

Attachment C

RESOLUTION OF THE BOARD OF SUPERVISORS COUNTY OF SANTA BARBARA, STATE OF CALIFORNIA

IN THE MATTER OF RECOMMENDING THAT THE)	RESOLUTION NO. 10-_____
BOARD OF SUPERVISORS ADOPT SPECIFIC)	
AMENDMENTS TO THE SEISMIC SAFETY AND)	Case No: 10GPA-00000-00001
SAFETY ELEMENT, LAND USE ELEMENT, AND)	
CONSERVATION ELEMENT OF THE SANTA)	
BARBARA COUNTY COMPREHENSIVE PLAN)	
TO ESTABLISH CONSISTENCY WITH)	
GOVERNMENT CODE 65302)	

WITH REFERENCE TO THE FOLLOWING:

- A. On December 20, 1980, by Resolution No. 80-566, the Board of Supervisors of the County of Santa Barbara adopted the Comprehensive Plan for the County of Santa Barbara.
- B. In April 2010, pursuant to the California Environmental Quality Act (CEQA), a Draft Negative Declaration was prepared for the proposed update to the Seismic Safety and Safety Element, Land Use Element, and Conservation Elements of the County’s Comprehensive General Plan and circulated to the appropriate State agencies and the public for review and comment.
- C. In June 2010, a Final Negative Declaration was prepared and presented to the Planning Commission.
- D. The Board of Supervisors now finds that, in the interest of the orderly development of the County and to preserve the health, safety, and general welfare of the residents of the County, it is necessary to:
 - 1. Adopt specified amendments to the County’s Seismic Safety and Safety Element as presented in Exhibit A of this resolution.
 - 2. Adopt specified amendments to the County’s Land Use Element as presented in Exhibit B of this resolution.
 - 3. Adopt specified amendments to the County’s Conservation Element as presented in Exhibit C of this resolution.
 - 4. Adopt the Final Negative Declaration (10NGD-00000-00010) for the Update to the County’s Seismic Safety and Safety Element, Land Use Element, and Conservation Element.
- E. Public officials and agencies, California Native American Indian tribes, civic organizations, and citizens have been consulted and have advised the Planning Commission on the proposed

amendments in a duly noticed public hearing pursuant to Sections 65351 and 65353 of the Government Code.

- F. The Planning Commission has held a duly noticed public hearing, as required by Section 65353 of the Government Code, on the proposed amendments, at which hearing the amendments were explained and comments invited from the persons in attendance.
- G. The Planning Commission of the County of Santa Barbara, after holding duly noticed public hearings on the above described item, has endorsed and transmitted to the Board of Supervisors said recommended change by resolution pursuant to Government Code Section 65354.

NOW, THEREFORE, IT IS HEREBY RESOLVED as follows:

1. The above recitations are true and correct.
2. Pursuant to the provisions of Section 65356 of the Government Code, the above described changes are hereby adopted as an amendment to the Seismic Safety and Safety Element, Land Use Element, and Conservation Element of the Santa Barbara County Comprehensive General Plan.
3. The Chair and the Clerk of the Board are hereby authorized and directed to sign and certify all documents and other materials in accordance with this Resolution to reflect the above described action by the Board.

PASSED, APPROVED, AND ADOPTED by the Board of Supervisors of the County of Santa Barbara, State of California, this _____ day of _____, 2010, by the following vote:

AYES:

NOES:

ABSENT:

Chair of the Board of Supervisors
County of Santa Barbara

ATTEST:

Michael F. Brown
Clerk of the Board of Supervisors

APPROVED AS TO FORM:
DENNIS A. MARSHALL
County Counsel

By: _____
Deputy Clerk

By: _____
Deputy County Counsel

Exhibit A Amendments to the County's Seismic Safety and Safety Element

Exhibit B Amendments to the County's Land Use Element

Exhibit C Amendments to the County's Conservation Element

Exhibit A
To
Attachment C



SEISMIC SAFETY & SAFETY ELEMENT

ADOPTED 1979

REPUBLISHED MAY 2009

DRAFT UPDATE

MARCH 2010

SANTA BARBARA COUNTY
COMPREHENSIVE GENERAL PLAN



County of Santa Barbara
Planning and Development
123 E. Anapamu Street
Santa Barbara, CA 93101

The electronic version of the Santa Barbara County Comprehensive Plan can be found at: <http://longrange.sbcountyplanning.org>



Former Seismic Safety and Safety Element Cover – Replaced March 2009

TABLE OF CONTENTS

I. ABSTRACT	6
II. INTRODUCTION	9
STUDY PURPOSE AND ORGANIZATION	9
THE STUDY	11
III. GENERAL GEOGRAPHY AND GEOLOGY	17
INTRODUCTION	17
GEOGRAPHY	17
GEOLOGICAL FORMATIONS	19
GEOLOGIC STRUCTURE	26
THE SHORELINE	39
THE OFFSHORE ISLANDS.....	41
AREAS OF SPECIAL GEOLOGIC INTEREST.....	42
IV. GEOLOGIC AND SEISMIC HAZARDS.....	43
INTRODUCTION	43
FUNDAMENTALS OF ENGINEERING SEISMOLOGY	51
SEISMICITY OF SANTA BARBARA COUNTY	76
SEISMIC ZONING	127
TSUNAMIS AND SEICHES	131
LIQUEFACTION	137
LANDSLIDES AND SLOPE STABILITY	151
EXPANSIVE SOILS	166
SOIL CREEP	178
COMPRESSIBLE AND COLLAPSIBLE SOILS.....	189
HIGH GROUNDWATER.....	203
SHORELINE REGRESSION	219
SUBSIDENCE.....	221
V. CONCLUSIONS AND RECOMMENDATIONS	223
MANAGING GEOLOGIC AND SEISMIC HAZARDS	223
LAND USE PLANNING.....	223
SUBDIVISION ORDINANCE	225
GRADING CODES	225
BUILDING CODES	226
EVACUATION PLANNING.....	226
MILITARY INSTALLATIONS.....	227
GEOLOGIC AND SEISMIC GOALS AND POLICIES	228
IMPLEMENTATION MEASURES.....	231
VI. FIRE HAZARD AND FIRE SERVICES'	257
INTRODUCTION	257
CAUSES AND HISTORY OF WILDFIRE	258
IGNITION SOURCES	258
FUEL BEDS	259
HISTORY OF WILDLAND FIRES	260
RESPONSIBLE AGENCIES AND HAZARD SEVERITY	262
FIRE RESPONSIBILITY AREAS	262
FIRE HAZARD SEVERITY ZONES.....	263
HAZARD REDUCTION MEASURES	264
PLANNING.....	264

IMPLEMENTATION MEASURES	266
LAND USE PLANNING.....	268
DEVELOPMENT IN HAZARDOUS AREAS.....	268
FIRE DEVELOPMENT STANDARDS	268
DEFENSIBLE SPACE/CLEARANCE AROUND STRUCTURES	269
FIRE GOALS, POLICIES, AND IMPLEMENTATION MEASURES	271
CONCLUSION	278
VII. FLOOD CONTROL.....	295
INTRODUCTION	295
SETTING AND HISTORY	295
AREAS COMMONLY SUBJECTED TO FLOODING	295
HISTORICAL FLOOD EVENTS.....	298
FLOOD HAZARDS	298
MITIGATION OF FLOOD HAZARDS	300
IDENTIFICATION AND AVOIDANCE OF FLOOD HAZARDS.....	300
EMERGENCY RESPONSE TO FLOOD EVENTS.....	307
FLOOD CONTROL PROJECTS	308
FLOOD GOALS, POLICIES, AND IMPLEMENTATION MEASURES	310
IMPLEMENTATION MEASURES.....	313
CONCLUSIONS AND RECOMMENDATIONS.....	316
VIII. COUNTY OFFICE OF EMERGENCY SERVICES.....	317
SANTA BARBARA COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN	318
IX. APPENDIX	352
GLOSSARY	352
REPORT REFERENCES.....	358
BIBLIOGRAPHY.....	367
CITATIONS.....	382

MAPS

GEOLOGIC MAP	27
SOUTH COAST AREA - WEST	27
SOUTH COAST AREA - EAST	29
SANTA YNEZ VALLEY AREA.....	32
LOMPOC AREA	34
SANTA MARIA-ORCUTT AREA	36
SEISMIC-TECTONIC	86
SANTA BARBARA COUNTY	86
SOUTH COAST AREA - EAST	88
SOUTH COAST AREA - WEST	90
SANTA YNEZ VALLEY AREA.....	92
LOMPOC AREA	94
SANTA MARIA-ORCUTT AREA	96
LIQUEFACTION	140
SANTA BARBARA COUNTY	140
SOUTH COAST AREA - EAST	142
SOUTH COAST AREA - WEST	144
SANTA YNEZ VALLEY AREA.....	146
LOMPOC AREA	148
SANTA MARIA-ORCUTT AREA	150
SLOPE STABILITY, LANDSLIDES	155
SANTA BARBARA COUNTY	155
SOUTH COAST AREA - WEST	159
SANTA YNEZ VALLEY AREA.....	161
LOMPOC AREA	163
SANTA MARIA-ORCUTT AREA	165
EXPANSIVE SOILS	169
SOUTH COAST AREA - EAST	169
SOUTH COAST AREA - WEST	171
SANTA YNEZ VALLEY AREA.....	173
LOMPOC AREA	175
SANTA MARIA-ORCUTT AREA	177
SOIL CREEP POTENTIAL	180
SOUTH COAST AREA - EAST	180
SOUTH COAST AREA - WEST	182
SANTA YNEZ VALLEY AREA.....	184
LOMPOC AREA	186
SANTA MARIA-ORCUTT AREA	188
COMPRESSIBLE-COLLAPSIBLE SOILS	192
SANTA BARBARA COUNTY	192
SOUTH COAST AREA - EAST	194
SOUTH COAST AREA - WEST	196
SANTA YNEZ VALLEY AREA.....	198
LOMPOC AREA	200
SANTA MARIA-ORCUTT AREA	202

HIGH GROUNDWATER	207
SANTA BARBARA COUNTY	207
SOUTH COAST AREA - EAST	209
SOUTH COAST AREA – WEST	211
SANTA YNEZ VALLEY AREA.....	213
LOMPOC AREA	215
SANTA MARIA-ORCUTT AREA	217

I. ABSTRACT

The Seismic Safety and Safety Element is intended to guide land use planning by providing pertinent data regarding geologic, soil, seismic, fire and flood hazards. Although development in Santa Barbara County dates back to the establishment of the Santa Barbara Mission in 1786, and there has been substantial growth in more recent years, much of the County remains rural and undeveloped. It is therefore appropriate to consider these hazards now in planning for future development.

Santa Barbara County encompasses a wide diversity of terrain and geologic formations and features. It includes mountain ranges such as the Santa Ynez and San Rafael; major rivers such as the Cuyama, Santa Ynez and Santa Maria; extensive lowlands in the Santa Maria, Lompoc, Carpinteria and Goleta areas; and four Channel Islands.

The County is underlain by up to 35,000 feet of marine sedimentary rocks of late Mesozoic and Cenozoic ages. The sedimentary rocks are diverse, but are dominated by great thicknesses of sandstone and shale with lesser amounts of conglomerate, alluvial fan deposits, dune sand, and diatomite. Outcrops of igneous rocks are limited, except on the Channel Islands. The Rincon and Monterey Formations are two of the weakest and most troublesome formations in the County. They are located primarily in the Santa Ynez Mountains. The geologic units are shown on the geologic maps for the four study areas.

Faults are numerous in the County, several of which are considered major. The main faults have been named, and are shown on the Geologic and Seismic-Tectonic Maps. In the coastal zone, the main faults generally trend east-west; in the northern part of the County, they are predominantly northwest-southeast.

Most of the hills and mountains are folded to some degree. The topography sometimes reflects this structure and sometimes has been substantially modified by erosion.

Earthquakes are not strangers to the County, with strong shaking and major damage resulting from earthquakes occurring in 1769, 1812, 1852, 1857, 1872, 1893, 1902, 1917, 1925, 1926, and 1952. This means that a damaging quake has occurred on the average of every fifteen to twenty years.

Earthquakes are caused by movement along faults, which are surfaces between blocks of the earth's crust. In California, experience has shown that movement during historic times has nearly always taken place along pre-existing faults. Only a very few existing faults are considered to be active or potentially active. The more recently a fault has moved, the more likely it is that it may move again; so active faults have been defined as those which have moved during geologically recent time (approximately the last 11,000 years).

This study considers nine faults to be active: Big Pine, Graveyard - Turkey Trap, Mesa, More Ranch, Nacimiento, Pacifico, Santa Cruz Island, Santa Rosa Island, and Santa

Ynez. In addition, the San Andreas fault zone - by far the major fault in California - lies a short distance northeast of the County.

Because of its great length and historic activity, it poses a substantial seismic threat to Santa Barbara County even though it is outside the County.

Potentially active faults are of much less concern, but should also be considered. The following eight faults fall into this category: Arroyo Parida, Bradley Canyon, Carpinteria, Goleta, Mission Ridge, Red Mountain, Rincon Creek, and San Jose.

Ground rupture along a fault tract can destroy any structure astride or immediately adjacent to the fault. Therefore, it has been recommended that buildings not be constructed on faults considered to have a significant chance of movement in the next one hundred years. However, much more damage is caused by the resulting earthquake shockwaves. In addition to the major directly damaging effect on buildings, seismic shock can induce or aggravate - many other potentially disastrous problems such as tsunamis (seismic sea waves, frequently erroneously referred to as "tidal waves"), landslides, settlement, and liquefaction. The intensity of shock waves in bedrock at any given point is largely a function of the magnitude of an earthquake and the distance to its focus. On this basis, the County was divided into zones of relative seismic hazard, as shown on the Seismic Tectonic Map. Detailed data on local conditions would permit refinement of these "seismic zones," but examination of local conditions was beyond the scope of this study.

Although seismic hazards were the main focus of the study, other soil and geologic problems exist which should be considered - to varying degrees - in land use planning, and, subsequently, in reviewing the design of specific projects. These problems include landslides, expansive soils, soil creep, compressible and collapsible soils, high groundwater, erosion, and subsidence. Based on available data, areas were classified as having low, moderate, or high susceptibility to each problem, except that fault displacement was considered separately, and erosion and subsidence were not rated. The degree of uncertainty in these designations was also indicated.

In order to avoid having to consider each problem independently in land use planning, a composite number called a Geologic Problem Index (GPI) was devised. The GPI was obtained by multiplying each problem rating number for a given area by a weighting factor and summing the results. Different weighting factors were used for each problem, depending on their relative importance.

The Grading and Building Codes of Santa Barbara County are considered generally satisfactory with respect to geologic hazards, but some amendments are recommended. An adequate investigation of each specific site to be developed is imperative where the possibility of soil or geologic problems exist.

Residents of Santa Barbara County are well aware of the fire hazard problem and the destruction that uncontrolled wildfires can cause. However, sensitive land use planning and effective development regulations can go a long way toward reducing fire hazard.

One critical issue that the County faces is how much development to permit in areas of extreme fire hazard. Short of a case-by-case analysis of local conditions in relation to present and proposed fire prevention and control practices, no definitive rules on overall density in fire hazard areas can be set. Instead, all development activities within areas of high or extreme fire hazard should be closely regulated. In the Subdivision Ordinance, the County already requires that special procedures be followed in fire hazard areas. A requirement that all development proposals be accompanied by a plan to show what the developer intends to do to minimize fire hazard would provide the County with the information necessary for evaluation. In some areas, it may be necessary to prohibit development, but, in others, development could be permitted if adequate control measures were implemented. The cumulative impacts of development in fire hazard areas should be examined, as well as the individual impacts.

A secondary issue is what kinds of controls should be instituted to reduce fire hazard. Research foresters in the U.S. Forest Service have put forth the concept of controlled burns as an improved technique for fire management in chaparral areas. The objective of this type of program is to achieve an acceptable and realistic level of fire occurrence and fire size based on ecological, social, and economic considerations. If this system were to be implemented in Santa Barbara County, the long term trend toward fewer, larger fires might be reversed. County residents would have to tolerate more fires burning over 100 acres, but far fewer fires burning over 5,000 acres. The chaparral ecosystem would be maintained, and watershed and flood damage possibly could be reduced. A study should be undertaken by the County jointly with responsible federal and State agencies to determine whether this procedure would be viable and should be implemented locally.

One of the most important flood control issues facing the County concerns regulation of development in areas prone to flooding. For current flood control programs to be effective, it is important that the flood-carrying capacity of streams and floodway areas not be impaired. Of related importance, obviously, are the fire hazard issues previously discussed. Because of their interrelationship, decisions on flood control improvements should not be made independently of decisions on fire prevention and control programs, and on land use in areas of high and extreme fire hazard.

Another policy issue related to flood control involves the multiple use of buffer zones alongside flood channels. Setbacks from these channels can provide public access for maintenance of the channels as well as reducing the threat to structures from bank erosion. Preservation of streamside natural communities is another advantage. Setbacks also can be used for recreational trails. However, the privacy and security of neighboring property owners may be threatened.

The U.S. Department of Housing and Urban Development, in cooperation with the County Flood Control and Water conservation District, is mapping flood hazard areas in the County. When finalized (scheduled for December 1978) these maps will form the basis for flood plain management required under the National Flood Insurance Program, and will be used to establish flood insurance rates. The Federal Flood Plain Management Regulations provide that "flood insurance shall not be sold or renewed under the program within a community, unless the community has adopted adequate flood plain management regulations consistent with federal criteria." The Seismic Safety and Safety Element recommends implementation of flood plain zoning or other similar measures.

The element raised a number of questions deserving further investigation. More geologic data are needed, particularly with regard to seismic - tectonic mapping. Problems along the coast, such as shoreline regression, liquefaction potential and tsunami risk, need additional study. As new information becomes available, it will be incorporated as addenda to this element. An update of the Seismic Safety and Safety Element should include a study of emergency services planning in the County.

A bibliography of the general geology and seismicity of Santa Barbara County was compiled and a list of references cited in the text was prepared. A glossary of selected geological and seismological terms commonly used in practice and in the text also is included.

II. INTRODUCTION^{1 2}

STUDY PURPOSE AND ORGANIZATION

Objectives

The purpose of this study was to obtain data concerning geology, soils, seismicity, and fire and flood hazards of Santa Barbara County, and to provide recommendations and criteria to aid in land use planning in order to ensure that future development will be compatible with the environment.

The California Government Code, Sections 65302 (f) and (i), requires a Seismic Safety Element and Safety Element as part of all city and county general plans. The State General Plan Guidelines suggest consolidation of similar elements where possible, in order to avoid "excessive duplication and cross references to the similar or identical subjects contained in the separate elements."³ With regard to the Seismic Safety and Safety Elements, the Guidelines state:

The seismic safety element contributes information on the comparative safety of using lands for various purposes, types of structures, and occupancies. It provides primary policy inputs to the land use, housing, open space, circulation and safety elements.

Because of the close relationship (of the seismic safety element) with the safety element the local planning agency may wish to prepare these two elements simultaneously or combine the two elements into a single document.⁴

Participating Consultants

The investigation was a team effort headed by Livingston and Associates and Moore and Taber. The team consisted of the firms and individuals listed below. The portions of the study for which each participant was primarily responsible are noted.

Although not a part of the team organized by, and responsible to Moore and Taber, Environmental Systems Research Institute (ESRI) played a vital role by handling all of the computer work involved in the Geologic Problems and Geologic Problems Index.

Organization

Portion of Study

Moore and Taber
Woodland Hills

General coordination and review of geologic/seismic portions of study. Preparation of all sections of report not specifically listed for other team members.

California Earth Science Corp.
Santa Monica

Preparation of section on faults and seismic hazards and bibliography

Lindvall-Richter and Associates
Los Angeles

Preparation of seismic history, tsunamis, and review of seismic hazard evaluation.

Robert M. Norris, Ph.D.
and Robert W. Webb, Ph.D.
University of Calif.
Santa Barbara

Preparation of geography and geology description, coastline erosion, and geologic interest areas.

Livingston and Associates
San Francisco

Preparation of Fire Hazard chapter.

Bookman-Edmonston Engineering, Inc.
assisted by County Flood Control
Engineer

Preparation of Flood Control chapter.

Acknowledgments

We wish to acknowledge the invaluable assistance of our consultants, particularly California Earth Science Corporation whose efforts were extensive and beyond the originally anticipated scope.

We are also grateful to Wendell Nichols and Ray Coudray, engineering geologists in the County Public Works Department and the staff of the County Planning Department for their assistance including making their files and aerial photographs available. Dr. Jack Estes of the University of California, Santa Barbara and Mason Hill were most helpful to California Earth Science Corporation.

THE STUDY

Scope

The study consisted primarily of a thorough review of the general geology of Santa Barbara County and its compilation onto base maps, and an investigation of the main geologic and soil problems, with emphasis on those associated with faults and earthquakes. Specific geologic and soil problems that were considered, together with their effect on land use planning, were ground rupture, ground shaking, tsunamis and seiches, soil liquefaction, landslides and slope stability, expansive soils, soil creep, compressible and collapsible soils, high groundwater, erosion and shoreline regression, and subsidence.

Although not considered a soil or geological problem, areas with unique geological features of interest were listed and described so that they could be considered for preservation. Mineral deposits and soil characteristics as applied to agricultural uses are investigated in the Conservation Element.

For purposes of the study, the County was divided into four study areas mainly on the basis of population and future potential development. The study areas consist of the following:

South Coast: Elongated area along the coast divided into west, central, and east sections, extending from Gaviota Pass to the Ventura County line and from the coast to the approximate crest of the Santa Ynez mountains.

Santa Ynez Valley: Approximately square area in the Santa Ynez River Valley, extending from the vicinity of Buellton on the west to San Lucas Ranch on the east, north to Los Alamos, and south to and including the foothills of the Santa Ynez mountains south of the Santa Ynez River.

Lompoc: Roughly rectangular area along the Santa Ynez River, extending from the Pacific Ocean on the west to Santa Rita Valley on the east, north to the approximate crest of the Purisima Hills (but not including Vandenberg Air Force Base), and south to and including the hills south of the Lompoc urban area.

Santa Maria: Includes the area bounded by the Pacific Ocean on the west, Casmalia and Solomon Hills on the south, Fulger Point – Bradley Canyon on the east, and the Santa Maria River on the north.

Topographic base maps for the county (1" = 8000') and each study area (1" = 2000') were supplied for transfer of geologic and soil data. The geologic and soil problems were studied in a general way on a Countywide basis and in more detail for the four study areas.

The study included a thorough review of published technical reports and geologic maps, a review of most pertinent unpublished reports, and discussions with many public officials and personnel with special technical or geologic expertise.

A comprehensive up-to-date bibliography of all available published data, including masters and Ph.D. theses of the geology and seismicity of Santa Barbara County was compiled. A list of all references cited in the text of the report, in addition to the bibliography, also was prepared.

An extensive study of stereographic aerial photographs was made, primarily to detect ancient landslides. While most of the work involved collecting and evaluating existing data, this portion of the study added a substantial amount of new information.

Inspection trips were made to familiarize consultant staff with some of the areas of the County and to check specific points in question.

Limitations

Every attempt was made to provide a thorough study within the limitations of time and funding, and it is believed that this goal has been achieved. Nevertheless, the inherent limitations of such a study must be recognized. Although specific limitations are described elsewhere in this report - particularly with respect to the present limited state of knowledge of seismic hazards this subject must be emphasized. The large area covered by the study, the scale at which the work was done, and the limited data available in many areas means that the results are not infallible, particularly with respect to small areas.

The study is an appropriate early step in planning and should be very useful in this regard, but care must be exercised that it is not taken as the final answer regarding decisions on any specific site. New data developed in specific site investigations – or new techniques - may supersede the generalized conclusions presented in the report.

Also, factors other than geologic conditions may be more critical. Except for ground rupture along a fault, and sometimes massive landslides, the geologic and soil problems normally encountered can usually be solved by appropriate engineering design of structures and grading.

Data Collection

Information was taken from the pertinent published references listed in the accompanying Bibliography. In addition, valuable data - both written and oral - was obtained from the following organizations.

U. S. Geological Survey
U. S. Department of Agriculture Soil Conservation Service
California State Division of Oil and Gas
County of Santa Barbara
City of Santa Barbara
City of Carpinteria
City of Guadalupe
City of Lompoc
City of Santa Maria
University of California, Santa Barbara
Santa Barbara City College
Montecito County Water District
Various private consulting firms

Geologic Maps

Just as the heart of an architect's efforts are his building plans, so are geologic maps for the geologist. On these he plots his data from field observations, boring logs, aerial photographs, and other sources to portray the geologic structure and history and to make evaluations in terms of geologic problems that might affect the use of the land.

The geologic maps of the four study areas presented with this report are a compilation of geologic data from several sources. No original field work or mapping was done by Moore & Taber during the investigation, although a fairly extensive study of aerial photographs was made to map ancient landslides. Basically, the work by Thomas Dibblee, Jr. (Bulletins 150 and 186) and W. P. Woodring et al (Professional Paper 222) were utilized as the base geologic maps for the urban study areas. At the eastern end of the County in the Carpinteria district, the geology was taken from a Ph.D. thesis by Harold Lian (UCLA, 1952).

Various U. S. Geological Survey Groundwater Supply Papers were also utilized, and where the geology differed substantially from that of Dibblee or Woodring, particularly in regard to faults, these features were shown on the geologic map and their sources noted. This is also true for faults located by private consultants. The area covered by each source map is shown on the legend accompanying each map.

Essentially, these various source maps were spliced together where necessary and enlarged by photographic methods to the required scale. The data were then transferred to the base topographic maps for the four urban study areas (1" = 2000').

A 1" = 8000' reproduction mylar composite geologic map of the County prepared as a part of this study is on file in the County Public Works Department. However, a countywide geologic map was not reproduced as a part of this report because of the cost and the fact that the four California Division of Mines and Geology state map sheets which cover Santa Barbara County are publicly available. All of the significant faults are shown on the Countywide Seismic - Tectonic map and geological detail is shown on each of the study area geologic maps.

The geologic compilation shows the major bedrock units, surficial units, faults and folds. Most of the rock units and faults are shown exactly as indicated on the source maps used to compile the geologic and seismic - tectonic maps of the various study areas. Contacts between geologic units and faults on the geologic map do not necessarily match at boundaries between map source areas even by the same author, and they generally were not adjusted during the compilation. Since no original field work was performed by Moore & Taber during the investigation, no significant attempt at reconciliation of the discrepancies was made. Reconciliation and field checking were not possible with the available time and funds allotted.

The various formational and rock units with their symbols, as shown on the geologic maps, are those used on the source geologic maps for the particular area. Where there is a discrepancy because different authors use the same symbols for different rock units, the most reasonable symbol was used. This is the case for example, for the Sisquoc Formation (Tsq) as mapped by Dibblee opposed to Sisquoc mapped by Woodring (Ts). The symbol (Ts) as mapped by, Dibblee refers to the Sespe Formation, therefore, Tsq has been used on the maps to represent the Sisquoc Formation and Ts has been used to denote the Sespe Formation.

Seismic - Tectonic maps were prepared for the County and each of the four study areas. These maps show all the known faults and folds obtained from the various source maps and designate the relative degree of activity and the estimated maximum credible and maximum probable earthquake magnitude (where applicable) assigned to each fault. Based on distance from the causative fault and the estimated earthquake magnitude, zones of earthquake intensity were established, and these are also shown on the maps. Areas subject to inundation by tsunamis were also rated and shown on these maps.

Because of photo enlargement, scale differences between individual maps, drafting and transfer techniques, and reproduction methods, possible error in the exact location of formational contacts and faults and folds may be present when compared with or in relation to existing cultural features.

While the transferred and compiled data at the larger map scale (1" = 2000') will prove extremely useful in planning, much of the geologic mapping was performed many years ago and, therefore, needs to be updated with more recent geological detail and cultural features.

Problem Rating Maps

The various soil and geologic problems were evaluated and rated according to the severity of the problem by applying geologic and engineering judgment to available geologic and soils data gathered in the study. The data were transferred to the topographic base maps for the County and study areas to delineate the areal extent and degree of the problem. The data from the base maps were transferred to grid base maps and the ratings for the individual problems were then encoded to produce the various computerized maps. These maps reflect the approximate severity of each problem and its areal extent by means of a series of symbols.

Problems that were rated and delineated on topographic base maps were tsunamis - seiches, earthquake intensity (ground shaking), liquefaction, slope stability, compressible soils, and high groundwater. Expansive soil and soil creep (a function of expansion and slope) were derived directly from data obtained from the Soil Conservation Service maps and slope maps.

In addition to the problem rating - distribution map of each problem, the weighted summation of all of the eight problems was computed to obtain the Geologic Problem Index (GPI). The numerical range of the GPI was then divided into five categories of severity to produce a GPI severity map for the County and each of the four study areas. A more detailed description of the whole rating system, as well as the criteria used in rating each problem, are given in subsequent sections of the report.

III. GENERAL GEOGRAPHY AND GEOLOGY

INTRODUCTION

Santa Barbara County encompasses a wide diversity of terrain and geologic formations and features. It lies partly in the Transverse Range geomorphic province and partly in the southern Coast Range province. The boundary between these two provinces is usually drawn along the Santa Ynez River. The Transverse Ranges of the County include the Santa Ynez Range, the Santa Barbara Channel offshore, and the Channel Islands. Three of the islands - Santa Cruz, Santa Rosa, and San Miguel – represent the seaward extension of the Santa Monica Mountains. Little Santa Barbara Island, some miles to the southeast, is also included in the County, but is more properly included in the Peninsular Range province of Orange and San Diego counties.

GEOGRAPHY

Topography

Santa Barbara County, westernmost of the Southern California counties, includes 2740 square miles and four channel islands. The County is bounded on the west and south by the Pacific Ocean and on the north and east by San Luis Obispo and Ventura respectively.

Three major east west trending valleys dominate the northeastern half of the County. The Cuyama River Valley, the Santa Maria Valley and Los Olivos - Los Alamos lowland. The northernmost, the Cuyama River Valley is bounded on the south by the Sierra Madre with elevations ranging from about 400 feet to 5845 feet at Peak Mountain.

The Sisquoc River separates the Sierra Madre from the San Rafael Mountains, whose elevations range from about 3000 feet to 6828 feet at Big Pine Mountain. Other typical peaks are Figueroa Mountain (4528'), Bald Mountain (4042'), and San Rafael Mountain (6593'). These summits and the connecting ridge are known as Hurricane Deck. Relief in the eastern county is considerable, and the topography is generally rugged because of the rapid downcutting of the Cuyama Sisquoc, and Santa Ynez rivers and their tributaries.

In contrast, the northwestern third of the County is dominated by a series of low hills with separating valleys, some of which are broad and flat. The Santa Maria Valley, on the north, extends about eight miles southward to the Casmalia and Solomon Hills and about twenty miles from the settlement of Sisquoc to the sea. The highest peaks in the Casmalia and Solomon Hills are Mount Lospe (1840') and Mount Solomon (1340'). All the valleys and intervening ridges in this part of the County have a northwesterly trend.

South of the Casmalia-Solomon Hills lies the Los Olivos – Los Alamos lowland, whose lower portion is called the San Antonio Valley, which crosses Vandenberg Air Force Base to reach the sea. This valley is bounded on the south by the Purisima Hills, whose highest peak is Redrock Mountain (1984'). The narrow Santa Rita Valley separates the Purisima Hills from the Santa Rita Hills to the south. Beyond lies the relatively broad Lompoc Valley, which is drained by the lower Santa Ynez River.

Development

Like most climatically desirable parts of California, Santa Barbara County has been experiencing rapid population growth. The proportion of acreage still readily transferable from rural to urban use, in which natural geologic hazards are minimal, is limited. Pressure to develop areas subject to substantial geologic hazards or problems is increasing. These hazards must be recognized and considered in the planning and design of projects in such areas.

Moreover, loss of recreational resources is a growing problem. Potential recreational areas near urban centers may be lost unless the wisest long-term planning is implemented and natural preserves are expanded beyond those already designated (such as the less accessible National Forests and Parks). Increasingly, as energy sources are diminished, recreation areas close to population centers will be needed.

Fortunately, the County is not yet so urbanized that planning is in the “too little and too late” category. It is imperative, however, that the sort of poorly-planned urban sprawl seen elsewhere in Southern California be avoided. In too many instances in the past, rapid population growth in California has pushed new urbanized development into

geologically unfriendly terrain, where even minimal precautions were not observed because of ignorance of facts that were often readily available. Planning can avoid the areas least feasible for development from a geologic point of view. Thorough geologic and engineering studies, and possibly substantial corrective work, may be required in other areas to provide reasonable assurance of a trouble free environment.

GEOLOGICAL FORMATIONS

The County is underlain mainly by marine sedimentary rocks of late Mesozoic and Cenozoic ages.⁵ Many of these rocks were deposited in a marine environment roughly similar to the margins of the Santa Barbara Channel. Some of the County's prominent rock units, however, seem to have been laid down in marine waters as much as 6000 feet deep, perhaps like the deeper parts of the Gulf of California.

All these bedded sedimentary rocks have been subjected to strong compressional forces producing folds and faults, which are especially evident in the San Rafael and Santa Ynez Mountains and on the offshore islands. The hills and valleys in the northwestern part of the County are chiefly controlled by folding and faults are few. In the Transverse Range section of the County, both folds and faults trend strongly east-west, giving rise to the prominent grain of those ranges. Likewise, in other parts of the County, the trend of both folds and faults is more northwesterly, consistent with the grain of the Coast Range province.

The rock formations exposed in the County are largely of marine sedimentary origin, except on the offshore islands which also include volcanics and basement rock. Total thicknesses of the formations are impressive: more than 25,000 feet in the Santa Ynez Range, up to 35,000 feet in the San Rafael Mountains, and 15,000 feet under the Los Olivos - Los Alamos lowland, to mention only a few.

The sedimentary rocks are diverse, but are dominated by great thicknesses of sandstone and shale with lesser amounts of conglomerate, alluvial fan deposits, and dune sand. Of the more common sedimentary rocks, limestone is the most poorly represented in the County; only a few thin beds occur in the San Rafael and the Santa Ynez Mountains. Some unusual sedimentary rocks are prominent, however, such as the thick diatomites or diatomaceous shales found in the upper Monterey and Sisquoc formations. Thick, light-colored diatomites, whose purity and quantity are as yet unmatched anywhere in the world, are derived from the Sisquoc formation near Lompoc and have been the basis of an important mining industry for many years. (The sequence of sedimentary rocks found in the County is summarized in the columns shown in Figures 1 to 6.)

	AGE	FORMATION	LITHOLOGY	THICKNESS	DESCRIPTION	
QUATERNARY	RECENT	ALLUVIUM (N)		0-1000'	Gravel, sand, silt	
	PLEISTOCENE	Upper	ELDER ALLUVIUM (N)		0-2000'	Sand, silt, basal gravel
			FANGLOMERATE (N)		0-3000'	Boulder gravel, sand
		Lower	CASITAS (N)		0-3000'	Boulder, cobble, and pebble gravel, buff sand, silt and clay
	PLIOCENE ?	SANTA BARBARA		0-2000'	Fine yellow sand and silt	
TERTIARY	MIOCENE	Upper	MONTEREY		2200'	Hard and soft siliceous shale
		Middle				Soft-organic shale and thin limestone lentils
	Lower	RINCON		1700'	Gray clay shale	
		VAQUEROS		300'	Buff sandstone	
	OLIGOCENE	SESPE (N)		2200'-4500'	10000'	Buff to pink orbic sandstone, red to green siltstone and basal red sandstone and conglomerate
	EOCENE	Upper	GOLDWATER		2500'-3200'	Buff sandstone
						Sandstone and siltstone
			COZY BELL		1550'-1900'	Gray clay shale
		MATILIJA		1800'-2100'	Buff sandstone	
		Middle ?	JONCAL		4000'-5300'	20000'
CRETACEOUS	Upper	JALAMA		2000'+	Conglomerate, sandstone and gray clay shale	
CRETACEOUS OR UPPER JURASSIC ?	FRANCISCAN				FAULT CONTACT Sheared black clay shale, hard green-grey sandstone, local intrusions of greenstone and serpentine SANTA YNEZ FAULT	

(N) Non-marine formation; all others marine

FIGURE 1

SEDIMENTARY ROCK UNITS SOUTH OF SANTA YNEZ FAULT
 EAST OF SAN MARCOS PASS

(From T. W. Dibblee: California Division of Mines and Geology, Bulletin 186, 1966)

	AGE	FORMATION	LITHOLOGY	THICKNESS	DESCRIPTION	
QUATERNARY	RECENT	ALLUVIUM (N)		0-100	Gravel, sand, silt	
	PLEISTOCENE	Upper	OLDER ALLUVIUM (N)	0-200	Gravel, sand, silt	
			FANGLOMERATE (N)		0-100	Boulder gravel
	Lower	SANTA BARBARA		0-2000'	Fine yellow sand	
	?				NOT IN CONTACT	
TERTIARY	PLIOCENE	Upper	PICO		0-2000'	Blue gray siltstone, fine sand; basal conglomerate
		Lower	SISQUOC			Diatomaceous clay shale
	MIOCENE	Upper	MONTEREY		1700-2300'	Hard platy siliceous shale; soft fissile to hard platy siliceous shale, thin limestone beds
		Middle				
		Lower	RINCON		1700'	Gray clay shale
		?	VAQUEROS		300'	Buff sandstone
	OLIGOCENE		SESPE (N)		2500'	1000' interbedded gray to buff sandstone and red to green gray siltstone
		?	GAVIOTA		0-1000'	Buff sandstone
	EOCENE		COLOWATER		0-2500'	Buff sandstone, thin beds of gray sandy siltstone
		Upper	SACATE		2500'-3000'	Gray clay shale; minor buff sandstone
COZY DELL				1800'-4000'	Gray clay shale; minor buff sandstone	
Middle		?	MATILAJA		1000'-2000'	Buff sandstone
			ANITA		1-300'	Clay shale and buff sandstone
CRETACEOUS	Upper	JALAMA		4500'+	2000' Dark gray clay shale; minor thin sandstone beds	
					SANTA YNEZ FAULT	

(N) Non-marine formation; all others marine

FIGURE 2

SEDIMENTARY ROCK UNITS SOUTH OF SANTA YNEZ FAULT,
 WEST OF SAN MARCOS PASS

(From T. W. Dibblee: California Division of Mines
 and Geology, Bulletin 186, 1966)

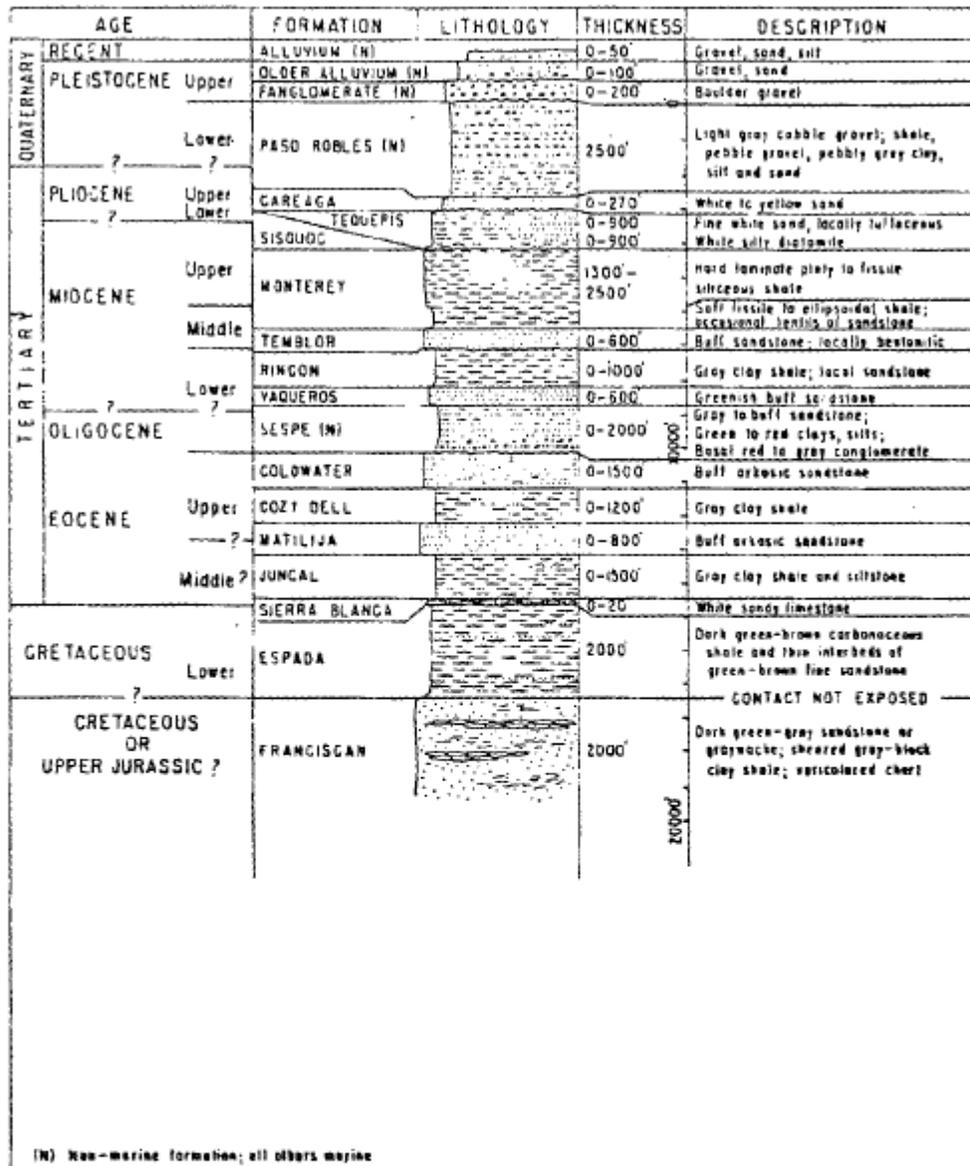


FIGURE 3

SEDIMENTARY ROCK UNITS NORTH OF SANTA YNEZ FAULT

(From T. W. Dibblee: California Division of Mines and Geology, Bulletin 186, 1966)

AGE	FORMATION	LITHOLOGY	THICK.	DESCRIPTION	
Recent	Alluvium		0-100'	Silts and gravels	
Pleistocene upper	Terraces		0-100'	Gravels	
Pliocene lower	Sisquac		3200+	Diatomaceous siltstone.	
				Clay shale or diatomaceous mudstone.	
Miocene	Monterey		1000-3000'	Thin bedded clay shale or laminated diatomite.	
				Porcelaneous and cherty siliceous shales.	
	Tranquillon		0-1200'	Organic shales and thin limestones.	
				Rhyolite and basalt lava, agglomerate, tuff, bentonite.	
				Rincon	Claystone.
Vaqueros		0-900'	Sandstone & conglomerate.		
Oligocene	Sespe / Alegria		0-2000'	Pink to buff sandstone and red and green siltstone. Gray to buff marine sandstone.	
	Gaviota		1600±	Fossiliferous buff sandstone and siltstone.	
	Eocene	Sacate		1000-1500'	Buff sandstone and clay shale.
Cozy Dell					700-2000'
Matilija			0-2000'	Buff arkasic sandstone.	
Anita		0-1000'	Dark gray clay shale.		
			Sierra Blanca	0-50'	Algal limestone lens.
Cretaceous	Upper	Jalama		2200+	Buff fine-grained sandstone. Gray siltstone. Buff sandstones and gray clay shales.
	middle? and Lower	Espada		4000+ to 6800+	Dark greenish brown carbonaceous shales and thin sandstones.
Jurassic	Upper	Honda		1500'	Basal pebbly sandstone. Dark greenish brown nodular claystone.
		Franciscan		?	Hard green sandstone and black shale. Serpentine intrusions.

