored and handled and that information on their storage, handling and use is available to the Fire Department, Public Works Department and other safety-oriented departments/agencies.

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5.9. Hazard: Naturally Occurring Biological Threats

5.9.1. Jurisdictions Affected by Naturally Occurring Biological Threats

Naturally-Occurring Biological Threats risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 28. Naturally Occurring Biological Threat Events Probabilities and Severities by Jurisdiction

Imperial County Probability: Very High	**Imperial County Severity: High**
Brawley Probability: Very High	**Brawley Severity: High**
Calexico Probability: Very High	**Calexico Severity: High**
Calipatria Probability: Very High	**Calipatria Severity: High**
El Centro Probability: Very High	**El Centro Severity: High**
Holtville Probability: Very High	**Holtville Severity: High**
Imperial City Probability: Very High	**Imperial City Severity: High**
Westmorland Probability: Very High	**Westmorland Severity: High**
Imperial Irrigation District Probability: Very High	**Imperial Irrigation District Severity: High**
Office of Education Probability: Very High	**Office of Education Severity: High**

5.9.2. Hazard Definition

Public health-related hazards may be the result of a naturally occurring event or terrorism. This has never been of more concern than since the beginning of the coronavirus disease 2019 (COVID-19) Pandemic that began in early 2020. Key hazards of concern to Imperial County today are described below.

Coronaviruses are species in the genera of virus belonging to the subfamily *Coronavirinae* in the family *Coronaviridae*. Coronaviruses primarily infect the upper respiratory and gastrointestinal tract of mammals and birds. A number of different currently known strains of coronaviruses infect humans.

The current ongoing pandemic is due to COVID-19, an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, Hubei, China, and has resulted in the ongoing pandemic. The first confirmed case has been traced to November 17, 2019, in Hubei. As of July 3, 2020, more than 10.8 million cases have been reported across 188 countries and territories, resulting in more than 521,000 deaths. More than 5.76 million people have recovered.[45, 46] A flu pandemic occurs when a new influenza virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to- person worldwide. Flu viruses are spread mainly from person to person through coughing or sneezing by people with flu. Sometimes people may become infected by touching something such as a surface or object, with flu viruses on it and then touching their mouth or nose. The symptoms of flu virus include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills, and fatigue.

Prior to COVID-19, the most publicized human coronavirus was SARS-CoV which causes SARS and has a unique pathogenesis because it causes both upper and lower respiratory tract infections and can also cause gastroenteritis. Coronaviruses are believed to cause a significant percentage of all common colds in human adults. Coronaviruses cause colds in humans primarily in the winter and early spring seasons. The significance and economic impact of coronaviruses as causative agents of the common cold are hard to assess because, unlike rhinoviruses (another common cold virus), human coronaviruses are difficult to grow in the laboratory. Coronaviruses can even cause pneumonia, either direct viral pneumonia or a secondary bacterial pneumonia. Coronaviruses also cause a range of diseases in farm animals and domesticated pets, some of which can be serious and are a threat to the farming industry.

Dengue Fever also known as breakbone fever is an infectious tropical disease caused by the dengue virus. Symptoms include fever, headache, muscle and joint pains, and a characteristic skin rash that is similar to measles. In a small proportion of cases the disease develops into the life-threatening dengue hemorrhagic fever, resulting in bleeding, low levels of blood platelets and blood plasma leakage, or into dengue shock syndrome, where dangerously low blood pressure occurs. Dengue is transmitted by several species of mosquito within the genus *Aedes*, principally

A. aegypti. The virus has four different types; infection with one type usually gives lifelong immunity to that type, but only short-term immunity to the others. Subsequent infection with a different type increases the risk of severe complications. As there is no commercially available vaccine, prevention is sought by reducing the habitat and the number of mosquitoes and limiting exposure to bites. The incidence of dengue fever has increased dramatically since the 1960s, with around 50–100 million people infected yearly. Early descriptions of the condition date from 1779, and its viral cause and the transmission were elucidated in the early 20th century. Dengue has become a global problem since the Second World War and is endemic in more than 110 countries. Apart from eliminating the mosquitoes, work is ongoing on a vaccine, as well as medication targeted directly at the virus.

Yellow Fever, also known as Yellow Jack or "Yellow Rainer" is an acute viral hemorrhagic disease. The yellow fever virus is transmitted by the bite of female mosquitoes (the yellow fever mosquito, *Aedes aegypti*, and other species). Yellow fever presents in most cases in humans with fever, chills, anorexia, nausea, muscle pain (with prominent backache) and headache, which generally subsides after several days. In some patients, a toxic phase follows, in which liver damage with jaundice (inspiring the name of the disease) can occur and lead to death. Because of the increased bleeding tendency (bleeding diathesis), yellow fever belongs to the group of hemorrhagic fevers. The World Health Organization estimates that yellow fever causes 200,000 illnesses and 30,000 deaths every year in unvaccinated populations.

Novel Influenza A (H1N1) is a novel flu virus that is a unique combination of swine and human flu viruses. This virus is transmitted from person to person, not from pigs to humans. The symptoms of novel flu are similar to the symptoms of regular seasonal flu and include fever, cough, sore throat, rhinnorhea (runny nose), nasal congestion, body aches, headache, chills and fatigue. Some people have reported diarrhea and vomiting along with respiratory symptoms. Like seasonal flu, this novel flu may be more severe in those who have chronic medical conditions. The current novel influenza virus spreads the same way as seasonal flu. Flu viruses are spread by an ill person coughing or sneezing. Sometimes people can become infected by touching something with flu viruses on it (such as a doorknob) and then touching their mouth or nose. People with novel flu are potentially contagious as long as they have symptoms and possibly for up to 7 days after they become ill. Children, especially younger children, might be contagious for longer than 7 days.

H1N1 Influenza Virus (swine flu) is an influenza (flu) virus that was first detected in people in the United States in April 2009. The virus spreads from person-to-person, probably in much the same way that regular seasonal flu viruses spread. The symptoms of flu virus include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills, and fatigue. Many people who have been infected with the H1N1 virus also have reported diarrhea and vomiting. Severe illnesses and death have occurred as a result of illness associated with influenza viruses. On June 11, 2009, the World Health Organization (WHO) declared that a global pandemic of H1N1 flu is underway.

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*, which most commonly affects the lungs (pulmonary TB) but can also affect the central nervous system (meningitis), lymphatic system, circulatory system (miliary tuberculosis), genitourinary system, bones and joints. Tuberculosis is one of the top four infectious killing diseases in the world and most common major infectious diseases today.

West Nile Virus (WNV) is a mosquito-borne virus that has been found in parts of Asia, Eastern Europe, Africa, and the Middle East. The virus arrived in the Western Hemisphere in 1999 in New York City. The more severe forms of West Nile virus are West Nile encephalitis, West Nile meningitis, and West Nile meningoencephalitis. Encephalitis refers to an inflammation of the brain, meningitis is an inflammation of the membrane around the brain and the spinal cord, and meningoencephalitis refers to inflammation of the brain and the membrane surrounding it.

Bovine Spongiform Encephalopathy (BSE) is widely referred to as "mad cow disease." It is a chronic degenerative disease that affects the central nervous system of cattle. BSE is named because of the spongy appearance of the brain tissue of infected cattle examined under a microscope. BSE belongs to a family of diseases known as the transmissible spongiform encephalopathies (TSEs). TSE animal diseases found in the United States include scrapie in sheep and goats, chronic wasting disease in deer and elk, transmissible spongiform encephalopathy in mink, feline spongiform encephalopathy in cats, and in humans: kuru, both classic and variant Creutzfeldt-Jakob disease, Gerstmann-Straussler-Scheinker syndrome, and fatal familial insomnia.

There is no evidence to date that BSE emanated from TSEs in other animals. Regarding feeding practices, it is known that cattle can become infected with BSE by eating feed contaminated with the infectious BSE agent. This is why in 1997 the U.S. Food and Drug Administration (FDA) prohibited the use of most mammalian protein in the manufacture of animal feed intended for cattle and other ruminants. BSE is not a contagious disease. There is no evidence that the disease is transmitted through direct contact or animal-to-animal spread. The primary means by which animals become infected is through consumption of feed contaminated with the infectious BSE agent.

Lyme Disease (Borrelia burgdorferi) is a systemic, tick borne disease with protean manifestations, including dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The best clinical marker for the disease is an initial skin lesion that occurs in 60%-80% of patients.

Botulism is a serious paralytic illness caused by a nerve toxin that is produced by the bacterium Clostridium botulinum. There are three main kinds of botulism. Food borne botulism is caused by eating foods that contain the botulism toxin. Wound botulism is caused by toxin produced from a wound infected with Clostridium botulinum. Infant botulism is caused by consuming the spores of the botulinum bacteria, which then grow in the intestines and release toxin. All forms of botulism can be fatal and are considered medical emergencies. Food borne botulism can be especially dangerous because many people can be poisoned by eating a contaminated food.

Campylobacter jejuni (Pronounced "camp-e-low-back-ter j-june-eye") was not recognized as a cause of human food borne illness prior to 1975. Now, the bacterial organism is known to be the most common cause of food borne illness in the U.S. (Salmonella is the second most common cause). Food is the most common vehicle for the spread of Campylobacter and poultry is the most common food implicated. Some case-control studies indicate that up to 70% of sporadic cases of campylobacteriosis are associated with eating chicken. Surveys by the USDA demonstrated that up to 88% of the broiler chicken carcasses in the U.S. are contaminated with Campylobacter while a recent Consumer Reports study identified Campylobacter in 63% of more than 1000 chickens obtained in grocery stores. Other identified food vehicles include unpasteurized milk, undercooked meats, mushrooms, hamburger, cheese, pork, shellfish, and eggs.

E. coli is found in the family of bacteria named Enterobacteriaceae, which is informally referred to as the enteric bacteria. Most forms of E. coli are harmless; however, there are strains that cause serious illness. Other enteric bacteria are the Salmonella bacteria (also a very large family, with many different members), Klebsiella pneumoniae, and Shigella, which many people consider to be part of the E. coli family.

Hantavirus infection is caused by a group of viruses that can infect humans with two serious illnesses: hemorrhagic fever with renal syndrome (HFRS) and Hantavirus pulmonary syndrome (HPS). Hantaviruses are found without causing symptoms within various species of rodents and are passed to humans by exposure to the urine, feces, or saliva of those infected rodents. Ten different Hantaviruses have been identified as important in humans.

Hepatitis A is one of five human hepatitis viruses that primarily infect the human liver and cause human illness. The other known human hepatitis viruses are hepatitis B, C, D, and E. Hepatitis A is relatively unusual in nations with developed sanitation systems such as the U.S. Nevertheless, it continues to occur here. Each year, an estimated 100 persons die as a result of acute liver failure in the U.S. due to hepatitis A. Approximately 30,000 - 50,000 cases occur yearly in the U.S. and the direct and indirect costs of these cases exceed $300 million. Hepatitis A is totally preventable and need not occur.

Listeria monocytogenes is a pathogenic (disease-causing) bacterium that is food-borne and causes an illness called listeriosis. It is frequently overlooked as a possible cause of illness due to its unique growth capabilities. First, it is somewhat difficult for laboratories to grow, and when they do so, Listeria can be confused with common harmless contaminants and disregarded. Second, most bacteria grow poorly when temperatures fall below 40°F, while Listeria survives at in temperatures from below freezing (20°F) to body temperature and it grows best at O°F to 50°F, including the temperature range that we use for refrigeration. As a result, Listeria may be transmitted in ready-to-eat foods that have been kept properly refrigerated.

Monkeypox is a rare viral disease that occurs mostly in central and western Africa. It is called "monkeypox" because it was first found in 1958 in laboratory monkeys. Monkeypox was reported

in humans for the first time in 1970. In early June 2003, monkeypox was reported among several people in the U.S. Most of these people got sick after having contact with pet prairie dogs that were sick with monkeypox. This was the first time that there had been an outbreak of monkeypox in the U.S. The disease is caused by Monkeypox virus. It belongs to a group of viruses that includes the smallpox virus (variola), the virus used in the smallpox vaccine (vaccinia), and the cowpox virus. In humans, the signs and symptoms of monkeypox are like those of smallpox, but usually they are milder. Another difference is that monkeypox causes the lymph nodes to swell.

Norwalk virus is a virus that attaches to the outside of cells lining the intestine. Once attached, it transfers its genetic material into that cell. There it reproduces, finally killing the human cell to release new copies of it that attach to more cells of the intestine's lining. Common names of the illness caused by the Norwalk and other small round structured or caliciviruses are viral gastroenteritis, acute nonbacterial gastroenteritis, food poisoning, and food borne infection. This illness occurs worldwide. Humans are the only known hosts. The viruses are passed in the stool of infected persons. Of viruses, only the common cold is reported more often than viral gastroenteritis. Norwalk and Norwalk-like viruses are increasingly being recognized as leading causes of food-borne disease in the United States. People most often get Norwalk virus infection by swallowing infected food or water. Outbreaks in the U.S. are often linked to eating raw shellfish, especially oysters and clams. Steaming does not kill the virus or prevent its transmission.

Plague is a disease caused by Yersinia pestis (Y. pestis), a bacterium found in rodents and their fleas in many areas around the world. Pneumonic plague is different from the bubonic plague. Both are caused by Yersinia pestis, but they are transmitted differently and their symptoms differ. Pneumonic plague can be transmitted from person to person; bubonic plague cannot. Pneumonic plague affects the lungs and is transmitted when a person breathes in Y. pestis particles in the air. Bubonic plague is transmitted through the bite of an infected flea or exposure to infected material through a break in the skin. Symptoms include swollen, tender lymph glands called buboes. Buboes are not present in pneumonic plague. If bubonic plague is not treated, however, the bacteria can spread through the bloodstream and infect the lungs, causing a secondary case of pneumonic plague. Patients usually have fever, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. Nausea, vomiting, and abdominal pain may also occur. Without early treatment, pneumonic plague usually leads to respiratory failure, shock, and rapid death.

Salmonella is a type of bacteria that causes typhoid fever and many other infections of intestinal origin. Typhoid fever, rare in the U.S., is caused by a particular strain designated Salmonella typhi. But illness due to due to other Salmonella strains, just called "salmonellosis," is common in the U.S. Today, the number of known strains of this bacteria total over 2300.

SARS is a respiratory illness of unknown cause that has recently been reported in a number of countries. According to the World Health Organization (WHO), the main symptoms and signs of

SARS include a fever greater than 100.5° F (38° C), and cough, shortness of breath, or difficulty breathing. The cause of SARS is not known at this time. Researchers at CDC and around the world are working to find the cause of SARS. At this early stage of the investigation, it seems more likely that SARS is caused by an organism that we have less experience with rather than a commonly occurring, known organism.

The **Shigella** germ is a bacterium that can cause sudden and severe diarrhea (gastroenteritis) in humans. Shigella lives in the human intestine and is commonly spread both through food and by person-to-person contact. The illness is also known as "bacillary dysentery." About 25,000 or so laboratory confirmed cases of shigellosis are reported each year in the U.S. However, many cases go undiagnosed and/or unreported, and the best estimates are that 450,000 cases of Shigella infection actually occur annually in the U.S.

Tularemia is a potentially serious illness that occurs naturally in the U.S. It is caused by the bacterium Francisella tularensis found in animals (especially rodents, rabbits, and hares). Tularemia is also known as "rabbit fever." Tularemia is usually a rural disease and has been reported in all U.S. states except Hawaii. Tularemia is a widespread disease in animals. About 200 human cases of tularemia are reported each year in the U.S. Most cases occur in the south- central and western states.

Canine Distemper is a viral disease of young dogs characterized by high fever and respiratory inflammation. It can affect wild animals and County pets. Other animal diseases which can affect humans include rabies and toxoplasmosis (an opportunistic infection caused by the microscopic parasite Toxoplasma gondii, found in raw or undercooked meat and cat feces), as well as parasites such as roundworms, whipworms, hookworms, ringworms, and mange.

Exotic Newcastle Disease (END) is a contagious viral disease affecting many species of birds including poultry and wild birds. This is probably one of the most infectious diseases of poultry in the world with a death rate of almost 100 percent in unvaccinated poultry flocks and so virulent that many birds die without showing any clinical signs. The disease can even infect and cause death in vaccinated poultry. END is extremely contagious. The spread is primarily through direct contact between healthy birds and the bodily fluids of infected birds. It can be transmitted through infected bird droppings as well as secretions from the nose, mouth and eyes. It spreads rapidly among confined birds…like commercially raised chickens. The disease is also easily spread by virus- bearing material picked up on shoes and clothing and carried from an infected flock to a healthy one. END can also spread from poultry flocks to wildlife as wild birds come into contact with infected poultry, possibly when wild birds enter a pen to feed on spilled grain. Although experiments have documented that several wild species including ducks and pheasants can develop the disease, widespread illness and death has only been documented in double-crested cormorants in the United States and Canada. This disease affects the respiratory, nervous and digestive systems, with an incubation period ranging from two to 15 days. The available information

suggests that Newcastle disease can affect people; however, it does not pose a significant health risk. In humans, the disease is usually limited to conjunctivitis, which is a mild inflammation of the tissues around the eyes and is seen in persons associated with infected birds or facilities where infected birds are housed. It should be noted that poultry products in the Arizona marketplace, including eggs and meat, continue to be safe to consume.