FIGURE 4

SEDIMENTARY ROCK UNITS IN WESTERN SANTA BARBARA COUNTY;
 WESTERN SANTA YNEZ MOUNTAINS

(From T. W. Dibblee: California Division of Mines and Geology, Bulletin 150, 1950)

AGE	FORMATION	LITHOLOGY	THICK.	DESCRIPTION
Recent	Dune Sand		0-50'	Wind-blown sand.
	Alluvium		0-150'	Silt, sand, gravel.
	Terraces		0-150'	Gravel, sand.
Pleistocene	upper Orcutt		0-300'	Sand, basal gravel.
	lower Paso Robles		0 to 4500'	Cobble and boulder gravel. Shale-pebble gravel, silt.
Pliocene	upper Careaga		0-800'	Pebbly gray silt, clay, sand. Basal marl. Buff sand, pebbly sand. Fine yellow sand.
	middle Foxen		0-900'	Gray claystone.
	lower Sisquoc		2800' to 5000'	Diatomite and claystone. Diatomaceous claystone. Laminated diatomite and diatomaceous shale.
	Miocene upper Monterey		2000' to 4500'	Porcellaneous siliceous shale. Cherty siliceous shale. Organic shales and thin limestones.
Miocene lower Lospe ?		0-300'	Reddish sandstone, tuff.	
Cretaceous Lower Espada or "Knoxville"		?	Dark greenish brown clay shale and sandstone.	
Jurassic Upper Franciscan		?	Hard green sandstone. Sheared black claystone. Varicolored cherts. Massive to amygdaloidal basalts. Numerous serpentine intrusions.	

FIGURE 5

SEDIMENTARY ROCK UNITS IN WESTERN SANTA BARBARA COUNTY;
 SOUTHERN SANTA MARIA BASIN

(From T. W. Dibblee: California Division of Mines and Geology, Bulletin 150, 1950)

Igneous rocks are quantitatively unimportant on the County's mainland and are associated mostly with the Franciscan formation exposed in the San Rafael Mountains, the Casmalia Hills, and at a few places in the Santa Ynez Range. These rocks are of considerable interest as far as California's geologic history is concerned, especially those outcrops near Point Sal in the Casmalia Hills, but apart from the serpentines and small amounts of chromite, they are of little economic interest. Serpentines are metamorphic rocks of greenish, blackish, or grayish color formed by the alteration of earlier volcanic rocks. Where serpentine crops out extensively, as on the slopes of Figueroa Mountain, landslides and unstable ground are ever-present deterrents to land development.

One of the County's most troublesome rock units is the Rincon mudstone, which is exposed in a band on the south face – and locally on the north flank - of the Santa Ynez Mountains from near Point Conception eastward to the County line at Rincon Creek. The Rincon forms grass-covered slopes in the upper foothills, resulting in open country free of chaparral whose smooth, rounded slopes have encouraged development. Unfortunately, this rock readily breaks down into an unstable, heavy, clay soil, which expands when wet and develops deep cracks when dry. It slumps naturally and frequently where slopes occur. These unfavorable characteristics have proved costly and troublesome where houses and roads are built on this rock unit. Where the terrain is flat, structures have been damaged by the constant expansion and shrinkage of the soil; where slopes occur, these effects are augmented by the tendency for soil creep, slumps, and landslides to develop.

To some extent, soils developed on the Monterey Formation share the Rincon's difficulties, although as a rule they are not as severe.

Several other formations have characteristics that can produce special problems. The Fanglomerate or Older Alluvium, which occurs discontinuously in the lower foothills of the Santa Ynez Range, is so excessively bouldery (it contains huge blocks of sandstone, often eight to ten feet across) that any construction can prove extremely costly if excavation is required. The Santa Barbara formation, which occurs in patches on the coastal hills and in the lower foothills from Carpinteria to Goleta, is so soft and weakly cemented that it is rapidly gullied and washed wherever the protective vegetative cover is removed. Steep slopes are especially hazardous unless great care is taken to maintain the vegetative cover intact.

In the northern part of the County, the old dune sands, which extend well into the eastern Santa Maria Valley and Santa Rita Valley behave erosionally much as the Santa Barbara Formation does. The dunes are naturally covered by short grass and other annuals that effectively stabilize the sand. Where this cover has been removed, however, the soft and uncemented sands are quickly picked up by wind, and little scars become larger as sand is blown away. This sand is somewhat subject to gullying as "Jell, but slopes are generally minimal so that wind erosion is usually the most serious problem.

Volcanic rocks are uncommon on the mainland. Some basalts and rhyolites do occur in the western Santa Ynez Range near Mount Tranquillon, but by far the larger portion of the volcanics is found on offshore islands, particularly on Santa Cruz. Much of the north coast of Santa Cruz, from Prisoners Harbor to the western tip, is composed of a thick mass of basaltic and andesitic flows, some of which were once quarried to build the Santa Barbara breakwater. Basaltic rocks occur on both Santa Rosa and San Miguel islands, but not as abundantly as on Santa Cruz. Much of the western half of the South side of Santa Cruz is composed of volcanic rocks also, but these are tuffs, agglomerates, and fragmental volcanics rather than flows. Santa Barbara Island is composed entirely of basaltic lavas.

GEOLOGIC STRUCTURE

Faulting

A general description of faulting is given here. For a more detailed discussion of faults and their relationship to seismic hazards see sections on “Regional Geologic Structure” and “Description of Individual Faults.” Faults are numerous in the County and include several major ones. The main faults have been named, and are shown on the Geologic and Seismic-Tectonic maps. A large number of small, generally insignificant faults are also present but are not named. In the coastal zone, the main faults generally trend east-west; in the northern part of the County they are generally northwest-southeast, thus conforming to the two predominant trends in California.

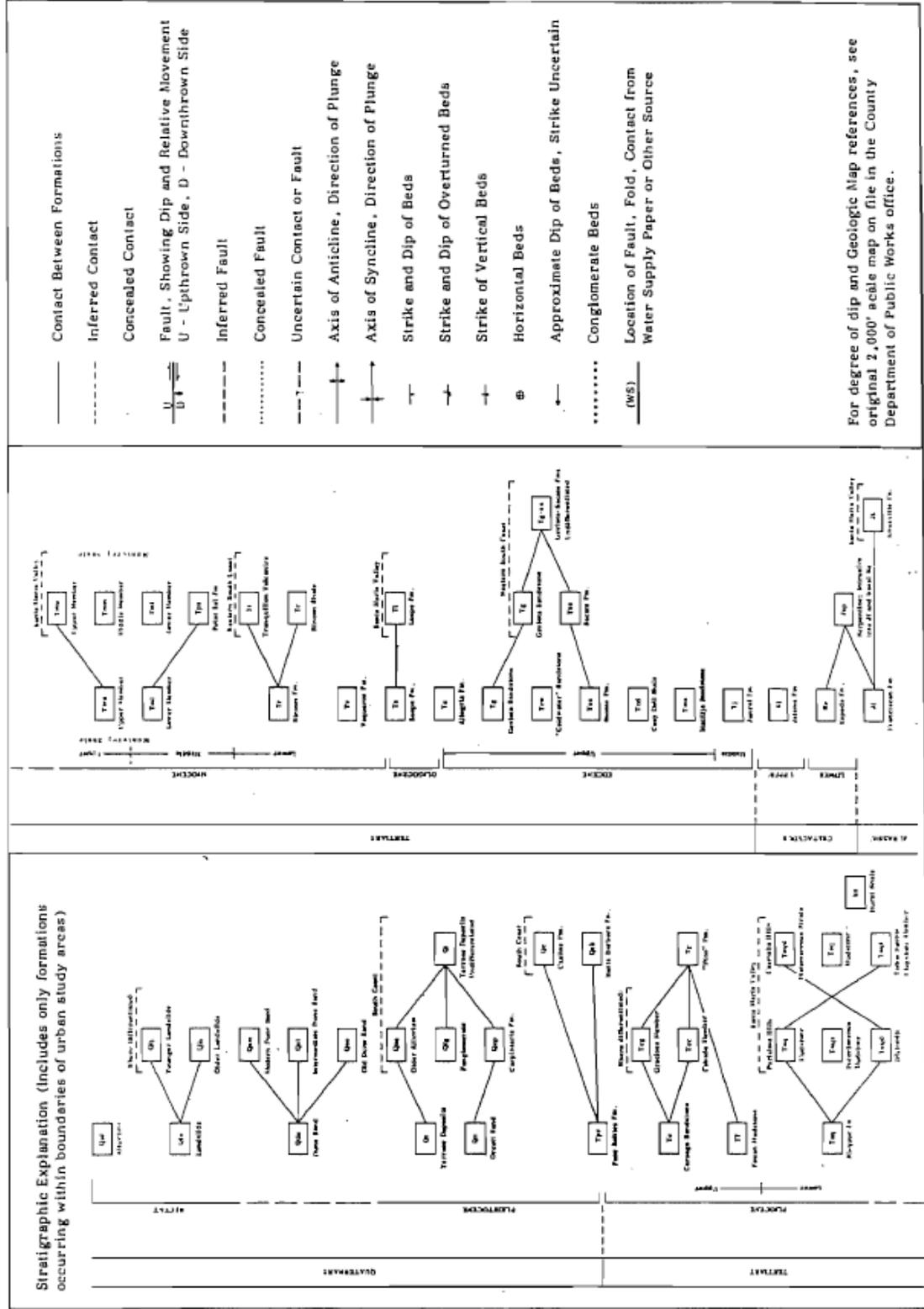
North of Santa Ynez Valley, major structures are the north and south Cuyama faults, their eastern extension the Ozena fault and the Nacimiento fault,⁶ a major feature which extends from near Monterey southward to join the Big Pine fault near Big Pine Mountain. The Big Pine fault, itself a major southern California fault, extends eastward as far as the San Andreas fault, some twenty-five miles east of the Santa Barbara – Ventura county line. South of Big Pine Mountain, major Santa Barbara County faults include parallel and sub-parallel faults like the Little Pine, Camuesa, Hildreth, Munson, and Tule Creek fractures. It is probable that these faults are related to the Nacimiento fault system of the Coast Range province.

The Nacimiento fault is the major structural feature of the southern Coast Ranges, although its history is the least known of all California’s major fault zones. This is due partly to the region’s poor accessibility and partly to apparent inactivity along the fault for perhaps a million years or more. This fault is believed to have significant strike slip in a right lateral sense, with coastal segments moving northwestward relative to the landward block. The Nacimiento system is actually a complex network of parallel and subparallel faults, which, in Santa Barbara County, broadly includes the Cuyama, Suey, Little Pine, Camuesa, and western segment of the Big Pine faults. Although these faults appear to be related, the Little Pine is a thrust, the Big Pine a reverse with left lateral slip, and the Camuesa an oblique fault with at least some right lateral slip.

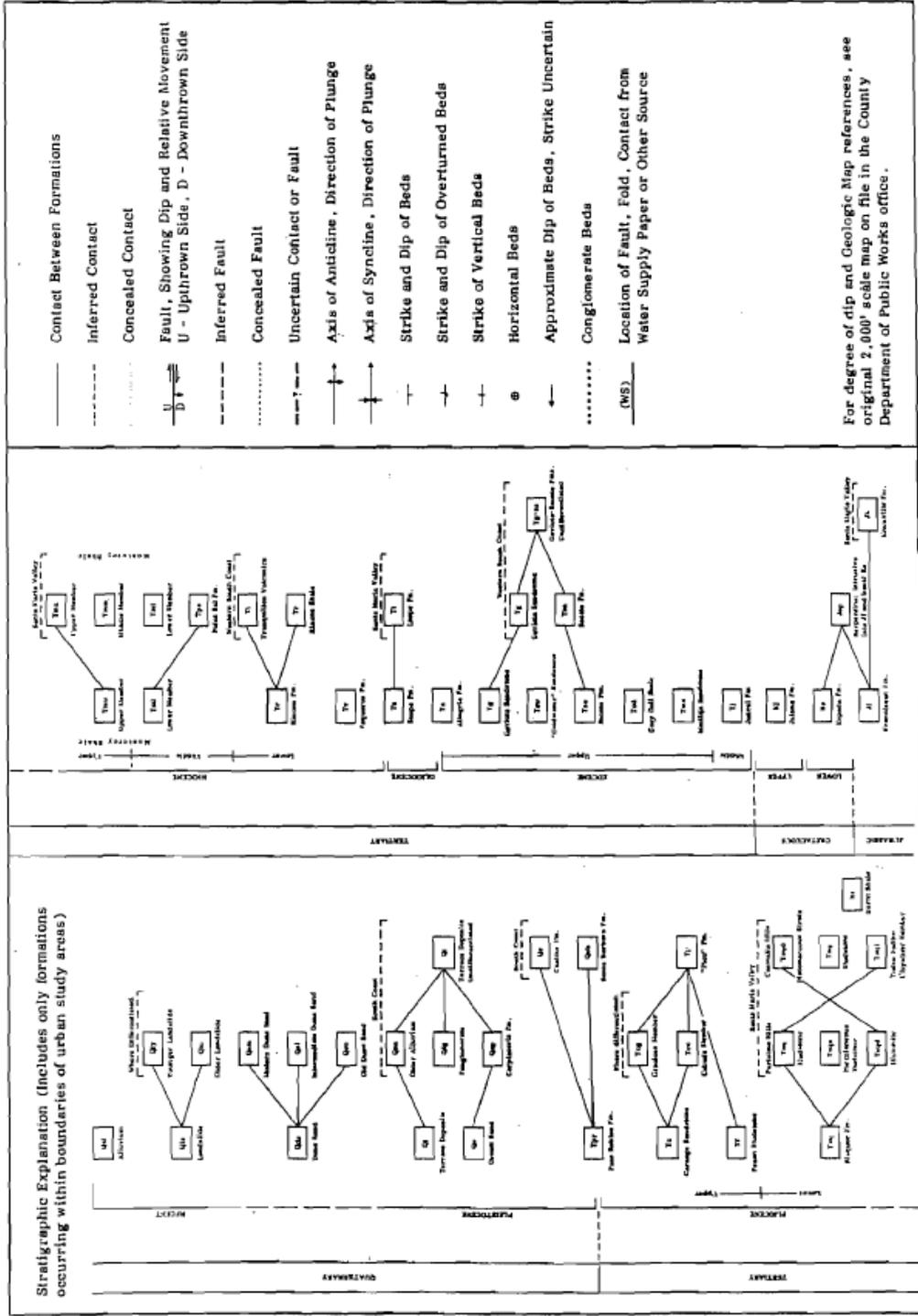
GEOLOGIC MAP SOUTH COAST AREA - WEST



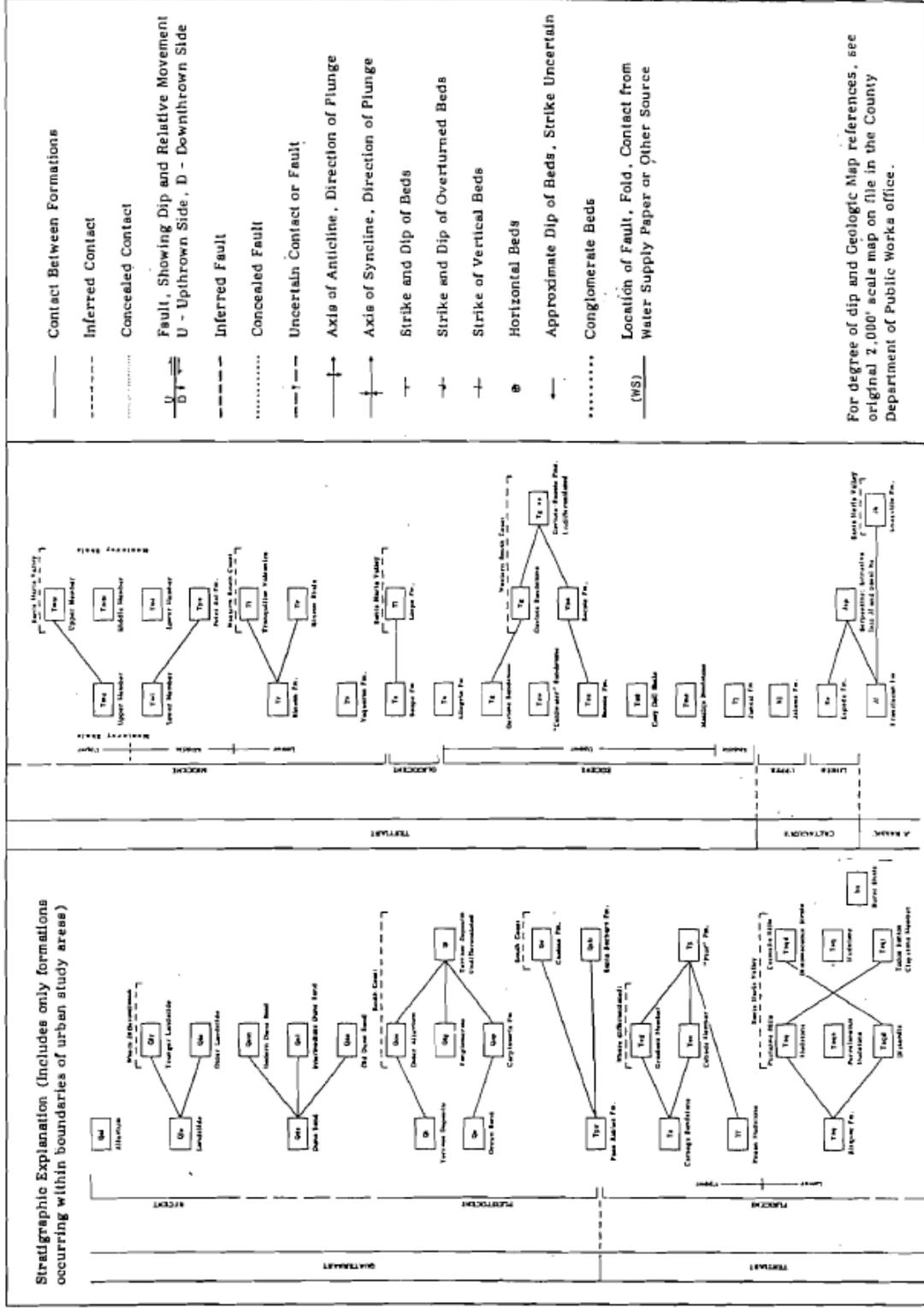
South Coast Study Area ~ West Geologic Map



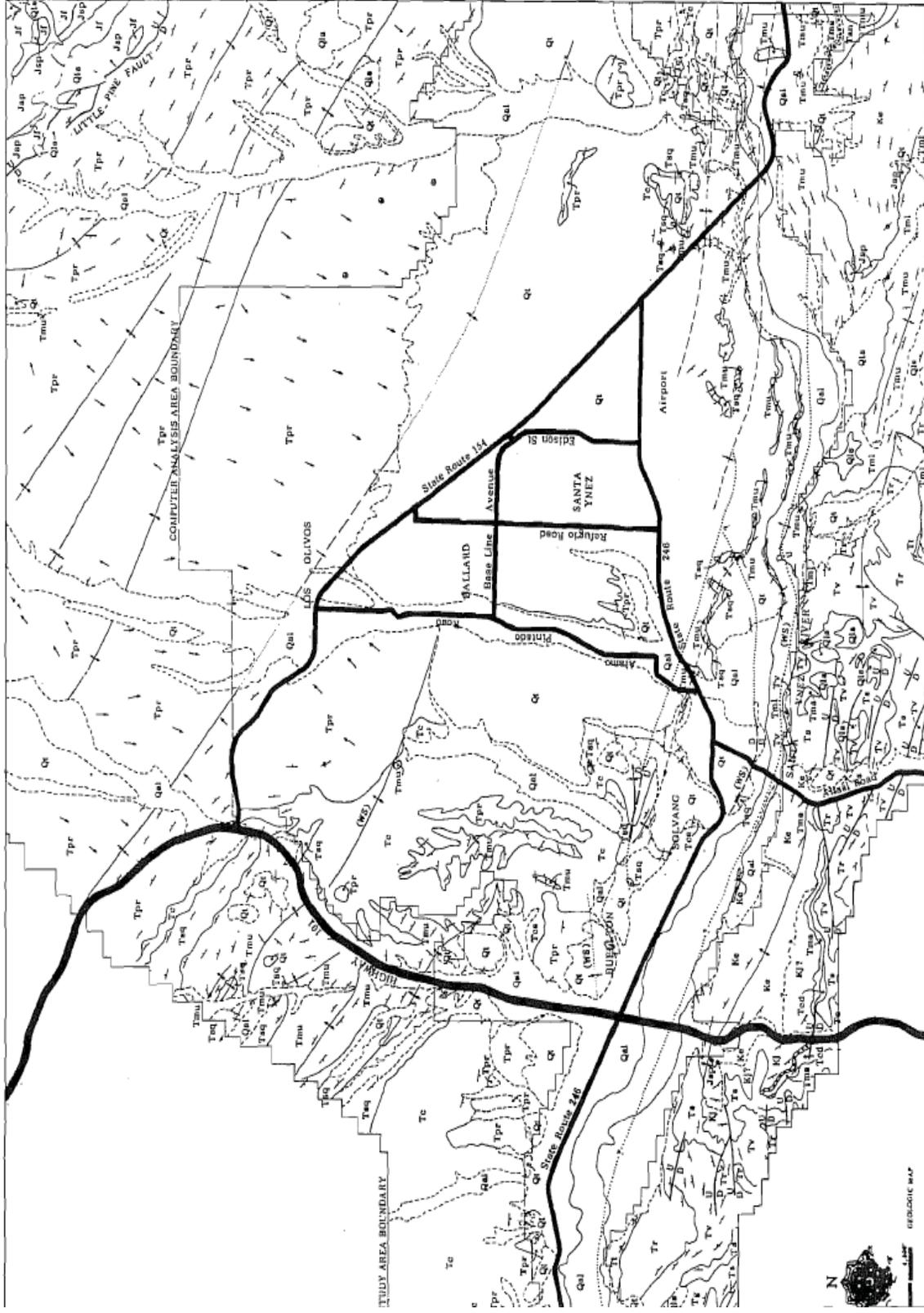
South Coast Study Area ~ East Geologic Map



Santa Ynez Valley Study Area Geologic Map

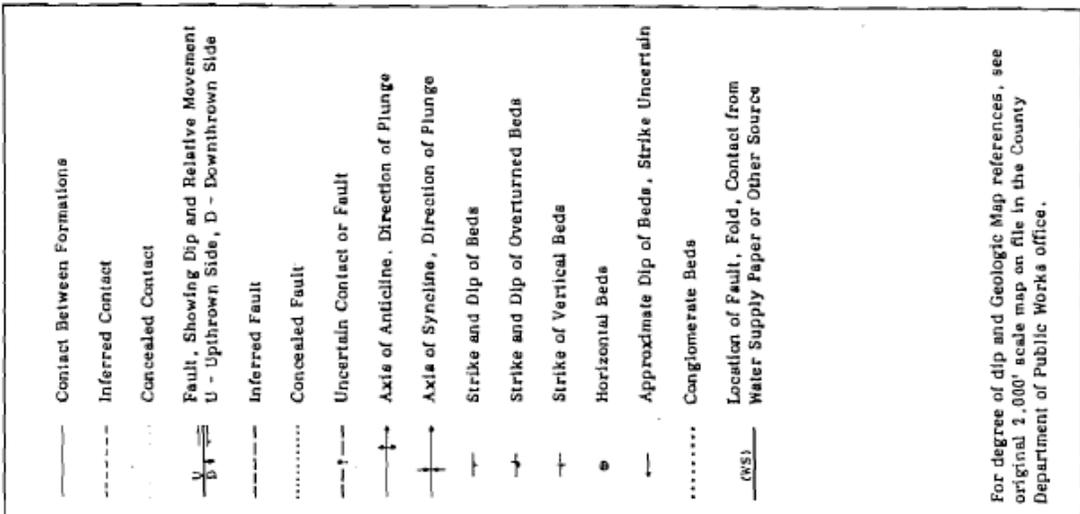
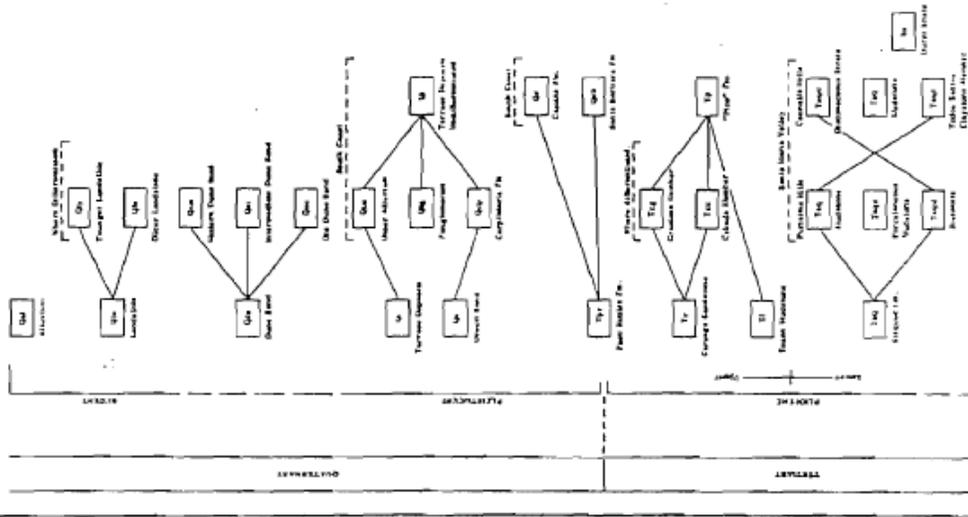


SANTA YNEZ VALLEY AREA



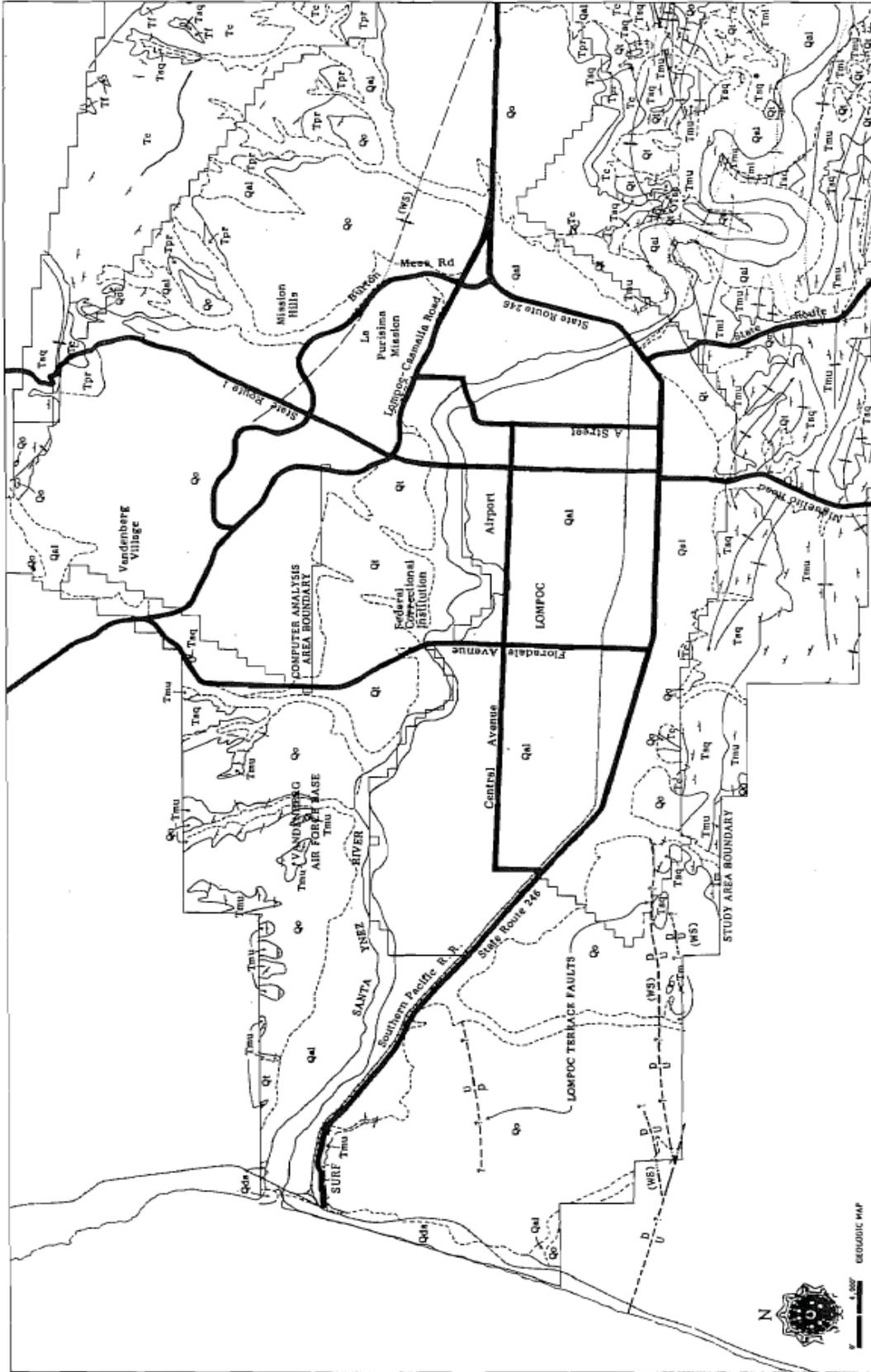
Lompoc Study Area Geologic Map

Stratigraphic Explanation (Includes only formations occurring within boundaries of urban study areas)

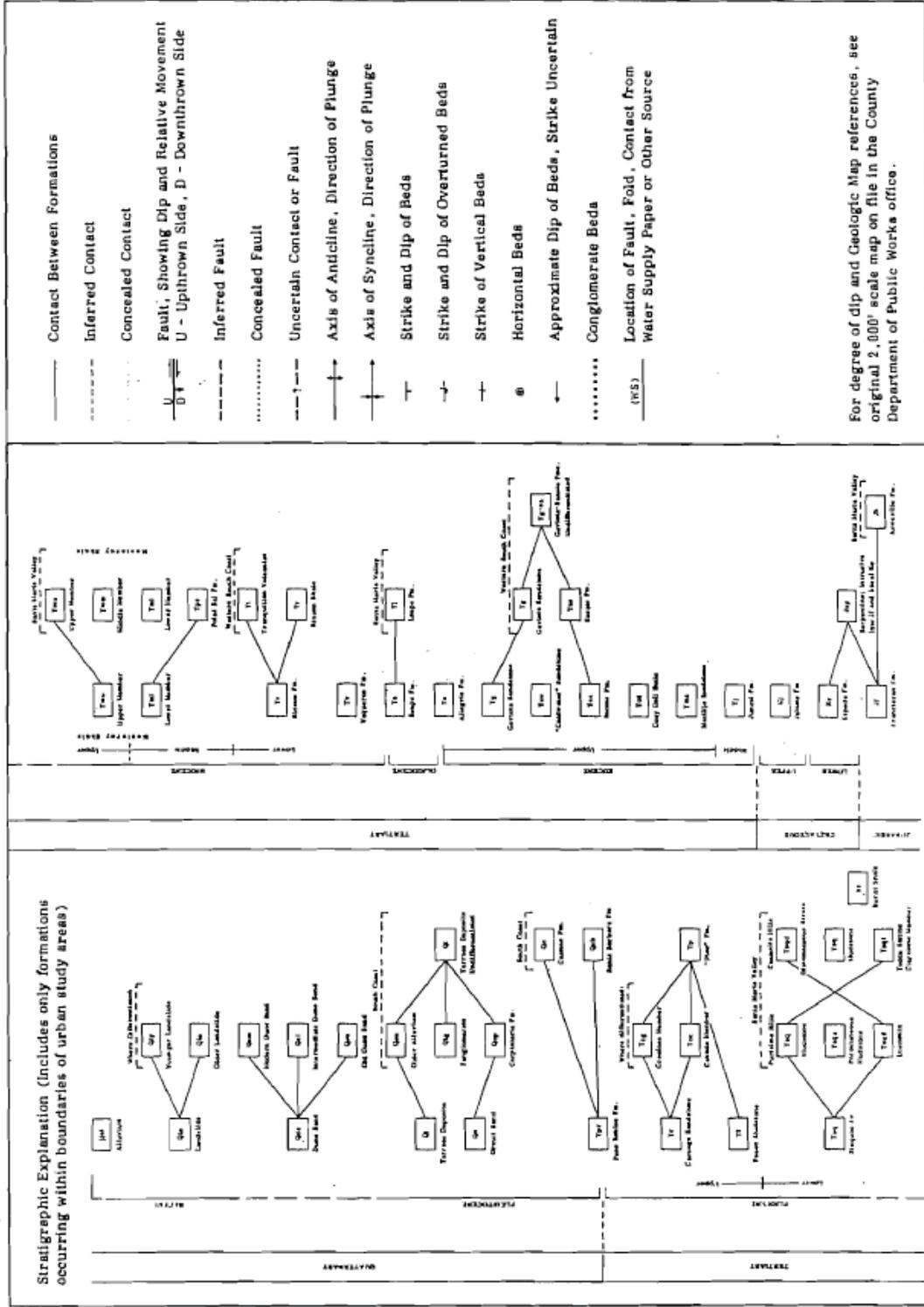


For degree of dip and Geologic Map references, see original 2,000' scale map on file in the County Department of Public Works office.

LOMPOC AREA

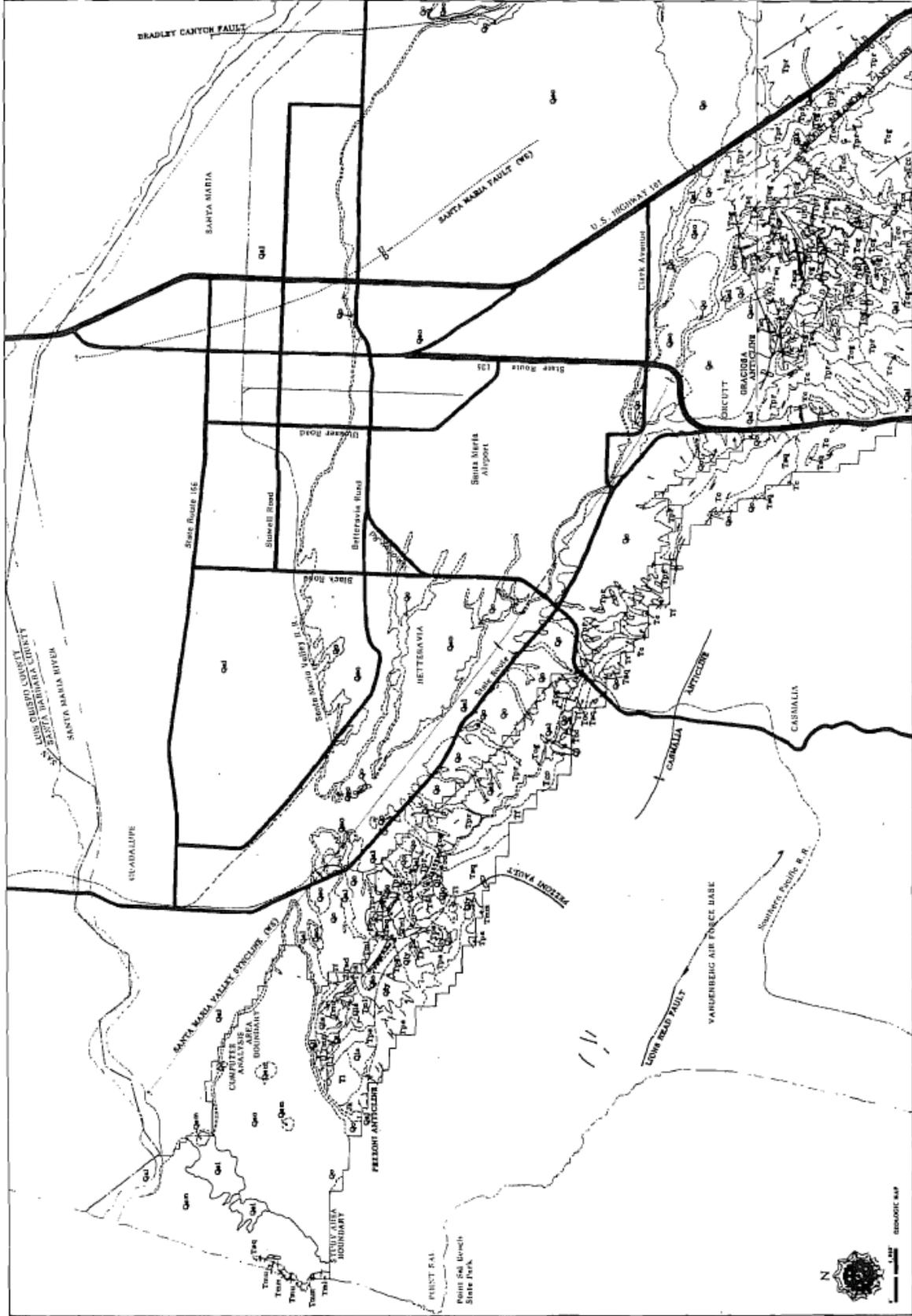


Santa Maria-Orcutt Study Area Geologic Map



For degree of dip and Geologic Map references, see original 2,000' scale map on file in the County Department of Public Works office.

SANTA MARIA-ORCUTT AREA



The major east-west fault is the Santa Ynez. It extends from near Jameson Lake on the upper Santa Ynez River, westward through Blue Canyon and Forbush Flat on the north slope of the Santa Ynez Range near Gibraltar Reservoir, to near Gaviota Pass where it branches. The south branch of the Santa Ynez fault strikes out to sea near the mouth of Alegria Canyon a few miles west of Gaviota Beach. The other branch continues westward to join the Pacifico fault, which dies out in the upper part of the Jalama Creek drainage. This fault system can be characterized as a high angle, oblique slip fault with appreciable left lateral slip.

On the south flank of the Santa Ynez Range and beneath the coastal plain, there are a number of faults parallel and subparallel to the mountains. Eastward from Gaviota Pass, the main faults are the Refugio, Carneros⁷, Dos Pueblos and Eagle, Glen Anne, San Pedro and San Jose, More Ranch, Lavigia, Mesa, and Mission Ridge. The Carpinteria and Red Mountain faults strike eastward into Ventura County from the eastern coastal plain. Only the More Ranch - Mission Ridge - Arroyo Parida faults form a persistent and probably continuous structure extending into Ventura County to the east. All these faults may owe their origin to the same stresses that produced the Santa Ynez fault to the north, though positive evidence of this direct relationship is lacking.

Some geologists relate the Santa Cruz Island fault to the Malibu fault, a major Transverse Range structure paralleling the Santa Ynez fault and of similar movement pattern.

Most of the coastal plain faults have steep dips with major dip-slip components. The Glen Anne, Dos Pueblos, and Eagle faults are short and cross the flat-lying coastal plain. They are less obvious because of the terrain they traverse, but well records and groundwater level variations affirm their presence and importance. In the foothill area, the Carneros fault is traceable for eight or nine miles and has a vertical displacement of about 1500 feet upward on the coastal block. The More Ranch, Lavigia, and Mesa faults underlie the heavily developed Goleta - Santa Barbara areas. These faults are poorly exposed, but escarpments such as the northeast-facing mesa overlooking downtown Santa Barbara is recognized as the result of upthrust of the coastal block. Maximum vertical displacements on any of these faults is probably not more than 2500 feet. Though topographic evidence for current movement is meager, indirect evidence suggests that these faults may become active at any time.

For example, the 1925 Santa Barbara earthquake was occasioned by the sudden slip of an offshore fault, perhaps the seaward extension of the Mesa fault. Some of these faults have juxtaposed relatively young late Pleistocene deposits against older rocks. It is likely that past movement on the Mesa and Laviaia faults is responsible, in part, for the dips of 40° or more that are observed in the Plio-Pleistocene Santa Barbara Formation near the yacht harbor.

Uplifted marine benches at Lavigia Hill, Hope Ranch, More Mesa, and Goleta Mesa, to elevations of as much as 600 feet, certainly indicate young or recent tectonic activity, although much of this elevation is difficult to relate positively to faulting.

The major Mission Ridge - Arroyo Parida fault zone forms the boundary of the coastal plain and the Santa Ynez block north of Montecito and is responsible, to some extent, for the sharp relief of the Santa Ynez mountain front. The Santa Barbara Riviera (Mission Ridge), a highly developed residential area built on the somewhat unstable Monterey formation, has been formed partially by movement on the Mission Ridge fault zone, which passes mostly north of the Riviera proper.

Folding

Most of the hills and mountains in Santa Barbara County are folded to some degree. The low range of hills in the northwestern part of the County are primarily simple anticlinal arches, slightly eroded and usually faulted to only a minor degree. These archlike folds are separated by downwarped or synclinal valleys. That topography conforms so perfectly to structure indicates geologically recent folding; erosion has not yet had sufficient time to erase or modify this correspondence. In the San Rafael Mountains, where folding may be much older, topography conforms imperfectly to underlying structure. For example, Cachuma Mountain is synclinal and San Rafael Mountain anticlinal.

Depending upon how one assesses the situation, the Santa Ynez Range may be described as either a faulted anticline or a southward-dipping homocline raised on the north along the Santa Ynez fault. Those who favor the anticlinal concept note that northward dipping rocks occur just north of the Santa Ynez fault and compose many of the same formations found in the main part of the range to the south. Another way of viewing the Santa Ynez Range is to consider it the steep northern side of a large synclinal structure comprising the Santa Barbara Channel or the western part of the Ventura basin.

Although most of the range is a homoclinal structure, it is crossed obliquely by several folds that are especially prominent on either side of San Marcos Pass and account for this sag in the range. The highway more or less follows the axis of a syncline. East of Gibraltar Road, the dips in the rocks steepen, first becoming vertical and then, as one continues east, overturning to the north. Overturned beds are defined as beds folded more than 90.0 from their original depositional position. Such structure is evident from about Romero Canyon eastward as far as the Ojai Valley in Ventura County.

Perhaps the most important consequence of folding is the development of anticlinal folds in porous and permeable sedimentary rocks. These provide traps in which petroleum and natural gas have accumulated at a number of places in Santa Barbara County. Most of the anticlinal traps evident from surficial geology have been drilled. There is always the possibility that additional traps, not evident from surface geology, may contain oil and gas; it is unlikely, however, that accumulations of large size have been overlooked.

THE SHORELINE

Santa Barbara County has a distinctive and long shoreline for a county of its size. The western coast, from the mouth of the Santa Maria River south to Point Arguello, a distance of about twenty-five miles, trends more southerly than the California coast generally, and is interrupted by prominent rocky headlands such as Point Sal and Purisima Point. From Point Arguello to Point Conception, the coast forms an open, curving bight facing southwest. This segment of the coast is about fifteen miles long. From Point Conception, the coast trends nearly due east for almost seventy miles to Rincon Creek. This is the longest east-west trending coast on the Pacific shore of the United States, excluding Alaska. In addition, the three islands lying off the south coast have an east-west trend and add about 200 miles to the County's shoreline.

The Western Coast

This part of the shoreline is the most exposed in Santa Barbara County and experiences the full brunt of Pacific winds and waves. The northernmost portion is sandy beach, which grades inland into the extensive- Guadalupe sand dunes. In one place, these active dunes extend inland about two miles. (Ancient dunes extend about twelve miles inland to the town of Sisquoc.) - It is likely that the Santa Maria River and other streams to the north furnish the sand supply for the beaches here and in turn, as the persistent northwesterly winds blow sand inshore, for the dunes as well.

Point Sal is a prominent headland formed by marine erosion of the seaward end of Point Sal Ridge. The beach is narrow here, with many parts exposed only during lowest tides. Because of rock resistance at Point Sal, there is a short stretch of east-west trending shore on the south side of Point Sal Ridge. Beginning about two miles southeast of Lion's Head (a rocky point southeast of Point Sal), the beach again is flanked inshore by extensive dunes. These dunes occur more or less continuously southward to Point Pedernales, about two miles north of Point Arguello, although they are quite narrow south of Purisima Point.

Some cliffs occur even along this portion of the coast, and one rocky headland, more or less surrounded by dune sand, occurs at Purisima Point. In many places, dunes have a steep seaward slope, in some instances over 100 feet high. It is likely that these steep dunes cover an old sea cliff because, at a number of places, a narrow strip of exposed bedrock is present behind the beach and below the dunes. Such an exposure is present from near Purisima Point almost to the mouth of the Santa Ynez River. It begins again about two and a half miles south of Surf, extending to near Point Pedernales where the dunes end.

The Monterey Formation accounts for the greater part of rocks exposed in the sea cliffs in Santa Barbara County. This rock is chiefly a hard, splintery, silicified shale, but in many places it is a soft diatomaceous shale. It contains numerous thin beds of volcanic ash, is often tightly folded or crumpled, and in many places is shattered or fractured

extensively. The weaker portions of the Monterey formation are readily eroded by both marine and non-marine processes.

Mussel Rock, a small headland at the south end of the Guadalupe Dune Field, is formed from the Monterey Formation, but the prominent Point Sal headland is carved mainly from the more resistant suite of rocks that are known collectively as the Franciscan Formation. This formation includes an assortment of hard, crystalline volcanic rocks, some soft serpentine, very hard cherts, and some well-cemented sandstones. The general durability of these rocks accounts for the prominence of the headland at Point Sal. Some softer rocks, consisting of siltstone and soft shale of the Point Sal Formation, together with tuffs, conglomerates, and sandstones of the Lospe Formation, do occur between Mussel Rock and Lion's Head. At Lion's Head, the Monterey Formation is exposed again.

Bedrock exposed from Purisima Point southward to the mouth of the Santa Ynez River is Monterey Formation. Bedrock is first encountered beneath the covering dune and beach sand about two and one half miles south of Surf, where the Sisquoc Formation is exposed.

The Sisquoc Formation is less silicified than the Monterey, but no more durable. It is a thin-bedded, rather soft, somewhat punky, diatomaceous shale, which responds to erosion in much the same manner as the Monterey.

The Southern Coast

Apart from two short stretches of coast, one at Point Pedernales and the other near the mouth of Canada del Rodeo northwest of Jalama where volcanic rocks are present, the entire coastal cliff from two and a half miles south of Surf to the city of Santa Barbara is formed from either the Monterey or the Sisquoc Formations. Thus, this coastal cliff can be expected to respond to marine erosion in much the same way throughout. One minor exception occurs on the south coast at More Mesa between Goleta Slough and Santa Barbara, where a massive siltstone forms a particularly high, steep cliff. This siltstone has been assigned to the Pico Formation by several geologists, although the assignment is-disputed.

A low alluvial coast occurs at Santa Barbara. This is replaced eastward by low bluffs cut in the non-marine Casitas Formation near Santa Barbara Cemetery. Alluvial materials again make up the low bluff from Santa Barbara Cemetery eastward as far as Ortega Hill at Summerland, where coarse, land-deposited gravels and the Casitas Formation form a bluff 100 feet high. Most of the bluff below Summerland is cut in these coarse alluvial gravels, but a short stretch of the coast near Loon Point is eroded from the Casitas Formation.

The low coast from Loon Point to near Carpinteria State Beach is chiefly a wave-deposited sandy beach with a low-lying alluvial plain to landward. At Carpinteria Salt Marsh, or El Estero, the beach is a cusped headland or a low sandbar developed in the

lee of a nearly submerged rocky reef which is exposed off Sand Point only at the lowest tides. Although this reef is not large, it has provided enough shelter from waves to allow the headland at Sand Point to develop.

Finally, from Carpinteria State Beach east to the county line at Rincon Creek, the sea cliffs are formed, once again, from the Monterey Formation.

THE OFFSHORE ISLANDS

Santa Barbara County includes four offshore islands: Santa Barbara, Santa Cruz, Santa Rosa, and San Miguel. Of these, Santa Barbara Island and nearby tiny Sutil Island are far to the southeast of the three Channel Islands. These two small islands are part of Channel Islands National Monument. Both are composed of basaltic lava flows that have been cut into steep cliffs as much as 500 feet high. There are no beaches on either island.

Santa Cruz Island embraces a wider variety of rock types than much of the mainland County and includes the County's only exposed granitic rocks and its oldest rocks as well (the Santa Cruz Island schist of middle or early Mesozoic age). For the most part, the shore is composed of bold, rocky cliffs, some rising 500 feet from the sea. Generally, beaches are small pocket beaches found at the mouths of canyons, but some longer stretches of sandy beach do occur, especially on the western and southwestern end of the island. Although much of the island's coast is cut into volcanic rocks (some of which were quarried to build the Santa Barbara breakwater in the late 1920's and early 1930's), extensive stretches of coastal cliffs, especially about the isthmus near Chinese Harbor, are formed from the Monterey Formation. In Chinese Harbor, there is a landslide that is kept active by a burning oil seep. The seep causes the shaly rock, baked by the smoldering fires, to crumble and slide down to the sea as talus.

The pattern of beaches is roughly similar on Santa Rosa Island, although well-developed beaches are more prominent and constitute a greater percentage of the coast than they do on Santa Cruz. Most of the coastal cliffs on Santa Rosa are cut from the Monterey Formation, which has a more varied lithography here than on the mainland coast or Santa Cruz. In addition to the typical siliceous and diatomaceous shales usually present in this rock unit, it includes a coarser-grained sandstone, breccia, and conglomerate, plus a considerable thickness of tuffaceous rock indicating a more voluminous contribution from volcanic sources than is characteristic of the mainland Monterey.

Some volcanic flows and volcanoclastic rocks occur along the Santa Rosa Island coast, but they are much less prominent on this island than on Santa Cruz or San Miguel to the west.

San Miguel Island, the windswept, westernmost island in the chain, has a lower elevation than Santa Rosa or Santa Cruz to the east and has proportionally much more

sandy beach than either of the two other islands. The prominent rocky headlands in the eastern half of the island are formed chiefly from volcanic rocks. In the western part of the island, the rocky cliffs are cut mostly in relatively durable Cretaceous and early Tertiary sedimentary rocks, which are generally more resistant and firmly cemented than the Monterey Formation.

AREAS OF SPECIAL GEOLOGIC INTEREST

Point Sal Area

This region from near Mussel Rock southeastward along the coast to the mouth of Shuman Canyon and inland to the crest of the Casmalia Hills (or Point Sal Ridge as it is sometimes called), contains one of the best ophiolite sequences in California. These sequences are unusual groups of igneous and sedimentary rocks widely believed to represent deep ocean floor materials plastered against the edge of the continent during the process of sea-floor spreading. Many classes and research investigators visit this remarkable area. Part of the area lies within Point Sal State Beach Park and part within Vandenberg Air Force Base but most is on private ranch lands.

Guadalupe Dunes

This environmentally sensitive area extends from the mouth of the Santa Maria River southward to Mussel Rock and inland a maximum of two miles. There is a sand mining operation in the central portion of this area and a small County park in the northerly portion. In recent years this area has been disturbed by off-road vehicle use.

Type Locality, Santa Barbara Formation

This highly fossiliferous shallow marine deposit was first described from exposures near Cabrillo Boulevard and the City College football field in Santa Barbara. The remaining exposures should be preserved.

Carpinteria Tar Pits

An active tar seep containing fossil vertebrate remains of type and variety similar to those found in La Brea Pits in Los Angeles occurs near the coast adjacent to - and possibly partly within the Carpinteria State Beach Park. Any portion of these tar pits outside park property should be added to the park eventually and protected.

San Miguel Island

San Miguel Island is government property under the nominal management of the Navy and the National Park Service. This island includes a relatively undisturbed insular area with fine coastal sand dunes a wide variety of rock types and an elevated marine terrace. It is also of interest anthropologically.

Nojogui Falls

This small but scenic waterfall, with a well developed travertine deposit, is located on private land, just south of the County Park.

Type Locality, Refugian Stage

This locality forms the standard for this stage of Cenozoic time for the west coast of the United States. The micro-fossil assemblage is thus considered a “classic” example of the small life forms prevalent at the time. It lies on the Hollister Ranch in Santa Anita Canyon which has been recently subdivided into 100 acre lots. Although development could pose a problem, difficulty of access presently protects the area.

Zaca Lake

This lake, located in the southwest portion of the San Rafael Mountains, was formed by a landslide which blocked drainage of a canyon. It is of geologic interest because it shows how the topography can be significantly changed by massive landsliding.

IV. GEOLOGIC AND SEISMIC HAZARDS

INTRODUCTION

Factors in Land Use Planning

Geologic, soil, and seismic factors affect the suitability of land for various uses and, hence, should be considered, along with other factors, in land use planning in order to eliminate or minimize their adverse effects. However, a distinction should be made – even though it cannot always be sharply drawn between problems for which there is a practical and economically feasible solution and those for which there is not. For some problems, such as ground offset as a result of fault displacement, it is not practical to solve the problem by engineering. In others, such as large landslides, solutions will exist, but they may be prohibitively expensive. However, some geologic problems such as expansive soils do not have a major impact on development and can be compensated for in design at a relatively moderate cost. The following tabulation provides a very rough classification of factors to be considered in land use planning.

Critical

- Ground rupture from fault movement
- Tsunamis and seiches
- Liquefaction

Sometimes Critical

- Groundshaking
- High groundwater
- Subsidence (normally correctable with engineering)
- Slope stability and landslides

Soil creep

Less Critical

Expansive soils

Compressible - collapsible soils

Ground rupture from fault offset and tsunamis and seiches are the only geologic problems for which there are really no ~~really~~-feasible engineering solutions, and which could be considered as dominant factors in planning (assuming fairly frequent occurrence). Items lower on the list should also be taken into account during development, and probably should be given some consideration in planning land use or density. However, an owner or prospective developer could argue that if a problem can be solved by engineering or appropriate site preparation to meet building standards, his property should not be subjected to planning constraints, provided that he is willing to spend the money necessary to solve the problem.

The emphasis of this study, as required by State law, was to prepare a seismic safety element evaluating seismic problems and related hazards. However, other soil and geologic problems deserve serious consideration, and also were investigated as to their possible effect on land use planning and safe, prudent development of property.

Basis for Evaluation

Types of Data - In order to evaluate the severity of the various types of problems, two approaches to data collection and analysis were used. One was to obtain areal geologic maps and reports from various sources such as the U. S. Geological Survey and U. S. Soil Conservation Service. From this basic information, the potential effects of the various problems on residential and commercial development was estimated. This method is by its very nature general and somewhat subjective.

A second approach, utilized in limited areas where data are available, was to determine those factors or situations that have caused problems in the past. Most geologic problems occur regardless of the presence of man. However, in undeveloped areas they usually have relatively little impact and frequently go undetected. Hence, the relatively heavily developed South Coast region may appear to have more problems than the rest of the County, but this could be misleading, and these problems could exist in various locations throughout the County and possibly could remain unobserved.

Specific Problems - Some examples of geologic problems deserve brief mention. Seismically related problems, including reported ground rupture and effects of ground shaking, have occurred on occasions during historic time in Santa Barbara County. There are some reports of tsunamis (seismic sea waves) in the past. However, the other main seismically related problems - such as creep along fault tract traces and liquefaction of the soils under seismic shock - are not known to have damaged structures in the County in the past.

Landslides and mass earth movements not associated with earthquakes have damaged structures and caused other problems in the County, notably in the heavily developed southern foothill. Slope erosion has caused trouble throughout the County, notably along the south coastal bluffs, where combined with bedding-plane landslides, erosion has damaged or threatened structures built adjacent to the bluffs.

Expansive soils can cause distress to structures built upon them and have caused problems sporadically throughout the County. The most extreme cases of structural distress have occurred in a belt along the south coastal foothills, where geologic formations outcrop that are either highly expansive themselves or generate highly expansive topsoils. Although expansive soils are a major and frequently underestimated problem, damage from this source can be minimized with appropriate engineering. However, in hilly areas, the effect of expansive soils in producing creep can be very difficult to overcome and may make dense development impractical without considerable engineering design.

Settlement of the ground surface can occur from consolidation of low density soils, collapse of high void soils upon saturation, or from subsidence due to fluid withdrawal. Settlement from the first two causes occurs sporadically throughout the County in the alluvial flatlands and in poorly-compacted, man-made fills, but subsidence due to fluid withdrawal is not known to have occurred in Santa Barbara County.

Near-surface groundwater in the form of perched water or a static high water table is a problem from several standpoints. A high groundwater table - depending on its depth - may not affect some types of development, but would make use of private sewage disposal systems (seepage pits or fields) impractical. It can affect excavations for utilities, basements, and pools, and require special design. The soils may also be susceptible to liquefaction. A high water table exists in the slough and lowland areas along the South Coast and perched water is found in several locations throughout the County.

With the adoption of stricter engineering and geologic controls on development, instances of damage from certain geologic problems are decreasing. This study will assist in minimizing the occurrence of such problems.

Limitations of "State-of-Seismic Art" - Certain limitations regarding the overall scope of the work were described under Limitations in the Introduction. For seismic hazards, a special warning is needed. The earth's crust and the faults that transect it form a very complex system. Although the expenditures of time and money spent in the field of seismology have increased very sharply since the San Fernando earthquake of 1971, and our knowledge has also increased substantially, specific solutions are still handicapped by the lack of knowledge and data, particularly the short historic record that provides the time base. Every major earthquake - and particularly the San Fernando earthquake - has added substantially to our knowledge and revised at least some previously held ideas. It is clear that there is much to learn. Under the present state-of-the-art, we cannot accurately predict which fault will move, when, or even in

many cases if it will move. Therefore, detailed seismic zoning is not justified by the present state of knowledge and implies an accuracy that presently is not achievable. Hudson (1972) has concluded that it is not feasible to seismically zone the City of Pasadena; this conclusion would apply to many other areas of comparable or even larger size.

Geologic Problem Rating System

In order to show the geologic problem ratings in usable form for land use planning purposes, the conclusions regarding the evaluation of the various geologic problems were shown on maps. The maps were designed to stand on their own as technical documents as much as possible; however, a general discussion of each problem is included in the report. The problems have been rated by drawing boundaries on maps of the entire County (excluding the National Forest) at a scale of 1" = 8000' and the study areas at a scale of 1" = 2000'. For a given area, each geologic problem evaluated was given one of three number ratings:

<u>Problem Rating</u>	<u>Description</u>
1	None to low
2	Moderate
3	High

The ratings were based on the relative degree of severity for each specific problem, compared only to the same problem. No attempt was made to compare it to other geologic problems in the original rating. It was generally not possible to give quantified ratings, but the problems were numerically defined for expansive soils, soil creep, and ground shaking.

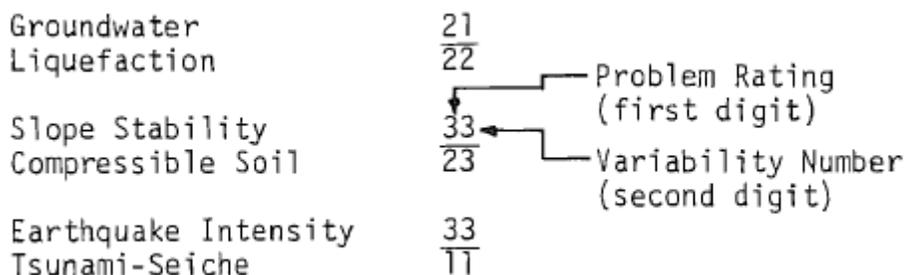
There is a wide range in the reliability and possible variability of ratings due to lack of basic data, sharp local variations within any designated area that cannot be portrayed at the scale mapped, and possible subjective variations in evaluating the available data. Therefore, a second single digit number indicating the reliability or possible variation was introduced. This second digit is located immediately after the rating number and gives the maximum probable range in the problem rating. Thus, a variability number of 2 means "+1" and indicates that the problem may be one rating higher (more severe) than the basic designation. The meanings of the variability numbers are given below. (Maximum probable range means that there is at least a 90% probability the property lies within the variability limits given.)

<u>Variability Number (2nd Digit)</u>	<u>Variation</u>	<u>Variability Number</u>	<u>Variation</u>
1	No variation	4	+2 rating
2	+1 rating	5	-2 rating
3	-1 rating	6	±1 rating

For example, a 35 rating for any given problem would indicate a high rating (3) with a possible variation (down) of two levels (5). A summation of the problem rating - variation system is shown below.

<u>Problem Rating Description</u>	<u>Numerical Designation</u>	<u>Possible Variation from Assigned Rating</u>
Low	1 1	- no variation
Low	1 2	+1 (moderate)
Low	1 4	+2 (high)
Moderate	2 1	- no variation
Moderate	2 3	-1 (low)
Moderate	2 2	+1 (high)
Moderate	2 6	± (high or low)
High	3 1	- no variation
High	3 3	-1 (moderate)
High	3 5	-2 (low)

For convenience, two geologic problems were plotted on each map, with the problems paired off so that boundaries on the map were common for both problems whenever possible. Six problems were rated in this manner to produce three maps. Examples of the two problem designations for each map are indicated below:



Of course, even within a given small area, it will not be uncommon for a particular geologic problem to range from low to high. It would not be meaningful to show the full range, if only a small portion of the area is given one of the classifications. Therefore, the estimated rating and variation have been selected as representing at least 90 percent of the area so designated. For example, if a problem rating of 22 is assigned to a given area, it is believed that at least 90 percent of the area is either in 2 (moderate) or 3 (high). Or, if 31 is assigned, at least 90 percent of the area is estimated to be at level 3 (high – no variation).

Geologic Problem Index

It was deemed appropriate to develop a composite number to give an overall indication of the difficulty to safely develop any particular area, from a geologic point of view.

Therefore, a system for rating geologic problems for a given area on both an individual and collective problem basis was devised which could be performed by computer. The resulting collective or cumulative value has been designated the Geologic Problem Index (GPI). Ground rupture is the only geologic problem considered separately, partly because it is such a serious or overriding problem in the limited locations where it occurs and partly because it is a linear rather than areal feature.

When all the different kinds of problems were designated, the rating of each was multiplied by a weight factor that approximately represents the magnitude of the problem involved in developing an area with respect to the weight factors for the other problems. The weight factors were chosen on the basis of the effect of the following considerations assuming a high rating (3) for each problem.

1. Consequences of the problem, that is whether or not property damage or loss of life would result and whether it would be moderate or severe.
2. Frequency of occurrence assuming no special precautions were taken. This was difficult to evaluate because some conditions such as expansive soils are constantly present, while tsunamis may be many decades or even centuries apart.
3. Difficulty of prevention. Some problems are relatively easily prevented. Others are very expensive or even impossible to prevent.

The values resulting from multiplying the rating of each problem by its weight factor have been summed to give a GPI. The variation of rating values also has been multiplied by the weighting factors and summed to give a possible range of variation. The weight factors and an example of a GPI calculation are given below based on a hypothetical hillside area with an unstable geologic formation (e.g., Rincon) in the South Coast region.

Geologic or Soil Problem	Rating			Weight Factor	Weighted Rating
	1	2	3		
Seismic Severity (ground shaking)			3	18	54
Tsunamis-Seiches	1			19	19
Liquefaction	1			15	15
Slope Stability			3	23	69
Expansive Soils			3	7	21
Soil Creep			3	4	12
Compressible/ Collapsible Soils		2		11	22
High Groundwater	1			3	3
				(100)	GPI = 215

Since the weighting factors were chosen to give a total of 100, a cell with no problems (Rating 1) would have a GPI of $1 \times 100 = 100$. A cell with severe problems in all categories would be $3 \times 100 = 300$, and a cell with all problems rated moderate would have a GPI of 200. In actuality, no land lies at the upper limit because some of the problems are unique to hillsides and some are essentially limited to flatland, so that no one piece of ground can have a high rating for all problems. The actual computed range was 100 - 236.

Expansive soils and soil creep were not mapped Countywide. Therefore, in order to provide an approximately equivalent basis of comparison with the urban study areas, a moderate rating of (2) was assigned, with a possible variation from low to high (\pm)

It was concluded that some guidance was needed in understanding the significance and meaning of the GPI ratings. In order to simplify the situation resulting from a large number of Geologic Problem Indices, the range of values for the entire County was divided into the following five categories. The limits of these categories were arrived at by applying engineering judgment in an attempt to establish absolute limits based on the theoretical severity of various combinations of problems and ratings, and then modified slightly so as not to have an exaggerated distribution of the number of cells within the categories.

<u>Category</u>	<u>GPI Range</u>	<u>Overall Problem Severity</u>
I	100-125	Low
II	126-145	Low-moderate
III	146-180	Moderate
IV	181-210	Moderate-severe
V	211 up	Severe

A discussion of the application of the categories as well as a computer printout display of the categories are given in the section on Conclusions and Recommendations, page 134.

Two other examples of the application of the GPI rating system for specific areas are given below to compare to the previously rated hypothetical hillside area underlain by an unstable geologic formation such as the Rincon Formation. As can be seen from the previous example, slope stability, soil creep, and expansive soils - which are interdependent and associated with each other in some formations such as the Rincon - have a high rating and are dominant factors in the GPI. Because of the hillside location, the area would not be subject to tsunami seiches, liquefaction or groundwater. Conversely, a flatland area located in the Goleta Slough would be more subject to tsunami, liquefaction, high groundwater and settlement.

<u>Problem</u>	<u>Weight Factor</u>	<u>Isla Vista</u>		<u>Goleta Slough</u>	
Ground Shaking	18	3*	54**	3*	54**
Tsunamis - Seiches	19	1	19	2	38
Liquefaction	15	1	15	2	30
Slope Stability	23	1	23	1	23
Expansive Soils	7	2	14	2	14
Soil Creep	4	1	4	1	4
Compressible Soils	11	2	22	3	33
High Groundwater	3	2	<u>6</u>	3	<u>9</u>
GPI			157		205
Category			III		IV

* Rating

** Weighted Rating

FUNDAMENTALS OF ENGINEERING SEISMOLOGY

Introduction

Earthquake design of important structures requires reasonable engineering decisions concerning the effects of ground motion on the structure. Consequently, the design engineer wants and needs to know as much as possible about the nature of the seismic ground motions to be expected at the particular site during the proposed lifetime of the structure.

The purpose of this section is to provide a very general and basic description of the “state-of-the-art” of earthquake engineering as it relates to the effects of a seismic event on a site under consideration. In addition to a brief presentation of the nature of the earthquake, this section presents some current methods and techniques for estimation of earthquake magnitudes, ground motion parameters, and probable reoccurrence of seismic events.

It should be emphasized that these methods and techniques represent the best information to date, but should not be considered as an exact or absolute solution. In most instances, they represent an average or idealized solution and must be applied in conjunction with considerable engineering judgment. Two events, the Alaskan Earthquake of 1964 and the San Fernando Earthquake of 1971, gave a tremendous impetus to basic research in this country into the nature of earthquakes and their effects. It is expected that earthquake engineering methods will change drastically in the next few years as the results of this research become available.

Realizing that this report will be of interest to persons with varied backgrounds, some of which will not be of a technical nature, an attempt has been made, insofar as possible, to present the material so it may be comprehended by the majority. Where interest is created for a more detailed or technical description, the reader should refer to the Bibliography.

The Nature of Earthquakes

It is generally accepted that the earth’s crust is not in a state of absolute quiescence, but that the crust is made up of a small number of adjoining plates, which are moving relative to one another. In the vicinity of the plate boundaries, the tendency for relative displacement between the neighboring regions sets up elastic strain; it is generally held that earthquakes are caused by the sudden release of stress when the earth’s crust fractures or slips at a weak point under an excess of this gradually accumulated tectonic stress. The seismically active areas of the world, such as California, generally lie along plate boundaries. Anderson (1971) describes the theory of plate tectonics as it applies to Southern California.

The point at which the initial rupture occurs and the first earthquake waves radiate is referred to as the focus or hypocenter. The position on the earth’s surface directly

above the focus is called the epicenter. Seismic waves are produced near the edge of the rupture as it spreads out from the focus, releasing the accumulated strain energy. Consequently, if the magnitude of energy released is significant, as is generally the case for large earthquakes, there will be relative movement between the two sides of the fault at other locations besides the immediate vicinity of the epicenter.

Faults and Earthquakes

A fault is a fracture or fracture zone in the earth's crust along which there has been a displacement of the two sides relative to one another. The displacement may range from a few inches to tens of feet. Cumulative displacements along large faults can total several hundred miles over a long span of geologic time. A fault is generally described and classified by the orientation of its surface and by the direction of its movement. Figure 6 illustrates some types of idealized faults.

If the movement takes place abruptly - as is usually the case - an earthquake results. If the focus (source location) of an earthquake is shallow, the fracture often extends to the surface of the ground where it is recognized as a fault. However, if the focus is deep, or the energy release is small, the fracture may not extend to the surface. Nevertheless, it is believed that the mechanism of nearly all earthquakes is related to faulting whether or not the fault break related to a particular earthquake extends to the surface.

The likelihood of major earthquakes on a particular fault can, in principle, be determined from geological, geodetic and seismological data, such as earthquake history, distribution of epicenters, strain level and rate, and the ages of fault displacements during the last several thousand years. Unfortunately, the geologic data are usually not adequate to estimate the expected frequency of destructive earthquakes on an individual fault (Ziony et al., 1973). The age of latest displacement on an individual fault is the criterion for determining potential activity which can be applied most consistently to a regional study of faults. Depending on the preserved geologic record, the recency of movement can be approximated for each fault from geologic or topographic features and historic data. On this basis, the ages of latest movement along individual faults can be compared. With this approach it is often assumed that faults with the more recent displacements are the most active and most capable of producing earthquakes (Ziony et al., 1973). However, a fault may be active, as reflected in frequent small earthquakes or tectonic creep (continuous slow movement, often without earthquakes), and not capable of generating a large destructive earthquake. Elastic strain necessary for a large earthquake may actually be released by the continuous activity. On the other hand, the absence of historic and geologically recent earthquakes could indicate a large accumulation of strain energy and the consequent hazard of an impending large event (Allen, 1968).

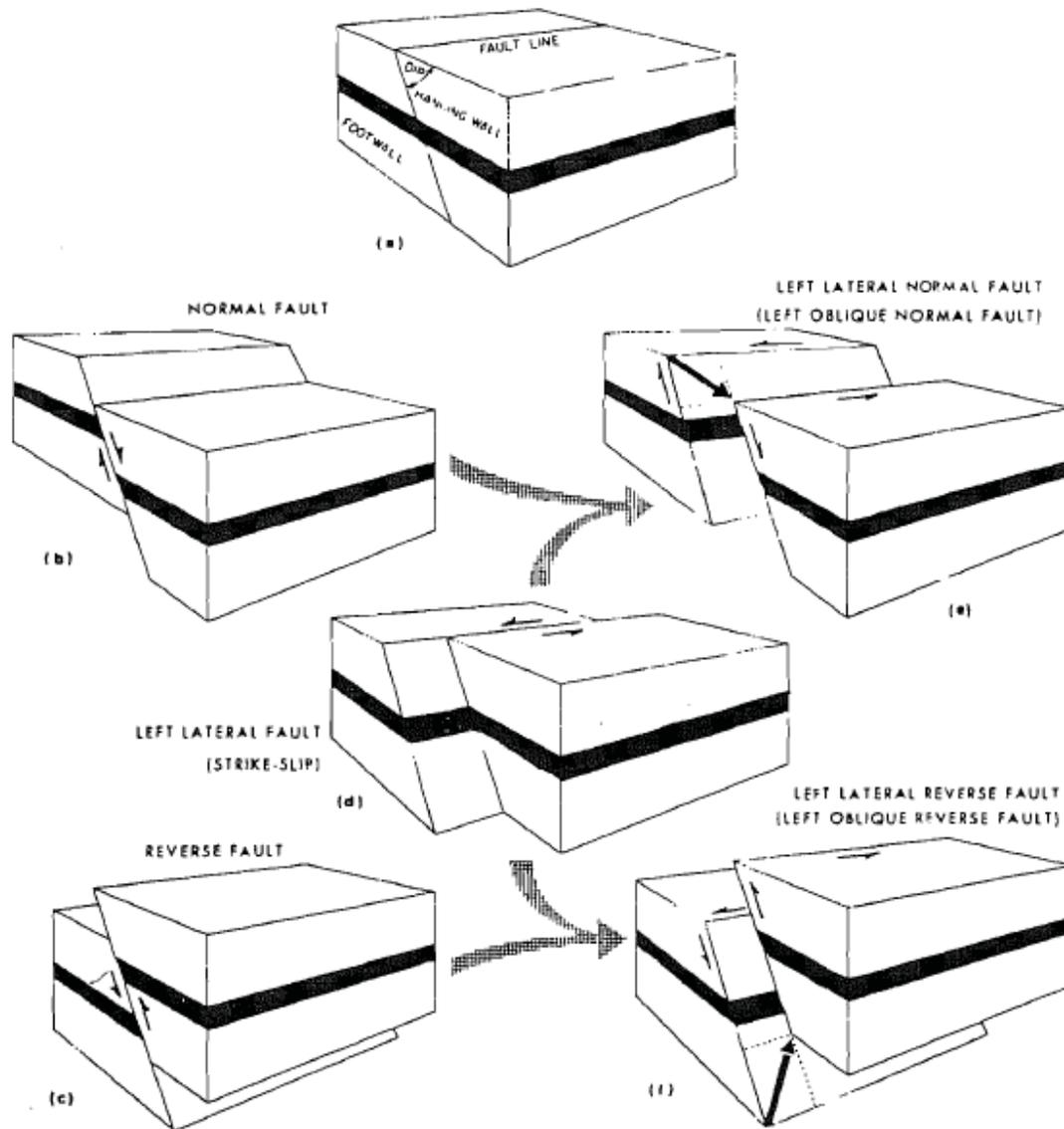


Figure 4. Types of fault movement. a) Names of some of the components of faults. b) Normal fault, in which the hanging wall has moved down relative to the foot wall. c) Reverse fault, sometimes called thrust fault, in which the hanging wall has moved up relative to the foot wall. d) Lateral fault, sometimes called strike-slip fault, in which the rocks on either side of the fault have moved sideways past each other. It is called *left* lateral if the rocks on the other side of the fault have moved to the left, as observed while facing the fault and *right* lateral if the rocks on the other side of the fault have moved to the right, as observed while facing the fault. e) Left lateral normal fault, sometimes called a left oblique normal fault. Movement of this type of fault is a combination of normal faulting and left lateral faulting. f) Left lateral reverse fault, sometimes called a left oblique reverse fault. Movement of this type is a combination of left lateral faulting and reverse faulting. Two types of faults not shown are similar to those shown in e and f. They are a *right* lateral normal fault and a *right* lateral reverse fault (a right oblique normal fault and a right oblique reverse fault, respectively).