5.9.3. History

On March 19, 2020, California Governor Newsom issued Executive Order N-33-20 directing all residents immediately to heed current State public health directives to stay home, except as needed to maintain continuity of operations of essential critical infrastructure sectors and additional sectors as the State Public Health Officer may designate as critical to protect health and well-being of all Californians. In order to reduce the number of cases in Imperial County while complying with the State mandates, drastic action was initiated. On Friday, March 20, 2020, the County of Imperial Health Officer issued an order that complied with the governor's instructions. Public and private gatherings of over 50 people were prohibited, bars closed completely, and restaurants ceased dine-in services. Standards were set by the California Department of Public Health and the Center for Disease Control and Prevention (CDC), and they were enforced. These included increased sanitation standards, social distancing, and the use of facemasks. All non-essential businesses were closed. Grocery stores, gas stations, banks, emergency services, utilities, and other businesses deemed "essential" had limited hours and new protocols. People who had underlying conditions, had compromised immune systems, or were elderly were advised to quarantine themselves at home. Non-essential personnel were prohibited from entry into a hospital or long-term care facility. Non-emergent medical procedures were cancelled. All who could, worked remotely from home, but many lost their jobs as a result of the pandemic. [47, 48, 49, 50]

In 2003 the first evidence of West Nile virus (WNV) in California was found in mosquitoes collected in Imperial County near the Salton Sea. Several flocks of sentinel chickens from the same region were also positive for WNV. In 2006, Imperial County had one case of West Nile Virus identified. Since 2003, two human cases of West Nile virus infection have been detected. The two mosquito species most likely to spread WNV in Imperial County are Culex tarsalis and Culex pipiens.

Tuberculosis (TB) incidences in the U.S. states bordering Mexico which include Imperial County have been increasing due to Mexico's higher TB rate and frequent border crossings and travel in the U.S. for employment, commerce, health services, and leisure. Imperial County has also had at least one case of Hantavirus and Lyme disease. A 9-year-old girl from Imperial County was among 14 people in the nation who were infected during 2006 – 2009 by a rare strain of the swine influenza virus.

5.9.4. Risk Assessment

At the time of the writing of this MHMP, the risk of a naturally occurring biological threat in Imperial County is 100% due to the ongoing COVID-19 Pandemic. At this time, Imperial County has the sixth highest number of coronavirus cases among the State of California's 58 counties. It has the tenth most deaths. The final analysis of the COVID-19 Pandemic and its effect on Imperial County will be written long after this MHMP is complete. Needless to say, the effects have already been devastating to the county's residents and economy.

COVID-19 has unfortunately proven what we wrote in the 2014 MHMP when we said that the potential "exists for one or more of these virulent diseases to dramatically affect the life, health and safety of County citizens."

- **Effects on people and housing.** Humans are susceptible to the effects of most naturally-occurring biological threats.
- **Effects on agriculture.** Certain naturally-occurring biological threats can cause severe damage to livestock.

5.9.5. Risk Assessment Conclusion

The COVID-19 Pandemic has demonstrated that the risk for a pandemic outbreak of a lethal disease does exist in Imperial County. Preparedness should be maintained at a high level.

5.9.6. Plans and Programs

Imperial County has experienced devastating effects from COVID-19. The County updates its website daily with the latest statistics and information.

The IID proclaimed a local emergency in response to California Government Code §3100 regarding public employees and their role as "essential workers". [51] The IID Sequestration Program[52] created a voluntary on-site, shelter-in-place program for a core group of employees to ensure the reliability of the district's energy system and to keep employees safe during the COVID-19 pandemic. IID is California's third-largest public power provider, serving 155,000 customer accounts in the Imperial and Coachella Valleys, representing a population of approximately 450,000. IID began the sequestration program, which is voluntary on the part of employees considered to have critical operational skills, in late April. Each wave has consisted of a three-week period. The third phase of the district's sequestration program will involve 10 employees who will work 12-hour shifts over 21 consecutive days, housed at designated critical IID facilities 24-hours-a-day. The sheltered employees will continue to maintain the district's essential energy operations, which are important to customers who rely on these services in the harsh desert climate of the Imperial and Coachella Valleys.

Influenza viruses have caused epidemics and pandemics for centuries. Because these viruses have the propensity to mutate and change from season to season, a vaccine providing long-term protection is not available. Therefore, the best way to prepare for the next pandemic strain is early

detection.

In Imperial County, influenza surveillance is conducted in a number of ways. Three sentinel influenza surveillance sites in out-patient clinics in Brawley, El Centro, and Calexico participate in year-round surveillance for patients with symptoms of influenza-like illness (ILI). All case-patients are given a rapid influenza test, and samples are collected for additional virologic and bacteriologic testing at the Naval Health Research Center (NHRC) laboratory in San Diego.

In 2009, surveillance for Severe Acute Respiratory Infections began in both hospitals. Samples are collected from hospitalized patients who meet the criteria (fever, cough and/or sore throat, or pneumonia in children <5 years) and sent to NHRC lab for testing. In addition, Syndromic surveillance is conducted in the emergency departments of both local hospitals (Pioneers Memorial Hospital and El Centro Regional Medical Center) for patients with influenza-like illness to monitor the frequency and distribution of ILI. This information is reported weekly or biweekly in a report that is distributed to key stakeholders and posted on the website.

Integrating hospital-based surveillance into the existing influenza surveillance system complements and strengthens overall surveillance activities. Both clinic and hospital-based surveillance for influenza and other respiratory viruses enhances Imperial County Public Health Department's ability to detect strains currently in circulation and monitor mortality due to pneumonia and other severe respiratory diseases. Overall, this allows a clearer epidemiological picture of influenza activity in the community and enables the Public Health Department in collaboration with other community stakeholders to build on strategies for preparedness and control measures should a new virus subtype with pandemic potential be detected.

Other enhanced surveillance projects currently being conducted in Imperial County include:

Syndromic Surveillance: Syndromic surveillance has been used for early detection of outbreaks, to follow the size, spread, and tempo of outbreaks, to monitor disease trends, and to provide reassurance that an outbreak has not occurred. Although syndromic surveillance does not replace traditional public health surveillance, it allows tracking of disease indicators in near real-time by capturing hospital data, parsing chief-complaint text strings into syndrome groupings, and analyzing data for abnormalities by applying multiple temporal and spatio-temporal outbreak-detection algorithms.

In 2008, Imperial County Epidemiology began collaborating with San Diego County to extend an automated syndromic surveillance program to emergency departments at both hospitals in Imperial County (El Centro Regional Medical Center and Pioneers Memorial Hospital). This project provides surveillance report summaries on a variety of selected syndromes, which can be used as markers for increased activity for influenza-like illnesses, fever, rash, and symptoms indicative of gastrointestinal illness and botulism, among others. This project provides the ability to identify increases in symptom frequency that may indicate an infectious disease outbreak; monitor

syndrome trends; and obtain aggregate data for various surveillance projects. Other surveillance projects for diseases and conditions include Coccidioidomycosis Surveillance (aka Valley Fever) and heat-related illnesses and death.

Mexicali Binational Tuberculosis (TB) Projects: Imperial County's activities for 2013-2014 include a variety of objectives, beginning with a sweeping TB education campaign. First, they will target the medical provider community, starting with hospitals and physicians, offering on-site education related to screening and treating Latent TB Infection and Active TB cases. To launch the campaign, Imperial County Public Health Department hosted an event on March 26, 2013 in recognition of World TB Day. The conference targeted local private provider, hospital, and clinic physicians that screen, treat, and discharge binational TB patients. Next, in an effort to educate community hospitals on screening, treating, discharge planning, and laws pertaining to reporting TB Suspects and TB Cases, the TB Controller is conducting on-site training and education sessions, including the opportunity for questions and answers. Both local hospitals admit TB patients from Mexico, creating the need for ongoing and updated TB education. Following TB education at the hospitals, the TB Control Program is targeting corrections agencies and detention facilities, schools, homeless shelters, and addiction rehabilitation centers. All of these facilities treat binational patients. Eventually, there are plans for a binational conference in order to increase collaborative and timely TB reporting and effective treatment efforts with Mexicali, Baja California. CURE TB (a referral and continuity of care program for tuberculosis patients and their contacts that travel between the United States and Mexico), United States – Mexico Border Health Commission (created to provide international leadership to optimize health and quality of life along the U.S.- México border), the Mexican Consultant, and the California State TB Control Branch, as well as TB counterparts from Mexico have expressed interest and are expected to participate in the conference. Imperial County Public Health Department TB Control Program attended the San Diego – Imperial – Baja California TB Cross Jurisdictional Sharing Retreat on May 31, 2013. The event was hosted by the non-profit International Community Foundation and was designed to review the Puentes de Esperanza program and best practices in cross jurisdictional sharing arrangements in public health. In addition, a draft mutual aid agreement was presented for discussion to encourage cross jurisdictional coordination of TB care.

Public Health: According to the California Code of Regulations, the County Health Officer (CHO) will take whatever measures are necessary to investigate and control reported or suspected diseases and conditions. Such measures include, but are not limited to, confirmation of a clinical or laboratory diagnosis, determination that an unusual disease or disease outbreak exists, determination and investigation of the source, and the prevention and control of the disease. Various functions within County Public Health assist the CHO, depending on the issues being addressed. The Imperial County Public Health Department coordinated a number of vaccination clinics in Imperial County in the fall with the assistance of partner agencies. In addition, information on flu prevention to local school, clinics and the public has been made available. The

Public Health Department conducts year-round monitoring of influenza-like illness at sentinel clinic sites in the county. A surveillance system is also in place at both local hospitals to monitor severe influenza-like illness among hospitalized patients. This provides health-care providers with up-to-date information about the type of viruses that are circulating in our community to assist with treatment decisions.

Immediate Disease Control Measures: Among other responsibilities, the CHO is authorized under the California Health and Safety Code to take measures as may be necessary to prevent the spread of communicable disease. Generally, actions may include obtaining information pertaining to the incident, assess the health risk to the community, notify appropriate agencies, and coordinate disease prevention and control with community, local, regional, state and federal agencies. Should it be necessary, the CHO will also initiate Quarantine measures within the County.

Notification of First Responders, Medical Community and Public Sector: If, after consultation with appropriate local, regional, state or federal agencies, the CHO determines that an imminent or actual health threat exists, local response will be initiated in accordance with emergency response and notification protocols. Depending on the nature of the event, potential responders may include local, state and/or federal emergency/disaster, law enforcement and health agencies.

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5.10. Hazard: Volcanos and Mud Pots

5.10.1. Jurisdictions Affected by Volcanos and Mud Pots

Volcanos and mud pot risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities.

Table 29. Volcanos and Mud Pots Probabilities and Severities by Jurisdiction

Imperial County Probability: Low	**Imperial County Severity: High**
Brawley Probability: Low	**Brawley Severity: High**
Calexico Probability: Low	**Calexico Severity: High**
Calipatria Probability: Low	**Calipatria Severity: High**
El Centro Probability: Low	**El Centro Severity: High**
Holtville Probability: Low	**Holtville Severity: High**
Imperial City Probability: Low	**Imperial City Severity: High**
Westmorland Probability: Low	**Westmorland Severity: High**
Imperial Irrigation District Probability: Low	**Imperial Irrigation District Severity: High**
Office of Education Probability: Low	**Office of Education Severity: High**

5.10.2. Hazard Definition

Lava Domes (also known as Volcanic Domes) are any steep-sided mound that is formed when lava reaching the Earth's surface is so viscous that it cannot flow away readily and accumulates around the vent. Sometimes domes are produced by repeated outpourings of short flows from a summit vent, and, occasionally, extremely viscous lava is pushed up from the vent like a short protrusion of toothpaste from a slightly squeezed tube. More commonly, however, the initial small extruded mass is gradually expanded by new lava being forced up into its interior. Fractures forming in the solidified shell of the expanding dome may allow small flows to escape onto its flanks or around its base, but, for the most part, the growth is simply a slow swelling. As the dome grows, the expanding crust breaks up, and pieces of it roll down to form a heap of angular rock fragments (breccia) around its base. Continued crumbling of the shell of the dome may result in a heap of debris that nearly buries the solid portion of the dome.[53]

A mud pot is a sort of acidic hot spring, or fumarole, with limited water. It usually takes the form of a pool of bubbling mud. The acid and microorganisms decompose surrounding rock into clay and mud. Surface water collects in a shallow, impermeable (usually due to a lining of clay) depression that has no direct connection to an underground water flow. Thermal water beneath the depression causes steam to rise through the ground, heating the collected surface water. Hydrogen sulfide gas is usually present, giving mud pots their characteristic odor of rotten eggs. Some microorganisms use the hydrogen sulfide for energy. The microbes help convert the gas to sulfuric acid, which breaks down rock into clay. The result is a gooey mix through which gases gurgle and bubble. The mud of a mud pot takes the form of a viscous, often bubbling, slurry. As the boiling mud is often squirted over the brims of the mud pot, a sort of mini-volcano of mud starts to build up, sometimes reaching heights of 3–5 feet. Mud pots form in high-temperature geothermal areas where water is in short supply. The little water that is available rises to the surface at a spot where the soil is rich in volcanic ash, clay, and other fine particulates. The thickness of the mud usually changes along with seasonal changes in the water table. There are several locations in and around the Salton Sea that are home to active mud pots.[54]

5.10.3. History

The Salton Buttes lie within the Salton Sea Geothermal Field located about 145 kilometers (90 miles) southeast of Palm Springs in Imperial County. Nearby towns include Westmorland, Calipatria, Niland, and Brawley. The Salton Buttes are located in the southeastern portion of the Salton Sea.

The Salton Buttes geothermal system is fueled by heat emanating from zones of partially molten rock (magma) deep below the Earth's surface. Eruptions occurring about 400,000 years ago were followed by a long lull in volcanic activity until about 18,000 years ago. The most recent eruptions, which took place about 1,800 years ago, started explosively, then progressed to a

relatively gentle effusion of dense, glassy-looking (obsidian) lava domes.

The spitting of the mud when carbon dioxide is released from a central vent slowly builds up a muddy cone that rises around it. Some here are as tall as five feet. The presence of the vents is believed by some scientists to be evidence that the San Andreas fault runs beneath them.

As a part of the U.S. Geological Survey's Volcano Hazards Program, the California Volcano Observatory aims to advance scientific understanding of volcanic processes and lessen the harmful impacts of volcanic activity in the active areas of California and Nevada. The following maps show the locations in California that are volcanically active areas. At the southernmost spot on this map, the green triangle shows the area in Imperial County that is volcanically active. [55, 56]

Figure 57. Volcanically Active Areas – Map 1

Closely associated with a fumarolic field and a geothermal field, there is evidence of buried volcanoes underground. This curious area contains a geothermal field, which fuels the strange mud pots found here, pools that contain a kind of acidic mud that bubbles up and is sometimes ejected out over the rim. Amazingly, microorganisms thrive in the boiling muck, and in combination with the acid, help to break down the rock to create the muddy ponds. The mud volcanoes here are created by the same dynamic.

Figure 58. Volcanically Active Areas – Map 2

Salton Buttes: The Salton Buttes are a group of volcanoes in California, on the Salton Sea (Salton Trough). The Salton Buttes consist of a row of five (5) lava domes that stretch 4.3 miles long and are the only active volcanoes in Southern California.

The lava domes in the Salton Buttes are identified as:

1. Mullet Island
2. North Red Hill (also called Red Island)
3. Obsidian Butte
4. Rock Hill
5. South Red Hill (also called Red Island)

Figure 59. Salton Buttes

Other significant areas:

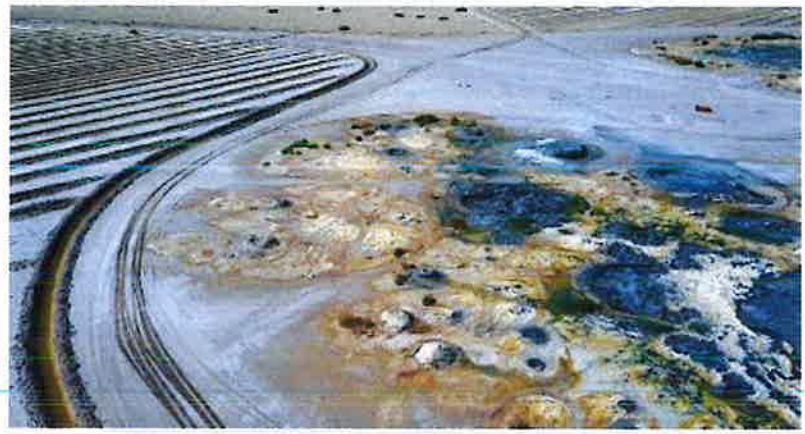

Figure 60. Dust Control Test Area

Mud pots located near Mullet Island that were underwater until recently. As the Salton Sea's water levels have dropped, more mud pots have been exposed. The area is now gated to keep vehicles out as it has become a test site for dust control studies.

Figure 61. Davis-Schrimpf Seep Field

Much larger mud pots can be found in the Davis-Schrimpf Seep Field, located at the intersection of Davis Road and Schrimpf Road on the southeastern side of the Salton Sea.