FIGURE 6
 TYPES OF FAULT MOVEMENT

(from California Geology, November, 1971)

Despite these uncertainties, the age of latest displacement is the most useful and easily applied criterion for estimating the future probability of an earthquake on an individual fault. As outlined below, faults are divided into four classes in order of increasing age since the last movement (modified from Cobarrubias et al., 1973).

Historically Active (HA) - Faults for which destructive earthquakes within historic time are reasonably well documented are classified as historically active. In some cases earthquakes have originated on possible sub-sea faults or sub-sea extensions of known faults. Epicenters are not always well located, fault patterns are complex, and individual fault traces are discontinuous and have variable trends. Thus, assignment of historic activity on the basis of an earthquake originating on a possible sub-sea extension of a fault is considered speculative.

Active (A) - Faults that show evidence of displacement during the most recent epoch of geologic time (Holocene or Recent epoch) are classified as active. Ziony (1973) and Ziony et al. (1973) estimate that the Recent epoch began approximately 11,000 years ago. Any topographic reflection of fault displacement is considered evidence that the causative fault is active because after 11,000 years such evidence would probably be obliterated by erosion and deposition. Figure 7 shows landforms along recently active faults. Some topographic features, as evidence of Holocene displacement along faults in Santa Barbara County, are summarized in Table 1 in the following section.

Fault scarps are formed when the original ground surface is displaced due to fault movement; recent fault scarps are sometimes difficult to differentiate from “fault-line scarps.” Fault-line scarps form along faults as a result of greater erosion of soft rocks on one side of a fault trace. If the rocks on opposite sides of a fault have the same susceptibility to erosion, the resulting scarp probably formed as a result of displacement in geologically recent time. Otherwise, the scarp would be substantially obliterated, subdued, and less conspicuous.

Sagponds occupy depressions along recently active faults; the depressions apparently form as a result of uneven settling of the ground within a fault zone during an earthquake. It is estimated that deposition would fill a sagpond within 11,000 years; thus sagponds provide criteria for classifying a fault as active.

Drainage lines may be displaced laterally along a fault. Such offsets would probably be obliterated by erosion within 11,000 years and thus their presence is a good criterion for classifying a fault as active. Caution must be used in identifying such offsets because stream channels may form preferentially along less resistant broken rock in a fault zone. In this case, the direction and amount of offset may be inconsistent.

The youngest alluvium filling drainage courses is considered to be of Recent age; if such deposits are displaced, the fault is classified as active. It should be recognized that rates of erosion and deposition vary widely due to differences in terrain, climate, vegetation and rock type. Thus, the lower age limit of 11,000 years assigned to

Holocene (Recent) alluvium and residual topographic features produced by faulting is only an approximation.

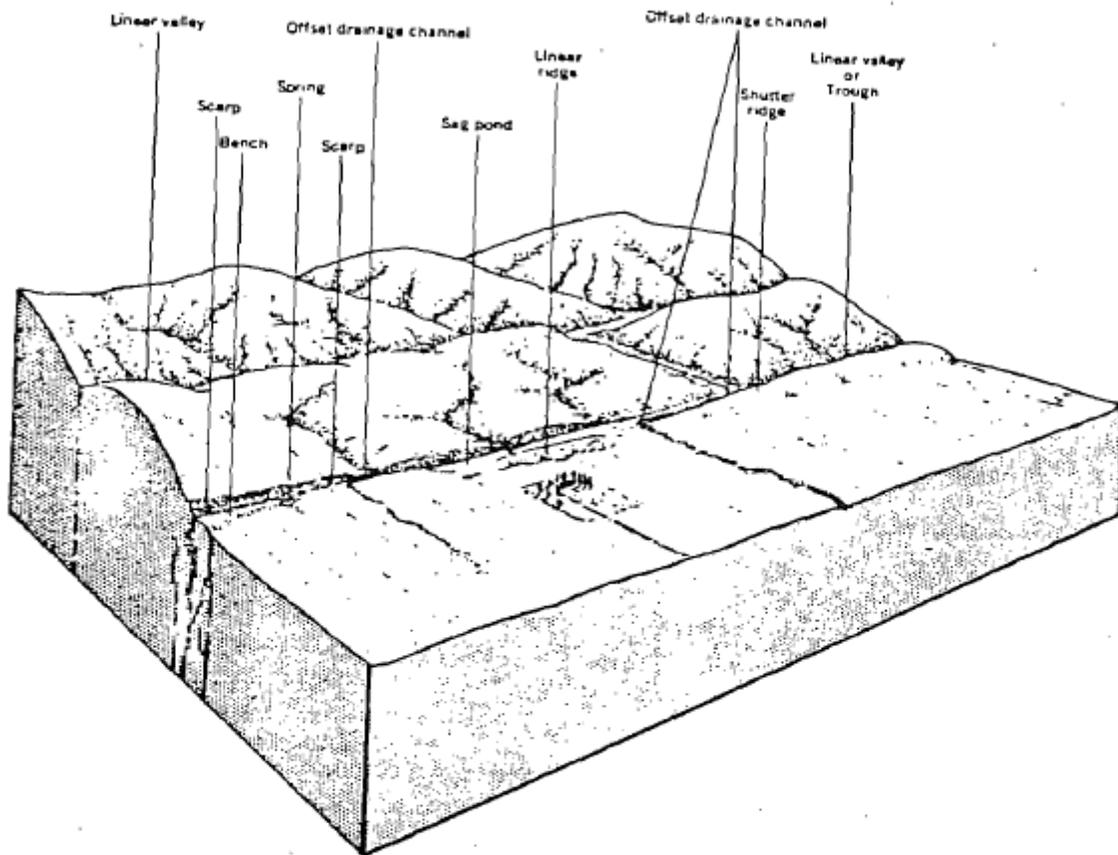


FIGURE 7

LANDFORMS ALONG RECENTLY ACTIVE FAULTS

(from Vedder and Wallace, 1970)

Elevation changes have been measured across several faults in Santa Barbara County; this difference is based on comparison of elevations along level lines surveyed in 1957-1960 and 1971 (Willott, 1972). Such elevation differences can be the result of groundwater withdrawal or differential compaction of poorly consolidated sediments present only on one side of a fault rather than tectonic activity (Lamar and Lamar, 1973). Thus, differential ground elevation by itself, is not considered adequate evidence that a fault is active and capable of generating a destructive earthquake.

More or less continuous displacement or creep may occur along a fault without associated noticeable seismic activity. Some geologists believe that such movement may prevent the accumulation of strain energy necessary for a major earthquake. The significance of creep in terms of the earthquake hazard of an individual fault is poorly understood.

Potentially Active (PA) – Faults which displace deposits of late Pleistocene age and show no evidence of Recent (0 to 11,000 years old) movement are considered potentially active. The late Pleistocene is estimated to span 11,000 to 500,000 years before the present (Ziony, 1973). Actually, such young deposits are usually poorly dated because of a lack of fossils and other organic material suitable for radiometric age determinations. Published geologic maps of Santa Barbara County usually indicate that old alluvium, terrace deposits, and fan conglomerate are of late Pleistocene age.

The upper surface of old alluvium occurs above the level of present deposition and has been eroded by down-cutting of the main valley and tributary streams. These deposits are older than the alluvium presently being deposited in the main stream valley. If erosion proceeds to the point where only isolated outliers of alluvial sediments cap high points, such deposits are usually classified as river or stream terrace deposits.

Fan conglomerate consists of material deposited in an alluvial fan. Dibblee (1966) considers the fan conglomerate in the Santa Barbara area to be of late Pleistocene age because it is dissected and contains huge boulders which were probably deposited by torrential downpours considered typical of the Pleistocene ice ages.

We have followed usual convention and consider these older alluvial deposits to be late Pleistocene in age. This age designation is primarily based on the fact that the pre existing alluvial deposit has been eroded. The erosion presumably occurs because the deposit has been uplifted or the main valley has downcut. Actually, in the Santa Barbara area, there is no assurance that the required uplift or downcutting and erosion occurred more than 11,000 years ago. Thus, the distinction between “active” and “potentially active” faults is difficult to define.

Inactive - Faults that only displace rocks of early Pleistocene age or older (500,000 years old or older) and show no evidence of more recent movement are classified as inactive. Early Pleistocene to late Pliocene sediments fill many of the lowland valleys in Santa Barbara County. These deposits are often conformable (no discordance in structure) with overlying late Pleistocene and Recent deposits. They are commonly not

well dated because of a lack of fossils and material suitable for radiometric age determinations. Thus, the 500,000 years upper age for early Pleistocene deposits is usually not well established, and faults which displace such deposits should be considered a greater hazard than faults which displace only older rocks. Cobarrubias et al (1973) have recognized this distinction and classified such faults as “Potentially active, subgroup two - low potential.”

In the overall geologic picture, the majority of faults fit into the inactive category. Geologic mapping usually shows that bedrock at any site contains faults of various sizes, most of which have been quiescent for millions of years. Such faults constitute no significant earthquake risk. For engineering design, it is only faults within the first three categories (HA, A, PA) which require consideration and judgment regarding the likelihood and effects of seismic activity within the lifetime of the project.

Parameters Describing Earthquakes

In the following few pages, the principal parameters used by earthquake engineers to characterize an earthquake and the shaking it produces at a site are described. These parameters are largely empirical, as a precise theoretical description is hampered by lack of detailed knowledge of the source mechanism and by the complexity of the propagation of the resulting seismic waves through the normally non-homogeneous geologic formations typical of the seismic region of the earth. The empirical approach to the problem is handicapped by the small number of recorded events, particularly large ones, upon which the data are based.

There are two terms which are commonly used to describe the size of an earthquake. These are “intensity” and “magnitude.”

Earthquake Intensity - Intensity is an indication of an earthquake's apparent severity at a specific location, as determined by observers. It is a measure of the effects of an earthquake determined through interviews with persons in the quake area, damage surveys, and studies of earth movements. Consequently, intensity is a subjective measure of the size of an earthquake.

In the absence of any instrumental recordings of the ground motion, seismologists describe the severity of the ground shaking at a particular site by assigning an intensity number. The Modified Mercalli intensity scale is generally used in the United States to subjectively measure the effects of earthquake motion. This scale grades the effects into twelve classes ranging from I (ground motion not felt) to XII (nearly total damage). This scale is shown in Figure 8.

Intensity scales were used for the purpose of drawing seismic intensity maps which contain contour lines of equal seismic intensity. The Uniform Building Code seismic risk map is determined largely from such intensity maps of past damaging earthquakes. It should be noted that because our recorded seismic history is short relative to earthquake recurrence intervals this method has serious limitations.

MODIFIED MERCALLI INTENSITY SCALE

Intensity. A subjective measure of the force of an earthquake at a particular place as determined by its effects on persons, structures, and earth materials. The principal scale used in the United States today is the Modified Mercalli, 1956 version as defined below (modified from Richter, 1958, p. 137-138):

- I. Not felt.
- II. Felt by persons at rest, on upper floors, or favorably placed.
- III. Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
- IV. Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing automobiles rock. Windows, dishes, doors rattle. Wooden walls and frame may creak.
- V. Felt outdoors; direction estimated. Sleepers awakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing. Shutters, pictures move. Pendulum clocks stop, start, change rate.
- VI. Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D¹ cracked.
- VII. Difficult to stand. Noticed by drivers of automobiles. Hanging objects quiver. Furniture broken. Weak chimneys broken at roof line. Damage to masonry D, including cracks; fall of plaster, loose bricks, stones, tiles, and unbraced parapets. Small slides and caving in along sand or gravel banks. Large bells ring.
- VIII. Steering of automobiles affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
- IX. General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. General damage to foundations. Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground and liquefaction.
- X. Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
- XI. Rails bent greatly. Underground pipelines completely out of service.
- XII. Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown in the air.

¹ See Uniform Building Code for specifications on quality of masonry construction.

FIGURE 8

MODIFIED MERCALLI SCALE

(taken from Nichols and
Buchanan, circular 690, 1974)

Earthquake Magnitude - Richter Magnitude is an arbitrary scale which gives a measure of the total amount of energy released by an earthquake as determined by measuring the maximum amplitude produced on a standard recording instrument. It is a measure of the absolute size of an earthquake, and does not consider the effect at any specific site location.

In 1935 C. F. Richter defined the magnitude, M , of an earthquake for shallow shock as

$$M = \log \frac{A}{10A_0}$$

where A is the maximum amplitude recorded by a Wood-Anderson seismograph at a distance of 100 kilometers from the disturbance, and A_0 is an amplitude of one thousandth (0.001) of a millimeter. Observations at distances other than 100 km are corrected to the standard distance. Due to non-uniformities in the earth's crust, different fault orientation and other factors, M is not a precise measure of the size of an earthquake. For best results, an average value of M is determined from a number of recordings from different seismological stations.

There is no upper limit to the Richter Scale. However, since there is a physical limit to the amount of strain that rock can endure, it seems reasonable to postulate that there is an upper bound for the magnitude of an earthquake. In California, this is generally taken as 8.5.

Earthquakes of magnitudes 5.0 or greater can generate sufficient ground motion to be potentially damaging to structures. Design engineers are generally not concerned with earthquakes of a magnitude less than about 4.0 or 5.0, since they are of short duration and do not produce ground motion that causes serious damage to ordinary structures.

The relationship between the magnitude of an earthquake and the energy which it releases is generally given by the expression

$$\log E = 11.8 + 1.5 M$$

where M is the Richter magnitude and E is the energy in ergs.

It should be noted that the magnitude and energy releases are not related linearly. A difference of one unit in magnitude corresponds to a factor of 31.6 in the amount of energy released. Consequently, an earthquake of magnitude 8 represents an energy release approximately 32 times greater than that of a magnitude 7 earthquake and about 1000 times greater than that of a magnitude 6 earthquake.

Magnitude and Surface Rupture Length

For most smaller earthquakes, below magnitude 6, the vertical and horizontal dimensions of the slipped fault area are believed to be the same order, but for large

earthquakes the length of the slipped area may be measured in hundreds of miles, whereas the perpendicular dimension of California fault ruptures is thought to be at most 10 to 20 miles in extent. When plotting the length of ground surface rupture along the fault with respect to the magnitude of past earthquakes, considerable scatter is observed. However, as a whole, it can be said that the length of surface rupture increases with magnitude.

Housner (1969) has developed the following idealized relationship between the magnitude, M , and the length of surface rupture, L , in miles.

$$L = 1.82 \times 10^{-2} e^M \quad (M < 6.3)$$
$$L = 2.25 \times 10^{-5} e^{2M} \quad (M > 6.3)$$

This relationship is plotted on Figure 9 with data from several earthquakes having well defined ground rupture. Tocher (1958) and Greensfelder (1973) have proposed similar relationships for California and Nevada earthquakes as shown on Figure 9.

For engineering purposes, this idealized relation could be used to assign a maximum credible magnitude that might result from a fault of known length. Surface faulting in a particular earthquake generally extends over just a part of the total length of the pre-existing fault. Albee and Smith (1966) noted that the length of surface rupture accompanying historic earthquakes in Southern California has commonly been one-half to one-fifth the total length of the fault system on which the earthquake occurred. For analysis, it is necessary to make some assumptions as to the maximum length of fault that could reasonably be expected to slip in a single earthquake. This is generally taken as 50% of the total fault length and is related to the maximum credible earthquake. This value (50%) was used in assigning magnitudes to the various faults in Santa Barbara County, listed in Table 3, under the topic heading "Description of Individual Faults."

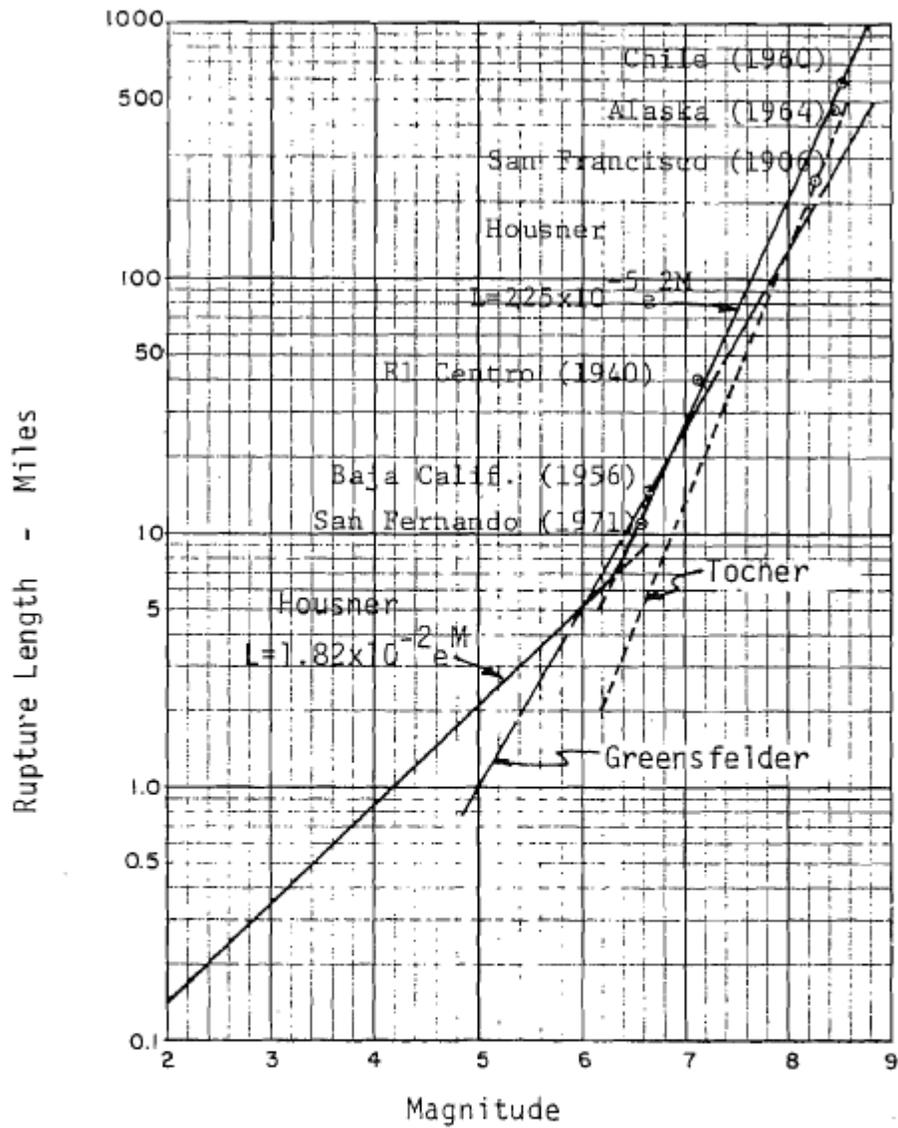


FIGURE 9

IDEALIZED RELATIONSHIP BETWEEN
FAULT RUPTURE LENGTH vs
MAGNITUDE OF EARTHQUAKE
(modified from Housner, 1969)

Earthquake Frequency

Since the lifetime of most engineered structures is limited to a few decades and since strong earthquakes are not an every day occurrence, it is important to learn about the frequency of earthquakes. Documented earthquake history is far too brief to permit reliable estimates of earthquake frequency on particular faults or in small regions. Consequently, it must be remembered when speaking of recurrence intervals or probability of occurrence that the calculations must be based on a statistically significant sample of seismic events. Considering the limited period that we have been making suitable earthquake measurements (about forty years in California), it requires an area about the size of Southern California to provide a sufficient history of events for a seismically active region. Even an area of this size is not sufficient for calculating the probability of very large earthquakes.

However, the number of worldwide seismic events are statistically sufficient even for large magnitudes, so that their frequency of recurrence can be described by the equation

$$\log n = 7.7 - 0.9 M$$

where n is the mean annual frequency of a magnitude M earthquake. As shown on Figure 10, which shows a plot of world earthquakes, the curve deviates from a straight line relationship above magnitude 8, and the assumption is made that the line representing the relationship falls off asymptotically to a maximum value of magnitude 8.7.

Available data for a region including Southern California and northern Mexico (100,000 square miles) over a 29-year period indicate the frequency distribution for magnitudes between 3 and 6.5 follow the same form as the distribution of world earthquakes. Assuming that the same form of frequency distribution can be used for California earthquakes up to about 8.5, Housner (1970) calculated the probability of a seismic event producing an acceleration exceeding a specific value at least once during a specific period. The accelerations were based on earthquake magnitude and an idealized relationship of motion attenuation with distance. Curves representing Housner's calculations are shown on Figure 11. Other calculations were made by Marachi and Dixon (1972) using past seismicity data for Southern California. Their results, which are shown in Figure 12, are approximately the same as Housner's. The basic assumption necessary to formulate these curves is that the occurrence of earthquakes within a region is random in time and in space, thus assuming that all portions of the region are equal in seismic activity.

Even though the probability or return period of a seismic event at a particular site cannot be fully determined at the present time, use of the previous information in conjunction with reasonable judgment regarding the site's relative seismicity can give the design engineer a good "feel" for the likelihood of seismic activity during the expected lifetime of his structure.

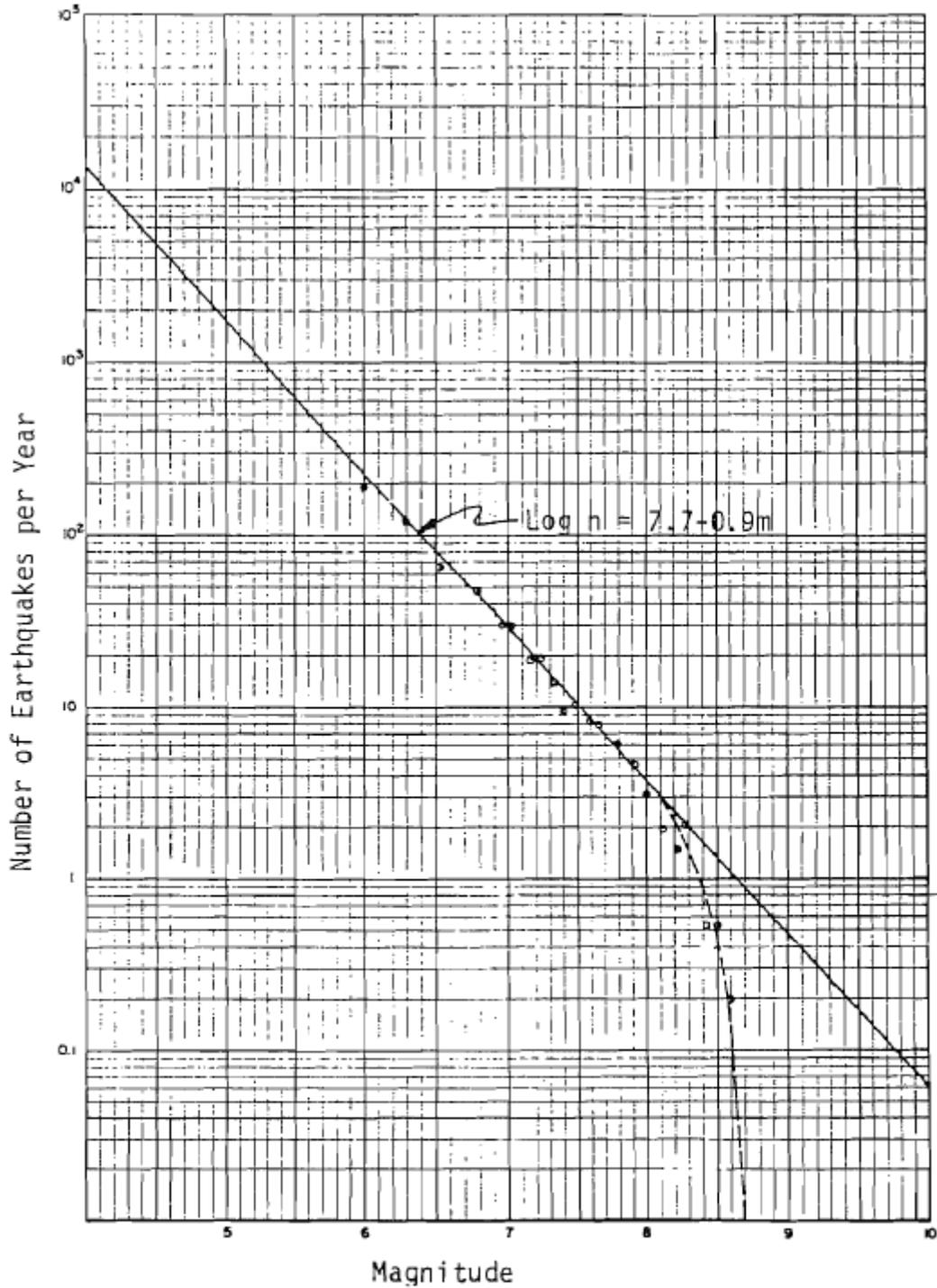


FIGURE 10
AVERAGE NUMBER OF WORLD EARTHQUAKES
PER YEAR DURING A 43-YEAR PERIOD

(from Housner, 1969)

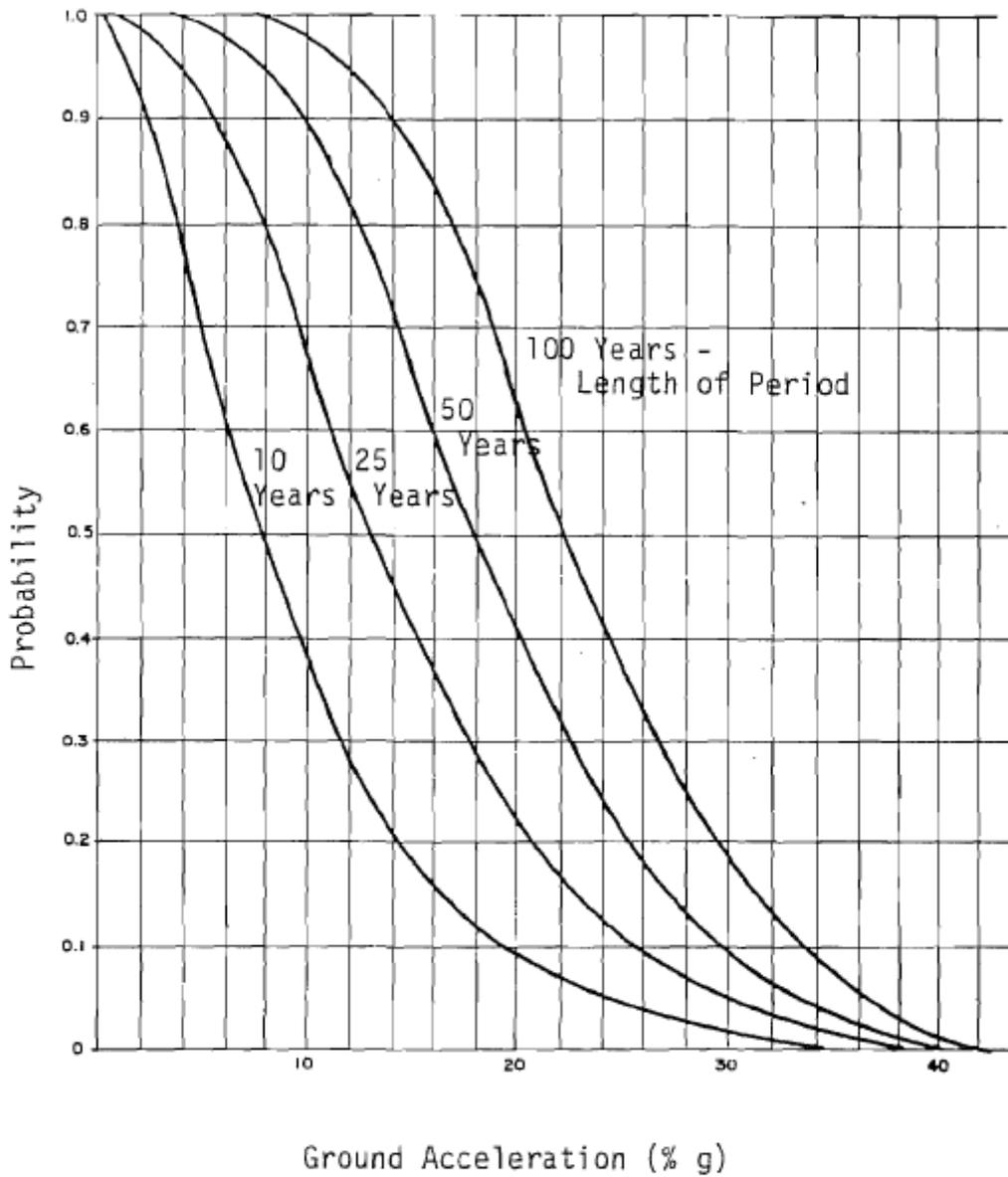


FIGURE 11
PROBABILITY OF ACCELERATION
EXCEEDING A SPECIFIC VALUE
AT LEAST ONCE DURING A SPECIFIED PERIOD

(from Housner, 1970)

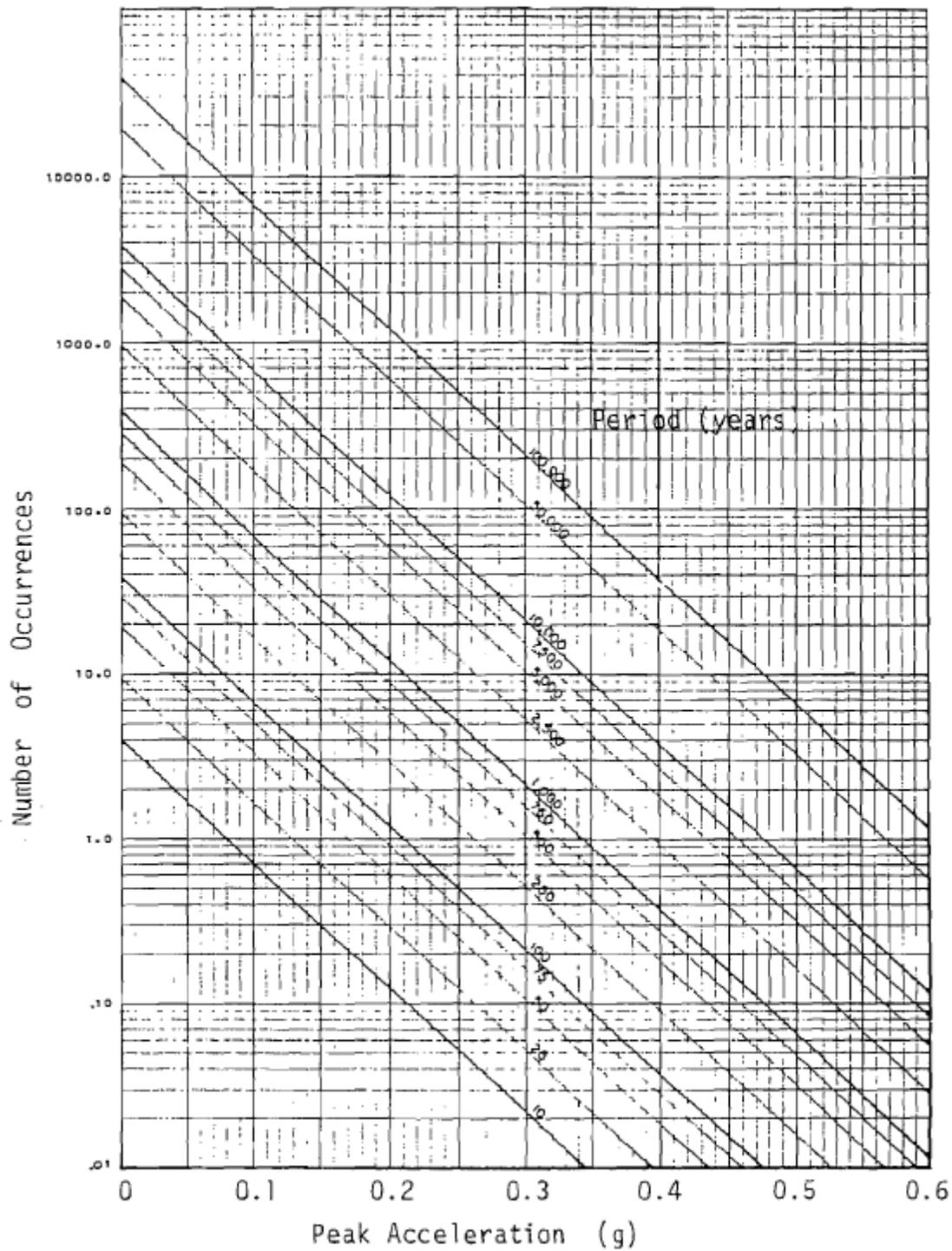


FIGURE 12

OCCURRENCES OF ACCELERATIONS IN SOUTHERN CALIFORNIA
(modified from Marachi and Dixon, 1972)

Earthquake Recurrence Intervals

The seismic risk, of a fault can be defined best by determining the long-term recurrence intervals (interval in years between earthquakes) of earthquakes with a given magnitude. The recurrence intervals are calculated on the basis of long-term slip rates of geologic units along the fault (Wallace, 1970; Clark, et al., 1972; Lamar et al., 1973). This approach can provide a-basis for comparison of the earthquake risk of individual faults and has been used to estimate the recurrence intervals for major faults in southern California (Lamar et al., 1973). The results of such analyses for the San Andreas and Big Pine faults are shown in Table 2. As indicated in the descriptions of individual faults, data are not sufficient to determine the long-term slip rates of other active faults in Santa Barbara County. This is because of the difficulty in measuring and dating the offset of geologic units with sufficient accuracy.

Wallace (1970) presented the following equation for the recurrence interval at a given point on a fault:

$$R_x = D/S \qquad \text{Equation (1)}$$

Where R_x = recurrence interval at a point on the fault

D = displacement accompanying an earthquake (related empirically to Richter magnitude)

S = long-term rate of movement (from geodetic data or offset of geologic units)

This equation simply states that if elastic strain accumulating along a fault is typically released by earthquakes with displacement D , then the interval between such earthquakes (recurrence interval, R) will equal the displacement (D) divided by the long-term rate of movement (S). The following assumptions are made: (1) Slip on faults occurs incrementally as sudden events which produce earthquakes. Slip will continue at the same rate as that determined by geodetic data and offset of geologic units. (2) Elastic strain accumulates between earthquakes; the displacement during an earthquake represents the release of this accumulated elastic strain. It should be emphasized that the data are insufficient to verify these assumptions; the calculated recurrence intervals are only reasonable estimates based on present knowledge. For example, recurrence intervals determined by Equation (1) represent a long term average; there is, however, evidence of significant local (Ambraseys, 1970) and worldwide (Davies and Brune, 1971) time variations in the level of seismic activity.

For large earthquakes the distance from the causative fault out to the limit of destructive earthquake accelerations is usually small relative to the total rupture length. Thus Equation (1) is adequate for assessing the earthquake hazard of a particular site. For engineering applications, where the fault to site distance is large relative to rupture length, and for comparison with the historic record of earthquakes, it is necessary to determine recurrence intervals over the entire length of the fault. Clark et al. (1972) used the following equation developed from Wallace-(1970) to calculate recurrence intervals for the San Jacinto fault system:

$$R_t = \frac{R_x L}{L_t} \quad \text{Equation (2)}$$

where: R_t = recurrence interval along a fault
 R_x = recurrence interval at a point on the fault
 L = length of fault rupture (related to Richter magnitude - see Figure 9)
 L_t = total length of fault or fault segment for which recurrence interval is required

Estimation of Ground Motion Parameters

To an observer located within the zone of influence of an earthquake, the earthquake is characterized by a rapid series of vibratory ground displacements. Because of convenience in seismic and engineering studies, it has been desirable and customary to record the time history of the movement in terms of accelerations. It is this acceleration record or a suitable fabricated hypothetical acceleration record that is used in the latest type of seismic analysis and design.

A strong motion earthquake accelerogram is characterized in part by the intensity of accelerations, duration of strong shaking, and predominant natural period of the vibratory motion. These strong motion characteristics are a function of the particular earthquake and the location of the recorder both with respect to the geological and soil conditions, and with respect to the source of the seismic waves. Thus, the major factors that appear to influence the type of earthquake motion felt at a particular site are the source mechanism, the propagation path characteristics, and the geologic and soil conditions at the site.

Some general statements that can be made with certainty from the current theory are useful in a qualitative understanding of earthquake ground motions.

1. The strength of the long period end of a ground motion spectrum increases with the length and depth of the fault break and its relative displacement.
2. The short period end of the spectrum which includes the peak acceleration depends more on the velocity of the fault displacement. The high accelerations in the Parkfield (1966) event illustrate this point. This "dislocation velocity" is itself dependent on the stress available to accelerate the surrounding rock once the fracture has started.
3. Higher frequency waves decay faster with distance than lower frequency waves.
4. Surface waves, which are more prevalent in alluvial deposits than in rock, decay less rapidly with distance than do body waves.

The following sections briefly summarize some of the techniques for determining these ground motion parameters with the greatest emphasis on maximum acceleration prediction, as most investigators have been concerned with this problem.

Maximum Accelerations - The severity of shaking at a particular site is most often measured by maximum or peak acceleration of the ground, even though velocity and displacement are more descriptive properties. Further, peak acceleration itself is not a particularly reliable measure of the strength of the acceleration record. It is to the overall strength of the record (rather than to an isolated peak) that structures respond. However, magnitude and peak acceleration are the best engineering measures commonly used at the present time. Also, as they have been in use for some time, they carry with them the benefits of engineering experience. However, it is expected that the source parameters, such as seismic movement, effective stress, and stress drop, will become the fundamental parameters in the estimation of potential ground shaking in earthquake engineering. These parameters are physically related to the faulting process and to the resulting seismic radiation, and are presently the subject of intense research in strong motion seismology.

A number of investigators have proposed methods for determining bedrock or ground acceleration resulting from earthquakes. The previous investigations were reviewed by Seed, Idriss and Kiefer (1969) with the purpose of developing weighted average values applicable to California earthquakes. These results were summarized in a set of curves relating earthquake magnitude and distance from causative fault to the maximum bedrock acceleration.

Prior to the 1971 San Fernando earthquake, very few strong motions had been recorded within 25 miles of the causative fault. Simulation of strong motion rock accelerograms were generally based on strong motions recorded on soil deposits. Utilizing the records obtained in the San Fernando earthquake in conjunction with a 1-dimensional model and the assumption that all motion is propagated between the rock and soil surface in the form of vertically traveling, horizontally polarized, shear waves, Schnabel and Seed (1972) developed hypothetical rock motions from records obtained on soil deposits. Schnabel and Seed have produced attenuation curves for maximum bedrock accelerations. The curves, which relate maximum ground acceleration to distance from the causative fault as a function of earthquake magnitude, are shown on Figure 13. The Schnabel and Seed curves give higher estimates for the maximum rock acceleration than those of previous investigators (Seed, Idriss and Kiefer). Because it is generally believed that their analysis is based on the most current data, the Schnabel and Seed formulation is most often used to compute bedrock acceleration values.