Figure 62. Ocotillo Wells SVRA

In the Ocotilla Wells SVRA area, there are additional small mud pots. These mysterious, volcano-like pots of bubbling muddy liquid are located approximately one and a half miles into the public lands managed by the Bureau of Land Management.

Figure 63. The Niland Geyser

Dubbed "The Slow One" and "the Niland Geyser," this mud pot five miles northwest of Niland is emitting much more water than most mud pots, about 40,000 gallons a day. Experts are now calling it a "mud spring."

The Niland Geyser is an odiferous, bubbly mud pool that first appeared in 1953 and was a typical, stationary mud pot until sometime around 2007 when it began to move westward. Its progress was slow at first, but since April of 2018 it has grown increasingly mobile and now has moved 240 feet from its original site, leaving an unstable wet swath of ground behind. The Slow One is now perilously close to Highway 111, the Kinder Morgan petroleum pipeline and Verizon's buried fiber-optic cables. It has already disrupted Union Pacific's railroad tracks.

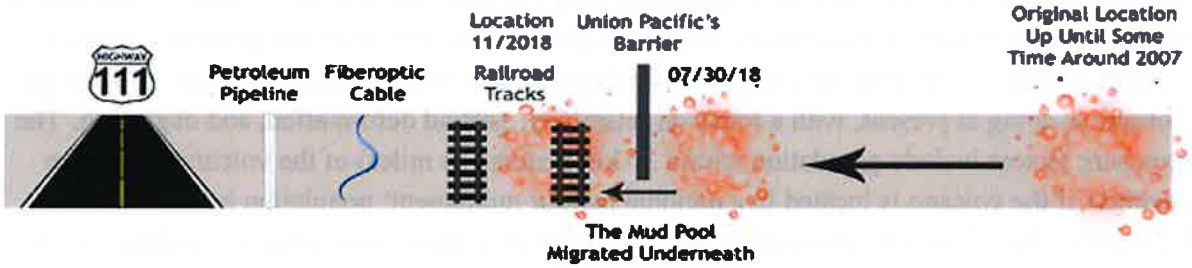

Figure 64. Niland Geyser Migration Timeline

Efforts to contain, drain, or otherwise stop the migrating mud spring have proved fruitless. Union Pacific attempted to build a wall, digging 75 feet down to stop the mud spring, but the geyser bubbled underneath and past the barrier. The rail line has created a temporary alternate track to route around the muddy pool, as the railroad track right of way was impacted.

Figure 65. Attempt to Stop Geyser Migration with a Wall

In September 2019, Caltrans issued a Press Release stating the 111 would be closed and traffic would be rerouted to make the necessary repairs.

Although the geyser/mud pot is releasing water, carbon dioxide, and hydrogen sulfide gases in low concentrations, it has been determined that it does not pose a health hazard to area residents.[57]

5.10.4. Risk Assessment

The Niland Mud Pot Geyser is a continuing and immediate threat to nearby critical infrastructures and County areas. The geyser continues to move in a southwesterly direction. Conditions of extreme peril to the safety of persons and property exist and are beyond the control of local resources, services, personnel, and equipment.

Pursuant to Codified Ordinance No. 2.104.060 of the County of Imperial and Government Code Section 8630, the Imperial County Board of Supervisors proclaimed a Local Emergency, and on June 26, 2018, Resolution 2018-52, M.O. #16a was signed. The Board of Supervisors review the need for continuing the local emergency at least once every thirty days until the local emergency can be terminated. It has been extended many times since the original proclamation.

A periodic assessment of hazards and the populations likely to be affected in a future eruption helps prioritize efforts where they are needed most. The updated Volcanic Threat Assessment combines 24 criteria (15 hazard factors and 9 exposure factors) that describe an individual volcano's hazard potential and the exposure of people and property to those hazards. The hazard factors include volcano type, eruptive history, explosiveness, time between eruptions, types of hazards from past eruptions, and effects of the hazards. Also included is an analysis of what the volcano is doing at present, with a focus on seismicity, ground deformation, and degassing. The exposure factors include population within 30 kilometers (18 miles) of the volcano; visitation numbers if the volcano is located in a national park or monument; population beyond 30 kilometers (18 miles) if a far-traveling lahar is a primary hazard; prior eruption fatalities; prior evacuations; aviation impacts, either to the local airport or to regional air transportation routes; impacts on power and transportation infrastructure; and major developments such as parks. USGS scored the hazard and exposure factors for each volcano. Based upon the scores, the volcanoes were grouped into one of five threat categories: very low, low, moderate, high, and very high. In 2018, the USGS added Salton Buttes to their list of potentially dangerous threats. Even though the most recent eruption occurred about 1,800 years ago, the threat potential rating is listed as "high" by the USGS. [58]

5.10.5. Risk Assessment Conclusion

Volcanic eruptions are certain to occur in California in the future and can be neither prevented nor stopped, but actions can be taken to limit damage from them. Reduction of risk to life and property can be achieved by avoiding threatened areas and by taking protective measures to reduce impacts when and where vulnerable areas cannot be avoided. Monitoring of volcanic precursors generally can identify the locality of impending volcanic activity, even though it often does not pinpoint the nature or timing of an eruption, or even its certainty. Hazard-zonation maps can then be used to

guide decisions regarding evacuation and other response activities. Thus, effective monitoring of volcanoes in the State, combined with preparation of contingency plans to deal with future eruptions, can help reduce risk to lives and property. [59]

The Salton Sea Geothermal Field, which currently produces enough power to supply about 325,000 homes, has persistent small to moderate earthquakes related to the geothermal system and to movement along regional faults. Monitoring of earthquake activity began in the 1930s, and the dense seismic network installed in the 1970s is operated by the USGS and the California Institute of Technology (Caltech). The available data are insufficient to establish a pattern of volcanic activity to determine the likelihood of eruption. The high heat flow from the area and relatively young age of Salton Buttes, however, attest to the potential for future eruptions.

5.10.6. Relationship to Other Hazards – Cascading Effects

The Niland Geyser poses a threat to man-made infrastructure including:

- State Highway 111
- Railroad tracks
- Petroleum pipelines
- Fiber optics telecommunication lines

In its path are Union Pacific freight railroad tracks that connect the Inland Empire to Yuma, Ariz.; a petroleum pipeline owned by Kinder Morgan, one of North America's largest energy companies; a stretch of fiber optic telecommunications lines owned by Verizon; and a portion of Highway 111, a major roadway connecting Interstate 10 in the Coachella Valley to the California-Mexico border. Caltrans has built a temporary road to provide access to travelers. Union Pacific has been forced to build temporary tracks to avoid running trains over land impacted by the Niland Geyser. A bridge may need to be built to solve this problem.[60, 61]

The area is largely a desolate desert. There are few residents in these areas. Much of the land affected is off-limits to visitors.

SOURCES

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5.11. Hazard: Terrorism

5.11.1. Jurisdictions Affected by Terrorism

Terrorism risk probability and risk severity assessments listed below were identified by the Hazard Mitigation Working Group as related to the County and participating communities. All probabilities and severity ratings were increased from medium to very high due to recent and ongoing cyber-attacks.

Table 30. Terrorism Probabilities and Severities by Jurisdiction

Imperial County Probability: Very High	**Imperial County Severity: Very High**
Brawley Probability: Very High	**Brawley Severity: Very High**
Calexico Probability: Very High	**Calexico Severity: Very High**
Calipatria Probability: Very High	**Calipatria Severity: Very High**
El Centro Probability: Very High	**El Centro Severity: Very High**
Holtville Probability: Very High	**Holtville Severity: Very High**
Imperial City Probability: Very High	**Imperial City Severity: Very High**
Westmorland Probability: Very High	**Westmorland Severity: Very High**
Imperial Irrigation District Probability: Very High	**Imperial Irrigation District Severity: Very High**
Office of Education Probability: Very High	**Office of Education Severity: Very High**

5.11.2. Hazard Definition

Terrorism is defined in 28 CFR Section 0.85 as "...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." Since September 11, 2001, terrorism has become a fact of life for all Americans. Planning for response to potential terrorist incidents has long been part of California's Emergency Preparedness Planning effort. California provides a target-rich environment for terrorists, with many facilities and venues and an easy place to hide in California's diverse population. Effective hazard mitigation that reduces risk to terrorism must be based upon technical expert information and analysis of actual terrorist events.

Terrorists often use threats to create fear among the public, to try to convince citizens that their government is powerless to prevent terrorism, and to get immediate publicity for their causes. Terrorist acts or acts of war may cause casualties, extensive property damage, fires, flooding, and other ensuing hazards.

Terrorism takes many forms, including:

Chemical. Chemical weapons have been used primarily to terrorize an unprotected civilian population and not as a weapon of war. This is because of fear of retaliation and the likelihood that the agent would contaminate the battlefield for a long period of time.

Some analysts suggest that the possibility of a chemical attack would appear far more likely than either the use of nuclear or biological materials, largely due to the easy availability of many of the necessary precursor substances needed to construct chemical weapons. Additionally, the rudimentary technical knowledge needed to build a working chemical device is taught in every college level chemistry course in the world. Some chemical agents are odorless and tasteless and are difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

A terrorist would not have to build a complicated chemical release device. During favorable weather conditions an already existing chemical plant could be sabotaged or bombed releasing a toxic cloud to drift into a populated area. The result could be just as dangerous as having placed a smaller chemical device in a more confined space. This type of incident would cause the maximum amount of fear, trepidation, and potential panic among the civilian population, and thus achieve a major terrorist objective.

Biological. Biological weapons are defined as any infectious agent such as a bacteria or virus used to produce illness or death in people, animals, or plants. This definition is often expanded to include biologically-derived toxins and poisons. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water because the agents are extremely difficult to detect. The agents are cheap, easy to make, and simple to conceal.

Even small amounts, if effectively deployed, could cause massive injuries and overwhelm emergency rooms. The production of biological weapons can be carried out virtually anywhere — in simple laboratories, on a farm, or even in a home.

However, experts say it remains very difficult to transform a deadly virus or bacterium into a weapon that can be effectively dispersed. A bomb carrying a biological agent would likely destroy the germ as it explodes. Dispersing the agents with aerosols is challenging because biomaterials are often wet and can clog sprayers. Most agree that, while a biological attack could be devastating in theory, in reality, the logistical challenges of developing effective agents and then dispersing them makes it less likely a terrorist could carry out a successful widespread assault.

Radiological. A radioactive material is a material made up of unstable atoms which give off excess energy in the form of radiation through the process of radioactive decay. Radiation cannot be detected by human senses. Wherever radioactive materials are used, transported, or stored there is a potential for a radiological accident to occur. Under extreme circumstances an accident or intentional explosion involving radiological materials can cause very serious problems. Consequences may include death, severe health risks to the public, damage to the environment, and extraordinary loss of, or damage to, property.

Some of their most common uses include use:

- by doctors to detect and treat serious diseases
- by educational institutions and companies for research
- by the military to power large ships and submarines
- by companies in the manufacture of products
- as a critical base material to help produce the commercial electrical power that is generated by a nuclear power plant
- as one of the critical components in nuclear weapons, which are relied upon to help deter the threat of war

Nuclear. The possibility exists that a terrorist organization might acquire the capability of creating a small nuclear detonation. A single nuclear detonation in the United States would likely produce fallout affecting an area many times greater than that of the blast itself. There is also the possibility that a terrorist will construct a "dirty bomb", a bomb that is used to distribute nuclear contaminated materials. It would have less of an effect than a "traditional" nuclear bomb, but the terror effect on the population would be great.

Explosive. The possibility exists that a terrorist may attack with conventional explosives, particular in a public setting. Innumerable incidents have occurred around the world involving car bombs, truck bombs, and bombs attached directly to terrorist individuals. Explosive terrorist

attacks may have consequences including death and damage to property.

Cyber-terrorism. Cyber-terrorism is the use of computer network tools to shut down critical government infrastructures such as energy, transportation, and government operations, or to coerce or intimidate a government or civilian population. The premise of cyber-terrorism is that as nations and critical infrastructure became more dependent on computer networks for their operation, new vulnerabilities are created. A hostile nation or group could exploit these vulnerabilities to penetrate a poorly secured computer network and disrupt or even shut down critical public or business operations. The goal of cyber-terrorism is believed to be aimed at hurting the economy of a region or country, and to amplify the effects of a traditional physical terrorist attack by causing additional confusion and panic.

5.11.3. History

The threat of terrorism has a unique effect on boarder communities such as those of Imperial County. Rather than just a mere geopolitical line separating the United States and Mexico, the border has been redefined as a line of defense against terrorism. The terrorist attacks of September 11 on New York City and Washington, D.C., resonated far away along the U.S.- Mexican border. The immediate results of the attacks and the security measures that followed were social and economic disruptions. People can no longer live and businesses can no longer operate as they once did in the border region.

Prior to September 11, 2001, the regions of Imperial County and Northern Baja California economically functioned in a semi-contiguous manner. With the implementation of NAFTA in 1994, and the subsequent movement of business and industry to both sides of the border, the region experienced an increase in economic activity. Effective July 1, 2020, a new trade agreement that replaces NAFTA took effect between the United States, Mexico, and Canada (USMCA). It is designed to be a mutually beneficial win for North American workers, farmers, ranchers, and businesses. Once implemented, the agreement is touted to create more balanced, reciprocal trade that supports high-paying jobs for Americans and grows the North American economy. The impact of the USMCA remains to be seen.[62]

In 1997, the Calexico-East Port-of-Entry was opened, creating a separate port for commercial use and dedicating the downtown Calexico port to noncommercial traffic. The existing Andrade port still handles both commercial and noncommercial crossings. The ports of entry in Imperial County are among the busiest on the U.S.-Mexican border.

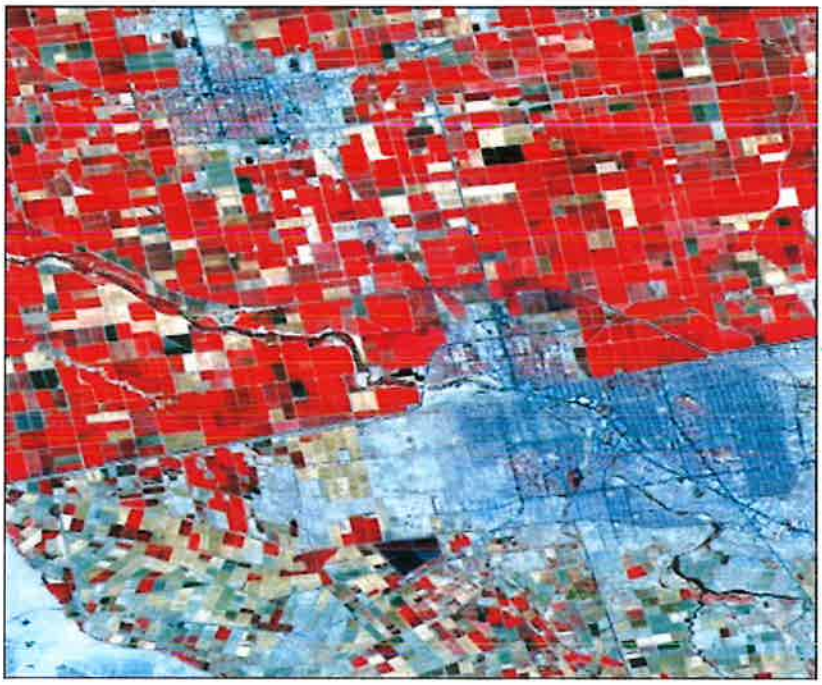
September 11 and subsequent news reports indicating that some terrorists in the United States have obtained drivers licenses for transporting hazardous materials, including hazardous wastes, called attention to a new form of hazardous material threat unique to the border region. Increased wait times at ports of entry have resulted in increased vehicular emissions in border communities.

Further aggravating the situation was the implementation on October 1, 2005 of the biometric laser

visa requirement for Mexican nationals crossing into the United States. An estimated two million Mexicans have not yet obtained their laser visas and are prohibited from crossing.

Figure 66. Calexico-Mexicali

The border town of Calexico-Mexicali spans the border in the middle of the image; El Centro, California is in the upper left.



Fortunately, Imperial County has no history of incidents of chemical, biological, radiological, nuclear, or explosive terrorism. The County has been impacted – as has the rest of the world – by recent computer viruses and hacking. Infrastructure is impacted tremendously when this occurs, and it takes a very long time to recover from a cyber incident.

5.11.4. Risk Assessment

Many terrorist events have occurred in California. The majority of these incidents have been bombings. However, there is also a concern for the potential of Weapons of Mass Destruction (WMD) use in future terrorist events. The use of WMDs increases the potential for mass casualties and damage.

One of the special considerations in dealing with the terrorist threat is that it is difficult to predict. One must know the minds and capabilities of various terrorists and terrorist groups. These are characteristics terrorist organizations strive to conceal. Because all terrorists are not the same, the calculation is even more difficult. Two things are clear from the perspective of hazard mitigation. The most often used weapon of terrorists is bombs, and the greatest potential for loss is from WMDs. It must be dutifully noted, however, that Imperial County is a port of entry from a foreign country, Mexico, which may create a greater risk purely based on demographics.

Since September 11, the concern lies on the border crossings into Imperial County. Some type of extreme militant foreign or domestic attack on water sources, populated areas, agriculture chemicals, and local military bases, whether it is a direct attack or some type of contamination, could occur. Because of the dynamic nature of the terrorist threat and the open nature of California society, all jurisdictions within California are vulnerable to the following:

- **Effects on people, economics and housing.** Depending on levels of contamination and exposure, effects could range from minimal to devastating. The terrorist attacks of September 11 prompted the United States to put Border Patrol and Customs agents on "Level 1" alert, meaning agents check every car and person entering the country. Because of this intense scrutiny, long backups of up to several hours exist at many border crossing points. This has crippled trade and commerce, depressing local border economies During the first two months following the terrorist attacks, fear of travel and increased congestion at the border reduced drastically the flow of traffic between the United States and Mexico. This reduced flow has undermined commercial and tourist activity on which border communities depend and caused serious problems for families that work, shop, and attend school on both sides of the border. Mexican border residents spend up to $3 billion on products and services annually in Southern California alone.
- **Effects on commercial and industrial structures.** Depending on levels of contamination and exposure, effects could range from minimal to devastating.
- **Effects on infrastructure.** Nuclear, radiological, and cyber-terrorism can have profound effects on infrastructure.
- **Effects on agriculture.** As peak produce season arrives on the U.S.-Mexico border, the agriculture sector faces increased import barriers and labor shortages.

5.11.5. Risk Assessment Conclusion

Due to events such as the 9/11 attack and the declared war against terrorism, national and local governments have assigned high priority to terrorist attack preparedness. Cyber-attacks on infrastructure have increased. Remote infrastructure where there is limited/difficult access is particularly vulnerable. After a cyber-attack, it typically takes a very long time to recover from the damages.

SOURCES

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https://ustr.gov/trade-agreements/free-trade-agreements/united-states-mexico-canada-agreement

Section 6. Goals and Objectives

The Imperial County Hazard Mitigation Planning Committee held a workshop to review and analyze the risk assessments from the 2014 MHMP and update their goals and objectives to reflect changes in development. The Planning Committee developed the following goals and objectives based on the risk assessment studies and selected those that were determined to be of greatest benefit in hazard reduction to the County. The current goals and objectives for Imperial County and the participating jurisdictions are as follows:

Earthquake

Goal 1 – Minimize loss of life, injury and damage to property, the economy and the environment from natural hazards

Objective 1: Continue to participate in California OES statewide earthquake warning system

Objective 2: Consolidate redundant communications

Objective 3: Acquire additional back-up generators

Goal 2 – Build and enhance local mitigation capabilities to ensure individual safety, reduce damage to public buildings, and ensure continuity of emergency services

Objective 1: Erosion control

Objective 2: Develop a Plan for supporting the prison in the event of an earthquake

Goal 3 – Maintain natural and man-made systems that protect the community from natural hazards

Objective 1: Retrofit bridges

Objective 2: Upgrade water tanks

Objective 3: Upgrade/retrofit critical facilities (includes URM)

Objective 4: Secure/relocate transformers

Flooding

Goal 1 – Minimize injury; loss of life; and damage to property, the economy, and the environment from natural hazards

Objective 1: Develop a Master Drainage Plan

Goal 2 – Maintain natural and man-made systems that protect the community from natural hazards

Objective 1: Drainage Improvements (increase capacity of storm drains – West and North End)

Objective 2: Road improvements

Extreme Weather

Goal 1 – Minimize injury; loss of life; and damage to property, the economy, and the environment from natural hazards

Objective 1: Improve public education regarding survivability and continuing functionality during a weather event (inform public of heat centers and protection of animals)

Objective 2: Develop a storm water management plan

Goal 2 – Build and enhance local mitigation capabilities to ensure individual safety, reduce damage to public buildings and ensure continuity of emergency services

Objective 1: Enhance power infrastructure

Goal 3 – Maintain natural and man-made systems that protect the community from natural hazards

Objective 1: Drought mitigation (ground water storage)

Wildfire

Goal 1 – Build and enhance local mitigation capabilities to ensure individual safety, reduce damage to public buildings and ensure continuity of emergency services

Objective 1: Vegetative maintenance and cleaning

Pest Infestation/Non Vectors of Human Diseases

Goal 1 – Maintain natural and man-made systems that protect the community from natural hazards

Objective 1: Increase monitoring of the Quagga Mussel to deter possibility of infestation

Objective 2: Increase monitoring of the Hydrilla plant (monitor growth and maintain the Hydrilla plant)

Naturally Occurring Biological Threats

Goal 1 – Minimize loss of life, injury and damage to property, the economy and the environment from natural hazards

Objective 1: Revise the Influenza Virus Pandemic Plan (increase detection, preparedness and responsiveness to potential biological threats)

Objective 2: Work with County Agriculture Departments to ensure adequate/increased testing for specific biohazards (increase detection, preparedness and responsiveness to potential biological threats)

Dam Failure

Goal 1 – Minimize loss of life, injury and damage to property, the economy and the environment from natural hazards

Objective 1: Develop an Evacuation Plan

Hazardous Materials

Goal 1 – Minimize loss of life, injury and damage to property, the economy and the environment from natural hazards

Objective 1: Increase/enhance training for major hazmat incidents (educate individuals to prepare for a potential rail incident at transportation off-loading and storage facilities

Goal 2 – Build and enhance local mitigation capabilities to ensure individual safety, reduce damage to public buildings and ensure continuity of emergency services

Objective 1: Enhance training for all first responders

Objective 2: Train individuals with high-pressure gas lines

Objective 3: Increase training for a major hazmat incident at the Tank Farm

Volcanos and Mud Pots

Goal 1 – Minimize loss of life, injury and damage to property, the economy and the environment from natural hazards

Objective 1: Develop an Evacuation Plan

Terrorism

Goal 1 – Minimize loss of life, injury and damage to property, the economy and the environment from natural hazards

Objective 1: Increase public education and awareness

Goal 2 – Build and enhance local mitigation capabilities to ensure individual safety, reduce damage to public buildings and ensure continuity of emergency services

Objective 1: Increase deterrence and prevention measures of the hospital's central plant operations

Objective 2: Secure public facilities and resources

Section 7. Status of 2014 MHMP Mitigation Projects

The status of the mitigation projects which were identified by the Imperial County and Planning Jurisdictions and incorporated into their 2014 MHMP are included in this section. Changes in development that have occurred in hazard prone areas to decrease the vulnerability are indicated in the Status/Comments area in each Program/Project listed. Projects that have been completed or are currently in progress have been removed. Projects where there was no activity have been reviewed and have either been deleted or are being carried over to the 2020 MHMP Update Mitigation Action Plans in the following Section 8.

7.1 Priority 1 Mitigation Projects from the 2014 MHMP

Table 31. 2014 Priority 1 Project – Earthquake

Program/Project Description	Earthquake Warning System	
Costs	$280,000	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial County Office of Emergency Services • Imperial County Fire Department	This project was not pursued because the County elected to participate in a statewide effort under the auspices of Cal OES. See the 2020 Mitigation Project related to continued participation in the statewide effort.
Financing	State Homeland Security Grant Funding	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Mitigate access issues and improve survivability • Increase effectiveness of emergency services • Protect life and property • Reduce damage through advance planning and preparations	
Related Hazard	Earthquake	

Table 32. 2014 Priority 1 Project – Flooding

Program/Project Description	Drainage Improvements throughout Imperial County	
Costs	$5,000,000	
Timeline/Schedule	3 – 5 years	
Responsible Agency	**Agency**	**Status/Comments**
		• A retention basin was built in West Imperial County.
	• Department of Public Works • Imperial Irrigation District	• Since the County's drainage system was designed to handle *irrigation* runoff, not *rainwater* runoff, there is more to do and this project will continue in the future.
Financing	• FEMA Hazard Mitigation Grant Program (HMGP) • Proposition 84 Funds through the Imperial Integrated Regional Water Management Plan (IRWMP) • General Fund	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Increase capacity of storm drains (West and North End) to reduce possibility of damage and loss due to flooding • Minimize the impact of a flood event • Protect life and property	
Related Hazard	Flooding	

Table 33. 2014 Priority 1 Project – Wildfire

Program/Project Description	Vegetative Management and Cleaning Plan	
Costs	FTE from each Jurisdiction	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	All Jurisdictions	• This is an on-going activity that will continue into the future • IID does a significant amount of vegetative management
Financing	Staff time	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Reduce the impact of wildland fire to infrastructures by creating perimeters around homes, structures and critical facilities • To mitigate access issues and improve survivability • Protect life and property	
Related Hazard	Wildfire	

Table 34. 2014 Priority 1 Project – Pest Infestation/Non-Vectors of Human Disease

Program/Project Description	Increase monitoring of the Quagga Mussel and Hydrilla Plant	
Costs	$750,000	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial Irrigation District • Agricultural Commissioner's Office	• IID sends Quagga Mussel samples in for testing on an ongoing basis • This is an on-going activity that will continue into the future

Financing	Imperial Irrigation District - Water Department Budget
Jurisdictions Affected	All Jurisdictions
Goals Addressed	Deter possibility of infestation/growth
Related Hazard	Pest Infestation/Non Vectors of Human Diseases

Table 35. 2014 Priority 1 Project – Naturally Occurring Biological Threats

Program/Project Description	Update/revise the Flu Pandemic Plan	
Costs	$67,000	
Timeline/Schedule	1 year then on-going	
Responsible Agency	**Agency**	**Status/Comments**
	Department of Public Health	• The County EOP was updated in 2019 and included plans for pandemic response; the new EOP is awaiting approval by the Board of Supervisors • Given the COVID-19 Pandemic, this is an on-going activity that will continue into the future and incorporate "new learning" from the current global crisis
Financing	Pandemic Influenza State General Fund Grant	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Increase detection, preparedness and responsiveness to potential biological threats • Protect life and improve survivability • Reduce damage through advance planning and preparations	
Related Hazard	Naturally Occurring Biological Threats	

Table 36. 2014 Priority 1 Project – Dam Failure

Program/Project Description	Update/revise Evacuation Plan	
Costs	FTE from each Jurisdiction	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial County Office of Emergency Services • All Jurisdictions	• Significant improvements in public notification have been achieved by participation in the national Integrated Public Alert and Warning System (IPAWS) • IPAWS is a national system, organized and funded by FEMA, for local alerting that provides authenticated emergency alert and information messaging to the public through cell phones and internet applications using Wireless Emergency Alerts (WEAs), and to radio and television via the Emergency Alert System (EAS)
Financing	FTEs	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Improve public notification and evacuation programs • Mitigate access issues and improve survivability • Protect life and property • Reduce damage through advance planning and preparations	
Related Hazard	• Dam Failure • Earthquake • Flooding • Wildfire • Hazardous Materials • Terrorism	

Table 37. 2014 Priority 1 Project – Terrorism

Program/Project Description	Increase Public Education and Awareness	
Costs	TBD	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial Irrigation District • Imperial County Office of Emergency Services • Public Health Department	• Public education and outreach are ongoing • In addition, IID continuously monitors systems in substations and trains staff in anti-terrorism
Financing	TBD	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Increase deterrence and prevention measures • Protect life and improve survivability • Reduce damage through advance planning and preparations	
Related Hazard	Terrorism	

7.2 Priority 2 Mitigation Projects from the 2014 MHMP

Table 38. 2014 Priority 2 Project - Earthquake

Program/Project Description	Upgrade/Retrofit Critical Facilities (includes URM)	
Costs	$1,000,000	
Timeline/Schedule	2 years	
Responsible Agency	**Agency**	**Status/Comments**
	• Planning and Development • All Jurisdictions	This is an ongoing effort with a continuous need to replace or retrofit old construction.
Financing	FEMA Hazard Mitigation Grant Program (HMGP)	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• To bring critical facilities up to current building standards • Protect life and improve survivability	
Related Hazard	Earthquake	

Table 39. 2014 Priority 2 Project – Flooding

Program/Project Description	County Roads Improvements	
Costs	$2,937,000	
Timeline/Schedule	2 – 10 years	
Responsible Agency	**Agency**	**Status/Comments**
	Department of Public Works	• Built retention basin for influx of water • As shown, this was potentially a 10-year project in 2014, and it is still ongoing
Financing	FEMA Hazard Mitigation Grant Program (HMGP) Reimbursement from U.S. Bureau of Reclamation	
Jurisdictions Affected	All Jurisdictions	

Goals Addressed	• Mitigate access issues and improve survivability • Protect life and property
Related Hazard	Flooding

Table 40. 2014 Priority 2 Project – Extreme Weather

Program/Project Description	Enhancement of Power Infrastructure	
Costs	TBD	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	Imperial Irrigation District	• A new generation station was built on the north end of the County near Nyland • This is an on-going project with power requirements continuously increasing
Financing	Imperial Irrigation District – Energy Department Budget	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Mitigate access issues and improve survivability • Protect life and property	
Related Hazard	• Extreme Weather • Earthquake • Flooding • Wildfire • Dam Failure	

Table 41. 2014 Priority 2 Project – Pest Infestation/Non-Vectors of Human Disease

Program/Project Description	Work with County Agriculture Department to Ensure Adequate/ Increased Testing for Specific Biohazards	
Costs	$490,000; 8-FTEs	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Department of Public Health • All Jurisdictions	This project is on-going but is currently on-hold due to COVID-19 priorities
Financing	• Public Health Emergency Preparedness Grant • Hospital Preparedness Program (HPP) Grant	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Increase detection, preparedness and responsiveness to potential biological threats • Protect life and improve survivability	
Related Hazard	Pest Infestation/Non Vectors of Human Diseases	

Table 42. 2014 Priority 2 Project – Hazardous Materials

Program/Project Description	Enhance Training for all First Responders	
Costs	$250,000	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial County Office of Emergency Services • All Jurisdictions	• The County has increased the number of Fire/OES staff that have been trained as specialists in HazMat response • The County has a very active team with MOUs in-place with other jurisdictions • This is an on-going effort

Financing	Homeland Security Grant Program (HMGP)
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Minimize the impact of a HazMat incident • Mitigate access issues and improve survivability • Protect life and property • Reduce damage through advance planning and preparations
Related Hazard	Hazardous Materials

Table 43. 2014 Priority 2 Project – Terrorism

Program/Project Description	Protection of Hospitals' Central Plant Operations	
Costs	$190,000	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	Department of Public Health, working with local hospitals	• A number of dual feeds have been established • This is an on-going effort
Financing	Hospital Preparedness Program (HPP) Grant	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Increase deterrence and prevention measures • Mitigate access issues and improve survivability • Protect life and property	
Related Hazard	Terrorism	

7.3 Priority 3 Mitigation Projects from the 2014 MHMP

Table 44. 2014 Priority 3 Project – Earthquake

Program/Project Description	Redundant Communications	
Costs	TBD	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial County Office of Emergency Services • Imperial Valley Emergency Communication Authority	• IID has developed multiple means of communications • IID runs generators to power communications capabilities and most communications systems have backup power sources • The County has improved its Very High Reliability (VHR) system
Financing	Homeland Security Grant Program (HSGP)	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Mitigate access issues and improve survivability • Protect life and property	
Related Hazard	• Earthquake • Flooding • Wildfire • Dam Failure • Hazardous Materials • Terrorism	

Table 45. 2014 Priority 3 Project – Extreme Weather

Program/Project Description	Drought – Groundwater Storage	
Costs	TBD	
Timeline/Schedule	TBD	
Responsible Agency	**Agency**	**Status/Comments**
	Imperial Irrigation District	This is an on-going effort for IID
Financing	TBD	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Protect life and improve survivability • Reduce damage through advance planning and preparations	
Related Hazard	Extreme Weather	

Table 46. 2014 Priority 3 Project – Hazardous Materials

Program/Project Description	Train Individuals with High-Pressure Gas Lines	
Costs	TBD	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial County Office of Emergency Services • All Jurisdictions	• The County has increased the number of specialists on its Hazardous Emergency Assistance Team (HEAT) • See YouTube video featuring Imperial County HEAT members at https://www.youtube.com/watch?v=_I80NGtiwUQ • This is an on-going effort
Financing	TBD	
Jurisdictions Affected	All Jurisdictions	

Goals Addressed	• Educate individuals to prepare for a potential HazMat incident • Protect life and improve survivability • Protect property • Reduce damage through advance planning and preparations
Related Hazard	Hazardous Materials

Table 47. 2014 Priority 3 Project – Terrorism

Program/Project Description	Secure Public Facilities and Resources	
Costs	TBD	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Sheriff's Office • Police Department • Imperial County Office of Emergency Services • All Jurisdictions	• IID has installed new cameras, new fencing, and new access controls at multiple facilities • This is an on-going effort
Financing	TBD	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Increase deterrence and prevention measures • Protect life and improve survivability • Protect property	
Related Hazard	Terrorism	

7.4 Priority 4 Mitigation Projects from the 2014 MHMP

Table 48. 2014 Priority 4 Project – Earthquake

Program/Project Description	Additional Emergency Back-up Generators for County Facilities	
Costs	$135,000	
Timeline/Schedule	2 – 5 years	
Responsible Agency	**Agency**	**Status/Comments**
	Department of Public Works	Several new generators were obtained through OES
Financing	County Facilities Maintenance	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Mitigate access issues and improve survivability • Protect life and property	
Related Hazard	• Earthquake • Flooding • Extreme Weather • Wildfire • Dam Failure • Hazardous Materials • Terrorism	

Table 49. 2014 Priority 4 Project – Extreme Weather

Program/Project Description	Storm Water Management Plan	
Costs	$60 million	
Timeline/Schedule	On-going	
Responsible Agency	**Agency**	**Status/Comments**
	• Imperial Irrigation District • County Planning Department • City and County Public Works	IID has some work planned on the north side of the County

Financing	Imperial Irrigation District – Water Department Budget
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Minimize the impact of a flood event • Mitigate access issues and improve survivability • Protect life and property • Reduce damage through advance planning and preparations
Related Hazard	• Extreme Weather • Flooding • Dam Failure

7.5 Priority 5 Mitigation Projects from the 2014 MHMP

Table 50. 2014 Priority 5 Project – Earthquake

Program/Project Description	Retrofit bridges/secondary impact to transport routes (Seismic projects: Winterhaven Drive Bridge at California Wasteway (est. $1,732,000); Forrester Road Bridge at the Westside Main Canal (est. $7,705,000); Araz Road at All American Canal (est. $1,388,400)	
Costs	$10,825,400	
Timeline/Schedule	2 – 5 years	
Responsible Agency	**Agency**	**Status/Comments**
	Department of Public Works	
Financing	Federal Funds – Highway Bridge Program (HBP)	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Mitigate access issues and improve survivability • Minimize disruption to transportation routes when bridges are affected • Minimize the additional cost of fuel for school districts when detour routes are implemented	
Related Hazard	• Earthquake • Flooding • Wildfire • Dam Failure • Hazardous Materials • Terrorism	

7.6 Priority 6 Mitigation Projects from the 2014 MHMP

Table 51. 2014 Priority 6 Project – Earthquake

Program/Project Description	Upgrade Water Tanks	
Costs	$606,000	
Timeline/Schedule	2 – 10 years	
Responsible Agency	Agency	Status/Comments
	Department of Public Works	
Financing	FEMA Hazard Mitigation Grant Program (HMGP)	
Jurisdictions Affected	All Jurisdictions	
Goals Addressed	• Protect life and improve survivability • Reduce damage through advance planning and preparations	
Related Hazard	• Earthquake • Flooding • Wildfire	

Section 8. MHMP Mitigation Strategies – Action Plan

Based on future plans, the County and participating jurisdictions prepared a prioritized mitigation Action Plan to reduce the effects of hazards, with emphasis on existing buildings and infrastructure.