Davenport (1972) studied the strong motion records from forty-six earthquakes and the results of underground nuclear explosions to determine a statistical relationship between ground acceleration, earthquake magnitude, and epicentral distance. His investigation determined the relationship:

$$a = 0.279 e^{0.8M} R^{-1.64}$$

Where: a = the peak acceleration in terms of gravity
M = the earthquake magnitude
R = the focal distance in kilometers

This relationship is illustrated in Figure 14. For application to seismic zoning, it was determined that the acceleration corresponding to a given recurrence rate is augmented by an uncertainty factor of approximately 1.5. Since Davenport's analysis incorporates the most recent data and is considered to be best adapted for planning purposes, it will be used in the subsequent zoning determinations of this study.

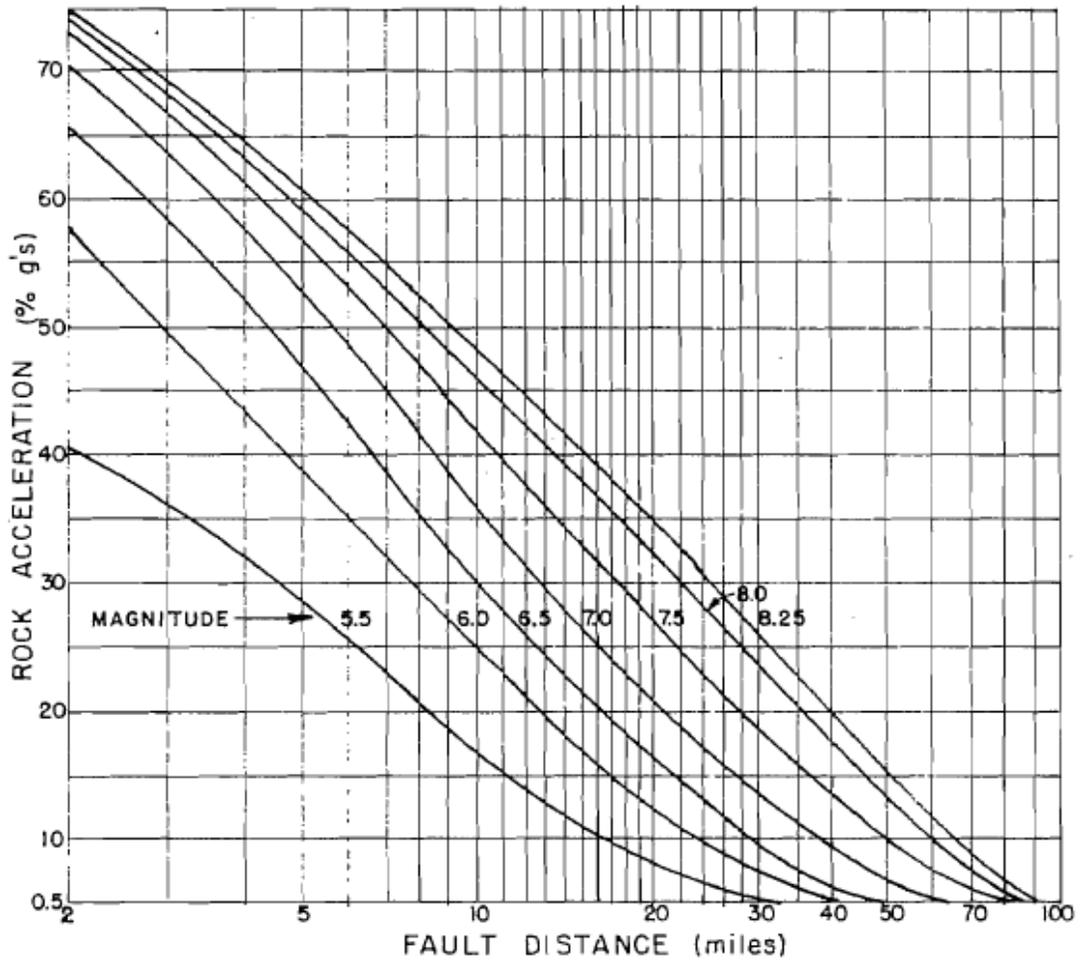


FIGURE 13

ROCK ACCELERATION vs FAULT DISTANCE
AND EARTHQUAKE MAGNITUDE

(from Schnabel and Seed, 1972)

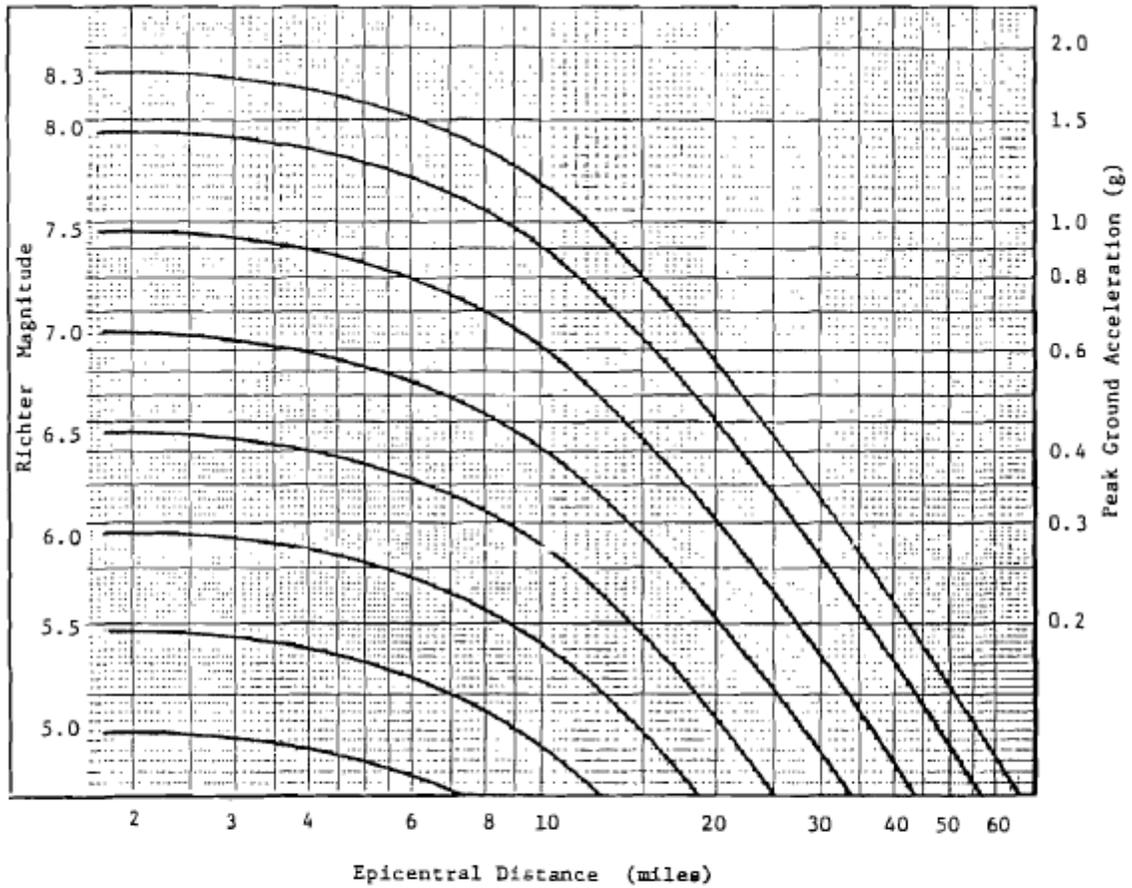


FIGURE 14

RELATIONSHIP BETWEEN EXPECTED
PEAK GROUND ACCELERATION,
EARTHQUAKE MAGNITUDE AND
DISTANCE FROM EPICENTER
(from Davenport, 1972)

Duration of Strong Shaking - The duration of strong shaking is an important characteristic of earthquake motion. Both experience and theory indicate that the duration of strong ground motion is generally related to the structural damage during an earthquake. The strong phase of shaking during the Parkfield earthquake of 1966 lasted only about 1.5 seconds, with a maximum acceleration of 0.5 g, and very little damage occurred. However, the Taft (1952) and El Centro (1940) earthquakes with lower accelerations, but a duration of strong shaking near twenty seconds resulted in considerable damage.

The duration of strong shaking has not been rigorously defined, and the determination of this parameter probably depends on the investigator. The general trend is that duration increases with magnitude and also with distance from the epicenter due to wave scattering and dispersion. Two possible criteria to be used are: (1) the time interval between the first and last acceleration peak which was greater than 0.05g, and (2) the time interval between the first and last peak which was greater than 25 - 30% of the maximum acceleration.

Housner's (1965) recommended relation between the duration of strong shaking and earthquake magnitude is shown on Figure 15. This estimation is based on several past strong motion records and is a subjective determination of the duration as presumed applicable to engineering studies. The low intensity earthquake motions at the end of large earthquakes or the low intensity vibrations associated with earthquakes of magnitude less than about 4 were not included.

The U. S. Geological Survey seismic design criteria for the Alaskan pipeline (1972) include a relationship between magnitude and strong motion duration. For comparison, this is also shown on Figure 15.

Predominant Periods - The predominant period reflects the frequency content of the ground motion and it is presently defined as the period at which the acceleration response spectrum reaches a maximum. It should be understood that the assigning of a predominant period to an earthquake record does not imply that the strength of the record is confined to a narrow range about that period. Except in very rare circumstances, the record strength is spread over one or several broad bands whose center can be approximately characterized by the peak acceleration response spectrum value. Two basic studies have attempted to assess the predominant periods of rock accelerations. Gutenberg and Richter (1956) presented data for the predominant periods of accelerations developed, at different epicentral distances, by earthquakes with magnitudes ranging from 5.5 to 6.5. Predominant periods for accelerations in rock at different epicentral distances for earthquakes with magnitudes greater than 7 were presented by Figueroa (1960). Comparison of the relationships showed that the predominant period, for any epicentral distance, increases with magnitude. Also the predominant period generally increases with the distance from the energy source. Both trends can be predicted by theoretical arguments. By interpolation and minor extrapolation, Seed, Idriss, and Kiefer (1969) presented what they believe to be reasonable average values for assessing predominant periods for a wide range of

magnitudes and distances to the causative fault. These values are presented on Figure 16. Due to the scatter of original data, some deviation from these average values, as with other values presented for determination of ground motion parameters, should clearly be expected.

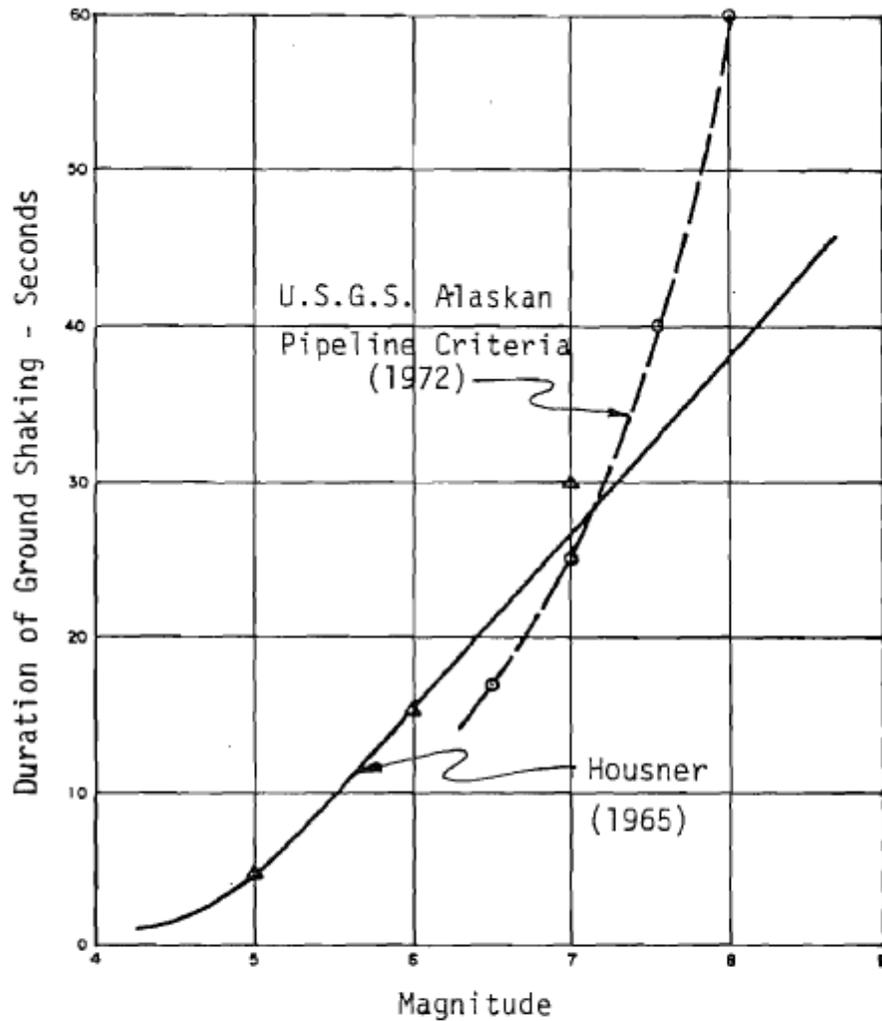


FIGURE 15

DURATION OF STRONG
MOTION EARTHQUAKES

(modified from Housner, 1965)

The Design Earthquake

As previously mentioned, the acceleration record of a seismic event, or response spectra derived from it, is the necessary starting point in contemporary seismic analysis and design. Since the chances of having available an earthquake record of the exact specifications required for design are extremely remote, it is necessary to formulate or fabricate a suitable hypothetical design earthquake.

The general earthquake data described in the previous sections and predetermined geologic and soils information can be utilized to estimate ground motions expected at a site under consideration. The expected magnitude for faults that are considered to have a possible effect on the site should first be determined. Then, knowing the expected magnitude and the distance from the site to the fault, ground motion parameters can be estimated. With the essential design features of the strong motion accelerogram determined, the design accelerogram can be formulated by modifying an existing accelerogram from a similar earthquake or an appropriate artificial accelerogram, such as one described by Housner et al (1968). After an accelerogram has been selected and the maximum amplitude adjusted by a scale factor, the time scale is also multiplied by an appropriate factor to change the predominant period to the desired design value. If the duration of strong shaking in the selected accelerogram is not about the same as the required duration, it can be changed by adding or repeating a small portion of the motion toward the end, or by cutting a portion of the accelerogram as appropriate.

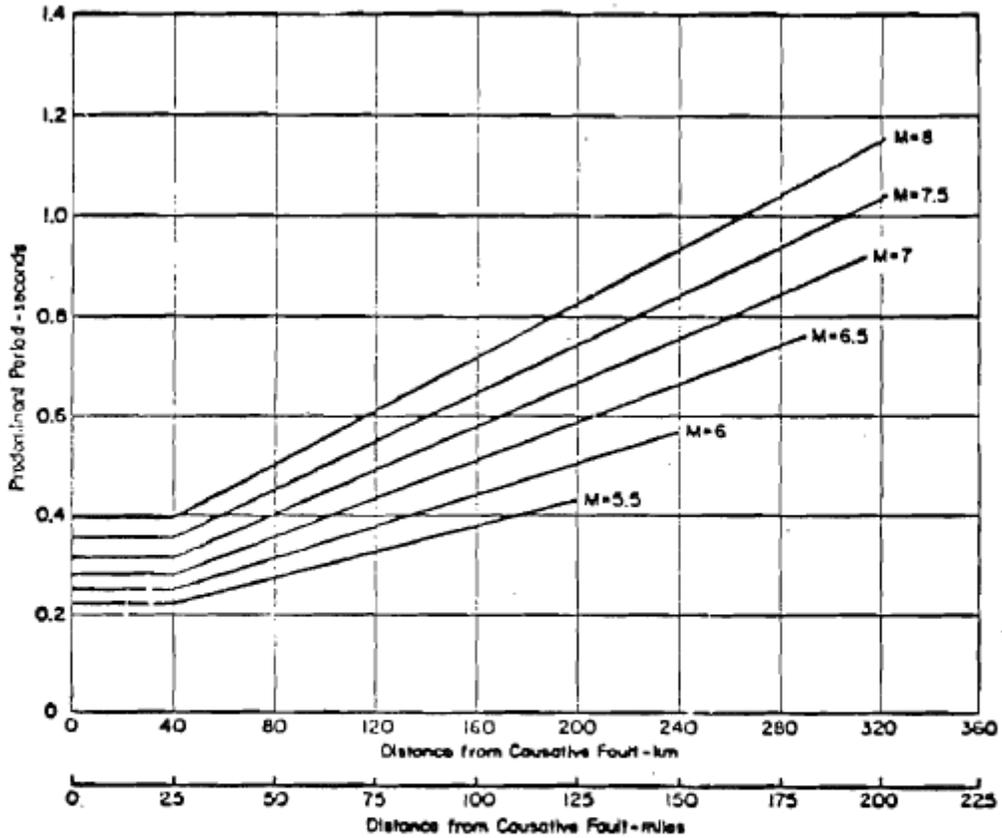


FIGURE 16

PREDOMINANT PERIODS FOR
MAXIMUM ACCELERATIONS IN ROCK
(from Seed, Idriss and Kiefer, 1969)

When performing a dynamic analysis of a structure either the equations of motion of the structure can be integrated directly for the particular design accelerogram, or the time histories of the design earthquake can be used to compute response spectra from which the maximum modal responses may be determined and combined in some approximate manner. The response spectrum for a specific earthquake record gives the peak response of a single degree of freedom linear oscillator, plotted as a function of the oscillator's natural period and damping when the oscillator is subjected to shaking given by that record.

Because of the random nature of earthquake records, different records with the same values of the general characteristics described above can produce responses in the structure differing by 50% or more (see Adu, 1971). Hence, for more important structures, it is usual to perform analyses using several different input earthquakes.

SEISMICITY OF SANTA BARBARA COUNTY

Regional Geologic Structure

A knowledge of the regional geologic structure is helpful in understanding the earthquake risk of individual faults. The Transverse Ranges Province of Southern California trends east-west, transverse to the northwest-southeast trend of the adjacent Coast Ranges, San Joaquin Valley, and Sierra Nevada Provinces to the north, and the Peninsular Ranges Province to the south. The east-west trending physiographic features in the southern portion of Santa Barbara County lie at the western end of the Transverse Ranges Province, whereas the northwest trending features in the northern part of the County are included in the Coast Ranges Province.

The orientation of the physiographic features is a reflection of the regional geologic structure. Within the Coast Ranges the northwest trending San Andreas and Nacimiento faults and other subparallel faults are the main structural features (see Seismic Tectonic map). Within the Transverse Ranges the San Andreas fault has a nearly east-west trend and other important faults trend east-west to northeast.

It has been suggested that California lies astride the juncture of two relatively rigid plates of the earth's crust that are sliding past each other in response to movement of subcrustal material (Atwater, 1970). The main surface trace of this juncture is the San Andreas fault. The same forces which are acting to move northward that portion of California on the western side of the San Andreas fault apparently result in a number of other important faults with the same northwest trend. In the southern Coast Range Province within Santa Barbara County these include the Nacimiento, Ozena, Suey, and Little Pine faults; the San Andreas fault is situated 7 miles northeast of Santa Barbara County.

Most of the recorded earthquakes and historic fault breaks in California have occurred as a result of rupture along faults in the San Andreas set of northwest trending faults; this suggests that most of the accumulating strain energy is being released along these

breaks. Important exceptions in the Transverse Ranges include movement on an east-west trending fault beneath Santa Barbara Channel, which may have caused the 1925 Santa Barbara earthquake, movement on the Big Pine fault in 1852 during a large earthquake, and movement on the Santa Monica fault system during the Point Mugu earthquake of February 21, 1973 (Ellsworth et al., 1973).

It has been suggested (Anderson 1971) that faults in the Transverse Ranges are produced by north-south compression relative to the major horizontal movement on the San Andreas fault. The east-west bend in the San Andreas fault as it passes through the Transverse Ranges tends to obstruct the principal regional motion, this produces compressional forces which are translated into uplift, along with a component of horizontal movement, of the Transverse Ranges along east west trending faults. If the east-west trending faults in the Transverse Ranges are only secondarily related to the major regional motion on the San Andreas fault as appears to be the case, this would explain why the earthquakes occurring along such east-west faults have historically been less frequent and less intensive.

General Seismicity

Earthquake risk in any region can be estimated usefully only by combining (1) geological studies identifying active faults, and (2) historical or instrumental records, resulting in catalogs of known occurrences of earthquakes. All historic fault movement in California has taken place on pre-existing faults. Furthermore, movement has always - or nearly always - taken place on faults for which there is evidence of geologically recent movement. In other words, the more recent the movement, the more likely future movement will occur.

It should be kept in mind that for every “active” or “potentially” active fault there are probably a thousand inactive faults, so a fault should not automatically be considered a hazard.

In regard to the second method of estimating earthquake risk, the entire known history of California earthquakes now extends only a little over two centuries. This is an extremely short time in the history of the earth, and even if our catalogs of earthquakes were complete for that interval, it is unlikely that they would give an adequate picture of the possibilities. For the earlier 150 years, we can list only the larger shocks with any pretense to completeness; to these are added a more or less haphazard sample of smaller earthquakes which have centered near enough to populated localities to attract attention.

Seismographs sufficiently sensitive to register the larger earthquakes in Southern California were installed at Berkeley and Mount Hamilton (Lick Observatory) in 1911. On many occasions, their recordings gave useful information bearing on the magnitudes of such events; but they were not sufficient for accurate determination of the corresponding epicenters.

Sensitive seismographs began regularly recording at Pasadena in 1923; in subsequent years, others were added, one of which began recording at the Santa Barbara Museum of Natural History in July, 1927. This program, begun under the Carnegie Institution of Washington and later transferred to the California Institute of Technology, has resulted in an increasingly complete listing of the smaller shocks of the area, with their associated ratings on the magnitude scale. A new network of seismograph stations surrounding the Santa Barbara Channel region was installed by the U.S.G.S. in 1969 to augment the CIT stations. (See plot of seismograph stations on Figure 17). This greatly improves the accuracy of locating seismic shocks in Santa Barbara County.

It was originally hoped that the smaller earthquakes would prove to be associated chiefly with the main active faults, and perhaps that a local increase in small activity might serve as warning of a large event in preparation. Such expectations have largely been disappointing. Long segments of major faults, such as the San Andreas fault, which are historically known to have been the seat of large earthquakes, have shown nearly complete quiescence in the last 50 years; while other localities, characterized by frequent small earthquakes, have not been subjected to larger ones. The epicenters of small earthquakes, as determined from the seismograph recordings, show little or no disposition to align in a manner to identify an active fault - except when they are aftershocks of a previous large one, and serve then to indicate the linear extent of faulting which presumably occurred in the main event.

Foreshocks occur; that is, a large earthquake may be preceded by a few minutes, hours, or days, by a shock which proves to have nearly the same epicenter. Unfortunately, until after the main event, there is nothing to distinguish such a foreshock from the ordinary small shocks which are always occurring scattered over the entire region.

There is at present much interest in new evidence that a measurable change in the speed of seismic waves may take place in an area where a large earthquake is in preparation. This possibility is being followed up vigorously, and new seismograph stations are being set up for this purpose. It is as yet too early to expect any definite results.

The incompleteness of information supplied by historical and seismographic data is partly compensated by the results of geological field work. The principal faults can be located, and, in favorable circumstances, the geologist may be able to decide whether or not a given fault is active - in the sense of being a potential source of strong earthquakes - independently of the known occurrence of such shocks.

Correlation of observed earthquakes with specific faults is often difficult. Historical accounts of the usual sort can, at most, establish a presumption that this or that known fault is responsible. Exceptions occur only on the rare occasions when actual fault displacement has been observed and described as was the case along the San Andreas fault in 1857.

Epicenters located by the use of seismographs have usually been subject to uncertainties of several miles. Unfortunately, much of Santa Barbara County is unfavorably located with respect to seismograph stations, and errors of ten to fifteen miles are possible: Consequently, there is often doubt as to which of several known faults a given recorded earthquake should be ascribed.

Search for active faults is now going on more vigorously than in the past; but it is certain that especially in the less populated areas, our information is far from complete. Moreover, some earthquakes originating offshore are large enough to cause damage on land. One such example is the major earthquake of 1927, off Point Arguello. Another may be the earthquake of 1812, suspected of having originated under the Santa Barbara Channel. In recent years, earthquakes of a wide range of magnitude have been located reliably with epicenters in the Channel; its waters probably cover a highly active geologic structure, possibly with more than one major fault. (See Figure 18 after Lee and Vedder, 1973).

A brief description of the most significant quakes affecting Santa Barbara County is given in a separate section. Review of this alone leads to some well-defined conclusions. In Santa Barbara County, as indeed in most of Southern California, there is one seismic event which chiefly determines the requirements for design of buildings and other structures to resist earthquakes. This is the likelihood of another event on the San Andreas fault comparable with that of 1857. We do not have as much detailed information on the effects in 1857 as we should like, but on the whole, they are comparable, in terms of intensity and geographical extent, with those of the 1906 earthquake centered farther north on the San Andreas fault. With this in mind, seismologists and engineers can envision the degree of earth shaking to be expected at given distances from the San Andreas fault. Ground shaking would be quite strong, usually exceeding what might be expected in earthquakes with other probable epicenters and magnitudes. Generally speaking, a structure designed to survive a repetition of the 1857 earthquake might be expected to withstand any other similar event.

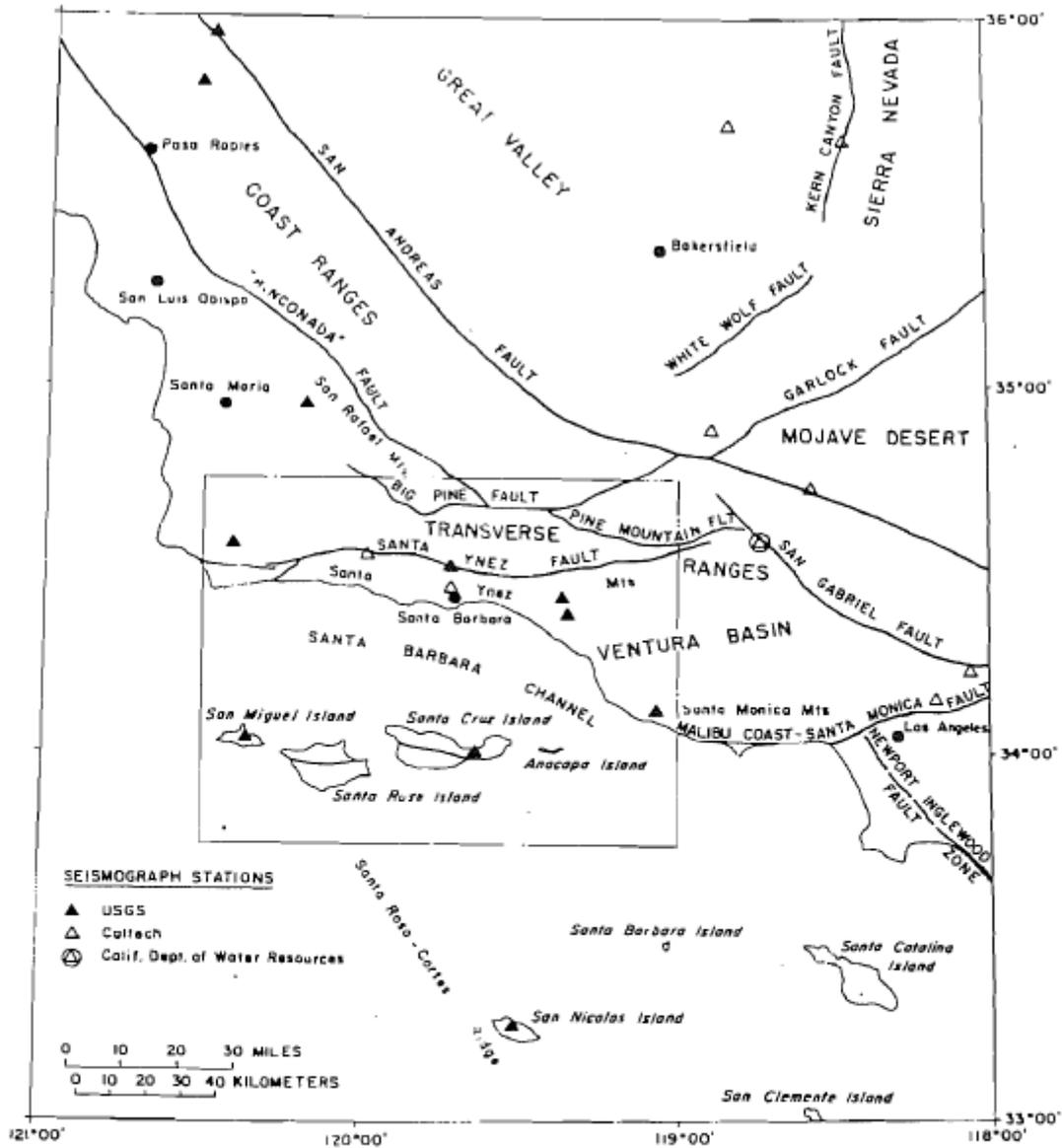


FIGURE 17

INDEX MAP SHOWING LOCATION OF SEISMOGRAPH STATIONS
IN SANTA BARBARA CHANNEL AND VICINITY (from Lee and
Vedder, 1973)

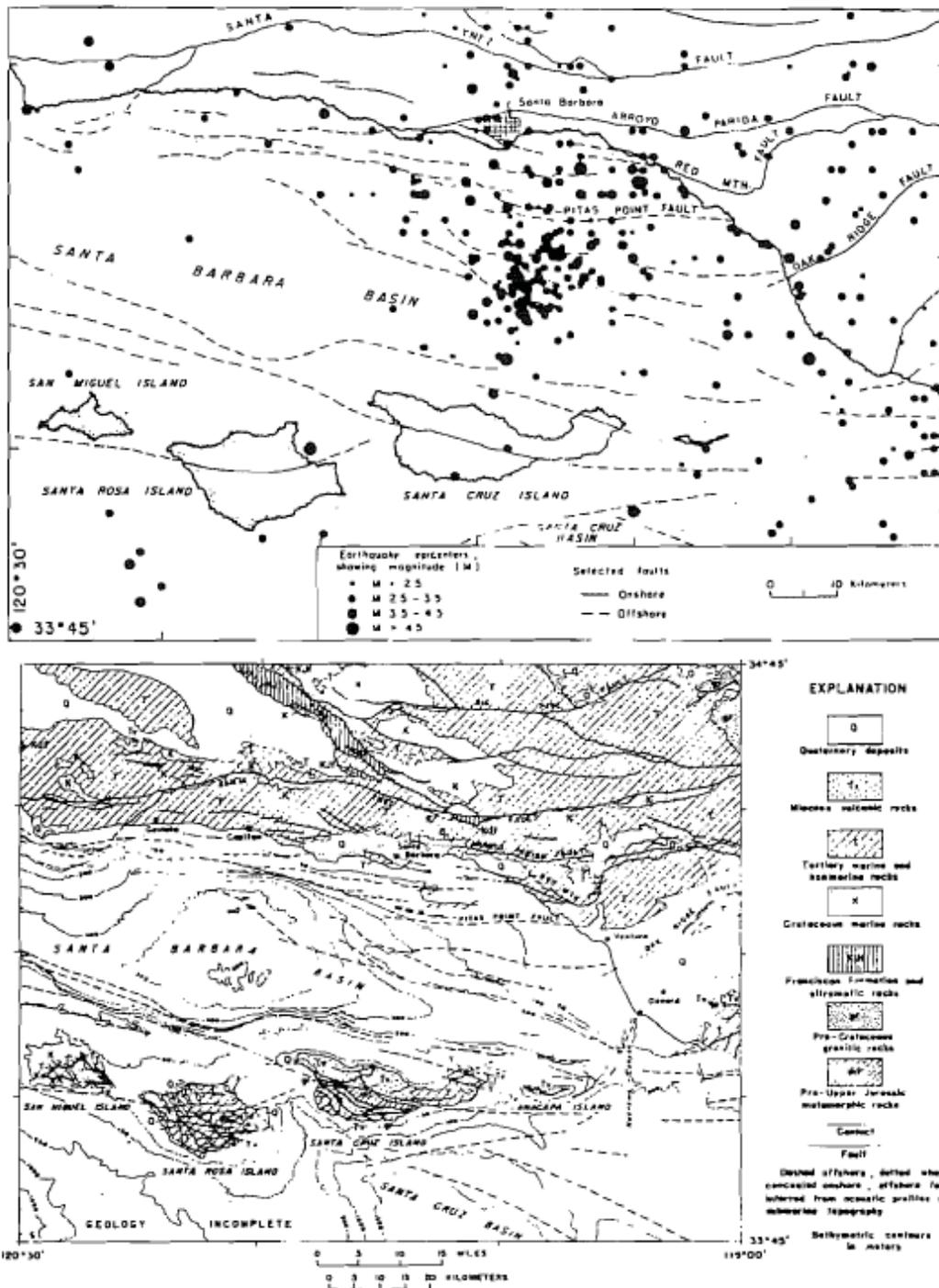


FIGURE 18
 EARTHQUAKE EPICENTERS AND GENERALIZED GEOLOGIC MAP OF
 SANTA BARBARA CHANNEL (from Lee and Vedder, 1973)

However, this conclusion must be qualified, and we cannot be sure to what extent. For example, the Mission at Santa Barbara was not damaged in 1857, although there was damage to houses in the town; but the earthquake of 1812 damaged the Mission church so that it had to be rebuilt. We would like to take into account the effects of the 1812 event as systematically as for 1857; but we are extremely uncertain as to where it originated. We can, of course, note that it was seriously damaging at Santa Ynez Mission, and destructive at Purisima (near Lompoc); so those particular places may be exposed to strong earthquakes in the future. Lompoc, indeed, has been shaken several times with varying degrees of damage.

Occurrence of earthquakes damaging at Los Alamos in both 1902 and 1915 renders that locality a likely site for future strong shaking.

Several damaging earthquakes have originated near the north shore of the Santa Barbara Channel, from Santa Barbara to Oxnard.

If, as seems probable, the earthquake of 1852 originated on the Big Pine fault, that adds to the probabilities of heavy shaking in the northern part of the County.

Another speculative source for a very large earthquake is the Nacimiento fault, and other faults associated with it. These lie largely outside of the County, and probably represent no appreciable risk beyond that due to the San Andreas fault.

A summary of historic fault movement in Santa Barbara and topographic evidence for Recent (0 - 11,000 years) fault displacement is shown in Table 1.

SUMMARY OF HISTORIC FAULT MOVEMENT AND TOPO-
 GRAPHIC EVIDENCE FOR HOLOCENE (0 - 11,000
 YEARS OLD) FAULT DISPLACEMENT

<u>Fault</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
San Andreas	1857				✓	✓	✓
Graveyard- Turkey Trap					✓		
Nacimiento					✓	✓	✓
Lion's Head				0.7			
Big Pine	1852	7+	R		✓		✓
Santa Ynez	1927?	7.3		0.8	✓	✓	✓
Pacifico	1927?	7.3				✓	
Red Mountain	1941?	6.0		1.3-2.0			
Mesa			C?	2.1	?		
More Ranch					✓		
Santa Cruz Island							✓
Santa Rosa							✓

Historic Evidence

- A Year of historic earthquake, queried if earthquake occurred on possible sub sea extension of fault
- B Magnitude of historic earthquake
- C Ground rupture (R) during historic earthquake or creep (C)
- D Elevation change in centimeters across fault on level lines surveyed 1957-60 and 1971; data from Willott (1972)

Topographic Evidence

- E Geologically Recent fault scarps
- F Sag ponds
- G Drainage offset

✓ Means item applies to particular fault;
 no data if blank.

TABLE I

Condensed Seismic History

The chronicle of earthquakes felt or causing damage in Santa Barbara County now extends over nearly two centuries; but this is too short a time, geologically speaking, to provide a reliable sample of the possibilities. Moreover, in the earlier years, our information was derived chiefly from the Mission chronicles, and consequently can be inclusive only for the few relatively large events.

Fairly complete lists of the known occurrences may be found in the seismic catalogs of Holden and of Townley and Allen, down to their closing dates; but almost all the earthquakes likely to be of significance are listed in the U. S. Department of Commerce, "Earthquake History of the United States," revised to 1970.

The entries which follow represent those earthquakes which seem of most value in establishing the extent and geological distribution of the known seismicity and in relating them to known or suspected faults and geologic structures.

1769, July 28 - Of interest here only as being the earliest definitely dated California earthquake. It was felt strongly by the pioneer exploring expedition of Portola when in camp on the Santa Ana River. This might really have been a major earthquake, in which case it would have been perceptible to some extent in the present area of Santa Barbara County.

1800 - The earliest reported earthquake felt in Santa Barbara.

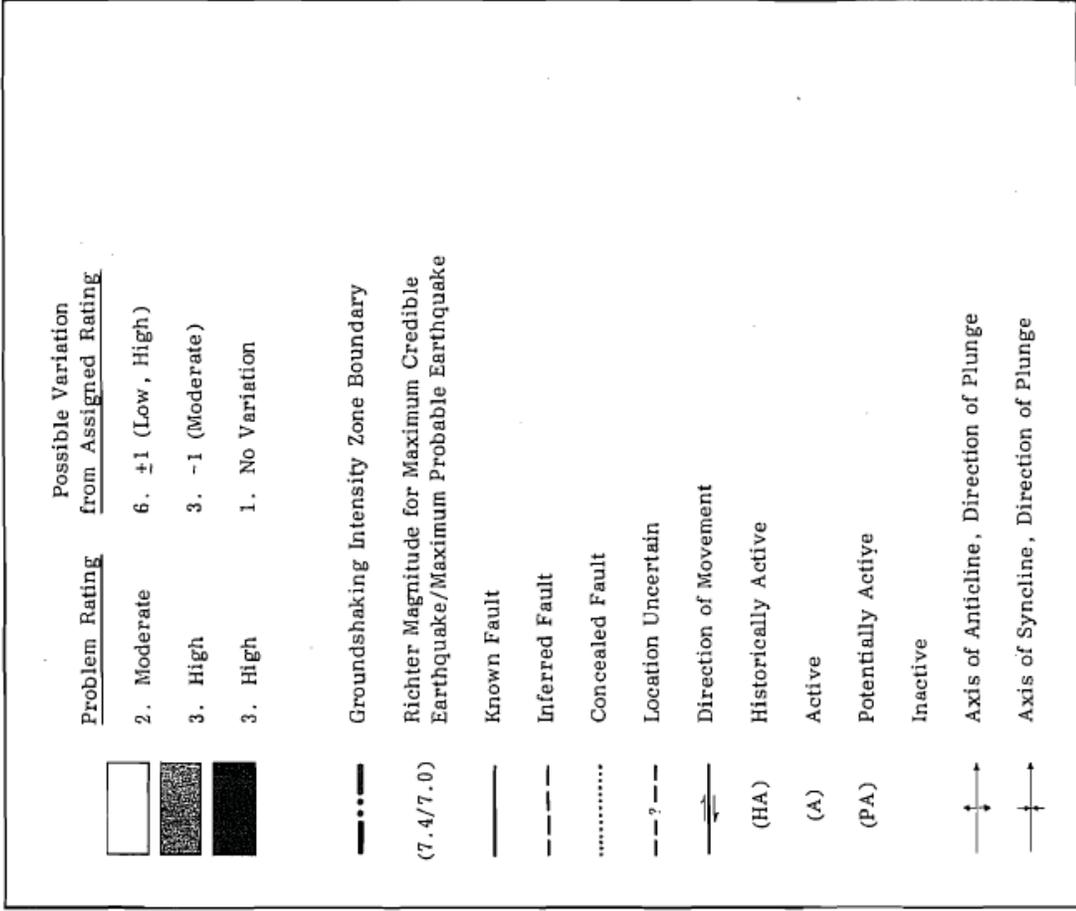
1806, March 24 - Felt at Santa Barbara. Walls of the Mission chapel were cracked.

1812, December 8 - This earthquake wrecked part of the Mission at San Juan Capistrano, and did some damage to San Gabriel Mission. Its effects probably did not extend much farther west. Early historians sometimes confused this earthquake with the December 21st quake.

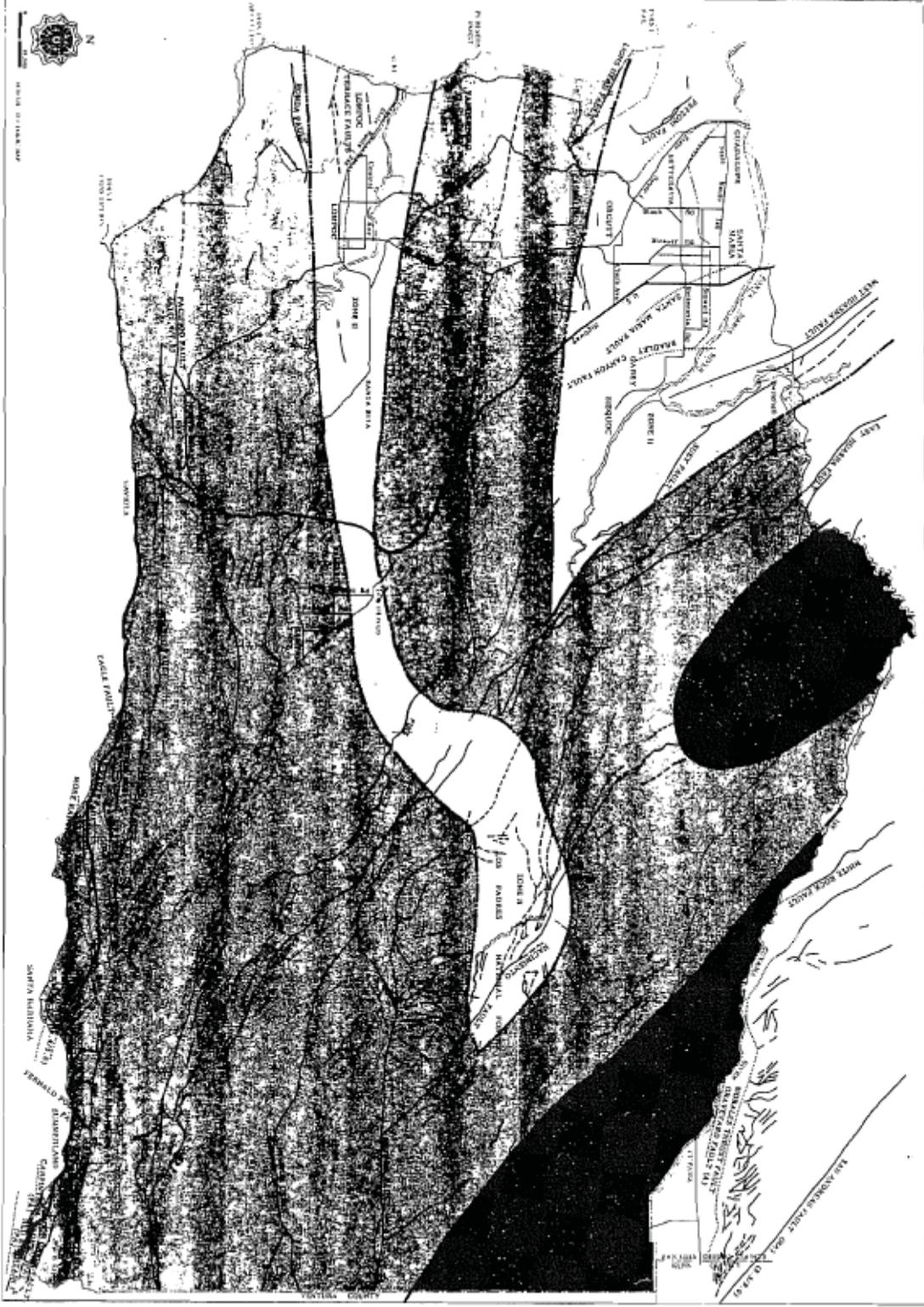
1812, December 21 - The damaging effects of this major earthquake increased from San Fernando westward. There was much damage at Santa Barbara, and the church was rebuilt soon after. At Santa Ynez, some of the structures were destroyed and never replaced. At Purisima (near Lompoc), much of the installation was wrecked; the site was abandoned, and replaced by buildings elsewhere.

This earthquake may have been accompanied by a wave of tsunami type, probably of only moderate height, on the coast of the Santa Barbara Channel (see discussion in the section on tsunamis).

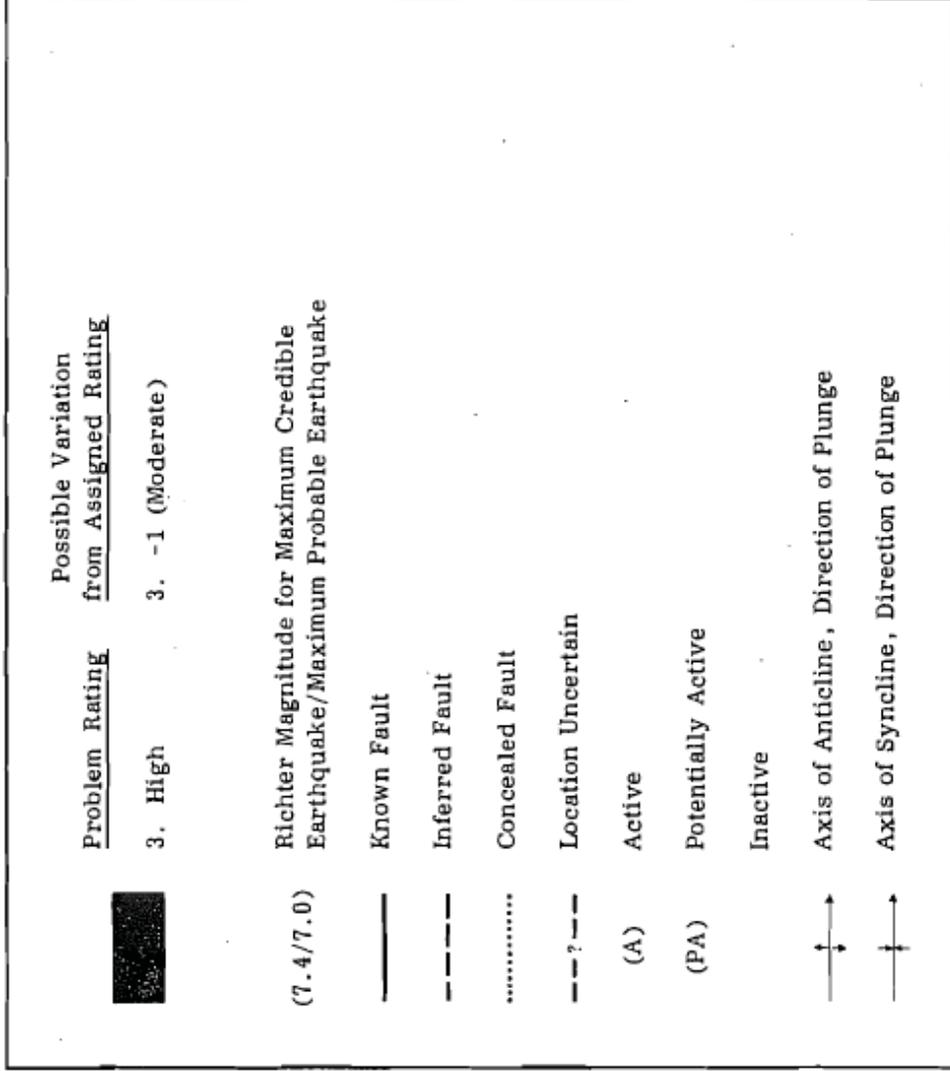
Santa Barbara County Seismic-Tectonic Map



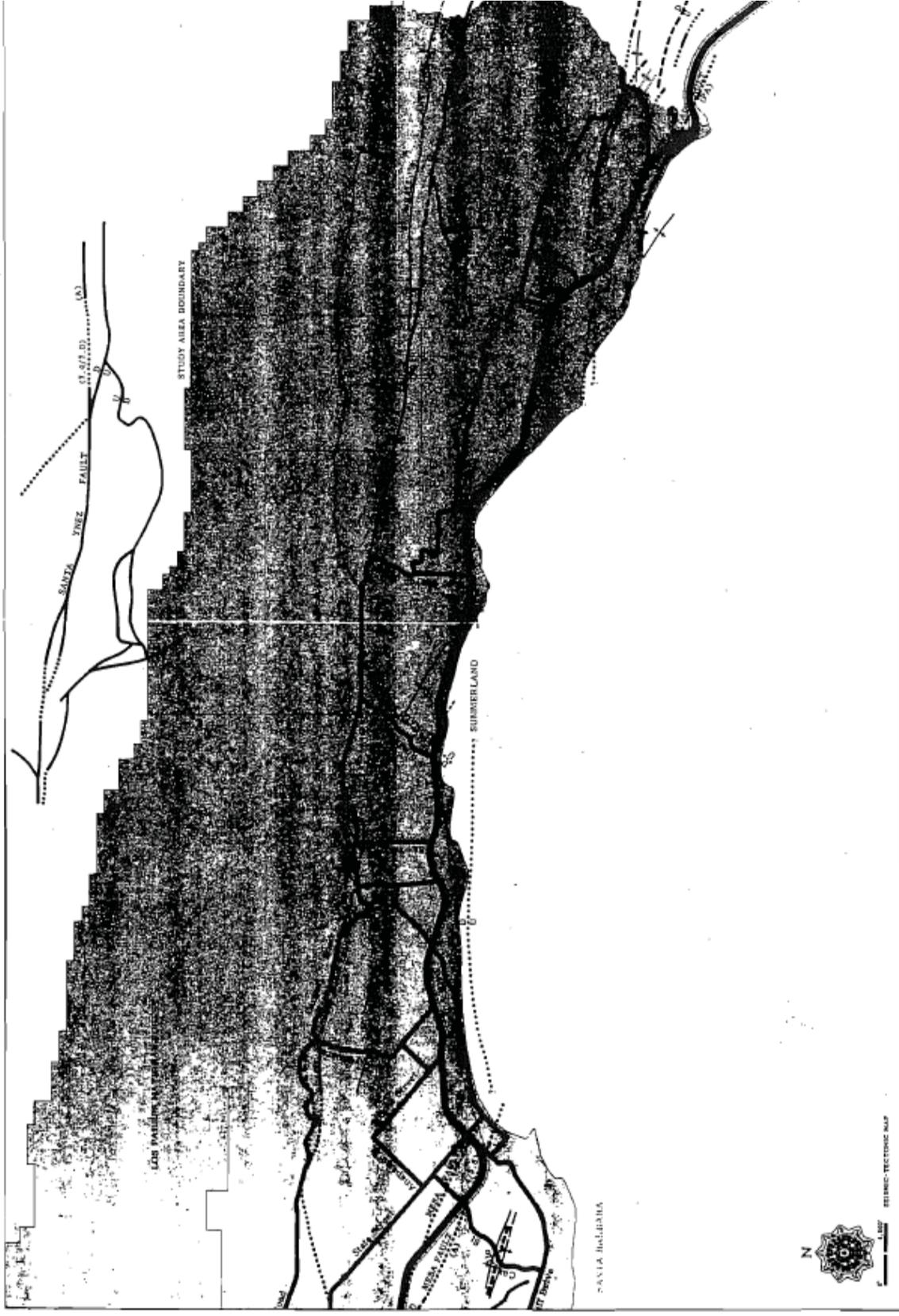
SEISMIC-TECTONIC
SANTA BARBARA COUNTY



South Coast Study Area ~ East Seismic-Tectonic Map



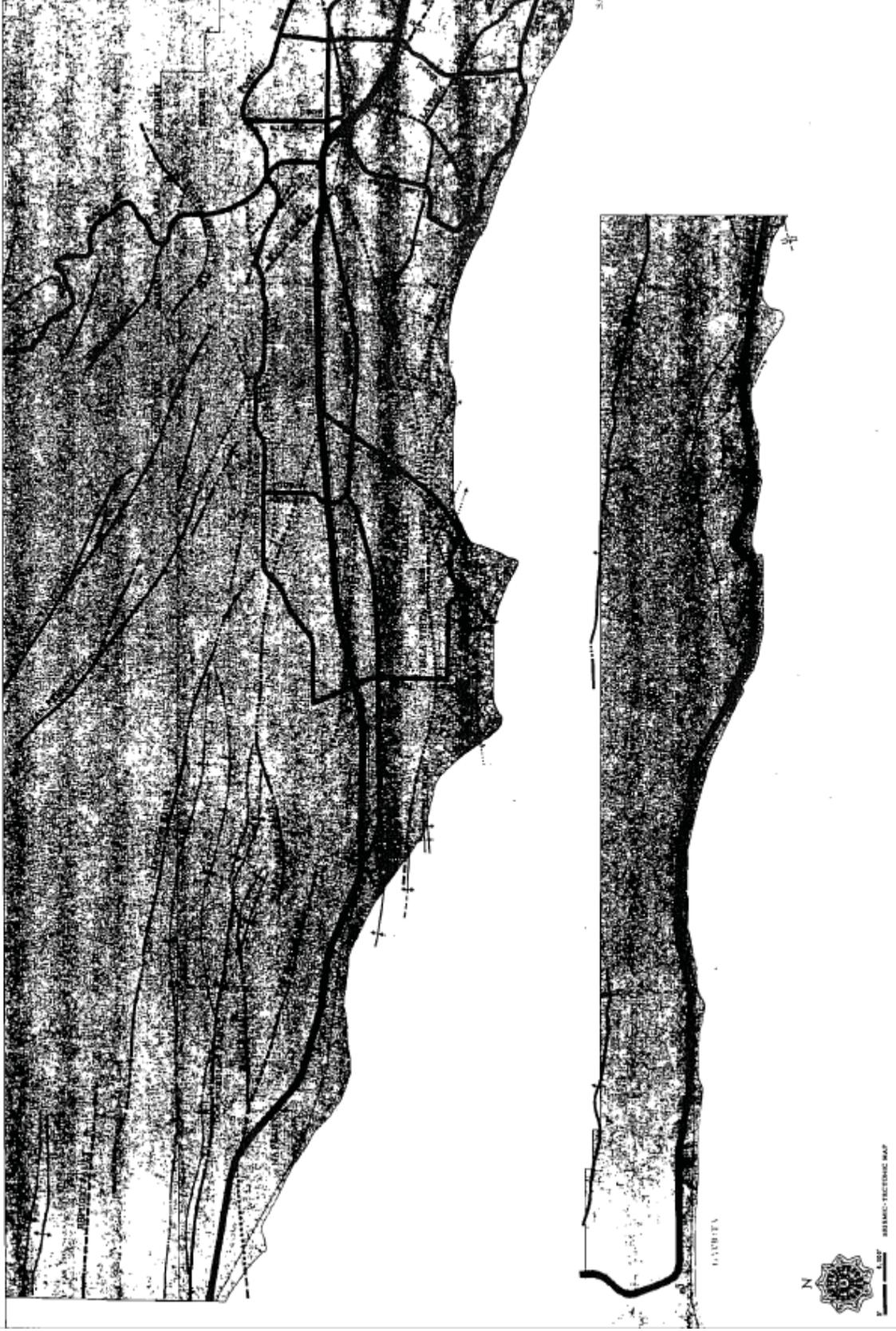
SOUTH COAST AREA - EAST



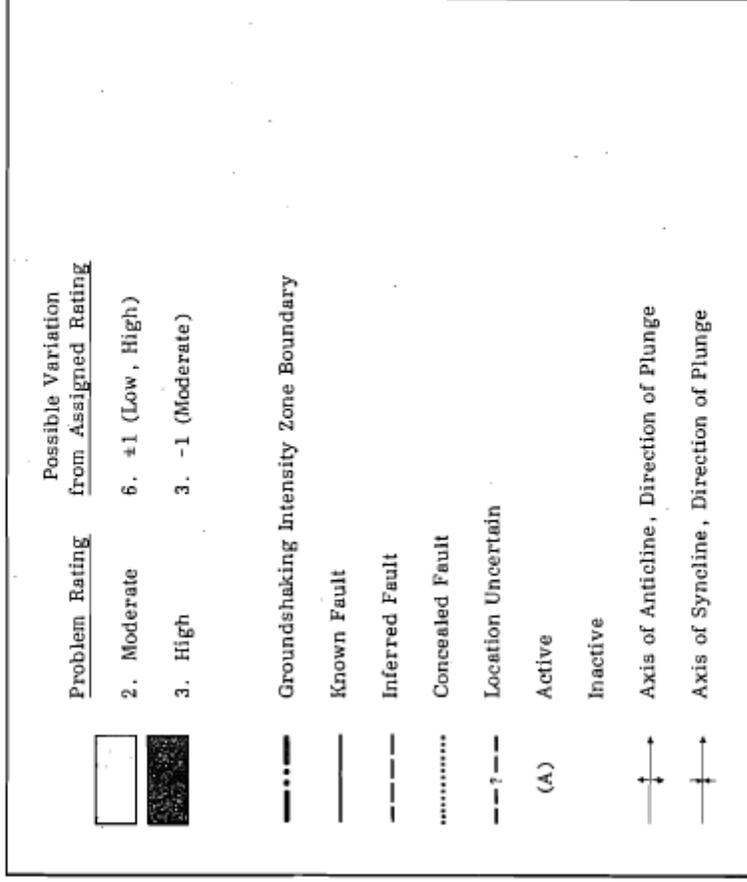
South Coast Study Area ~West Seismic-Tectonic Map

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	3. High	3. -1 (Moderate)
(7.4/7.0)	Richter Magnitude for Maximum Credible Earthquake/Maximum Probable Earthquake	
—	Known Fault	
- - -	Inferred Fault	
.....	Concealed Fault	
- - ? - -	Location Uncertain	
(A)	Active	
(PA)	Potentially Active	
	Inactive	
— † —	Axis of Anticline, Direction of Plunge	
— † —	Axis of Syncline, Direction of Plunge	

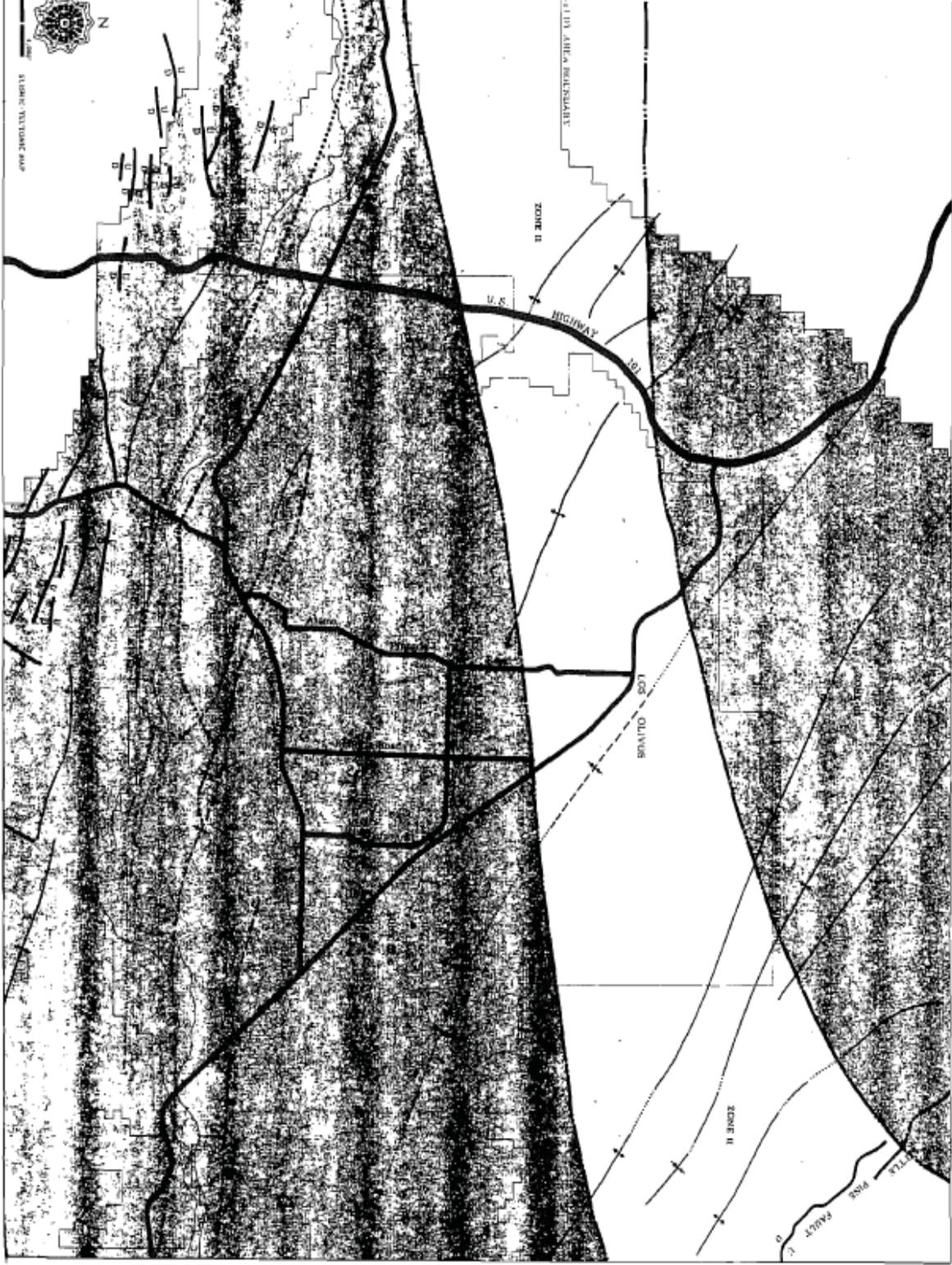
SOUTH COAST AREA - WEST



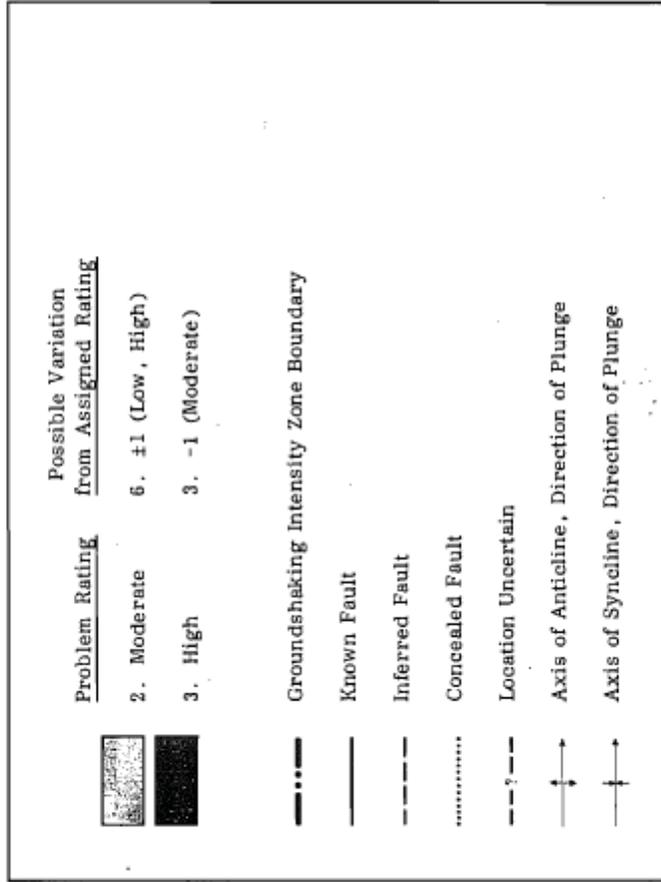
Santa Ynez Valley Study Area Seismic-Tectonic Map



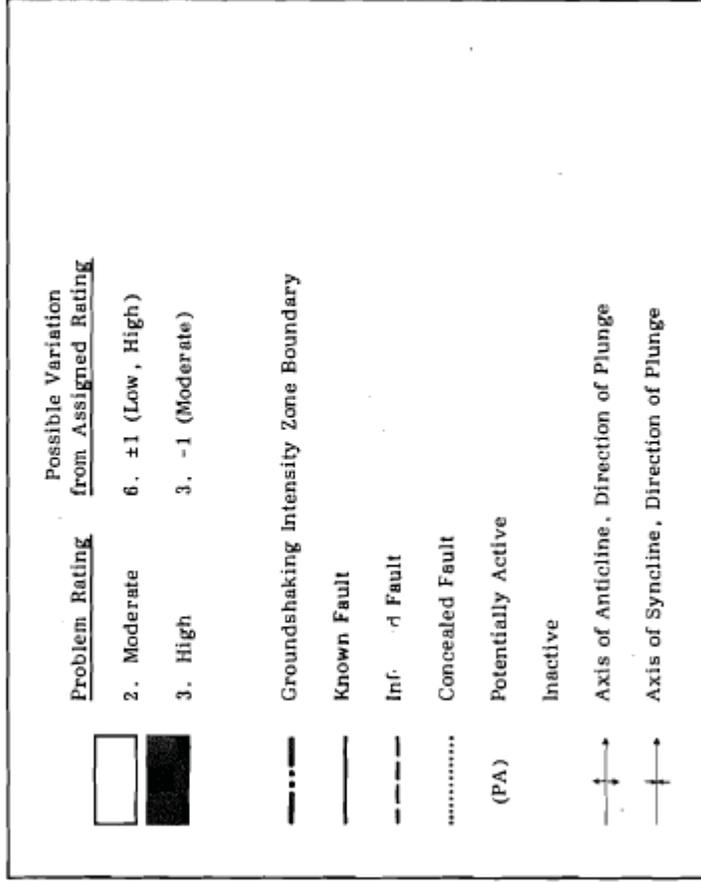
SANTA YNEZ VALLEY AREA



Lompoc Study Area Seismic-Tectonic Map



Santa Maria-Orcutt Study Area Seismic-Tectonic Map



Students accepting this as fact have generally supposed that the earthquake originated on some as yet unlocated fault under the Channel; that would agree with the facts, wave or no wave. If there was really no wave, it is a reasonable possibility that this earthquake originated on one of the large inland faults – perhaps even the San Andreas or Big Pine faults, or with more probability, the Santa Ynez fault.

1852, November 26 (probably) - There are slight difficulties about the date; some lists give the year as 1851, others give 1852, October 26. In any case, this was a large earthquake, felt over a wide area which probably included most of Santa Barbara County. The most significant-appearing report states that it opened a series of fissures extending for many miles in Lockwood Valley, which is directly on the course of the Big Pine fault.

1855, July 10 - A locally strong shock in the vicinity of Los Angeles, where a number of buildings were damaged. Bells were thrown down at San Gabriel Mission. An adobe dwelling whose site is now at the Los Angeles County Arboretum (in Arcadia) was wrecked. This earthquake may have originated on the Raymond fault. It was reported as felt as far as Santa Barbara and San Bernardino.

1857, January 9 – The earliest of three known great earthquakes in the California region (the others were in 1872 and 1906). It originated on the San Andreas fault, along which there were displacements, probably extending from the Carrizo Plain in San Luis Obispo County, southeast across the mountains to Burro Flat northeast of Banning.

This is often called the Fort Tejon earthquake, since the buildings at the fort (now a historical monument) were heavily damaged. This was the principal destructive effect, and only one life was lost in the earthquake. However, the nature and geographic extent of the reported faulting and shaking make it reasonably certain that the magnitude was closely comparable with that of the 1906 earthquake (rated at 8.3). The comparatively small loss of life is attributable to the thinly settled character of most of the heavily shaken area at the time.

In Los Angeles, the actual damage reported was less than in the 1855 earthquake, although there was a very strong, slow, swaying motion, and the Los Angeles River was thrown out of its bed. Houses were reported thrown down at San Fernando, and the roof of the Mission church at Ventura was damaged. At Santa Barbara, there is no report of damage to the Mission, but many houses in the town had cracked walls, rocks rolled down the hills, and water was spilled out of the Mission reservoir. There is a report that the lighthouse at Point Concepcion was severely damaged in this earthquake.

1872, March 26 - The second known great California earthquake, probably greater than those of 1857 and 1906, with its origin in Owens Valley, occurred along a major fault system east of the Sierra Nevada. It was felt with greater or less intensity over almost the whole of California and is listed as “severe” at Santa Barbara, but evidently not damaging there.

1883, September 5 - Shock felt at Los Angeles, Wilmington, Ventura, and Santa Barbara; apparently strongest at Ventura. The earliest of many shocks, usually very imperfectly reported, which appears to have centered offshore, in the region of Santa Barbara Channel and the islands. Definite assignment of epicenters to that area was not possible until the establishment of the seismograph network in Southern California especially after a station was setup at Santa Barbara in 1927.

1885, April 11 - Moderately strong earthquake felt over a wide area, apparently centering near Las Tablas (north of San Luis Obispo) where there was damage. This earthquake is of general interest because it may have originated on the major Nacimiento Fault, or on one of the active faults close to it in the same region.

1893, June 1 - At Santa Barbara, reported stronger than the preceding quake of May 18. Felt also at Ventura and Nordhoff (now Ojai), but there are no reports from more distant points.

1902, July 27 - Of damaging intensity in the vicinity of Los Alamos. Some damage also at Lompoc. Felt strongly, without damage, at Santa Barbara and San Luis Obispo. Numerous aftershocks were felt in the following days.

1902, July 31 - This was a particularly large aftershock of the preceding; it may even have been larger, but since all available accounts refer to both without much distinction, decision is not possible. In any event, this earthquake was large enough to add greatly to the damage at Los Alamos, where it is stated that not a chimney was left standing, and no house escaped damage. Most of the residents left the area. This is a noteworthy exception to the general rule that aftershocks occurring within a few days are much smaller than the principal shock.

Damaging effects of these two earthquakes are reported as greatest in a strip about 15 miles long and 4 miles wide. This presumably was along the valley in which Los Alamos is located; it may be accounted for in terms of ground characteristics, but also suggests an active fault. The July 27 and 31 shocks may be related to a succeeding event on January 11, 1915.

1902, December 11 - Three more earthquakes of this group; strongest at Los Alamos, but causing slight damage at Santa Maria, and felt at Lompoc, San Luis Obispo, and Santa Barbara.

1906, April 18 - The third known great California earthquake (magnitude 8.3), was commonly referred to as "the San Francisco earthquake". Heavy losses occurred at San Francisco from the earthquake and particularly from the resulting fire. Damage was also widespread over much of central California. Faulting also occurred along the San Andreas fault from Humboldt County south past San Francisco to the vicinity of San Juan Bautista. The earthquake was felt in most of Southern California, generally as a slow, swaying motion capable of disturbing small bodies of water and swinging

suspended objects, but there were no actually damaging effects south of Fresno County.

1915, January 11 - Damage at Los Alamos, especially to chimneys. Field investigation led to placing the epicenter two or three miles east of Los Alamos. It was generally felt throughout Santa Barbara County, and in much of San Luis Obispo and Ventura Counties, and was perceptible as far away as Los Angeles, Bakersfield, and San Jose. There were numerous aftershocks, but none comparable with the initial shock.

1916, October 22 - This shock was felt sharply at Santa Barbara, along the coast southeast as far as Ventura and also on Santa Cruz Island. The epicenter was most probably in the Santa Barbara Channel.

1917, April 12 - This shock was felt sharply at Santa Barbara, along the coast southeast as far as Ventura, and also on Santa Cruz Island. The epicenter was most probably in the Santa Barbara Channel.

1917, April 20 - Another shock, probably also in the Santa Barbara Channel, and somewhat smaller than that on April 12.

1919, January 25 - Shock centering north of Tejon Pass, felt as far as Santa Barbara and Los Angeles, and possibly a foreshock of the next.

1919, February 16 - Shock centering in southwest Kern County with minor damage at Maricopa; concrete floor cracked at Grapevine station, and an oil tank ruptured at Belridge. Felt over a widespread area, including points as distant as Coalinga and Los Angeles. The geographical extent of the effects, and seismograph recordings at Berkeley, indicate a magnitude somewhat greater than the Tejon Pass shock of October 22, 1916, hence probably over 6. The data do not agree well with origin on the San Andreas fault, but would fit an epicenter on the White Wolf fault near that of the major earthquake of July 21, 1952.

1919, August 26, 4:12 and 6:57 a.m. - Two minor shocks, both felt at Santa Barbara, and both large enough to write seismograph records at Berkeley and Mount Hamilton. The earlier shock was felt over a wider area and wrote larger records than the second. Its epicenter was presumably more distant from Santa Barbara than the second, which was locally stronger there.

1922, March 10 - Magnitude 6.5. Origin on the San Andreas fault in the vicinity of Cholame and Parkfield, where there was damage to brick chimneys, etc., and cracks in the ground. Felt over a large area.

1925, June 29 - The Santa Barbara earthquake. Magnitude 6.3. Heaviest damage at Santa Barbara with loss of life. Felt over a wide area, including practically all of Santa Barbara County.

The nearest seismographs in operations were at Pasadena; data from these and other stations do not permit accurate location of the epicenter. Attempts at such location have usually indicated an offshore origin, but this is not certain. Speculations published at the time of the earthquake suggesting an epicenter well inland from the coast are almost certainly in error.

This earthquake exposed the weakness of the type of construction, especially brick masonry, which had been common in California. It initiated the setting up of new and improved building regulations.

There were many aftershocks, recorded by seismographs and felt in the vicinity of Santa Barbara. (See also entry for June 29, 1926).

1926, February 18 - Felt rather strongly along much of the coast, particularly in Santa Barbara and Ventura Counties. Presumably centered offshore.

1926, June 29 - A strong aftershock of the 1925 earthquake. Some damage at Santa Barbara; one death due to a falling chimney.

1926, September 28 - Another offshore shock, apparently felt more strongly at Ventura than at Santa Barbara.

1927, November 4 - A major earthquake (magnitude 7.3). Centered off Point Arguello. Seismic sea wave (tsunami) rising to 8 feet on the west coast of Santa Barbara and San Luis Obispo Counties. Damage at Lompoc and elsewhere. Sufficient disturbance of the ground along the coastal route of the Southern Pacific Railroad to interrupt service until repairs could be effected. Felt to considerable distances inland. Numerous aftershocks.

1927, November 18 - Damage at Santa Maria. This was an aftershock of the preceding, of considerably lower magnitude, but with epicenter farther north (hence nearer Santa Maria).

1933, March 10 - The Long Beach earthquake, of magnitude 6.3, comparable with the Santa Barbara earthquake of 1925, but with greater total damage and casualties because of its centering in a more densely settled area. Much damage occurred to weak structures, notably school buildings. In consequence, the State Legislature passed the Field Act, which set reasonable standards for earthquake resistant construction in new schools and other public buildings.

The Long Beach earthquake did not reach a damaging level of shaking in Santa Barbara County.

1934, June 7 - Earthquake of magnitude 6 on the San Andreas fault in the vicinity of Parkfield (southern Monterey County). Felt over a wide area. Damage only in and near Parkfield.

1941, June 30 - Magnitude 5.9 - Epicenter offshore near Carpinteria. Damage at Carpinteria and Santa Barbara, especially to buildings damaged in the 1925 earthquake and imperfectly repaired.

1945, April 1 - Epicenter on or near Santa Rosa Island. Magnitude 5.4. Felt at many places along the coast. No reports of damage.

1952, July 21 - Major earthquake (magnitude 7.7) on the White Wolf fault, Kern County. Heavy damage at Arvin and Tehachapi (with loss of life); considerable damage at Bakersfield. Disproportionate damage, in view of distance from the epicenter, at Santa Barbara, seriously affecting structures along State Street, many of which had been damaged in 1925 and 1941.

This earthquake was notable for the strong slow ground oscillations, generally characteristic of major earthquakes effective to considerable distances from the source, touching off landslides and damaging dams. In central Los Angeles and in Long Beach many of the larger business structures had extensive interior damage (especially to plaster, partitions, and loose lighting fixtures) much like those caused in the same buildings by the Long Beach earthquake of 1933. Old and relatively weak masonry buildings, mostly of one and two stories, were only slightly affected, although such buildings were badly damaged in 1933 (and again in the 1971 San Fernando earthquake).

There were a very large number of aftershocks for many months, some of magnitude 6 or even larger; these were felt by many persons in the Los Angeles and Santa Barbara areas, but were of damaging intensity only in Kern County.

1952, November 21 - Earthquake of magnitude 6 with epicenter near Bryson, in southern Monterey County. There was damage at Bryson and at some other localities in the same area. The earthquake was widely felt. It is of interest as the largest earthquake which can be assigned reliably to the Nacimiento fault system. The level of seismicity to be assumed for the Nacimiento fault and others associated with it is difficult to assign, but the Nacimiento, Huasna, and other faults together constitute a major feature which might reasonably produce a major earthquake.

1957, March 18 - Near Oxnard; magnitude 4.7. Minor damage at Oxnard, Port Hueneme, and Ventura.

1959, September 30 - Off Point Concepcion. Magnitude 4.5. Felt widely in Santa Barbara County. Minor damage only.

1966, June 27 - Magnitude 5.3. Earthquake on the San Andreas fault zone in the Parkfield-Cholame Valley sector, with small continuing in the form of gradual creep, with many Comparable with 1922 and 1934 events.

1968, July 4 - Largest of a numerous swarm of shocks originating under Santa Barbara Channel. Magnitude 5.2. Minor damage at Goleta, Santa Barbara and Carpinteria.

1971, February 9 - The San Fernando earthquake. Magnitude 6.4. 64 lives lost, 44 of them in the collapse of two masonry structures dating from the 1920's, at the Veterans' Hospital near Sylmar. No strong effects in Santa Barbara County.

1973, February 21 - Magnitude 5.9. Epicenter a short distance offshore to the southeast of Point Mugu. Damage at Oxnard and vicinity. Possibly originating on Malibu fault system.

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Lompoc
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Recurrence Interval

A general discussion on recurrence intervals has been given in the section on Fundamentals of Engineering Seismology. Using the method described, recurrence intervals have been calculated for the San Andreas and Big Pine faults, known active faults on which movement would significantly affect Santa Barbara County.