The process used to prioritize mitigation strategies involved lengthy discussions with various jurisdictional stakeholders, followed by citizen and community reviews. The end result is a hazard mitigation Action Plan with a prioritized list of mitigation projects that Imperial County and the participating jurisdictions expect to carry out during the next five years.

Prioritizing Strategies

The process used was to first prioritize goals and their respective objectives based on priority maps created during the risk assessments. Available resources and public input were also considered. The County and participating jurisdictions next assessed each strategy listed under the prioritized list of goals. Imperial County and participating jurisdictions collectively prepared a prioritized mitigation Action Plan.

In assessing and evaluating each strategy, Imperial County and the participating jurisdictions considered the following factors:

1. The cost was justified
2. Financial resources were available; local or outside resources
3. Staff resources were adequate
4. Minimal impact on County department functions
5. Strategies mitigate risks for the riskiest hazard events
6. Strategies reflect the goals and objectives

Implementation/Administration

The Action Plan includes the principal contact and cooperating parties, timeframe, and estimated cost involved in carrying out the strategy. The use of FEMA's Benefit Cost Analysis (BCA) software (FEMA Mitigation BCA Toolkit Version 4.8) will be used to identify the cost- effectiveness of each activity or project undertaken and to perform benefit cost analysis for applications submitted under FEMA's HMA Grant Programs.

Each year the Action Plan will be revisited and the first year will be dropped as those activities are completed and another year will be added so that the Action Plan always reflects a five-year timeframe and remains current. Strategies undertaken and completed will be evaluated as to their effectiveness.

For the planning areas subject to flood hazards, the mitigation actions and projects that reduce flood risk and deal with repetitive loss structures will be in compliance with the NFIP. Those activities not completed during the first year will be re-evaluated and included in the first year of the new Action

Plan if still appropriate.

Even though individual strategies will be assigned a principal contact to ensure implementation, overall responsibility, and oversight, the general monitoring of the Action Plan has been assigned to County OES. County OES will provide periodic updates to the County Board of Supervisors.

This Action Plan serves as a guide to spending priorities but will be adjusted annually to reflect current needs and financial resources. Some strategies will require outside funding for implementation. If outside funding is not available, then the strategy will be set aside until new sources of funding can be identified.

Imperial County and participating jurisdictions assessed each hazard strategy listed under the prioritized list of goals and collectively prepared a prioritized mitigation Action Plan to reduce the effects of hazards, with emphasis on buildings and infrastructure.

Each of the participating jurisdictions have committed to utilizing the capabilities they have available to implement the mitigation strategies in this plan. Each will bring to bear capabilities in the areas of:

- Planning and Regulatory
- Administrative and Technical
- Fiscal
- Education and Outreach

The table in Section 1.13 provides an overview of the capabilities and resources that the participating jurisdictions have available for hazard mitigation efforts. In addition, Section 3, Participating Jurisdictions provides more detailed information about each

Following are Imperial County and participating jurisdictions' prioritized 2013 Mitigation Action Items.

8.1 Action Plan – Priority 1 Mitigation Strategies

Table 52. Priority 1 Project – Naturally Occurring Biological Threats

Program/Project Description	Update/revise the Flu Pandemic Plan to Incorporate Lessons Learned from COVID-19 Response
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	Department of Public Health
Financing	Pandemic Influenza State General Fund Grant
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Incorporate lessons learned from COVID-19 global crisis • Increase detection, preparedness, and responsiveness to potential biological threats • Protect life and improve survivability • Reduce damage through advance planning and preparations
Related Hazard	Naturally Occurring Biological Threats

Table 53. Priority 1 Project – Earthquake

Program/Project Description	Participate in the Cal OES Statewide Initiative for Earthquake Warning
Costs	County Fire and OES FTEs
Timeline/Schedule	On-going
Responsible Agency	• Imperial County Office of Emergency Services • Imperial County Fire Department
Financing	FTEs
Jurisdictions Affected	All Jurisdictions

Goals Addressed	• Mitigate access issues and improve survivability • Increase effectiveness of emergency services • Protect life and property • Reduce damage through advance planning and preparations
Related Hazard	Earthquake

Table 54. Priority 1 Project – Flooding

Program/Project Description	Drainage Improvements throughout Imperial County
Costs	$5,000,000
Timeline/Schedule	3 – 5 years
Responsible Agency	• Department of Public Works • Imperial Irrigation District
Financing	• FEMA Hazard Mitigation Grant Program (HMGP) • Proposition 84 Funds through the Imperial Integrated Regional Water Management Plan (IRWMP) • General Fund
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Increase capacity of storm drains (West and North End) to reduce possibility of damage and loss due to flooding • Minimize the impact of a flood event • Protect life and property
Related Hazard	Flooding

Table 55. Priority 1 Project – Wildfire

Program/Project Description	Vegetative Management and Cleaning Plan
Costs	FTE from each Jurisdiction
Timeline/Schedule	On-going
Responsible Agency	All Jurisdictions

Financing	Staff time
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Reduce the impact of wildland fire to infrastructures by creating perimeters around homes, structures and critical facilities • To mitigate access issues and improve survivability • Protect life and property
Related Hazard	Wildfire

Table 56. Priority 1 Project – Pest Infestation/Non-Vectors of Human Diseases

Program/Project Description	Increase monitoring of the Quagga Mussel and Hydrilla Plant
Costs	$750,000
Timeline/Schedule	On-going
Responsible Agency	• Imperial Irrigation District • Agricultural Commissioner's Office
Financing	Imperial Irrigation District – Water Department Budget
Jurisdictions Affected	All Jurisdictions
Goals Addressed	Deter possibility of infestation/growth
Related Hazard	Pest Infestation/Non Vectors of Human Diseases

Table 57. Priority 1 Project – Dam Failure

Program/Project Description	Improve Evacuation Planning by Continued Participation in the FEMA IPAWS Program
Costs	FTE from each Jurisdiction
Timeline/Schedule	On-going
Responsible Agency	Imperial County Office of Emergency Services All Jurisdictions

Financing	FTEs
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Improve public notification and evacuation programs • Mitigate access issues and improve survivability • Protect life and property • Reduce damage through advance planning and preparations
Related Hazard	• Dam Failure • Earthquake • Flooding • Wildfire • Hazardous Materials • Terrorism

Table 58. Priority 1 Project – Terrorism

Program/Project Description	Increase Public Education and Awareness
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	• Imperial Irrigation District • Imperial County Office of Emergency Services • Public Health Department
Financing	TBD
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Increase deterrence and prevention measures • Protect life and improve survivability • Reduce damage through advance planning and preparations
Related Hazard	Terrorism

8.2 Action Plan – Priority 2 Mitigation Strategies

Table 59. Priority 2 Project – Earthquake

Program/Project Description	Upgrade/Retrofit Critical Facilities (includes URM)
Costs	TBD
Timeline/Schedule	Ongoing
Responsible Agency	• Planning and Development • All Jurisdictions
Financing	FEMA Hazard Mitigation Grant Program (HMGP)
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• To bring critical facilities up to current building standards • Protect life and improve survivability
Related Hazard	Earthquake

Table 60. Priority 2 Project – Flooding

Program/Project Description	County Roads Improvements
Costs	$3,000,000+
Timeline/Schedule	2 – 10 years
Responsible Agency	Department of Public Works
Financing	FEMA Hazard Mitigation Grant Program (HMGP) Reimbursement from U.S. Bureau of Reclamation
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Mitigate access issues and improve survivability • Protect life and property
Related Hazard	Flooding

Table 61. Priority 2 Project – Extreme Weather

Program/Project Description	Enhancement of Power Infrastructure
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	Imperial Irrigation District
Financing	Imperial Irrigation District – Energy Department Budget
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Mitigate access issues and improve survivability • Protect life and property
Related Hazard	• Extreme Weather • Earthquake • Flooding • Wildfire • Dam Failure

Table 62. Priority 2 Project – Pest Infestation/Non-Vectors of Human Disease

Program/Project Description	Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards
Costs	$490,000; 8-FTEs
Timeline/Schedule	On-going
Responsible Agency	Department of Public Health All Jurisdictions
Financing	• Public Health Emergency Preparedness Grant • Hospital Preparedness Program (HPP) Grant
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Increase detection, preparedness and responsiveness to potential biological threats • Protect life and improve survivability
Related Hazard	Pest Infestation/Non Vectors of Human Diseases

Table 63. Priority 2 Project – Hazardous Materials

Program/Project Description	Enhance Training for all First Responders
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	• Imperial County Office of Emergency Services • All Jurisdictions
Financing	Homeland Security Grant Program (HMGP)
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Minimize the impact of a HazMat incident • Mitigate access issues and improve survivability • Protect life and property • Reduce damage through advance planning and preparations
Related Hazard	Hazardous Materials

Table 64. Priority 2 Project – Terrorism

Program/Project Description	Protection of Hospitals' Central Plant Operations
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	Department of Public Health, working with local hospitals
Financing	Hospital Preparedness Program (HPP) Grant
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Increase deterrence and prevention measures • Mitigate access issues and improve survivability • Protect life and property
Related Hazard	Terrorism

8.3 Action Plan – Priority 3 Mitigation Strategies

Table 65. Priority 3 Project – Earthquake

Program/Project Description	Redundant Communications
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	• Imperial County Office of Emergency Services • Imperial Valley Emergency Communication Authority
Financing	Homeland Security Grant Program (HSGP)
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Mitigate access issues and improve survivability • Protect life and property
Related Hazard	• Earthquake • Flooding • Wildfire • Dam Failure • Hazardous Materials • Terrorism

Table 66. Priority 3 Project – Extreme Weather

Program/Project Description	Drought – Groundwater Storage
Costs	TBD
Timeline/Schedule	TBD
Responsible Agency	Imperial Irrigation District
Financing	TBD
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Protect life and improve survivability • Reduce damage through advance planning and preparations
Related Hazard	Extreme Weather

Table 67. Priority 3 Project – Hazardous Materials

Program/Project Description	Train Individuals with High-Pressure Gas Lines
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	• Imperial County Office of Emergency Services • All Jurisdictions
Financing	TBD
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Educate individuals to prepare for a potential HazMat incident • Protect life and improve survivability • Protect property • Reduce damage through advance planning and preparations
Related Hazard	Hazardous Materials

Table 68. Priority 3 Project – Terrorism

Program/Project Description	Secure Public Facilities and Resources
Costs	TBD
Timeline/Schedule	On-going
Responsible Agency	• Sheriff's Office • Police Department • Imperial County Office of Emergency Services • All Jurisdictions
Financing	TBD
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Increase deterrence and prevention measures • Protect life and improve survivability • Protect property
Related Hazard	Terrorism

8.4 Action Plan – Priority 4 Mitigation Strategies

Table 69. Priority 4 Project – Extreme Weather

Program/Project Description	Storm Water Management Plan
Costs	$60 million
Timeline/Schedule	On-going
Responsible Agency	• Imperial Irrigation District • County Planning Department • City and County Public Works
Financing	Imperial Irrigation District – Water Department Budget
Jurisdictions Affected	All Jurisdictions
Goals Addressed	• Minimize the impact of a flood event • Mitigate access issues and improve survivability • Protect life and property • Reduce damage through advance planning and preparations
Related Hazard	• Extreme Weather • Flooding • Dam Failure

Section 9. Effects of Mitigation Action on Existing and New Buildings and Infrastructure

The tables on the following pages cross references whether the proposed mitigation actions, enumerated in Section 8, reduce the effects of hazards on existing and new buildings and infrastructure that are addressed by the actions. Development and land use changes are minimal throughout the County, within the cities of the County, and for the Imperial Irrigation District and the Office of Education.

Table 70. Imperial County: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

Imperial County	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

Imperial County	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

Imperial County	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 71. City of Brawley: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

City of Brawley	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

City of Brawley	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

City of Brawley	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 72. City of Calexico: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

City of Calexico	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

City of Calexico	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

City of Calexico	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 73. City of Calipatria: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

City of Calipatria	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

City of Calipatria	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

City of Calipatria	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 74. City of El Centro: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

City of El Centro	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

City of El Centro	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

City of El Centro	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 75. City of Holtville: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

City of Holtville	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

City of Holtville	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

City of Holtville	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 76. City of Imperial: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

City of Imperial	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

City of Imperial	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

City of Imperial	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 77. City of Westmorland: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

City of Westmorland	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

City of Westmorland	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

City of Westmorland	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 78. Imperial Irrigation District: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

Imperial Irrigation District	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System	Y	Y	Y	Y	Y	Y	Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)	Y	Y	Y	Y	Y	Y	Y
Earthquake Priority 3: Redundant Communications	Y	Y	Y	Y	Y	Y	Y

Imperial Irrigation District	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							
Priority 1: Drainage Improvements	Y	Y		Y	Y	Y	Y
Priority 2: Road Improvements		Y		Y	Y	Y	Y
Extreme Weather Mitigation							
Priority 2: Enhancement of Power Infrastructure	Y		Y			Y	Y
Priority 3: Drought – Groundwater Storage		Y			Y	Y	Y
Priority 4: Storm Water Management Plan	Y	Y		Y	Y	Y	Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning	Y	Y	Y	Y	Y	Y	Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant		Y			Y	Y	Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards		Y				Y	
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan	Y	Y	Y	Y	Y	Y	Y

Imperial Irrigation District	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders	Y	Y	Y	Y	Y	Y	Y
Priority 3: Train individuals with High-Pressure Gas Lines	Y	Y	Y	Y	Y	Y	Y
Terrorism Mitigation							
Priority 1: Increase Public Education and Awareness	Y	Y	Y	Y	Y	Y	Y
Priority 2: Protection of Hospitals' Central Plant Operations	Y	Y	Y	Y	Y	Y	Y
Priority 3: Secure Public Facilities and Resources	Y	Y	Y	Y	Y	Y	Y

Table 79. Office of Education: How the Mitigation Actions Identified Affect Existing and New Buildings and Infrastructure

Office of Education	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Naturally Occurring Biological Threats							
Priority 1: Revise Flu Pandemic Plan							
Earthquake Mitigation							
Priority 1: Statewide Earthquake Warning System							Y
Priority 2: Upgrade/Retrofit Critical Facilities (Includes URM)							Y
Earthquake Priority 3: Redundant Communications							Y

Office of Education	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Flooding Mitigation							Y
Priority 1: Drainage Improvements							Y
Priority 2: Road Improvements							Y
Extreme Weather Mitigation							Y
Priority 2: Enhancement of Power Infrastructure							Y
Priority 3: Drought – Groundwater Storage							Y
Priority 4: Storm Water Management Plan							Y
Wildfire Mitigation							
Priority 1: Vegetative Management and Cleaning							Y
Pest Infestation/Non Vectors of Human Diseases Mitigation							
Priority 1: Increased Monitoring of the Quagga Mussel and Hydrilla Plant							Y
Priority 2: Work with County Agriculture Department to Ensure Adequate/Increased Testing for Specific Biohazards							
Dam Failure Mitigation							
Priority 1: Develop Evacuation Plan							Y

Office of Education	Existing/New Infrastructure						
	Electrical and Power Infrastructure	Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
Hazardous Materials (HazMat) Mitigation							
Priority 2: Enhance Training for All First Responders							Y
Priority 3: Train individuals with High-Pressure Gas Lines							Y
Terrorism Mitigation							Y
Priority 1: Increase Public Education and Awareness							Y
Priority 2: Protection of Hospitals' Central Plant Operations							Y
Priority 3: Secure Public Facilities and Resources							Y

Section 10. Assets at Risk

List of Jurisdictions' Assets at Risk for All Applicable Hazards

(Including Location and Potential Dollar Losses)

Methodology used to prepare estimates: Assessor's values, replacement costs, insurance coverage, estimated costs based on recent construction procurements and/or local standard construction costs per square foot.
There is no way to make an accurate estimate of the potential limits one hazard may cause. % denotes the approximate damage/loss to the identified asset as a result of each relevant hazard. The method used to establish each % was to logically assess the practical extent of loss or damage to each asset as balanced by the vulnerability of the asset to each hazard.