Recurrence intervals for Richter magnitude 6, 7, and 8 earthquakes have been calculated for the San Andreas fault and magnitude 6 and 7 for the Big Pine fault, as indicated on Table 2. Values of displacement versus magnitude were taken from the least-squares fit curve for historic earthquakes from Bonilla and Buchanan (1970). Hausner's idealized relation between length of slipped fault versus magnitude (Figure 9) was used to determine the length of fault rupture (L) applied in equation 2.

Recurrence intervals for magnitude 8 earthquakes were not calculated for the Big Pine fault because this magnitude is in excess of the maximum credible earthquake, previously discussed under Fundamentals of Engineering Seismology.

The values of displacement (D) and rupture length (L) versus magnitude used in the calculations and the calculated recurrence intervals are indicated on Table 2. Because of the uncertainties in the slip rates and data relating magnitude to displacement and rupture length, the calculated recurrence intervals may be in error by a factor of two. The sources of data for the long-term slip rates are given under the detailed descriptions of the San Andreas and Big Pine faults.

In general, the greater the displacement of geologic units the greater the number of earthquakes that have occurred. Although data are insufficient to estimate recurrence intervals for other faults in Santa Barbara County, total displacements are included below; these data provide a qualitative basis for comparing the earthquake risk of individual faults.

CALCULATION OF EARTHQUAKE RECURRENCE INTERVALS
 SAN ANDREAS AND BIG PINE FAULTS

<u>Data on fault displacement and rupture length:</u>	<u>Earthquake Magnitude</u>		
	<u>6</u>	<u>7</u>	<u>8</u>
Fault Displacement (D), cm. from Bonilla and Buchanan (1970)	27	120	520
Fault Rupture Length (L), km. from Housner (Figure 9)	8.1	42	320
<u>Earthquake Recurrence Intervals</u> <u>(years):</u>			
San Andreas Fault (southern segment) Length (L_t) = 500 km; slip rate (S) = 3 cm/year			
At a point on the fault (R_x)	10	40	200
Over length of fault (R_t)	0.2	3	100
Big Pine Fault Length (L_t) = 95 km; slip rate (S) = 0.3 cm/year			
At a point on the fault (R_x)	90	400	*
Over length of fault (R_t)	8	200	*
* Magnitude 8 earthquake not calculated. Considered in excess of maximum credible earthquake			

TABLE 2

Description of Individual Faults

The fault names have been taken from the following 1:250,000 scale sheets of the California geologic map: San Luis Obispo (Jennings, 1958); Santa Marta (Jennings, 1959); Los Angeles (Jennings and Strand, 1969); Bakersfield (Smith, 1964), with some modifications and additions from the 1:750,000 scale preliminary California Fault and Geologic map (Jennings, 1973).

There is a natural tendency to investigate and name faults in more accessible, populated areas rather than in remote wilderness locations. Thus, more faults have been named and described in the immediate area of the Goleta - City of Santa Barbara - Carpinteria coastal area than in the back-country of the Santa Ynez and San Rafael Mountains. This bias may be desirable because it tends to place emphasis on the areas of greatest concern with respect to earthquake hazard.

The individual faults are described in detail in the following paragraphs in alphabetical order under each category of relative fault activity beginning with historically active. The faults are further identified and summarized with respect to activity, length, magnitude and age in Table 3.

The geologic age as determined by fossils is given for the rock units displaced by the faults. Table 4 shows the relationship between the geologic age and the approximate absolute age in years from radiometric measurements.

Historically Active - The following faults are considered historically active movement in historic time) as defined in the previous section Fundamentals of Engineering Seismology.

Big Pine Fault - The east-west to northeast trending Big Pine fault forms the approximate boundary between northwest striking faults and physiographic trend of the Coast Ranges to the north and east-west structures of the Transverse Ranges to the south. The Big Pine fault has been traced 53 miles to the southwest from its intersection with the San Andreas fault; it is a reverse fault with left lateral slip. According to Jennings and Strand (1969), in central Santa Barbara County, the west end of the Big Pine fault curves to the northwest and intersects the northwest trending Camuesa fault.

Jennings (1972) indicates that the eastern 43 miles of the Big Pine fault has had displacement during historic time. The displacement is believed to have occurred in 1852. Townley and Allen (1939) report that during 27-30 November 1852, continued shocks disturbed an area of over 900 square miles from San Luis Obispo to San Diego and east to the Colorado River. A zone of fissures at least thirty miles long was opened in Lockwood Valley located near the east end of the Big Pine fault. A rupture length of 30 miles long suggests an earthquake with a magnitude of about 7 (Figure 9). Horizontal stream offsets of up to 3000 feet occur along the central and eastern portion of the Big Pine fault (Hill and Dibblee, 1953), and Larsen (1958) noted displacement of a late Pleistocene alluvial fan of up to one mile. Evidence of Quaternary and historic

movement has been recently noted on the ten mile long, western- most segment of the Big Pine fault, according to Comstock (in preparation).

CLASSIFICATION OF FAULT ACTIVITY
 SANTA BARBARA COUNTY

Fault Identification	Fault Length (miles)	Estimated Magnitude of Maximum Credible Earthquake ^{1 & 2}	Age of Youngest Rock Unit Displaced
Historically Active (HA):			
Big Pine	53	7.1	0 - 11,000 years
San Andreas	620	8.4	0 - 11,000
Active (A):			
Big Pine Extension	70	7.2	Fault not verified
Graveyard - Turkey Trap	7	5.6	0 - 11,000
Mesa	4+	5.0+	0 - 11,000
More Ranch	9+	5.8+	0 - 11,000
Nacimiento	170	7.6	0 - 11,000 ³
Pacifico	13+	6.3+	0 - 11,000 ⁴
Santa Cruz Island	13+	6.3+	0 - 11,000
Santa Rosa Island	12+	6.2+	0 - 11,000
Santa Ynez	75+	7.2+	0 - 11,000 ⁴
Potentially Active (PA):			
Arroyo Parida	24+	6.6+	11,000-500,000
Bradley Canyon	5	5.2	11,000-500,000 ⁵
Carpenteria	3+	4.5+	11,000-500,000
Goleta	3	4.5	11,000-500,000
Mission Ridge	5+	5.2+	11,000-500,000
Red Mountain	13+	6.3+	11,000-500,000 ⁶
Rincon Creek	15+	6.4+	11,000-500,000
San Jose	9	5.8	11,000-500,000
Inactive:			
Carneros	6½	(5.5) ⁷	500,000 - 4 Million ⁷
Camuesa	23	(6.1)	12 - 16 Million
Dos Pueblos	4½	(5.1)	16 - 22 Million
Eagle	5	(5.2)	10 - 16 Million
East Huasna	50	(7.0)	10 - 12 Million
Erburu	1+	(3.5+)	12 - 16 Million
Glen Anne	3½	(4.8)	500,000 - 4 Million
Hildreth	13	(6.2)	12 - 16 Million
Honda	7	(5.6)	10 - 16 Million
Las Varas	3	(4.5)	16 - 22 Million
Lavigia	4½+	(5.1+)	500,000 - 4 Million
Lion's Head	5+	(5.2+)	4 - 12 Million ⁸
Little Pine - Loma Alta	36	(6.8)	500,000 - 4 Million ⁹
Lompoc Terrace	5½+	(5.3+)	500,000 - 4 Million
Modoc	1½	(3.8)	500,000 - 4 Million
Montecito	5	(5.2)	500,000 - 4 Million ¹⁰
Morales	35	(6.8)	1½ - 4 Million ⁹
Munson Creek	25	(6.7)	16 - 22 Million ¹¹
Ozena	25	(6.7)	12 - 16 Million
Pezzoní	4+	(3.8+)	4 - 12 Million
Refugio	6	(5.4)	16 - 22 Million
San Antonio	2	(4.2)	16 - 22 Million
San Pedro	4	(5.0)	16 - 22 Million
Santa Maria	7	(5.6)	500,000 - 4 Million
South Cuyama	37	(6.9)	1½ - 4 Million ⁹
Suey	18+	(6.5+)	10 - 12 Million
Whiterock	17	(6.4)	1½ - 4 Million
Ygnacio	1½	(3.8)	16 - 22 Million

TABLE 3

NOTES

- 1 Based on Housner's relationship between fault rupture length and Richter magnitude assuming the maximum credible earthquake results from ruptures along 50% of the fault length.
- 2 Magnitudes for inactive (in parentheses) indicate the potential size earthquake the fault might generate if it were active. There is a very large scatter in the data used to compute the maximum credible earthquake, particularly below magnitude 6.5. Consequently, the values shown are not accurate to the degree indicated by the decimal. There is approximately a 70% probability that the maximum credible earthquake will be within ± 0.5 magnitude of the values shown.
- 3 Evidence of Recent (0 - 11,000 years) movement is found along a segment of the fault 25 miles north of Santa Barbara County. Portions of the fault within Santa Barbara County are considered potentially active or inactive.
- 4 A historic (1927) earthquake occurred along the possible subsea extension of the Pacifico branch of the Santa Ynez fault. On this basis, these faults are considered "possibly historically active".
- 5 Sediments within groundwater basin have been displaced but there is no evidence of displacement of bedrock adjacent to basin. Considered a minor fault, not likely to generate a destructive earthquake.
- 6 Elevation changes along re-surveyed level line across fault and historic (1941) earthquake on possible subsea extension of fault suggest movement within past 0 - 11,000 years. On this basis, the fault could be classified as "possibly historically active".
- 7 Investigation by G. A. Brown and Associates for Goleta Water District noted "Glen Anne fault had affected the Terrace Deposits"; could be considered "possibly potentially active".
- 8 Possible elevation change along re-surveyed level line across fault could suggest recent movement (historically active); however, Terrace Deposits (11,000 to 500,000 years old) apparently are not displaced.
- 9 Situated at physiographic boundary between mountainous area and lowlands; topographic evidence of recent displacement would be quickly obliterated because of rapid erosion and deposition at such a location.
- 10 Montecito fault could be considered "possibly active" or "possibly potentially active" based on Hydrogeologic Investigation by Geo Technical Consultants which indicates "offsets in Terrace Deposits and alluvium west of Montecito".
- 11 On the basis of alignment of Munson Creek fault with Big Pine and Santa Ynez faults, Fisher and Dibblee (1961) suggest these faults are all situated over an active shear zone in basement rock beneath a thick sedimentary cover. There is no other evidence to suggest that the Munson Creek fault is active.

TABLE 3
(continued)

GEOLOGIC/ABSOLUTE AGE

Geologic Age	Absolute Ages (Approximate Years before present)	Typical Rock Type or Geologic Feature	
Quaternary	Holocene (Recent)	0 - 11,000	Recent alluvium (sand and gravel in recent river valleys and stream channels); topographic evidence of displacement such as recent scarps, sag ponds, drainage offsets; historic earthquakes; ground rupture during earthquake and creep; elevation changes along surveyed lines
	Late Pleistocene	11,000 - 500,000	Old alluvium, terrace deposits (uplifted and dissected alluvium) and conglomerate (alluvial fan deposits)
	Early Pleistocene	500,000 - 1½ million	Poorly consolidated sedimentary rocks filling lowland basins, water bearing
Tertiary	Late Pliocene	1½ - 4 million	Poorly consolidated sedimentary rocks, commonly water bearing
	Early Pliocene	4 - 10 million	Consolidated sedimentary rocks
	Upper Miocene	10 - 12 million	Consolidated sedimentary rocks
	Middle Miocene	12 - 16 million	Consolidated sedimentary and volcanic rocks
	Lower Miocene	16 - 22 million	Consolidated sedimentary rocks
	Oligocene	22 - 38 million	Consolidated sedimentary rocks
	Eocene	38 - 53 million	Consolidated sedimentary rocks
	Paleocene	53 - 65 million	Consolidated sedimentary rocks
	Cretaceous	65 - 135 million	Consolidated sedimentary rocks

Relation between geologic age and absolute age in years from radiometric measurements. Modified from Ziony (1973) and Dibblee (1973).

TABLE 4

Hill and Dibblee (1953) suggest 8 miles (13 km), Crowell (1962) 5 to 10 miles (8 to 16 km), and Carman (1964) 4 miles (6 km) of horizontal displacement on the Big Pine fault over the past 10 million years since Miocene. These values of displacement over 10 million years yield slip rates (S) ranging from .06 to .16 cm/year. Kahle (1966) has suggested 4 miles (6 km) of horizontal movement since late Pliocene. Assuming that the displaced late Pliocene rocks are approximately 2 million years old (Heirtzler et al., 1968; Dibblee, 1973), an average slip rate of .3 cm/year-is-determined. Comparing this with an average slip rate of 3 cm/year for the San Andreas fault, the earthquake generating potential of the Big Pine fault is estimated to be one-tenth as great as the San Andreas fault. Recurrence intervals for 6 and 7 Richter magnitude earthquakes required to relieve elastic strain accumulation along the Big Pine fault for a slip rate of .3 cm/year have been calculated and are listed on Table 2.

As previously noted, the west end of the Big Pine fault curves to the northwest and intersects the northwest trending Camuesa fault north of Lake Cachuma. However, an east-west trending lineation has been noted on satellite imagery (NASA Earth Resources Technology Satellite, ERTS-I) which could be a western continuation of the Big Pine fault (Estes, 1973; Comstock, in prep.). This lineation extends 43 miles westward from the mapped terminus of the fault, through the town of Los Alamos and to the coast through San Antonio Creek. A University of California at Santa Barbara graduate student, Steve Comstock, is presently involved in study of this feature as well as the western area of the mapped Big Pine fault. Comstock's preliminary investigations on the western continuation of the fault included study of 1:120,000 and 1:60,000 color infrared aerial photographs of the area of the ERTS-I lineament, and subsequent field study of the ground locations. East-west trending lineaments were observed and substantiated by ground check in the area between the Camuesa fault and west of Los Alamos.

Between 1934 and 1966, three earthquake epicenters greater than magnitude 4, and five epicenters of 3 to 4 magnitude occurred along this ERTS-I lineament (Hamilton, et al., 1969). Several damaging earthquakes occurred along the--lineation near Los Alamos during 1902 and 1915 (Townley and Allen, 1939); at least three of these earthquakes are estimated to be of magnitude 6 or greater (Lamar et al., 1973, pocket map). Additionally, there is a pronounced difference in surface and subsurface geologic structural trends north and south of this possible western continuation of the Big Pine fault. Structures north of the lineament have an average trend of north-northwest, whereas the median structural grain south of this line trends approximately 40° more westerly (Comstock, in preparation). This contrast reflects the same Coast Ranges-Transverse Ranges boundary marked by the Big Pine fault to the east.

During a recent landslide investigation by Moore & Taber on Vandenberg Road south of San Antonio Creek, a review of 1938 aerial photographs disclosed offsets of three small stream gullies. The gullies are offset in a left lateral sense, and when aligned with a straight portion of the valley wall show a trend of about N60W. The alignment of these jogs in the local drainage pattern could be fortuitous or could represent ground displacement along a small fault during historic times (1902 or 1915) associated with

movement along the westerly extension of the Big Pine fault. The jogs are more subdued in 1960 photographs.

Thus, seismic and structural evidence support a western continuation of the Big Pine fault to the Pacific Coast. However, Willot (1972) shows no significant elevation change across the possible western continuation of the Big Pine fault near the coast along San Antonio Creek during a thirteen year period, 1958-1971.

San Andreas Fault - The San Andreas, the principal active fault in California, extends for over 600 miles (1000 km) from at least the Salton Sea area northwestward to the Pacific Ocean near Point Arena. Although at its closest point the trace of the San Andreas fault is located 7 miles from the sparsely populated northeast corner of Santa Barbara County, a major earthquake on the southern segment of the San Andreas fault would subject the County (especially the Cuyama Valley) to severe ground accelerations. Two of the three largest (Richter magnitude 8 or greater) historic earthquakes in California have occurred along the San Andreas fault; these were the 1906 San Francisco earthquake and the less well known 1857 Fort Tejon earthquake. Although the trace of the 1857 break is not completely known, available evidence suggests that the surface rupture extended opposite Santa Barbara County from near San Bernardino, northwest at least 220 miles (350 km) to Cholame, approximately midway between Los Angeles and San Francisco (Allen, 1968). According to Olsen (1972), virtually every house in Santa Barbara was damaged by the 1857 Fort Tejon earthquake. Thompson and West (1883) state that many houses in Santa Barbara were damaged by cracks in adobe walls, rocks rolled down hills, and water spilled out of the Mission reservoir; there is no reference to damage at the Mission or in the official Mission histories. According to Charles Richter (personal communication, 1974), all authorities report that the 1857 earthquake caused collapse of the tile roof at San Buenaventura Mission church.

Wallace (1968) has suggested that many of the 3D-foot offsets of stream channels along this segment of the San Andreas fault may have formed during the 1857 earthquake. By comparison, the maximum horizontal displacement during the magnitude 8.3 1906 San Francisco earthquake was 21 feet. Therefore, the horizontal displacement suggests that the Richter magnitude of the 1857 earthquake was at least as great as the 1906 San Francisco earthquake, or magnitude 8.3+.

The portion of the San Andreas fault which broke during the 1857 earthquake has been extremely quiet seismically (Brune and Allen, 1967), and there is no evidence of creep (Brown and Wallace, 1968). Allen (1968) has suggested that this segment of the San Andreas fault is locked because of the curvature as it passes through the Transverse Ranges, and that strain release along the San Andreas fault in this area occurs principally as a result of major earthquakes similar to the 1857 event.

The San Andreas fault has been extensively studied, and considerable data on the offset of geologic units along the fault are available. Hill and Dibblee (1953) were the first to propose the concept of cumulative horizontal slip of hundreds of miles on the

San Andreas fault as a result of incremental fault displacement during earthquakes. In a more recent analysis, Huffman (1972) presented data which indicate that the average slip rate for the past 10 million years has been about 3 cm/year in the central Coast Ranges. This is consistent with geodetic data indicating current relative motion of $3.2 \pm .5$ cm/year in the same area (Savage and Burford, 1973).

For a slip rate of 3 cm/year and a maximum displacement of about 30 feet (900 cm) during the 1857 Fort Tejon earthquake, a recurrence interval of 300 years is indicated. Wallace (1970) has estimated that recurrence intervals calculated for the San Andreas are probably incorrect by at least a factor of 2; thus, the recurrence interval may be between about 150 and 600 years.

It should also be emphasized that the historic record is not adequate to verify Allen's (1968) theory that only major and infrequent earthquakes occur along the San Andreas fault segment opposite Santa Barbara County. Sufficient elastic strain has probably accumulated for at least a magnitude 7 earthquake, which could subject Santa Barbara County to severe earthquake accelerations.

Recurrence intervals for the release of elastic strain by Richter magnitude 6, 7, and 8 earthquakes for a slip rate (S) of 3 cm/year along the San Andreas fault are listed on Table 2.

Active (A) - The following faults are considered active (movement in last 11,000 years) as defined in the previous section, Fundamentals of Engineering Seismology.

Big Pine Extension - Described previously under Big Pine fault.

Graveyard - Turkey Trap - Upson and Worts (1951) indicate two 4 mile long in echelon faults which underlie the Holocene alluvium of central Cuyama Valley. The existence of these faults is based on the nearly east-west alignment of springs and the Graveyard and Turkey Trap group of ridges. The ridges are 200-400 feet wide and rise to 35 feet above the alluvial plain. Based on the data presented by Upson and Worts (1951), these features could be folds rather than faults in the alluvium. They may be secondary features caused by movement on a fault which cuts bedrock beneath the alluvium. Based on the locations of the en echelon ridges the total length of such a fault zone is estimated to be 7 miles.

Mesa Fault - The topographically high mesa in the southwest part of Santa Barbara is believed to be uplifted along the Mesa fault. As indicated by Dibblee (1966), the Mesa fault trends from its intersection with the More Ranch - Mission Ridge fault 4 miles southeast to the ocean. The Mesa fault may continue onshore to the east as the Carpinteria or Rincon Creek fault. Cross sections prepared by Dibblee (1966) indicate 600 feet vertical displacement of Pleistocene fanlomerate and 2500 feet vertical displacement of late Pliocene to Pleistocene sediments.

The northeast facing cliff of the mesa is considered to represent the fault scarp eroded southward from the fault trace by Mission Creek (Olsen, 1972). The fault is covered by alluvium, but the location mapped by Dibblee (1966) has been essentially verified along the southeast segment of the fault by gravity profiles over the fault (Olsen 1972). The trace of the fault is less well defined along the westerly part and gravity profiles are more subdued and flattened out. The trace in the southeastern part of Santa Barbara is defined by historic hot springs, an anomalous "mound" and a possible scarp (Olsen, 1972). Many features suggest tectonic creep; however, en echelon cracks in roadways, "push outs" in sidewalks and steps, and disrupted concrete parking areas are not necessarily continuous. Proof of tectonic creep, however, requires more observations (Olsen, 1972): but there appears to be sufficient evidence to arouse suspicion that the fault is active and worthy of additional study.

According to Willott (1972), 2.1 cm of vertical movement occurred across the fault along a level line surveyed in 1959 and 1970, and Jennings (1972) indicates Quaternary displacement along the Mesa fault.

A series of precise level lines have been established across the fault by A. G. Sylvester and students at University California at Santa Barbara (UCSB). Data regarding these lines as well as other instrumental measurement points are noted in Table 5 and the instrument locations are shown in Figure 19.

In 1925, a magnitude 6.3 earthquake occurred beneath the ocean about 10 miles south-southwest of Santa Barbara (Calif. Dept. Water Res., 1964). Willis (1925) suggested that the earthquake occurred on the Mesa fault; this would require a shallow dip on the Mesa fault. Hill (1932) questioned Willis' hypothesis because of the relatively steep surface dip of the fault. Jennings' (1972) map suggests that movement on the offshore continuation of the Oak Ridge fault of Ventura County is more likely to have caused this earthquake. According to Charles Richter (personal communication, 1974), because of the inadequate seismograph records, the epicenter may easily be in error by 10 miles; he prefers an origin on the More Ranch fault and perhaps the Mission Ridge fault.

More Ranch - The More Ranch fault trends east-west for 9 miles near the coast south of Goleta; the eastern end curves and may continue east as the Mission Ridge fault (Dibblee, 1966). The western portion of the More Ranch fault was originally named the Elwood fault by Hill (1932). The late Pliocene to Pleistocene sediments north of the fault have been downdropped up to 2000 feet at the east end; displacement decreases to the west and dies out near the ocean. Dibblee's (1966) map indicates displacement of Recent alluvium as well as old alluvium. Geologically recent movement is suggested by the north facing scarp which bounds the north edge of the coastal mesa at the east end and a small north facing scarp near the coast at the west end of the fault (Dibblee, 1966).

INSTRUMENTAL MEASUREMENT OF CRUSTAL MOVEMENT
 Santa Barbara County
 University California at Santa Barbara

<u>Fault</u>	<u>Measurement Type & Number</u>	<u>Locality and Site</u>	<u>Date Installation or Observation*</u>
Santa Ynez (North branch)	Q27	Santa Ynez Mountains: Alisal Ranch	1971*
Santa Ynez	Q30	Jameson Lake: Junca1	1970, 1971*
Santa Ynez	Q31	Wheeler Springs: Wheeler Gorge	1971
More Ranch	Q32	Santa Barbara: Mescalitan	1970
Channel Faults	NL17	Santa Barbara Channel	1971 (5 yr. intervals)
Santa Ynez	L7	Santa Ynez: Baseline	1970
Santa Ynez	L8	Santa Barbara: Jameson Lake	1970
Mesa	L9	Goleta: Golf Course	1970
Mesa	L10	Santa Barbara: Crosstown	1970
Mesa	L10	Santa Barbara: Lorinda	1970
Mesa	L10	Santa Barbara: Cook	1970
Mesa	L11	Santa Barbara: Burton Mound	1970
Santa Cruz Island	C54	Santa Cruz Island: Stanton Ranch	1969

Q = Small Triangulation Net
 NL = Trilateration Network
 L = Level Line
 C = Creepmeter

Date Source: Greensfelder, R.W., 1972, "Crustal Movement Investigation", Special Publication 37, California Division of Mines & Geology

TABLE 5

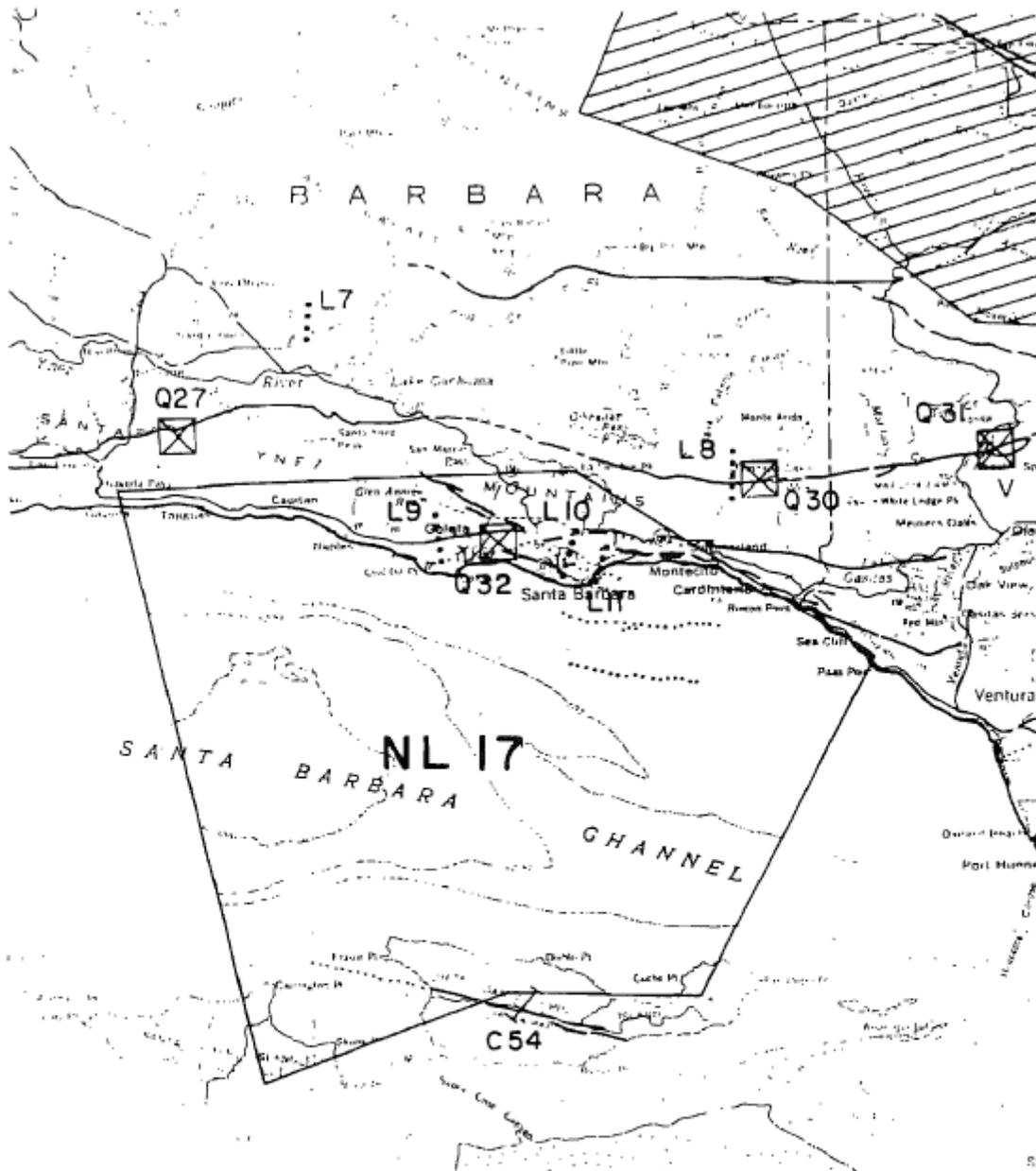


FIGURE 19

LOCATION OF CRUSTAL MOVEMENT INSTRUMENTS AND LEVEL LINES,
SANTA BARBARA COUNTY (from Greensfelder, 1972)

Nacimiento - The Nacimiento fault trends from its intersection with the Big Pine fault in Santa Barbara County 170 miles northwest to the Pacific Ocean near Point Sur. It is considered to be a strike-slip fault with a right lateral sense of movement. This structural zone is considered to mark an important boundary between different types of ancient basement rocks within the Coast Ranges (Page, 1966). However, most of the displacement occurred in pre-late Miocene time or more than 10 million years ago, and only a few hundred feet of post-late Miocene displacement has occurred (Vedder and Brown, 1968).

According to Hart (comment in Vedder and Brown, 1968), the Rinconada fault which branches from the Nacimiento fault 25 miles north of Santa Barbara County shows evidence of geologically recent movement. Hart has noted sagponds, small scarps, and offset drainage along the Rinconada fault. The Nacimiento fault shows similar features near its intersection with the Rinconada fault. Richter (1969) has suggested that a magnitude 6 earthquake located near Bryson in 1952 may have occurred on the Nacimiento fault at depth. Bryson is located approximately 70 miles north of Santa Barbara County. Jennings (1972) indicates that a 10 mile long segment of the Nacimiento fault in northern-most Santa Barbara County has Quaternary displacement, but the 32 mile long segment which extends southeast to its junction with the Big Pine fault has no recognized Quaternary movement.

Pacifico - The Pacifico fault trends east-west 13 miles at the western end of the Santa Ynez Mountains and meets the ocean near the mouth of Jalama Creek (Roubanis, 1963). Dibblee (1950) considers the Pacifico fault to be a member of the Santa Ynez fault zone because of its similar trend and location directly west of the intersection of the north and south branches of the Santa Ynez fault. The north branch of the Santa Ynez fault intersects the Pacifico fault 10 miles from the ocean.

According to Dibblee (1950), the maximum vertical displacement of the Pacifico fault amounts to 5000 feet, and drag folds indicate a large component of horizontal movement. Roubanis (1963) believes that displacement is predominately horizontal and is approximately 2 miles. Sagponds have been reported along the Pacifico fault (Roubanis, 1963), and vertical movement across the fault is indicated on the profile showing elevation changes between 1957-60 and 1971 prepared by Willott (1972). Jennings (1972) indicates Quaternary movement along the Pacifico fault west of its intersection with the north branch of the Santa Ynez fault.

Santa Cruz Island - The Santa Cruz Island fault trends west-northwest for 13 miles across the center of Santa Cruz Island. Erosion along this zone has formed the prominent Central Valley. According to Rand (1931), the rocks on opposite sides of the fault are very dissimilar so that the amount of displacement is not determinable. Bremmer (1932) indicates that the minimum displacement of middle Miocene volcanic rocks amounts to 4000 feet, and Weaver (1969) indicates that the vertical displacement is 7500 feet. Based on the offset of unique middle Miocene volcanic rocks, Weaver (1969) estimates one mile of horizontal displacement.

Geologically recent movement is indicated by displacement of Pleistocene terrace deposits (Rand, 1931) and horizontal offset of stream courses (Rand, 1931; Weaver, 1969). Jennings (1972) indicates recognized Quaternary movement over the length of the Santa Cruz Island fault.

Santa Rosa Island - The Santa Rosa Island fault trends east-west across central Santa Rosa Island. Based on a comparison of middle Miocene volcanic rocks, Weaver (1969) suggests a maximum of 10 miles of horizontal displacement on the Santa Rosa fault. Horizontal offset of stream courses of up to one mile and a possible 325 feet displacement of Pleistocene terrace deposits (Kew, 1927), suggests geologically recent movement. Jennings (1972) indicates that Quaternary displacement has occurred over the length of the Santa Rosa Island fault.

Santa Ynez - The Santa Ynez fault trends east-west 75 miles from its intersection with the Agua Blanca thrust fault in eastern Ventura County to Gaviota Pass in western Santa Barbara County. At Gaviota Pass the Santa Ynez fault splits into a south branch which intersects the coast 7 miles to the southwest, and a north branch which continues 7 miles further west. The fault system is characterized as J high angle, oblique slip fault with considerable left lateral slip. Along most of its course the Santa Ynez fault marks the base of the steep north-facing escarpment of the Santa Ynez Range; the south block of the fault has been uplifted to form the mountain range. The maximum vertical separation at the base of Eocene sediments indicated on structure sections (Dibblee, 1950, 1966) is 9500 feet. Dibblee (1966) has noted that the Tertiary sedimentary rocks on opposite sides of the Santa Ynez fault are vastly different. He believes that the differences may be explained by several miles of horizontal displacement, the north block having moved west.

Some investigations have supported Dibblee's hypothesis of such major horizontal displacement. Edwards (1971) suggests 37 miles of horizontal movement of lower Miocene sediments along the Santa Ynez fault, and McCracken (1969) believes that Oligocene sediments are horizontally displaced 12 miles. On the basis of a detailed study of Eocene sediments, Schroeter (1972) has suggested 9 miles (15 km) of horizontal displacement. In contrast Schmitka (1973) believes that Eocene rocks have been horizontally displaced 30 miles; however, he indicates that the north block of the fault has moved east. This is opposite to the movement direction suggested by Dibblee (1966) and the other investigations summarized above.

Other geologists question whether significant horizontal displacement in either direction has occurred along the Santa Ynez fault. Link (1971) believes that a maximum of only 1-2 miles of post Eocene horizontal displacement has occurred, and O'Brien (1973) suggests that the distribution of rock types in Oligocene sediment precludes significant horizontal movement across the south branch of the Santa Ynez fault. Opinions on the magnitude and direction of horizontal movement on the Santa Ynez fault are too contradictory to determine earthquake recurrence intervals from the long-term horizontal slip rate as has been accomplished for the Big Pine and San Andreas faults.

Recent horizontal movement is indicated by displacement of stream courses of a few hundred feet to 3 miles (Dibblee, 1966) and possible offset of Pleistocene terrace deposits (Page et al., 1951). According to Arthur G. Sylvester (personal communication in Sage, 1972), scarps and sagponds occur along the Santa Ynez fault north of Carpinteria. Jennings (1972) indicates that Quaternary displacement has occurred over the entire length of the Santa Ynez fault.

A magnitude 7.5 earthquake occurred off of Point Arguello in 1927; Hamilton et. al. (1969) has suggested that the earthquake occurred on a western extension of the Santa Ynez fault. This epicenter is aligned with the Pacifico fault (Calif. Dept. Water Res., 1964), which is a member of the Santa Ynez fault zone. Willott (1972) has compared elevations determined in 1957 and 1971 along a traverse across the south branch of the Santa Ynez fault and reports 0.8 cm displacement.

Potentially Active (PA) - The following faults are considered potentially active movement between) 11,000 - 500,000 years) as defined in the previous section Fundamentals of Engineering Seismology.

Arroyo Parida - The Arroyo Parida fault trends east-west along the south slope of the Santa Ynez Mountains from near Toro Canyon for 7 miles to the eastern boundary of Santa Barbara County. The presumed continuation of the Arroyo Parida fault further east has been named the Santa Ana fault. The east end of the Santa Ana fault is overridden by the San Cayetano thrust fault 17 miles east of Santa Barbara County. The west end of the Arroyo Parida fault is aligned with the Mission Ridge fault; the 6 mile gap in between is obscured by alluvium and Pleistocene conglomerate. According to Lian (1952), a branch of the Arroyo Parida fault at its west end trends southwest down Picay Creek and meets the coast west of Ortega Hill. The existence of this branch fault is based on truncated rock units and a turn in the scarp eroded along the fault (Lian, 1952). Willis (1925), Batley (1954) and Muir (1968) also show a south branch of the fault, at its west end.

The maximum vertical displacement along the Arroyo Parida fault noted by Chauvel (1958) amounts to 2700 feet (the north side down). Chauvel (1958) suggests a major component of horizontal displacement on the basis of striae in the fault plane and offset structural highs. Lian (1952) found no evidence for horizontal movement and estimates 2000-4000 feet of vertical displacement of Oligocene sediments.

Stream deflections along the fault may be the result of erosion along the fault zone rather than geologically recent horizontal displacement (Lian, 1952); not all streams show offsets (Chauvel, 1958). Cross sections prepared by Muir (1968) indicate displacement of late Pleistocene water bearing sediments and Pleistocene alluvium. Pleistocene conglomerate exposed on a hill between Toro Canyon Creek and Garrapata Creek (Dibblee, 1966) appears to be uplifted along the south side of the fault. Pleistocene conglomerate has also been displaced along the Mission Creek fault, which

is aligned with the west end of the Arroyo Parida fault. Jennings (1972) indicates Quaternary displacement along the entire length of the Arroyo Parida - Santa Ana fault.

Bradley Canyon - Worts (1951) shows the Bradley Canyon fault trending north-northwest for approximately 5 miles near the east end of the Santa Maria Valley. The existence of a fault is based on the alignment of a fault cutting Pleistocene terrace deposits on the north side of the Santa Maria River with the straight course of Bradley Canyon to the south. Approximately 60 feet of displacement of water bearing late Pliocene to lower Pleistocene sediments is indicated. Recent river deposits are not displaced according to a cross section in Worts (1951). No evidence of fault displacement of older, consolidated rocks north and south of the Bradley Canyon fault is indicated (Jennings, 1959).

Carpinteria - The Carpinteria fault parallels the shore for 3 miles southeast of Carpinteria and intersects the coast; it is aligned with the Mesa fault at Santa Barbara to the west. This fault forms the south boundary of the Carpinteria Basin. A minimum of 3000 feet of late Pliocene to Pleistocene sediments are downdropped against Miocene sediments on the south side (Dibblee, 1966). Older Quaternary alluvium, consisting of loosely consolidated sand is displaced along the fault.

Goleta - The Goleta fault is one of several faults which have been mapped by Hill (1932) and Dibblee (1966) in the foothills north and west of the Goleta Valley. Others assigned to this group and described in detail on succeeding pages are: Carneros, Dos Pueblos, Eagle, Glen Anne, Las Varas, Modoc, Refugio, San Antonio, San Jose and San Pedro. According to Hill (1932) topographic evidence of these faults is lacking.

The Goleta fault trends east west 3 miles along the north side of Goleta Valley. The west end is aligned with the Glen Anne fault. Upson (1951) indicates that the fault displaces old alluvium of Pleistocene age against late Pliocene to Pleistocene sediments. Upson's (1951) map indicates that old alluvium is tilted 60 degrees next to the fault trace.

Mission Ridge - The Mission Ridge fault trends east-west for 5 miles directly north of Santa Barbara. The eastern continuation is covered by alluvium; however, the east end is aligned with the Arroyo Parida fault. The structure at the western end is obscured by alluvium; Dibblee (1966) shows a sinuous trace covered by alluvium continuing west as the More Ranch fault. A curve in the trace occurs at the probable intersection with the San Jose, Modoc and Mesa faults. Dibblee (1966) indicates a maximum of 1500 feet of vertical displacement of lower Miocene sediments with the north side down. Pleistocene fanglomerates on Mission Ridge have been elevated as much as 820 feet (250 meters) in the south block of the fault; the steep scarp north of Mission Ridge is assumed to mark the position of the fault trace (Olsen, 1972). Locally the Pleistocene fanglomerate on Mission Ridge is tilted as much as 35 degrees, probably as a result of movement on the Mission Ridge fault (Dibblee, 1966), and cross sections in Muir (1968) show displacement of late Pliocene to lower Pleistocene water bearing sediments and Pleistocene alluvium.

Red Mountain - The Red Mountain fault has a sinuous, generally east-west trace for 13 miles along the south side of Red Mountain and Rincon Mountain (Putnam, 1942). Jennings (1972) indicates that the Red Mountain fault extends west for 25 miles beneath the ocean south of Santa Barbara. The north side of the fault is upthrown with about 20,000 feet of displacement (Stewart, 1943).