Table 80. Imperial County Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Government	Heber Fire Station	Imperial County	32.730891	-115.529718	$ 1,500,000	$ 1,000,000	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Heber Branch Library	Imperial County	32.730891	-115.529718	$ 3,500,000	$ 2,000,000	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	County Court House	Imperial County	32.792830	-115.563327	$ 13,616,391	$ 2,891,731	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	County Admin Center	Imperial County	32.792830	-115.563345	$ 10,734,672	$ 3,524,834	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	County Admin Building	Imperial County	32.748112	-115.562864	$ 1,822,170	$ 395,457	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Emergency Services Building	Imperial County	32.829459	-115.578689	$ 1,300,218	$ 1,491,560	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Public Works	Imperial County	32.792232	-115.564418	$ 2,631,280	$ 322,383	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	County Garage	Imperial County	32.791708	-115.568943	$ 1,054,058	$ 156,319	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Calexico Municipal Court	Imperial County	32.668792	-115.493294	$ 1,033,296	$ 56,060	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Air Pollution Control Dept.	Imperial County	32.792296	-115.562589	$ 4,913,961	$ 343,876	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Airport Terminal Building	Imperial County	32.838217	-115.570440	$ 3,590,970	$ 10,745	75%	25%	20%	20%	25%	20%	20%	20%	25%

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Government	Planning & Development Bldg	Imperial County	32.792830	-115.561400	$ 756,155	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Heber Essential Building (OES/Fire Protection)	Imperial County	32.729094	-115.534414	$ 1,980,657	$ 1,029,724	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	North County Administration	Imperial County	32.978630	-115.538998	$ 4,946,438	$ 3,559,034	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Horton Knox Office Bldg.	Imperial County	32.793860	-115.562589	$ 1,306,637	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Agricultural Commissioner	Imperial County	32.793860	-115.562055	$ 1,808,460	$ 301,980	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Juvenile Hall Building	Imperial County	32.748112	-115.562864	$ 6,375,296	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	CA Youth Authority	Imperial County	32.748075	-115.562842	$ 4,661,005	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	County Jail	Imperial County	32.748195	-115.562866	$ 21,220,708	$ 3,055,740	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Med. Security Facility	Imperial County	32.748277	-115.562867	$ 7,037,058	$ 413,726	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Betty Jo McNeece Facility	Imperial County	32.792000	-115.563051	$ 2,095,281	$ 64,476	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	County Center #2	Imperial County	32.747740	-115.560446	$ 1,520,843	$ 459,297	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Behavioral Health Building	Imperial County	32.793883	-115.561410	$ 3,278,879	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	Behavioral Health Facility	Imperial County	32.791719	-115.567645	$ 1,494,475	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	One Stop Employment Services Building	Imperial County	32.667752	-115.493509	$ 2,714,984	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Government	General Dynamics Building	Imperial County	32.825590	-115.574310	$ 4,311,155	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Water Treatment Plant	Gateway CSA Water Treatment Plant	Imperial County	32.82193	-115.73135	$ 1,826,517	NA	100%	25%	20%	20%	25%	20%	20%	20%	25%
Wastewater Treatment Plant	Gateway CSA Wastewater Treatment Plant	Imperial County	32.41020	-115.22180	$ 313,515	NA	100%	25%	20%	20%	25%	20%	20%	20%	25%
Wastewater Treatment Plant	Poe Colonia Wastewater Treatment Plant	Imperial County	32.98234	-115.58208	$ 49,747	NA	100%	25%	20%	20%	25%	20%	20%	20%	25%
Wastewater Pump Station	Country Club Wastewater Pump Station	Imperial County	32.48713	-115.25274	$ 49,747	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Bridge	Coachella Bridge Number One	Imperial County	32.843101	-115.101084	$ 300,000	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%
Bridge	Coachella Bridge Number Two	Imperial County	32.843101	-115.101084	$ 300,000	NA	75%	25%	20%	20%	25%	20%	20%	20%	25%

Table 81. Brawley Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Emergency	Police Department	Brawley	32.979052	-115.536479	$ 3,114,296	$ 500,000	75%	20%	20%	20%	25%	20%	20%	20%	25%
Emergency	Fire Station #1	Brawley	32.979104	-115.530203	$ 2,242,641	$ 500,000	75%	20%	20%	20%	25%	20%	20%	20%	25%
Emergency	Fire Station #2	Brawley	32.989254	-115.517043	$ 2,500,000	$ 500,000	75%	20%	20%	20%	25%	20%	20%	20%	25%
Emergency	EOC	Brawley	32.979052	-115.536479	$ 1,000,000	$ 500,000	75%	20%	20%	20%	25%	20%	20%	20%	25%
Government	Lions Center	Brawley	32.984728	-115.538825	$ 2,586,697	$ 500,000	75%	20%	20%	20%	25%	20%	20%	20%	25%
Government	Brawley Pool	Brawley	32.984728	-115.538825	$ 533,983	$ 80,000	75%	20%	20%	20%	25%	20%	20%	20%	25%

Table 82. Calexico Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Emergency	Police/Fire Station	Calexico	32.669833	-115.493202	$ 2,026,854	$ 906,584	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Fire Station #2	Calexico	32.674038	-115.516239	$ 572,668	$ 14,520	75%	20%	20%	20%	20%	20%	20%	20%	20%
Airport	Airport Terminal & Hangars	Calexico	32.666006	-115.505238	$ 1,488,100	$ 8,762	75%	20%	20%	20%	20%	20%	20%	20%	20%
Water Plant	Water Treatment Plant	Calexico	32.671922	-115.505172	$ 542,992	$ 3,069,285	75%	20%	20%	20%	20%	20%	20%	20%	20%
Sewer Plant	Sewer Treatment Plant	Calexico	32.664459	-115.568652	$ 171,220	$ 1,534,645	75%	20%	20%	20%	20%	20%	20%	20%	20%
Reservoir	Eastside Reservoir	Calexico	32.693918	-115.448526	$ 7,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Calexico 10	Calexico	32.696426	-115.501216	$ 1,700,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	City Hall	Calexico	32.671191	-115.493517	$ 3,421,369	$ 2,494,229	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	City Hall Mexican Consulate	Calexico	32.667559	-115.493326	$ 672,022	$ 204,266	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Library	Calexico	32,674734	-115.488275	$ 1,884,393	$ 174,836	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Carnegie Technology Library	Calexico	32.669483	-115.492811	$ 527,665	$ 10,737	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Community - Senior Center	Calexico	32.672382	-115.486743	$ 2,039,108	$ 79,803	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Day Care Center	Calexico	32.671887	-115.487084	$ 1,186,062	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Street Department/City Shops	Calexico	32.672438	-115.505206	$ 226,353	$ 125,963	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Office Facility	Calexico	32.672471	-115.505209	$ 27,434	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Utility Service Office (Modular)	Calexico	32.671922	-115.505172	$ 164,039	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Animal Shelter	Calexico	32.672501	-115.505249	$ 43,886	$ 614	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	UFW Building	Calexico	32.667036	-115.495735	$ 696,243	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Armory	Calexico	32.677147	-115.501848	$ 222,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Cultural Arts Center	Calexico	32.669226	-115.494891	NA	$ 10,000	75%	20%	20%	20%	20%	20%	20%	20%	20%

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Government	Border Park Restroom/Police Substation	Calexico	32.665716	-115.497526	$ 132,438	$ 3,069	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Rodriguez Park Facility	Calexico	32.677216	-115.505248	$ 1,091,272	$ 4,604	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Heber Park Facility	Calexico	32.670865	-115.492975	$ 132,434	$ 7,674	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Legion Field Facility	Calexico	32.672109	-115.505213	$ 245,957	$ 6,138	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Nosotros Field Facility	Calexico	32.673049	-115.517979	$ 57,139	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Rockwood Plaza	Calexico	32.670865	-115.492975	$ 155,839	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Water Tower Modular Rest Rooms	Calexico	32.665614	-115.494815	$ 49,757	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%

Table 83. Calipatria Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Emergency	Police Department	Calipatria	33.126087	-115.515201	$ 301,600	$ 52,000	75%	25%	20%	20%	20%	20%	20%	20%	20%
Emergency	City Hall and Fire Department	Calipatria	33.127950	-115.516456	$ 1,686,880	$ 192,400	75%	25%	20%	20%	20%	20%	20%	20%	20%
Government	Library	Calipatria	33.125555	-115.517209	$ 316,160	$ 52,000	75%	25%	20%	20%	20%	20%	20%	20%	20%
Government	Library Gazebo	Calipatria	33.125555	-115.517209	$ 31,200	NA	75%	25%	20%	20%	20%	20%	20%	20%	20%
Public Works	Public Works Shop and Yard	Calipatria	33.125596	-115.514154	$ 90,480	NA	75%	25%	20%	20%	20%	20%	20%	20%	20%
Public Works	Storage Building	Calipatria	33.118685	-115.527710	$ 204,000	$ 29,120	75%	25%	20%	20%	20%	20%	20%	20%	20%
Sewer	Sewer Plant	Calipatria	33.149380	-115.549315	$ 462,800	$ 41,600	75%	25%	20%	20%	20%	20%	20%	20%	20%
Government	Office Building	Calipatria	33.126648	-115.517861	$ 869,856	$ 50,000	75%	25%	20%	20%	20%	20%	20%	20%	20%
Government	Carmichael Center	Calipatria	33.126290	-115.517512	$ 74,048	$ 343,200	75%	25%	20%	20%	20%	20%	20%	20%	20%
Government	Road Storage	Calipatria	33.118685	-115.527710	$ 286,000	NA	75%	25%	20%	20%	20%	20%	20%	20%	20%
Government	Clock Tower	Calipatria	33.125688	-115.514149	$ 52,000	NA	75%	25%	20%	20%	20%	20%	20%	20%	20%
Park	Little League Building/Park Shade/Flag Pole	Calipatria	33.126648	-115.517861	$ 114,920	$ 28,600	75%	25%	20%	20%	20%	20%	20%	20%	20%

Table 84. El Centro Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Government	City Hall	El Centro	32.792449	-115.567145	$20,000,000	$2,000,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Fire Station #1	El Centro	32.791477	-115.560995	$8,000,000	$1,500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Fire Station #2	El Centro	32.785116	-115.535828	$4,500,000	$1,500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Fire Station #3	El Centro	32.810653	-115.574926	$10,000,000	$1,500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Police Station	El Centro	32.793323	-115.564707	$15,000,000	$1,500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Adult Center- EOC	El Centro	32.789982	-115.543997	$4,000,000	$500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Library	Library	El Centro	32.802842	-115.571607	$18,000,000	$2,000,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Old Post Office Building	El Centro	32.791059	-115.555139	$20,000,000	$500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Community Center	El Centro	32.790440	-115.543994	$8,000,000	$500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Water Treatm.	Water Treatment Plant	El Centro	32.766744	-115.561418	$30,000,000	$3,000,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Sewer Treatm.	Sewer Treatment Plant	El Centro	32.796729	-115.578671	$30,000,000	$3,000,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Maintenance Shop	El Centro	32.789055	-115.550799	$6,000,000	$1,500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Sport Complex	MLK Pavilion Sport Complex	El Centro	32.796222	-115.560908	$5,000,000	$100,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Bucklin Park Facilities	El Centro	32.780500	-115.563866	$1,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Debbie Pitman Park Facilities	El Centro	32.788090	-115.577858	$1,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Swarthout Park Facilities	El Centro	32.799119	-115.55059	$1,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	FrazierPark Facilities	El Centro	32.803171	-115.557458	$1,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Economic Development	El Centro	32.792610	-115.566721	$2,500,000	$500,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Conrad Harrison Youth Center	El Centro	32.796262	-115.560073	$3,000,000	$200,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Sidewinder Skate Park	El Centro	32.796169	-115.555667	$4,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Park	Aquatic Center	El Centro	32.796196	-115.55519	$15,000,000	$1,000,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Valley Center Point	El Centro	32.802078	-115.571767	$3,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Business Incubator	El Centro	32.786275	-115.527345	$2,500,000	$200,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Carlos Aguilar Park Facilities	El Centro	32.804925	-115.572253	$1,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Starkfield Facilities	El Centro	32.784199	-115.551767	$100,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Town Square	El Centro	32.792595	-115.558970	$2,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Adams Park	El Centro	32.796206	-115.558844	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Countryside Park	El Centro	32.761777	-115.544836	$100,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Eight& Vine (water tower)	El Centro	32.784741	-115.561579	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Farmers park	El Centro	32.772892	-115.57396	$150,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	First Responders Park	El Centro	32.809462	-115.574456	$1,500,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Gomez Park	El Centro	32.784906	-115.538124	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Lepper Park	El Centro	32.791559	-115.585203	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	McGee Park	El Centro	32.790267	-115.542564	$100,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Plank Park	El Centro	32.784304	-115.591257	$300,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Memorial park (legacy)	El Centro	32.758134	-115.546005	$150,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Bus Station	Bus Tansfer Terminal	El Centro	32.791965	-115.558755	$6,000,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Parking	Public Parking Lot #6	El Centro	32.794139	-115.559321	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Parking	Public Parking Lot #5	El Centro	32.793598	-115.555794	$100,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Parking	Public Parking Lot #4	El Centro	32.793682	-115.554333	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Parking	Public Parking Lot #8	El Centro	32.792114	-115.557297	$100,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Parking	Public Parking Lot #3	El Centro	32.792152	-115.556391	$100,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Parking	Public Parking Lot #2	El Centro	32.792089	-115.555535	$100,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Parking	Public Parking Lot 5th & Olive	El Centro	32.790485	-115.554218	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Parking	Public Parking Lot 7th & Main	El Centro	32.793067	-115.559703	NA	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%

Table 85. Holtville Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Emergency	Police Station	Holtville	32.807964	-115.380768	$ 265,000	$ 60,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Fire Station Modular Office	Holtville	32.811349	-115.379309	$ 110,000	$ 30,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Fire/Police Administration Offices - Leased Building	Holtville	32.812572	-115.379312	NA	$ 80,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Emergency	Fire Engine Garage	Holtville	32.811349	-115.379309	$ 425,000	$ 30,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Chamber Building Visitors Center	Holtville	32.810978	-115.4380179	$ 110,000	$ 20,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	City Hall	Holtville	32.810976	-115.380420	$ 1,700,000	$ 300,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Library	Holtville	32.813808	-115.379849	$ 500,000	$ 125,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Sewer Treatment	Sewer Treatment Plant	Holtville	32.825717	-115.420034	$ 2,450,000	$ 650,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Water Treatment	Water Treatment Plant	Holtville	32.809068	-115.382628	$ 4,000,000	$ 1,100,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Reservoir	2.4 Million Gallon Reservoir	Holtville	32.809011	-115.380050	$ 1,525,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Public Works Yard Shop	Holtville	32.809064	-115.380203	$ 200,000	$ 70,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Public Works Repair Garage	Holtville	32.809064	-115.380203	$ 75,000	$ 50,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Public Works Yard Harding Filter Building	Holtville	32.809064	-115.380203	$ 200,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Holt Park Restroom	Holtville	32.811014	-115.371580	$ 120,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Mack Park Restroom	Holtville	32.814767	-115.367853	$ 50,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Old Fire Station	Holtville	32.810976	-115.389420	$ 500,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Pool – Bath House	Holtville	32.813087	-115.380136	$ 140,000	$ 14,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Pool – Youth Rec Center	Holtville	32.813087	-115.380136	$ 90,000	$ 5,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	Open Deck Timber Trestle	Holtville	32.811114	-115.345858	$ 1,525,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%

Table 86. City of Imperial Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Government	Imperial Public Library	City of Imperial	32.848188	-115.571457	$ 387,595	$ 261,913	75%	20%	20%	20%	20%	20%	20%	20%	20%
Government	City Hall	City of Imperial	32.844191	-115.569956	$ 7,530,991	$ 50,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Water Treatment	Water Treatment Plant	City of Imperial	32.840414	-115.571490	$ 20,000,000	$ 50,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Water Treatment	Water Treatment Plant	City of Imperial	32.853707	-115.569957	$ 21,000,000	$ 50,000	75%	20%	20%	20%	20%	20%	20%	20%	20%
Sports Complex	Irving Sports Complex	City of Imperial	37.664959	-122.463484	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Building	Apartments	City of Imperial	32.845441	-115.570078	$ 1,018,916	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Eager Park	City of Imperial	32.849514	-115.571156	$ 505,528	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Victoria Park	City of Imperial	32.821989	-115.550997	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Sky Ranch Park	City of Imperial	32.830245	-115.592503	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Joshua Park	City of Imperial	32.822077	-115.588400	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Evans Park	City of Imperial	32.844393	-115.565075	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Freddie Whit Park	City of Imperial	32.843342	-115.573647	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Sunset Ranch Park	City of Imperial	32.857930	-115.568172	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Savanna Park	City of Imperial	32.847553	-115.569439	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Paseo Del Sol Park-West	City of Imperial	32.828286	-115.555024	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Park	Paseo Del Sol Park-East	City of Imperial	32.828286	-115.555024	$ 40,000	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Lift Stations	15 Lift Stations- Various City Locations	City of Imperial	NA	NA	$ 2,006,216	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Storm Water	6 Storm Water Stations- Various City Locations	City of Imperial	NA	NA	$ 305,404	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%
Streetscape	Bus Stops/Décor Street Lights/Décor Planters/ Stop Lights/Public Art/ Banners	City of Imperial	NA	NA	$ 1,005,725	NA	75%	20%	20%	20%	20%	20%	20%	20%	20%

Table 87. Westmorland Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Likely Repair Cost	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Government	City Hall	Westmorland	33.034408	-115.621590	$ 630,000	$ 110,000	75%	20%	20%	20%	75%	25%	20%	20%	20%
Government	IID Building	Westmorland	33.035285	-115.621205	$ 260,000	NA	75%	20%	20%	20%	75%	25%	20%	20%	20%
Emergency	Fire Station	Westmorland	33.037364	-115.621593	$ 760,000	$ 65,000	75%	20%	20%	20%	75%	25%	20%	20%	20%
Government	Office - Lab	Westmorland	33.036978	-115.630153	$ 38,638	$ 5,000	75%	20%	20%	20%	75%	25%	20%	20%	20%
Government	Office Building	Westmorland	33.037283	-115.630152	$ 31,500	$ 155,000	75%	20%	20%	20%	75%	25%	20%	20%	20%
Building	Senior Center	Westmorland	33.035900	-115.624326	$ 125,000	$ 20,000	75%	20%	20%	20%	75%	25%	20%	20%	20%
Building	Youth Center	Westmorland	33.035111	-115.619846	$ 975,000	$ 30,000	75%	20%	20%	20%	75%	25%	20%	20%	20%
Waste Water Treatment	Waste Water Treatment Plant	Westmorland	33.037283	-115.630152	$ 1,091,914	$ 1,404,770	75%	20%	20%	20%	75%	25%	20%	20%	20%
Water Treatment	Water Treatment Plant/ Shop	Westmorland	33.033701	-115.623858	$ 806,351	$ 773,190	75%	20%	20%	20%	75%	25%	20%	20%	20%
Pool	Pool and Restrooms	Westmorland	33.035095	-115.623087	$ 200,000	$ 30,000	75%	20%	20%	20%	75%	25%	20%	20%	20%

Table 88. Imperial Irrigation District (IID) Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Levee	Reservation Levee	IID/Yuma East	32.7419444	-114.596389	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Reservoir	Bear Canyon Tank	IID/Picacho SW	33.0166667	-114.669167	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Reservoir	Imperial Reservoir	IID/Imperial Co.	32.8833333	-114.466944	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Reservoir	Senator Wash Reservoir North	IID/Imperial Co.	32.9166667	-114.483333	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Reservoir	Senator Wash Reservoir East	IID/Imperial Co.	32.909782	-114.478357°	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Reservoir	Senator Wash Reservoir South	IID/Imperial Co.	32.905	-114.476667	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Reservoir	Tadpole Tank	IID/Wiley Well	33.4036111	-114.9075	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	All American Canal (AAC)	IID/Imperial Co.	32.875379°	-114.474396°	S 23M per mile**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	Central Main Canal	IID/Imperial Co.	32.686698°	-115.455453°	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	Coachella Canal	IID/Imperial Co.	32.712955°	-114.943215°	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	Highline Canal	IID/Imperial Co.	32.696774°	-115.282619°	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	Westside Main Canal	IID/Imperial Co.	32.653372°	-115.662274°	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	All Lateral Canals	IID/Imperial Co.	Various	Various	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	All Heading Canals	IID/Imperial Co.	Various	Various	S 500K per site**	NA	75%	25%	20%	0%	25%	35%	20%	10%	25%
Utility	All American Canal Div. (Housing)	IID/Imperial Co.	32.52142	-115.28891	$ 2,726,066	$ 3,115,504	75%	25%	20%	10%	25%	0%	20%	10%	25%
Utility	Winterhaven Trouble Shooter Office	IID/Imperial Co.	32.44298	-115.38242	$ 412,456	$ 471,378	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1030 - Barrett	IID/Bard	32.51976	-114.294	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S2040 - Desert Shores	IID/Desert Shores	33.24724	-116.03031	$ 25,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1220 – Heber	IID/Heber	32.43731	-115.31427	$ 126,903	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5050 - Heber Geo.	IID/Heber	32.42905	-115.31019	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5070 - Second Imperial Geo.	IID/Heber	32.42861	-115.3206	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1045 - Black Mtn.	IID/Imperial Co.	32.03329	-114.49728	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Utility	S1210 - Goldfields	IID/Imperial Valley	32.03215	-114.59031	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1215 - Gold Mine Tap	IID/Imperial Valley	33.02822	-114.53033	$ 1,666,877	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1410 - U.S Gypsum	IID/Plaster City	32.47421	-115.5124	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1125 - Dixieland	IID/Seeley	32.47642	-115.46736	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1130 - Dixieland Prison	IID/Seeley	32.49582	-115.47335	$ 2,353,511	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S3005 - Imperial Valley	IID/Seeley	32.42983	-115.43077	$ 3,848,460	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1185 - Navy Base	IID/Seeley	32.48668	-115.40829	$ 141,926	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1330 - Plaster City	IID/Seeley	32.47457	-115.50965	$ 1,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1332 - Plaster City (new)	IID/Seeley	32.47512	-115.41498	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1015 – Araz	IID/Winterhaven	32.44298	-114.42855	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1025 – Bard	IID/Winterhaven	32.46903	-114.34468	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1255 - Imperial Dam	IID/Winterhaven	32.52847	-114.28411	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1295 - No Man's Land	IID/Winterhaven	32.4517	-114.35404	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S4020 - Pilot Knob Hydro	IID/Winterhaven	32.44199	-114.42856	$ 25,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1340 - Quechan Farm #1	IID/Winterhaven	32.44763	-114.36793	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1440 - Winterhaven	IID/Winterhaven	32.44323	-114.38007	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1445 - Yucca	IID/Winterhaven	32.43178	-114.42621	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1443 - Winterhaven Pole Yard	IID/Winterhaven	32.44298	-114.38238	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Mnt. Signal Wash	IID/Imperial Co.	32.43545	-115.44005	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Pinto Wash #1	IID/Imperial Co.	32.44644	-115.44945	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Pinto Wash #2	IID/Imperial Co.	32.44703	-115.45102	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Pinto Wash #3	IID/Imperial Co.	32.45384	-115.45164	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Yuha Wash	IID/Imperial Co.	32.45798	-115.45705	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Dunaway Wash #1	IID/Imperial Co.	32.46978	-115.46363	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Dunaway Wash #2	IID/Imperial Co.	32.47109	-115.46383	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Utility	Dunaway Wash #3	IID/Imperial Co.	32.47253	-115.46359	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Coyote Wash	IID/Imperial Co.	32.49829	-115.45335	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Fillaree Wash	IID/Imperial Co.	32.51451	-115.47829	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Fillaree Wash East	IID/Imperial Co.	32.51276	-115.46186	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Superstition Lake Bed	IID/Imperial Co.	32.40192	-115.43183	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Power Lines	IID/Imperial Co.	32.4057	-115.42232	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Hwy 98	IID/Imperial Co.	32.40827	-115.40906	$ 200,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Imperial Comm. Microwave Site	IID/Imperial Co.	32.50883	-115.33917	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Black Mt. Comm. Microwave Site	IID/Imperial Co.	33.03167	-114.49567	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Potholes Comm. Microwave Site	IID/Imperial Valley	32.5	-114.31033	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Pilot Knob Comm. Microwave Site	IID/Imperial Valley	32.44633	-114.428	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Drop # 1 Comm. Microwave Site	IID/Imperial Valley	32.42633	-114.56533	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	I.V. Sub. Comm. Microwave Tower	IID/Seeley	32.43017	-115.4305	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Imperial Dam Comm. Microw Tower	IID/Winterhaven	32.53033	-114.282	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	A & D Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	A Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	A3 Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	AW Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	AX Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	B Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	BD Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	BH Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	BO Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	BP Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Utility	BV Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	C Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CA Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CD Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CE Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CI Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CL Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CM Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CN Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CS Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CU Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	CW Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	D Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	DP Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	DS Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	DU Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	DV Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	E Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	ED Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	EO Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	F Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	G Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	GF Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	H Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	HL - 1 Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	HL - 4 Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	HX Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Utility	J Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	K Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	KM Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	KN Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	KS Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	L Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	LB Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	LC Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	LM Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	LU Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	LW Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	M Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	MR Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	MW -1 Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	MW -2 Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	MW -3 Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	MW -4 Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	N Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	P Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	PDP Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	PN Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	PW Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	PX Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	R Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	RBE Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	RC Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	RW Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Utility	T Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	U Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	USBR - A Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	VXE Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	WAPA Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Y Line	IID/Imperial Co.	NA	NA	$ 500K per site**	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Northend Division	IID/Brawley	32.02500	-115.32571	$ 5,194,441	$ 5,936,504	75%	10%	20%	10%	0%	10%	10%	25%	25%
Utility	Environmental Compliance Office	IID/Brawley	32.58656	-115.31827	$ 4,104,985	$ 4,691,308	75%	10%	20%	10%	0%	10%	10%	25%	25%
Utility	S1005 - Alamorio	IID/Brawley	32.57193	-115.25402	$ 17,369	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Beef Plant	IID/Brawley	32.59943	-115.31114	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1065 - Brawley	IID/Brawley	32.58207	-115.32096	$ 5,985,032	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1070 - Brawley Diesel	IID/Brawley	32.58111	-115.32092	$ 715,250	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1095 - Casey Rd. Gin	IID/Brawley	32.58406	-115.25512	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1305 - Orita Feed	IID/Brawley	32.48653	-115.24316	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1310 - Panno	IID/Brawley	32.57807	-115.33595	$ 88,487	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1313 - Parkview	IID/Brawley	32.59207	-115.32612	$ 125,576	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1355 - Rockwood	IID/Brawley	32.5732	-115.32136	$ 18,003,300	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S4045 - Rockwood Gas Turbine	IID/Brawley	32.57316	-115.3217	$ 12,002,200	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5080 - Western Power #1	IID/Brawley	32.54405	-115.30598	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5085 - Western Power #2	IID/Brawley	32.54253	-115.30598	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Brawley Diesel Comm. Microwave	IID/Brawley	32.14567	-115.30069	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Calexico Division	IID/Calexico	32.40066	-115.29939	$ 410,295	$ 468,908	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Western Division	IID/Calexico	32.41278	-115.27905	$ 561,865	$ 642,132	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	S1055 - Border	IID/Calexico	32.94	-115.29251	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1060 - Bravo	IID/Calexico	32.40182	-115.26172	$ 2,983,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1080 - Calexico	IID/Calexico	32.40126	-115.30003	$ 388,019	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1205 - Gateway	IID/Calexico	32.40547	-115.22411	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%

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Utility	S1315 - Perry	IID/Calexico	32.41423	-115.2946	$ 2,521,668	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1335 - Pruett	IID/Calexico	32.4115	-115.30492	$ 211,760	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Perry Substation Comm. Microwave	IID/Calexico	32.41233	-115.289	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Western Comm. Microwave Tower	IID/Calexico	32.41267	-115.27817	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1050 - Bombay	IID/Niland	33.23112	-115.41334	$ 652,330	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1085 - Calipatria	IID/Calipatria	33.07587	-115.30578	$ 988,726	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1115 - Crummer Rd.	IID/Calipatria	33.09397	-115.3841	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5030 - Elmore Geo.	IID/Calipatria	33.10697	-115.36266	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5010 - Hoch Geo.	IID/Calipatria	33.29859	-115.36905	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5055 - Leathers Geo	IID/Calipatria	33.10709	-115.33959	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1265 - Lindsey Rd.	IID/Calipatria	33.08895	-115.37352	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1280 - Midway	IID/Calipatria	33.11493	-115.23067	$ 11,930,180	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Niland Substation Comm. Microway	IID/Niland	33.14567	-115.30083	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1285 - Inland	IID/Calipatria	33.14515	-115.30098	$ 3,921,258	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5020 - Salton City #1 Geo.	IID/Calipatria	33.09495	-115.38833	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5025 - Salton City #2 Geo.	IID/Calipatria	33.09419	-115.38789	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5015 - Salton City #3 Geo.	IID/Calipatria	33.09407	-115.38410	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5023 - Salton City #4 Geo.	IID/Calipatria	33.09466	-115.38408	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5027 - Salton City #5 Geo.	IID/Calipatria	33.09214	-115.38383	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5075 Vulcan Geo.	IID/Calipatria	33.09729	-115.37058	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1090 - Calipatria Prison	IID/Calipatria	33.10123	-115.29522	$ 988,726	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Midway Substation Comm. Microwv	IID/Calipatria	33.11508	-115.26068	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Customer Operations	IID/El Centro	32.47526	-115.34445	$ 3,319,222	$ 1,758,963	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	El Centro Steam Plant	IID/El Centro	32.48166	-115.32354	$ 528,594,940	$ 15,137,118	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Fish Farm	IID/El Centro	32.47899	-115.32593	$ 1,015,053	$ 101,505	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Human Resources El Centro Div	IID/El Centro	32.47614	-115.34036	$ 5,701,280	$ 6,841,535	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Southend Division	IID/El Centro	32.44785	-115.34824	$ 3,321,491	$ 3,795,990	75%	25%	20%	10%	25%	0%	20%	30%	25%

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Utility	Southend Trouble Shooters	IID/El Centro	32.47302	-115.32979	$ 1,761,753	$ 2,013,432	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	System Operating Center "SOC"	IID/El Centro	32.48001	-115.32162	$ 3,875,062	$ 6,642,963	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Executive Office	IID/El Centro	32.47655	-115.34099	$ 2,443,406	$ 3,257,874	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Valley Plaza	IID/El Centro	32.47445	-115.34349	$ 1,375,477	$ 1,571,974	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Valley Plaza	IID/El Centro	32.47474	-115.34408	$ 1,592,477	$ 1,819,974	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Valley Plaza (Environmental Office)	IID/El Centro	32.47435	-115.34401	$ 1,561,791	$ 1,784,904	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Commercial (Corner Bld.)	IID/El Centro	32.47701	-115.32945	$ 486,261	$ 529,522	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Commercial (Green Bld.)	IID/El Centro	32.47700	-115.3297	$ 486,261	$ 529,522	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1100 - Central	IID/El Centro	32.4909	-115.34694	$ 1,483,089	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1110 - Clark	IID/El Centro	32.763655	-115.565364	$ 2,982,546	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1120 - Dahlia	IID/El Centro	32.46882	-115.34691	$ 2,982,546	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S4015 - El Centro Steam Plant Sub	IID/El Centro	32.48224	-115.32409	$ 50,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1190 - El Centro Switch Stn.	IID/El Centro	32.48147	-115.32147	$ 19,961,636	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1200 - Euclid	IID/El Centro	32.47966	-115.34731	$ 1,570,075	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1040 - Gios Mobile Home Park	IID/El Centro	32.4532	-115.34707	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1235 - Holtville	IID/El Centro	32.48763	-115.23289	$ 4,175,564	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1250 - Imperial	IID/El Centro	32.51347	-115.33828	$ 5,519,645	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Imperial Valley Mall Sub.	IID/El Centro	32.45543	-115.3207	$ 7,049,900	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1375 - Seeley	IID/El Centro	32.47493	-115.41684	$ 1,179	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1385 - Silsbee	IID/El Centro	32.45180	-115.38268	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1395 - System Operating Center	IID/El Centro	32.47991	-115.32163	$ 25,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1405 - Terminal Station	IID/El Centro	32.47774	-115.32928	$ 2,982,546	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1415 - Valley	IID/El Centro	32.46021	-115.32315	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1020 - Aten	IID/El Centro	32.4922	-115.30588	$ 25,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S.O.C Communication Microwave	IID/El Centro	32.47986	-115.32196	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Holtville Office	IID/Holtville	32.48731	-115.22876	$ 889,910	$ 1,017,040	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	S1105 - Chestnut Cooling	IID/Holtville	32.48599	-115.2244	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1175 - East Mesa II	IID/Holtville	32.47214	-115.14923	$ 955,593	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1180 East Mesa III	IID/Holtville	32.46486	-115.15872	$ 955,593	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5040 - Gem 2 Geo.	IID/Holtville	32.4653	-115.15805	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%

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Utility	S5045 - Gem 3 Geo.	IID/Holtville	32.46488	-115.15771	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1225 - Highline	IID/Holtville	32.46139	-115.16371	$ 5,966,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S5060 - Ormesa I Geo.	IID/Holtville	32.48979	-115.15425	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1425 - Verde	IID/Holtville	32.4337	-115.20255	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1430 - Walnut Ave. Cooling	IID/Holtville	32.48376	-115.22644	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1170 East Mesa I	IID/Holtville	32.48978	-115.1543	$ 210,263	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Drop # 4 Comm. Microwave Site	IID/Holtville	32.42483	-115.12967	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Holtville Substat Comm. Tower	IID/Holtville	32.812657°	-115.388160°	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Highline Substat Comm. Building	IID/Holtville	32.812654°	-115.388223°	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Risk Management	IID/City of Imperial	32.50798	-115.34195	$ 647,504	$ 740,004	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Operating Headquarters	IID/City of Imperial	32.51011	-115.33987	$ 29,758,057	$ 34,009,208	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Public Programs Office	IID/City of Imperial	32.40843	-115.33925	$ 1,567,356	$ 1,791,264	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Purchasing	IID/City of Imperial	32.50853	-115.34073	$ 1,941,443	$ 2,218,792	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	Records Management Office	IID/City of Imperial	32.50869	-115.3411	$ 3,735,526	$ 4,269,172	75%	25%	20%	10%	25%	0%	20%	30%	25%
Utility	S1230 - Holly Sugar	IID/City of Imperial	32.54726	-115.3409	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1400 - Superstition	IID/City of Imperial	32.52829	-114.4714	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Superstition Mtn Comm Microwv	IID/City of Imperial	32.57483	-115.5035	$ 182,919	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1010 - Anza	IID/Westmorland	33.07546	-115.58935	$ 202,286	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1360 - Salton City	IID/Westmorland	33.17125	-115.58186	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1370 - San Felipe	IID/Westmorland	33.06015	-116.03691	$ 113,412	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	S1435 - Westmorland	IID/Westmorland	33.02287	-115.3712	$ 5,000,000	NA	75%	25%	20%	10%	25%	0%	20%	0%	25%
Utility	Drop 1	IID/Imperial Co.	32.711580	-114.942777	$ 17,896,000	$1,789,000	75%	25%	20%	0%	100%	50%	25%	50%	75%
Utility	Drop 2	IID/Imperial Co.	32.705428	-115.030932	$ 35,791,000	3,579,000	75%	25%	20%	0%	100%	50%	25%	50%	75%
Utility	Drop 3	IID/Imperial Co.	32.705437	-115.126100	$ 17,896,000	$1,790,000	75%	25%	20%	0%	100%	50%	25%	50%	75%
Utility	Drop 4	IID/Imperial Co.	32.705328	-115.218943	$ 47,721,000	$4,773,000	75%	25%	20%	0%	100%	50%	25%	50%	75%
Utility	Drop 5	IID/Calexico	32.67314	-115.39203	$ 11,931,000	$1,194,000	75%	25%	20%	0%	100%	50%	25%	50%	75%
Utility	East Highline Drop	IID/Holtville	32.699587	-115.282601	$ 5,966,000	$597,000	75%	25%	20%	0%	100%	50%	25%	50%	75%
Utility	Double Weir	IID/Calexico	32.701210	-115.495457	$ 4,800,100	$480,000	75%	25%	20%	0%	100%	50%	25%	50%	75%
Utility	Imperial Dam Housing	IID/Winterhaven	32.867854	-114.480253	$ 1,760,000	$275,000	75%	0%	10%	35%	100%	50%	0%	25%	25%
Utility	Niland Inc. Switch Sub.	IID/Niland	33.242146°	-115.501049°	$ 10,897,761	$1,089,000	75%	0%	20%	0%	0%	0%	10%	0%	50%
Utility	Niland Generation	IID/Niland	33.243009	-115.499689	$ 113,870,000	$11,387,000	75%	20%	20%	0%	0%	50%	25%	50%	50%

Type	Name	Jurisdiction	Latitude	Longitude	Structure Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human	HazMat Incidents	Natural Bio Threats	Terrorism
Utility	All American Canal (concrete lined)	IID/Imperial Co.	S 32.718162 E 32.705490	S 114.752206 E 115.125205	$ 325,000,000	N/A	75%	25%	0%	0%	100%	35%	75%	50%	50%
Utility	New River Siphon	IID/Calexico	32.670799	-115.520799	$ 78,690,000	N/A	75%	25%	0%	25%	25%	35%	75%	5%	100%
Utility	Imperial Dam	IID/Winterhaven	32.883554	-114.468575	$ 260,000,000	$5,000,000	75%	10%	20%	25%	100%	50%	25%	50%	75%
Utility	Imperial Dam Control House	IID/Winterhaven	32.884076	-114.470095	$ 467,684	$46,000	75%	0%	20%	5%	100%	50%	25%	50%	75%

* Road and Bridge damage estimates are based on a per site cost figure, with each site covering an estimate road length of 2 to 300 feet. Each asset may experience multiple damaged sites from one hazard event, or multiple assets may experience one event each. There is no way to make an accurate estimate of the potential limits one hazard may cause.

** Canal, Levee, Dam and Reservoir Damage estimates are based on a per site cost figure, with each site covering an estimate canal length of 2 to 300 feet. Each asset may experience multiple damaged sites from one hazard event, or multiple assets may experience one event each. There is no way to make an accurate estimate of the potential limits one hazard may cause.

*** Power Line damage estimates are based on a per site cost figure, with each site covering an estimate power line length of 2 to 300 feet. Each power line may experience multiple damaged sites from one hazard event, or multiple power lines may experience one event each. There is no way to make an accurate estimate of the potential limits one hazard may cause.

Table 89. Imperial County Office of Education (ICOE) Assets at Risk for All Applicable Hazards

Type	Name	Jurisdiction	Latitude	Longitude	Replacement Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
Government	Administration Office	ICOE	32.751635	-115.563601	$ 10,734,000	$ 3,516,402	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	ICOE - Valley Community	ICOE	32.781476	115.514927	$ 3,064,000	$ 827,400	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Warehouse Brawley Union High School	Brawley	32.928428	-115.534934	$ 82,000	$ 107,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Barbara Worth Jr High	Brawley	32.980892	-115.547559	$ 15,297,000	$ 1,856,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	J. W. Oakley Elem	Brawley	32.983064	-115.517717	$ 11,202,000	$ 1,192,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Miguel Hidalgo Elem	Brawley	32.994580	-115.536322	$ 9,327,000	$ 953,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Myron D. Witter Elem	Brawley	32.971935	-115.540557	$ 12,825,000	$ 1,545,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Phil D. Swing Elem	Brawley	32.984170	-115.538388	$ 10,903,000	$ 1,201,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Magnolia Elementary	Brawley	32.985103	-115.541525	$ 3,004,000	$ 274,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Mulberry Elementary	Brawley	33.043424	-115.417688	$ 3,047,000	$ 150,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Brawley Union High	Brawley	32.982842	-115.534934	$ 44,250,000	$ 4,000,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Desert Valley High	Brawley	32.985103	-115.541525	$ 928,800	$ 222,852	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Del Rio Community Schools 1 & 2	Brawley	32.975330	-115.517741	$ 9,605,000	$ 596,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Administration Center	Calexico	32.675965	-115.482547	$ 2,185,000	$ 30,020	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Calexico High School	Calexico	32.676996	-115.487155	$ 35,000,000	$ 5,300,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Aurora High School	Calexico	32.671321	-115.496359	$ 3,016,000	$ 540,000	75%	75%	20%	25%	25%	0%	20%	0%	20%
School	Robert Morales-Adult Center	Calexico	32.681835	-115.516016	$ 2,425,000	$ 486,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Enrique Camarena Jr High	Calexico	32.673525	-115.474091	$ 5,610,000	$ 1,108,500	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	William Moreno Jr High	Calexico	32.681835	-115.516016	$ 17,426,000	$ 2,165,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Blanche Charles Elem	Calexico	32.681835	-115.516016	$ 12,663,000	$ 1,340,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Cesar Chavez Elem	Calexico	32.689135	-115.474462	$ 14,185,000	$ 2,341,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Dool Elementary	Calexico	32.673796	-115.487499	$ 8,280,000	$ 1,216,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Jefferson Elementary	Calexico	32.671870	-115.481982	$ 10,333,000	$ 1,496,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Kennedy Garden Elem	Calexico	32.690050	-115.494685	$ 9,456,000	$ 1,224,000	75%		20%	25%	25%	0%	20%	0%	20%
School	Mains Elementary	Calexico	32.677138	-115.511038	$ 9,007,000	$ 1,418,000	75%	25%	20%	25%	25%	0%	20%	0%	20%

Type	Name	Jurisdiction	Latitude	Longitude	Replacement Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
School	Rockwood Elementary	Calexico	32.677924	-115.495341	$ 11,498,000	$ 1,716,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	De Anza 9th Grade Academy	Calexico	32.674387	-115.489532	$ 16,227,000	$ 2,618,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Bill E. Young, Jr High	Calipatria	33.120870	-115.519077	$ 7,382,000	$ 322,000	75%		20%	25%	25%	0%	20%	0%	20%
School	Calipatria High School	Calipatria	32.978986	-115.531818	$ 25,245,000	$ 1,068,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Continuation High	Calipatria	32.978986	-115.531818	$ 279,750	$ 11,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Fremont Primary	Calipatria	32.978986	-115.531818	$ 10,423,000	$ 348,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Fremont Old Middle	Calipatria	32.978986	-115.531818	$ 3,014,000	$ 55,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Grace Smith School	Calipatria	33.237961	-115.516941	$ 8,910,000	$ 265,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	District Administration	El Centro	32.794081	-115.566969	$ 1,224,000	$ 184,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Central Warehouse	El Centro	32.783248	-115.539589	$ 3,434,000	$ 515,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Regional Occupation Center	El Centro	32.791468	-115.558889	$ 1,635,000	$ 72,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Central Union High	El Centro	32.788122	-115.564895	$ 39,344,000	$ 6,344,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Desert Oasis High	El Centro	32.781424	-115.548870	$ 3,495,000	$ 333,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Southwest High	El Centro	32.777355	-115.579578	$ 50,614,000	$ 5,415,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	De Anza Magnet	El Centro	32.779122	-115.574811	$ 4,536,000	$ 490,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Desert Gardens Elem	El Centro	32.783050	-115.559022	$ 6,838,000	$ 666,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Harding Elementary	El Centro	32.784468	-115.559033	$ 5,792,000	$ 648,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Margaret Hedrick Elem	El Centro	32.779289	-115.574857	$ 7,382,000	$ 738,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Kennedy Middle	El Centro	32.801304	-115.558197	$ 15,190,000	$ 1,569,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Martin Luther King Jr. Elementary	El Centro	32.803648	-115.578365	$ 9,295,000	$ 814,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Lincoln Elementary	El Centro	32.794617	-115.565946	$ 6,512,000	$ 695,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	McKinley Elementary	El Centro	32.802664	-115.559723	$ 6,184,000	$ 665,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Sunflower Elementary	El Centro	32.793512	-115.583886	$ 9,465,000	$ 1,075,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Washington School	El Centro	32.792444	-115.544131	$ 6,929,000	$ 819,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Wilson Junior High	El Centro	32.787723	-115.566772	$ 17,954,000	$ 1,863,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	McCabe Elementary	El Centro	32.752455	-115.595030	$ 13,583,000	$ 2,038,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Meadows School	El Centro	32.800346	-115.475371	$ 8,679,000	$ 1,780,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
Resource Center	Science and Math	El Centro	32.792843	-115.583140	$ 1,197,000	$ 147,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Heber Administration	Heber	32.727091	-115.530002	$ 18,161,000	$ 1,591,000	75%	25%	20%	25%	25%	0%	20%	0%	20%

Type	Name	Jurisdiction	Latitude	Longitude	Replacement Value	Contents Value	Earthquake	Flooding	Extreme Weather	Wildfire	Dam Failure	Pest Infestations/Non Vectors of Human Diseases	HazMat Incidents	Natural Bio Threats	Terrorism
School	Dogwood Elementary	Heber	32.738224	-155.538411	$ 9,316,000	$ 815,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Administration/ Maintenance	Holtville	32.813788	-115.372730	$ 3,792,000	$ 160,250	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Pine Elementary	Holtville	32.893419	-115.380375	$ 3,725,000	$ 380,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Emmett Finley Elem	Holtville	32.813793	-115.371010	$ 13,912,000	$ 1,605,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Holtville High	Holtville	32.815634	-115.386542	$ 21,663,000	$ 1,950,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Holtville Middle	Holtville	32.818000	-115.370268	$ 9,615,000	$ 906,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Sam Webb Continuation High	Holtville	32.815634	-115.386542	$ 780,000	$ 183,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
Government	Administration	Imperial	32.849497	-115.574862	$ 339,107	$ 50,866	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Ben Hulse Elementary	Imperial	32.845471	-115.576093	$ 15,316,000	$ 1,664,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Imperial Continuation High	Imperial	32.849972	-115.569940	$ 849,412	$ 97,402	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Westside Elementary	Imperial	32.758404	-115.734091	$ 1,322,000	$ 141,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	T.L. Waggoner Elem	Imperial	32.822084	-115.589303	$ 15,250,000	$ 1,412,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Frank Wright Middle	Imperial	32.855433	-115.570864	$ 15,481,000	$ 1,951,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Imperial High School	Imperial	32.848212	-115.575882	$ 27,893,000	$ 2,827,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Seeley Elementary	Seeley	32.794472	-115.692774	$ 13,379,000	$ 2,669,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Westmorland Union Elem	Westmorland	33.035108	-115.618713	$ 14,333,000	$ 1,676,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	San Pasqual Valley School District	San Pasqual	32.739491	-114.634675	$ 24,107,000	$ 3,617,000	75%	25%	20%	25%	25%	0%	20%	0%	20%
School	Community College	ICOE	32.825870	-115.505147	$ 71,174,000	$ 11,496,000	75%	75%	20%	25%	25%	0%	20%	0%	20%

Section 11. Plan Maintenance

The MHMP is subject to regular review and systematic, ongoing updates. Because the Plan is a "living" document that reflects the ongoing hazard mitigation commitment, planning, and implementation actions of Imperial County and the participating jurisdictions, the process of monitoring, evaluating, and updating the plan will be critical to the effectiveness of hazard mitigation in the County.

Imperial County OES has the responsibility for maintaining, evaluating, monitoring, and updating the Plan. County OES has developed a method to ensure that regular review and update of its Multi-Jurisdictional Hazard Mitigation Plan (MHMP) occurs. FEMA regulations require an update every five years. Imperial County OES will utilize the Hazard Mitigation Planning Committee to poll agencies to see if they want to continue to participate and if their elements of the Plan are up-to-date.

Factors that will be considered in evaluating whether a Plan update or revisions are required are:

- Relevance of MHMP goals and objectives to the evolving situation in Imperial County and participating jurisdictions (e.g., significant changes in the landscape due to implementation of hazard mitigation projects)
- Consistency of MHMP goals and objectives with changes in local, state, and federal laws, regulations, or policies
- Relevance of MHMP goals and objectives to current and expected conditions
- New technologies
- New information, e.g., identification of barriers or obstacles to successful implementation or completion of mitigation actions

On a yearly basis, the Planning Committee will review the risk assessment portion of the Plan to determine if the information should be updated or modified. The parties responsible for the various implementation actions will report to the County OES Deputy Coordinator on:

- Status of their projects
- Assessing the effectiveness of the Plan
- Implementation processes that worked well
- Any difficulties encountered
- How coordination efforts are proceeding
- Which strategies should be revised based on evaluating future conditions (e.g., socio-economic, environmental, demographic, change in built environments, etc.); how changing conditions and opportunities could impact community resilience in the long term)

Imperial County is committed to involving the public in the continual reshaping and updating of the MHMP. The Hazard Mitigation Planning Committee members are responsible for the annual review and update of the Plan.

Paper copies of the MHMP Update will be available for viewing on an on-going basis at the Imperial County Public Library/OES, City of El Centro Library, and the Imperial Irrigation District office and also posted on the County's website: www.co.imperial.ca.us, the County OES website: www.co.imperial.ca.us/emergencyPlans/multihazard_mitigation_plan.htm, the City of El Centro's website: www.cityofelcentro.org and the Imperial Irrigation District's website: www.iid.com. The public and stakeholders are welcome and encouraged to review and submit comments on an on-going basis. Since the development of the 2009 and 2014 MHMPs, no public or local community stakeholder's comments have been received.

The County OES Deputy Coordinator is the point of contact with the Participating Jurisdictions, Cal OES, and stakeholders for mitigation planning and implementation activities. The Deputy Coordinator will convene yearly (or sooner if necessary) meetings with the Planning Committee to discuss relevant feedback and changes received from the Planning Committee members, the public, and stakeholders. The County Fire Chief and County OES Deputy Coordinator will present the MHMP to the open Disaster Council meetings (meets quarterly) on a yearly basis, or sooner if necessary, for review and updates.