Displaced Pleistocene marine terraces and arched Ventura River terraces indicate geologically recent movement (Putnam, 1942), and Jennings (1972) shows Quaternary rocks displaced along the Red Mountain fault. Based on comparison of elevations across the Red Mountain fault in 1957 and 1971, Willott (1972) determined 1.3 to 2.0 cm of displacement, the north block having moved up. A magnitude 6.0 earthquake which occurred in 1941 (California Department of Water Resources, 1964) may have been situated on the offshore extension of the Red Mountain fault (Sylvester, 1970).

Rincon Creek - The Rincon Creek fault extends east from the coast near Sand Point in the Carpinteria area into Ventura County. According to Jennings and Strand (1969), the eastern end intersects the Red Mountain fault 12 miles east-southeast of Santa Barbara County. The Rincon Creek fault is aligned with the Mesa fault which intersects the coast at Santa Barbara 9 miles to the west. Analysis of subsurface data revealed the position of the fault and 3000 to 5000 feet of displacement (Lian, 1952). Pleistocene terrace deposits are displaced along the fault, the south block having moved up. Jennings' (1972) map is too small a scale to differentiate the Rincon Creek fault and the Carpinteria fault one half mile to the south; he combines these two faults into the Carpinteria fault and indicates that the fault has had Quaternary displacement.

San Jose - The San Jose fault is another of several located in the foothills north and west of Goleta. It trends in a northwesterly direction and has a length of approximately 9 miles including the possible concealed southeasterly extension to the north end of the Mesa fault. It is the only one of the group indicated by Jennings (1972) to have Quaternary displacement. According to Dibblee (1966), the south block of the San Jose fault is elevated so that it forms a small north facing scarp in Pleistocene conglomerate. According to Hill (1932), there has been 1550 feet horizontal and 775 feet vertical movement with the south side up relative to the north.

Inactive - The following faults are considered inactive (no movement in last 500,000 years) as defined in the previous section, Fundamentals of Engineering Seismology.

Carneros - The Carneros fault (Carneros fault of Dibblee 1966) is one of the several Goleta Valley faults. It trends in an east-west direction and according to Hill (1932) has 13,000 and 1600 feet of horizontal and vertical displacement with the south side up. Upson (1951) indicates that the eastern extensions of the Carneros and Glen Anne faults cut water bearing sediments of late Pliocene and Pleistocene age beneath Goleta Valley. The existence of the faults is based on differences in water level and the lack of the transmission of pumping effects in wells on opposite sides of the inferred fault trace.

Camuesa - The northwest trending Camuesa fault is located in the San Rafael Mountains in central Santa Barbara County and has a length of 23 miles. Jennings (1972) indicates that the Camuesa fault has had no recognized Quaternary displacement: According to Jennings and Strand (1969), the youngest rocks displaced along the Camuesa fault are middle Miocene sediments.

Dos Pueblos - One of Goleta Valley faults. Extends in westerly direction from Tecolote Canyon to the sea at El Capitan. Approximately 400 feet of vertical displacement with the north side up.

Eagle - South of and similar to Dos Pueblos fault. Estimated 9000 feet of horizontal and 500 feet of vertical movement with south side up.

East Huasna - The East Huasna fault has been traced 50 miles from the Santa Lucia Range in San Luis Obispo County southeast into the San Rafael Mountains in Santa Barbara County. Hall and Corbato (1967) indicate a maximum of approximately 1200 feet of vertical displacement; the youngest rocks displaced are of late Miocene age. According to Jennings (1972), the fault has no recognized Quaternary or historic movement.

Erburu - Short east-west coastal fault (1 mile) crosses Las Flores Canyon west of El Capitan Beach. Cuts Rincon and Monterey formations with south side up relative to north.

Glen Anne - One of Goleta Valley faults. Extends in easterly direction from Tecolote Canyon to Carneros Creek and probably beneath alluvium to Goleta. Approximate movement is 1800 feet horizontal and 1000 feet vertical. A geologic investigation by Glenn A. Brown and Associates (1971) for a proposed reservoir site east of Bartlett Canyon indicated that "trenching indicates that the Glen Anne fault has affected the Terrace Deposits" and thus the fault might be considered potentially active.

Hildreth - The Hildreth fault trends west-northwest 13 miles in the San Rafael Mountains of west-central Santa Barbara County. The Big Pine fault terminates the Hildreth fault at the northwest end and the Hildreth fault abuts the Munson Creek fault at its southeast end. The youngest rocks displaced by the Hildreth fault are of middle Miocene age (Vedder et al., 1967). According to Jennings (1972), there is no evidence of Quaternary displacement along the Hildreth fault.

Honda - The Honda fault trends east-west from near the coast at Point Perdernales, 7 miles along the north slope of the Santa Ynez Mountains. According to Dibblee (1950), the youngest rocks displaced are of middle to late Miocene age. Terrace deposits of late Pleistocene age rest uncomfortably across the fault and are 101 not displaced (Dibblee, 1950; Jennings, 1972). Willott (1972) analyzed elevation data along a level line surveyed in 1957-60 and 1971 across the Honda fault; he found no evidence of vertical movement.

Las Varas - One of Goleta Valley faults. The fault is mapped but unnamed by Dibblee {1966) and extends east from Dos Pueblos Canyon and its intersection with the Eagle fault to Bell Canyon (3.5 miles). 'A concealed fault beneath alluvium shown on Upson's (1951) map in the Goleta area, may be the easterly extension of the Las Varas fault. Displacement on the fault is approximately 1500 feet horizontal and 850 feet vertical with the south side up.

Lavigia - The Lavigia fault trends northwest 4-1/2 miles between Goleta and Santa Barbara. The north end is truncated by the More Ranch fault, and the south end is covered by old alluvium near the coast. Well data near the center of the fault indicate a minimum of 2100 feet of vertical displacement of late Pliocene to Pleistocene sediments, the north side having moved down. The displacement dies out to the southeast; the fault is not exposed in bedrock beneath old alluvium in the sea cliff southeast of the mapped end of the fault (Dibblee, 1966). According to Dibblee (1966) the fault is not expressed topographically. Jennings (1972) indicates that Quaternary displacement has occurred along the Lavigia fault.

Lion's Head - The northwest trending Lion's Head fault has been mapped from the coast south of Point Sal 5 miles into the Solomon Hills (Woodring et al., 1950). The youngest sediments displaced are late Miocene to early Pliocene in age. The map and cross section prepared by Woodring et al. (1950) suggest 6000- 7000 feet of displacement. Pleistocene terrace deposits resting across the fault are not displaced (Woodring et al., 1950), and Jennings (1972) indicates no Quaternary displacement. However, comparison of elevations surveyed in 1957-60 and 1971 indicates an abrupt 0.7 cm change in elevation across the approximate location of the Lion's Head fault; the south side is down similar to the older displacement (Willott, 1972). Changes in elevation along level lines across faults are probably not sufficient to establish that a fault is active (Lamar and Lamar, 1973). It would be desirable to trench the terrace deposits to verify that they are not displaced.

Little Pine & Loma Alta –The Little Pine fault is a major northwest trending reverse fault along which the of the Little Pine Mountain block of the San Rafael Mountains has been uplifted (Dibblee, 1966). The Little Pine fault has a sinuous trace which extends 36 miles from central Santa Barbara County southeast to intersect a strand of the Santa Ynez fault system (Juncal Camp fault). Over much of its length the elevated northeastern block of the Little Pine fault forms a steep, abrupt mountain front. Jennings (1972) indicates that a portion of the Little Pine fault and a 3 mile long branch called the Loma Alta fault displace Quaternary sediments. Dibblee (1966) shows sediments of late Pliocene to early Pleistocene along much of the down dropped southwest side of the Little Pine fault. The maximum displacement of late Pliocene to early Pleistocene sediments indicated by Dibblee (1950) is 4000 feet.

Lompoc Terrace - Evenson and Miller (1963) have described an east west trending ground water basin beneath Lompoc Terrace on the Point Arguello Naval Missile Facility (Vandenberg). The geologic structure is largely obscured by Pleistocene windblown sand; however, the available data suggest that the basin is bounded on the

south and possibly the north by east-west trending faults. The maximum length of faulting indicated by Evenson and Miller (1963) is 5-1/2 miles; the faults may continue to the west beneath the ocean. Well data indicate that about 1000 feet of poorly consolidated water bearing upper Pliocene to lower Pleistocene sediments are downdropped between older consolidated early Pliocene and late Miocene sedimentary rocks. Surface evidence of faulting in older rocks on the south side of the basin is described by Evenson and Miller (1963). The faults are overlain by Pleistocene sand, and no evidence of geologically recent movement is known.

Modoc - The Modoc fault trends northwest 1 1/2 miles between the Goleta and More Ranch faults; ground water data summarized above is the only evidence for its existence given by Upson (1951). Several other minor, unnamed faults are shown on Upson's (1951) geologic map.

Montecito - The Montecito fault was a previously unmapped fault and its presence in the Montecito area was postulated on the basis of drilling records obtained in an investigation by Geo Technical Consultants, Inc. (1974). They indicate the fault is vertical with the north side up and displacement on the order of several hundred feet. On the basis of their statement "Recent activity of this fault can be seen in offset terrace deposits and alluvium west of Montecito", the fault should be regarded with suspicion and considered as possibly or potentially active, similar to other related faults in the South Coast region.

Morales - The Morales fault is a thrust fault with a length of 35 miles. It trends northwest through the Caliente Range north of Santa Barbara County. At the north edge of Cuyama Valley the fault curves into a slightly sinuous east trending trace which parallels the north edge of the valley. Jennings and Strand (1969) show the trace extending east to within 3 miles of the San Andreas fault. At its closest point the fault lies directly opposite the Santa Barbara County boundary along the north bank of the Cuyama River.

Schwade (1954) shows 6000 to 9000 feet of displacement on the Morales fault; upper Miocene and older sediments are thrust over late Pliocene rocks. These younger sediments fill the lowlands of Cuyama Valley. The Caliente Mountains to the north have been uplifted along the fault, and the trace is situated at the base of the mountains. Cross sections prepared by Schwade (1954) show Recent alluvial sediments as conformable (no discordance in structure) with the underlying late Pliocene sediments; thus, the sediments filling Cuyama Valley could have been deposited during a period of continuous deposition and fault uplift of adjacent highlands from the late Pliocene through Recent time. However, study of 1:120,000 scale color IR air photographs indicates no physiographic evidence of geologically recent displacement, and Jennings (1972) indicates that the Morales fault lacks recognized Quaternary and younger movement. Any physiographic evidence of displacement would be quickly obliterated at the base of a mountain; trenching across the fault trace would be required to verify that no rocks younger than late Pliocene have been displaced.

Munson Creek - The Munson Creek fault has a generally east-west, sinuous trace for 25 miles from west-central Santa Barbara County into central Ventura County. According to Fisher and Dibblee (1961), the 10 mile long east-northeast trending segment of the Munson Creek fault in Santa Barbara County has had several thousand feet of horizontal displacement. This segment of the Munson Creek fault is aligned with the active eastern portion of the Big Pine fault to the northeast and with a east-northeast trending segment of the Santa Ynez fault to the southwest. Fisher and Dibblee (1961) believe that these faults are all characterized by a major component of horizontal displacement: their alignment suggests that they originated as a result of horizontal movement on a continuous shear zone within ancient basement rocks beneath the thick cover of sedimentary strata. The great thickness of the sedimentary sequence in this area may account for the lack of a continuous surface break along the postulated deep shear zone. Under Fisher and Dibblee's (1961) hypothesis the segment of the Munson Creek fault in Santa Barbara County should be considered as active as the Big Pine fault to the northeast and Santa Ynez fault to the southwest. However, the youngest rocks displaced along the Munson Creek fault are lower Miocene in age, and Jennings (1972) indicates that there is no evidence of Quaternary movement.

Ozena - The northwest trending Ozena fault is south of - and in echelon to - the South Cuyama fault; its trace extends for 25 miles on the northeast slope of the Sierra Madre Mountains. The southern portion of the trace underlies the headwaters of the Cuyama River, and the south end of the Ozena fault abuts the Big Pine fault. Larsen (1958) suggests that the principal movement was prelate Miocene or slightly later; prior to truncation by the Big Pine fault. The youngest rocks shown displaced on Madsen's (1958) map are middle Miocene sediments; he shows the fault overlain uncomfortably by folded upper Miocene sediments. Jennings (1972) indicated that the Ozena fault has no recognized Quaternary movement.

Pezzoni - Woodring *et al.* (1950) mapped the northwest trending Pezzoni fault over a distance of 4 miles in the Solomon Hills directly south of the Santa Maria Valley; the northwesterly end is obscured by old sand dunes. Fault displacement and down folding of 5000-6000 feet of the late Miocene to early Pliocene sediments is indicated on a cross section prepared by Woodring *et al.* (1950). No evidence of Quaternary or historic movement is indicated by Jennings (1972).

Refugio - This fault trends in an east-west direction along the south side of the Santa Ynez Mountains about 1/2 mile north of the coast in the El Capitan - Refugio coastal area. The south side of the fault is up relative to the north; vertical displacement is about 500 feet with no apparent horizontal movement.

San Antonio - The San Antonio fault is located in the low foothills north of Goleta. It makes a prominent concave (north) trace and truncates the southeast trending Ygnacio fault. The south side is up and the approximate displacement is 500 feet vertical.

San Pedro - The San Pedro fault is south of (4000+) and parallels the San Jose fault in the foothills north of Goleta. Displacement is approximately 1500 feet horizontal and

500 feet vertical with the south side up relative to the north. This fault is equivalent to the San Jose B fault of Hill (1932).

Santa Maria - As indicated by Worts (1951) the Santa Maria fault trends 7 miles north-northwest beneath the City of Santa Maria. A cross section prepared by Worts (1951) indicates 150 feet of displacement of late Pliocene to early Pleistocene water bearing sediments; the Recent river deposits beneath the Santa Maria Valley are not displaced. On the basis of oil well data, Canfield (1939) shows approximately 400 feet of displacement of lower Pliocene sediments on the Santa Maria fault. No evidence of faulting north and south of the Santa Maria fault is indicated in the older rocks exposed in the uplands adjacent to Santa Maria Valley.

South Cuyama - The South Cuyama fault trends northwest for 37 miles along the south side of Cuyama Valley and dies out south of the town of Cuyama (Jennings and Strand, 1969). Earlier workers (Schwade, 1954; Schwade *et al.*, 1958; Hill *et al.*, 1958) considered this fault to be the southeast extension of the Nacimiento fault, previously discussed. Older Cretaceous and Tertiary sediments of the Sierra Madre Mountains are faulted against younger, downdropped sediments filling Cuyama Valley.

Schwade (1954) shows 3500 to 5000 feet of fault displacement of the late Pliocene in Cuyama Valley. The South Cuyama fault is similar to the Morales fault in that the geologic and geomorphic data suggest fault movement from the late Pliocene possibly through Recent time. Jennings (1972) shows the South Cuyama fault displacing Quaternary rocks north of its intersection with the Whiterock fault. In this area Schwade (1954) indicates Cretaceous sediments faulted against Quaternary terrace deposits. To the southeast of the intersection with the Whiterock fault, Madsen (1959) and Jennings (1972) show no displacement of Quaternary deposits along the South Cuyama fault. The South Cuyama fault is situated at the base of the Sierra Madre Mountains where evidence of geologically recent displacement could be obliterated by rapid erosion and deposition. However, study of 1:120,000 scale air photographs indicates no evidence of geologically recent movement, and the fault trace is irregular. The terrace deposits have the appearance of being deposited against an old fault scarp and may not be displaced. Fault displacement of terrace deposits should be verified before this fault is classified as potentially active.

Suey - The Suey fault extends from the Sisquoc River 18 miles northwest to the north boundary of Santa Barbara County at the Cuyama River. Hall and Corbato (1967) suggest that the Suey fault continues northwest into San Luis Obispo County as a branch of the West Huasna fault which extends another 16 miles to a point opposite San Luis Obispo Bay. The youngest rock unit displaced by the Suey fault is late Miocene in age. The amount of displacement is not known in Santa Barbara County; to the northwest in San Luis Obispo County, Hall and Corbato (1967) have estimated 750 feet of possible post late Miocene horizontal movement. No evidence of Quaternary or historic movement is indicated by Jennings (1972).

White rock - The 17 mile long Whiterock fault is situated 2 miles west of the Morales fault in the Caliente Range north of Santa Barbara County. Within Santa Barbara County the fault trends northwest, obliquely across the western portion of Cuyama Valley. On the south side of Cuyama Valley the Whiterock fault intersects the South Cuyama fault. Schwade (1954) and Schwade et al. (1958) show 5000 feet of displacement of late Pliocene sediments along the Whiterock fault in the Russell Ranch Oil Field at the north edge of Santa Barbara County. Within Cuyama Valley Jennings and Strand (1969) show the Whiterock fault covered by Pleistocene and more recent sediments, and according to Jennings (1972) there is no evidence of Quaternary movement on the Whiterock fault.

Ygnacio - This fault is another of the Goleta Valley faults; it is located about three miles north of Goleta. It trends in a southeasterly direction and is truncated by the arcuate San Antonio fault. The north side is up and approximate displacement is 1500 feet horizontal and 800 feet vertical.

SEISMIC ZONING

Zoning for seismic hazards should consider all adverse aspects of seismic events. These include ground surface rupture along the fault, ground shaking due to the propagation of seismic shock waves, liquefaction of saturated soil, settlement of granular soils due to seismic densification, seismically-induced landslides, and generation of tsunamis. This section of the report concerns only the first two factors - ground surface rupture and ground shaking. Other adverse effects of earthquakes are treated under separate sections and their effects on land use planning are taken into account separately.

Because of the scale of the study and the fact that data on seismic hazards are limited, seismic zoning can best be based on a statistical approach. When planning reaches the design stage, more specific data must be acquired and more consideration given to the specific site conditions. This is particularly true for large or critical structures such as high occupancy buildings, schools, hospitals, and the like.

Ground Rupture

The ground surface rupture along a fault, although limited in area, is disastrous when it occurs under a structure, particularly dams (see item 9 under Recommendation for Future Study). Engineering design can do little to accommodate such movement, and for practical purposes, the only solution is to avoid location on a fault.

For planning or design of projects in or near a fault zone, several aspects of the fault must be considered. First, the character of the fault must be known. Is it a broad zone of interbraided fractures or a localized gouge zone? Is the fault zone a single line or does it have a series of branches or offshoots? Second, the exact location of the fault breaks must be determined in relation to the proposed structure site. When several breaks are known to exist, the relative age of the individual breaks should be determined whenever

possible. Finally, it is necessary to determine to some degree the probability of movement during the life of the structure. The probability of movement on an inactive fault is very low and would not normally prevent building anything but the most critical structures across the fault. In the case of an active fault that has a number of different traces, the last previous break has a much higher probability of movement than some of the older breaks.

All known active faults of significance are shown on the Seismic Tectonic Map along with a classification of their activity. The accuracy of their location will vary somewhat depending on the scale of the base map from which they were obtained and the degree of interpretation contained in the original work. However, we feel that the fault locations generally are accurate enough for planning purposes. For project design, it will be necessary in almost all cases to conduct specific site studies in order to determine the fault location more accurately. Also, future studies will almost surely result in the discovery of presently unknown faults and reclassification or relocation of some known faults.

Because of the extreme linear nature of faults, no ground rupture rating has been used for the fault zones. Instead, the following guidelines are recommended for planning and construction of projects which are located in close proximity to known faults.

Historically Active and Active Faults - No structures of consequence should be constructed within fifty feet of the fault trace, except those structures which cannot be relocated to avoid the fault. This would include projects such as highways, bridges, utilities, and the like.

Potentially Active Faults - Major or critical structures such as schools, hospitals, police stations, or communications facilities should not be constructed within fifty feet of a fault trace. All other types of structures should be planned to avoid a location on a fault insofar as practical.

Inactive Faults - Ground rupture should create no constraints on location of structures on inactive faults, except for an investigation to confirm that the fault is inactive. The ancient fault movement might have produced certain adverse foundation conditions, such as high ground water, weak gouge zones, or abrupt changes in bearing capacity. Thus, a more extensive foundation investigation can be anticipated for a site located on an inactive fault, even though the defects are not related to future ground rupture.

Ground Shaking

The severity of ground shaking at a specific site is dependent on the following items:

- (1) The source mechanism which initiates the energy release. This is commonly described in terms of the Richter magnitude of the earthquake.

(2) Energy attenuation in the bedrock during wave transmission between the earthquake focus and the site. This is a function of the distance between these two points, the type of rock, and the geologic structure of the bedrock. Distance is probably the most important factor.

(3) Bedrock geometry at the site. This is determined largely by the subsurface or surface bedrock topography.

(4) Soil properties, if soil is present at the site.

In this study, the potential energy release in item number (1) has been determined by correlation with the total mapped fault length using Housner's relationship described earlier on Figure 9. Items (2), (3), and (4) have been lumped together statistically, and are determined from the magnitude of the maximum probable earthquake and the distance from the fault in accordance with Davenport's (1972) method, also described earlier in this report. However, these procedures do not directly consider the historic seismic shocks to be expected rather than the maximum magnitude that can reasonably be expected. Also, the historic seismicity covers too short a time span to provide a good basis for prediction of future shocks.

It has been observed that the length of the ground rupture associated with an earthquake ranges from 20% to 50% of the total fault length (Albee and Smith, 1966). The maximum credible earthquake has thus been taken as one which ruptures along 50% of the total fault length. This provides an earthquake magnitude as great as could reasonably be anticipated at any time in the future for the specific fault under consideration. Sometimes an earthquake of this magnitude is used for design against collapse of important structures, but is not a suitable parameter for zoning studies because the maximum credible earthquake in most cases has a very low probability of occurrence during a normal building's life. For a fault with a high strain rate like the San Andreas, this probability may be as high as 25% for a 50 to 100 year project life; but for some other active faults in the County, this probability may be only about one to two percent. For this reason, it is more reasonable to use a lesser earthquake for land use planning and zoning.

The maximum probable earthquake is defined as the maximum size earthquake that could reasonably be expected to occur during a project's life. If adequate data were available to calculate recurrence intervals for all the major faults in the County, it would be a fairly straightforward task to select a standard probability of occurrence and to calculate the maximum probable earthquake for this condition. Unfortunately, there are only two faults affecting the study area for which sufficient data are available to calculate recurrence intervals - the San Andreas and the Big Pine faults. Consequently, it is necessary to rely on another method to determine the maximum probable earthquake, which - for Planning and zoning purposes - has been defined as one that would produce a fault rupture along 25% of the total length of the fault. As was done in the case for the maximum credible earthquake, the magnitude of the earthquake was determined using Housner's (1969) relationship between magnitude and rupture length.

The validity of this approach is verified by data for the San Andreas fault for which we have the most abundant and reliable data on recurrence interval, but the method proves somewhat conservative for the Big Pine fault and probably even more conservative for some of the other faults in the County.

In preparing the Seismic-Tectonic Map, the hazard of ground shaking has been equated to peak ground acceleration. Although the duration and spectral content of the shaking are also important factors in the determination of damage due to ground shaking, they have not been included in the overall rating, because there is no common means of including these factors for general planning purposes. Therefore, the peak acceleration should be regarded as an index of the intensity, but not - by itself or without modification - as a design factor. The County has been subdivided into four zones of increasing risk, based on peak ground acceleration. The expected maximum ground acceleration in each of the zones is tabulated below.

Zone I	Less than 20% of gravity
Zone II	20% to 50% of gravity
Zone III	50% to 70% of gravity
Zone IV	Greater than 70% of gravity

The zone limits were established by calculations based primarily on Davenport's (1972) relationship between magnitude and peak acceleration. In applying these values to zoning concepts, Davenport has calculated an uncertainty factor on the order of 1.5 to allow for the uncertainties associated with the geotechnical character of the intervening rock and soil. Where this factor augments the calculated peak acceleration, it could shift the particular site to the next higher zone. This condition is recognized in the assignment of the variability number (second digit of the hazard rating number). Applying the uncertainty factor to a particular site in Zone II, for example, could shift the seismic intensity to a value corresponding to that of Zone III. Consequently, the assigned primary rating of 2 for this zone is followed by a 6 variability number, which means that after applying the Davenport's uncertainty factor, the primary rating could shift to a 1 (low) or a 3 (high). Zone IV covers areas which are so close to a major fault that a transition from a 3 rating to a 2 rating is very improbable even with the application of the uncertainty factor, consequently a hazard rating number of 31 (high with no variation) has been assigned to this zone.

The fault shown on the Seismic-Tectonic Map as the westerly extension of the Big Pine fault is not shown on any published geologic maps, but there is a strong linearity visible on the Earth Resource Technology Satellite (ERTS) photographs. This, coupled with the historic strong earthquakes felt in the Los Alamos area, was sufficient in our opinion to locate an historically active fault down San Antonio Canyon and to include its effects in the seismic zoning. There presently is an on-going investigation of this major fault, which may confirm or deny its existence.

As can be seen from the Seismic-Tectonic Map, the zones are determined by the four major faults in or adjacent to Santa Barbara County. These faults are the San Andreas,

the Santa Ynez, the Big Pine (including the westerly extension), and Nacimiento faults. Somewhat smaller faults, located closer to the metropolitan area, such as the More Ranch - Mission Ridge - Arroyo Parida fault and the San Jose - Mesa fault, are overshadowed by an adjacent larger fault, such as the Santa Ynez fault. Even areas located very close to the epicenter of a maximum probable earthquake on one of the smaller faults would experience a ground acceleration which would not exceed that resulting from the more distant larger earthquake. Nevertheless, these smaller faults should not be ignored, because they increase the probability that any given degree of ground shaking will occur.

Due to the distribution of large faults throughout the County, there is no area that is presently classified as Zone I. However, if the westerly extension of the Big Pine fault is not considered, a relatively small area west and south of Santa Maria would fall into this zone. A majority of the County, including the metropolitan South Coast area, is situated in Zone III. The Santa Maria and Lompoc areas are located in Zone II, although Lompoc is situated in narrow strip of Zone II between two broad Zone III areas. None of the developed areas of the County is located in Zone IV.

TSUNAMIS AND SEICHES

Tsunamis are sea waves - sometimes erroneously referred to as "tidal waves" - which are caused by submarine or coastline earthquakes. These are relatively low and harmless in the open ocean, but can reach substantial heights when they approach shallow water depths near shore. They can travel hundreds and even thousands of miles and maintain enough energy to be destructive. Seiches are waves which are generated in an inland body of water by earthquakes.

Risk from a tsunami (seismic sea wave) to installations and developments on or near the coast of Santa Barbara County undoubtedly exists, and must be considered in prudent planning. However, an alarmist attitude calling for extreme precautions is not justified, on the basis of what is known of the circumstances of such occurrences in all parts of the world, and on the few and partly doubtful records and reports of such occurrences on this coast.

Such waves have been known to rise to great heights - 50 or even 100 feet - on the coasts of Japan, South America, Alaska and Hawaii. These wave heights are associated with very rapid shallowing of the ocean bottom toward the coast. Off Japan, South America and Alaska, the tsunami waves originate in association with deep submarine troughs - the Japan Trench, Atacama Deep, Aleutian Trench, etc., and reach extreme heights on the nearest coast. On Hawaii, a similar effect is produced by sudden rising of the ocean floor as one approaches the islands, and has repeatedly produced coastal flooding on the arrival of seismic sea waves originating from the distant earth movement.

No such abrupt shallowing of the ocean toward the coast exists in Southern California, and there is no oceanic trough off this coast. Consequently, effects of tsunami waves

due to distant earthquakes have been limited to a rise of a few feet, sufficient at worst to swamp or damage small craft. Waves during local storms, or the high surf occasionally set up by waves originating in storm centers far out in the Pacific present a more serious and more frequent hazard.

On many coasts, waves of tsunami type are occasionally observed associated with moderately large earthquakes originating comparatively close inshore. While these are limited and local events, compared with the great seismic sea waves that sweep over the ocean, they may present a serious local risk.

On the Southern California coast, we know of one event of this kind which is well documented, and another, the reports of which have been much discussed pro and con as to whether such a seismic sea wave did occur. On November 4, 1927, a major earthquake originated off the coast opposite Point Arguello. The shaking on shore was noteworthy, there was damage at Lompoc, and the tracks of the coastal route of the Southern Pacific Railroad were so disturbed that train service was interrupted until major repairs could be completed. A true tsunami of relatively small amplitude occurred; it was recorded on tide gages as far away as Hawaii, and reached heights of six feet above mean tide level on the west coasts of Santa Barbara and San Luis Obispo Counties.

On December 21, 1812, an earthquake damaged the Mission installations increasingly from San Fernando westward to Purisima (near Lompoc), which was largely demolished, and was afterwards rebuilt on a different site. The available chronicles and histories include several reports of waves occasioned on the coast of the Santa Barbara Channel, all of which have been questioned. In various versions, there are three principal accounts.

- (1) A ship at anchor off Gaviota was disturbed by the wave which was observed to pass to the shore and splash up visibly in the canyons. The latter remark led the late Professor Louderback, from consideration of the contours and general topography, to infer that the splash might have reached a height of 50 feet. More recent students have been reluctant to accept this conclusion.
- (2) A small smuggling vessel in the harbor at Refugio (west of Goleta) is said to have been carried an unspecified distance up the canyon and returned when the wave subsided. This account may be found in Bancroft's historical works, for example, but rests on questionable authority, although it is said to be taken from the captain's log.
- (3) Several descriptions of the earthquake, largely at second hand state that there was a high wave at Santa Barbara. Apparently, the Mission chronicles do not confirm this. Rather, they indicate that the strong earthquake was felt, and thereupon, the populace retired to higher ground in anticipation of a wave which did not materialize.

Apart from the doubtful height of 50 feet at Gaviota, there is nothing in these reports which is inconsistent with a wave of small height, like that of 1927. Such a wave might have been started by an earthquake originating under the Santa Barbara Channel, or even on the islands. The possibility of another similar occurrence cannot be rejected.

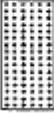
There are five major areas along the Santa Barbara Coast which are subject to inundation by a tsunami if an earthquake were to occur off shore. These areas are Point Sal at the mouth of the Santa Maria River, the mouth of the Santa Ynez River west of Lompoc, Goleta Slough - Santa Barbara Airport area, Santa Barbara City Harbor Area, and Carpinteria. Several other but smaller areas at the mouths of major streams, such as the beaches at Refugio, El Capitan and Gaviota, would also be susceptible to inundation. These are located in lowland areas along the coast. [The current Statewide Tsunami Inundation Maps are available from the California Geological Survey.](#)

In planning of all coastal installations and developments, it is recommended that a 10-foot high sea wave be considered and that a conservative contour elevation of 40 be used as a basis for establishing the tsunami risk limit. This elevation is somewhat arbitrary and considers the possible limits of run-up in lowland gentle sloping areas. It does not mean that a high level of destruction would necessarily result at that elevation. Areas lying below the 10-foot contour would be most susceptible to inundation and damage.

Where steep bluffs 15 feet or greater in height are exposed to the ocean along the coast a tsunami threat is not considered serious. These bluffs would act similar to sea walls and would reflect the anticipated maximum 10-foot high sea waves. On the other hand, because of the channeling effect created at some areas where high promontories are present and narrow constricted entry channels are formed, inundation due to run-up could be substantial.

Deciding what precautions to take regarding tsunamis is difficult not only because the degree of hazard is difficult to ascertain but even more because of the very low, unknown frequency of occurrence. Since the recurrence interval for a substantial tsunami is probably greater than the life of structures, and considering the value of coastline property, prohibition of building for this reason does not appear justified. The loss of life factor is of more concern. For major shocks some distance away there would be sufficient warning for residents to evacuate. A local shock originating in the channel or offshore islands could produce a wave height in Santa Barbara County as large as a distant major shock; it would not likely provide adequate warning. Aside from the fact that much of the low level shoreline is already developed, a large number of people would frequently occupy the beach even if there were few buildings. A tsunami occurring at high tide under storm or high wind conditions would be the most critical.

Santa Barbara County Tsunamis, Seiches

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	1. Low	1. No Variation
	2. Moderate	6. ±1 (Low, High)

TSUNAMIS, SEICHES
SANTA BARBARA COUNTY

Partly because of the relatively low wave height anticipated and partly because of the low frequency of occurrence tsunamis were given a weighting factor of 19, and areas considered subject to inundation have been rated as moderate with a high to low variability factor (26) up to the approximate 40 foot contour.

Seiches can affect bodies of water as small as swimming pools, but normally would be likely to cause major damage only to developed areas surrounding - or downstream from - large lakes. In addition to small waves initiated by ground shaking which might affect the local shoreline, larger waves can be generated by large landslides triggered by an earthquake. These waves could overtop a dam and cause serious damage to property lying downstream.

There are several lakes in the County, the largest being Lake Cachuma. Except for some recreational facilities, there is little shore development surrounding the lake. Other water bodies subject to seiches are Twitchell and Gibraltar Reservoirs, Jameson and Zaca Lakes and Sheffield Dam. Detectable seiches would be more frequent than tsunamis, but generally of less wave height.

LIQUEFACTION

Liquefaction is the almost complete loss of strength of saturated sandy soil accompanying ground shaking during an earthquake. The seismic shock waves densify loose, saturated, granular soil causing a reduction in the pore space between the sand grains. This transfers the intergranular load to the pore water and results in a temporary loss of strength. On relatively level ground this may cause the water to rise to the ground surface, usually carrying sand with it and forming sand "boils", which are familiar features where liquefaction occurs as a result of strong ground motion. On sloping ground liquefaction will usually result in slope failure such as occurred at the Sheffield Dam in the 1925 Santa Barbara earthquake.

In connection with buildings, the resulting low shear strength and volume reduction can cause extreme settlements or even overturning of structures supported on such soils. The most serious examples of this have occurred in Japan. Damage from liquefaction in the United States was usually overlooked or not considered. It was not until this condition occurred near the Van Norman dam during the San Fernando earthquake of 1971 that real concern about liquefaction increased dramatically in California. It is possible that there has been an over-reaction, but caution is prudent until more experience and data are acquired on liquefaction potential.

Although to our knowledge there is no historic evidence of liquefaction in Santa Barbara County, most of the low coastal plain and valley bottoms underlain by alluvium were given a moderate (2) rating with respect to liquefaction potential. This rating was largely based on the probable depth to groundwater with consideration given to probable soil characteristics (i.e., classification, grain size, density) and probable earthquake intensity and duration. The presence of groundwater is one of the key factors in determining liquefaction potential. In the absence of information regarding the relevant soil

characteristics, the most reliable data available were groundwater measurements from wells monitored by the United States Geological Survey. Where depth to groundwater is known or reasonably inferred, a variability value of 2 (possibility of being one rating level higher) was applied. Similarly in alluvial areas where the depth to water was uncertain, a rating of 26 (moderate - high to low) was assigned. Liquefaction is not known to occur in areas underlain by bedrock; these areas have been rated low with no variation. Areas in geologically recent granular materials have been rated low with a possible variation to moderate or high considering a possible localized high perched water condition.

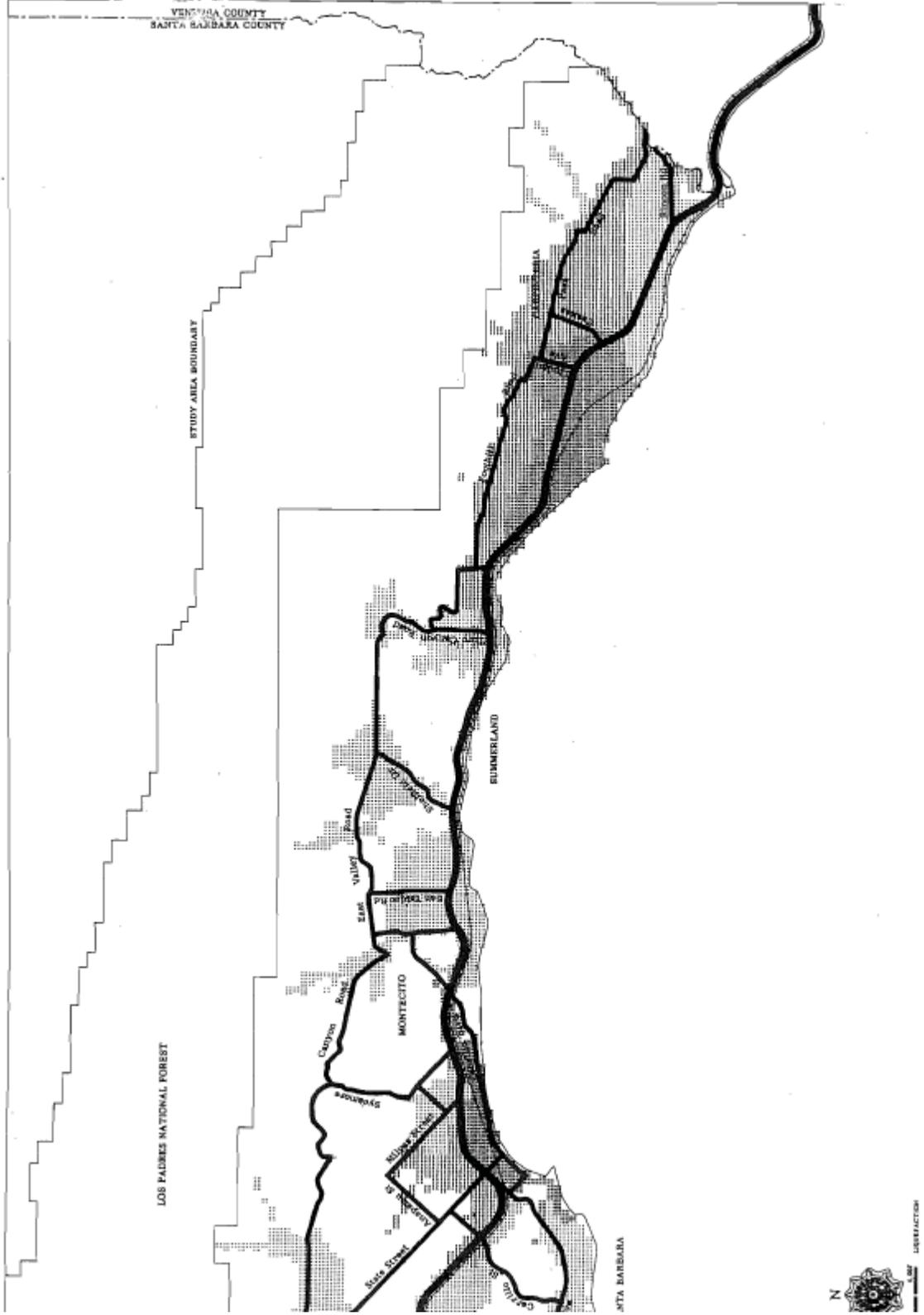
Santa Barbara County Liquefaction

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	1. Low	1. No Variation
	1. Low	2. +1 (Moderate)
	1. Low	4. +2 (High)
	2. Moderate	2. +1 (High)
	2. Moderate	6. ±1 (Low, High)

South Coast Study Area ~ East Liquefaction

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)

SOUTH COAST AREA - EAST



South Coast Study Area ~ West Liquefaction

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)

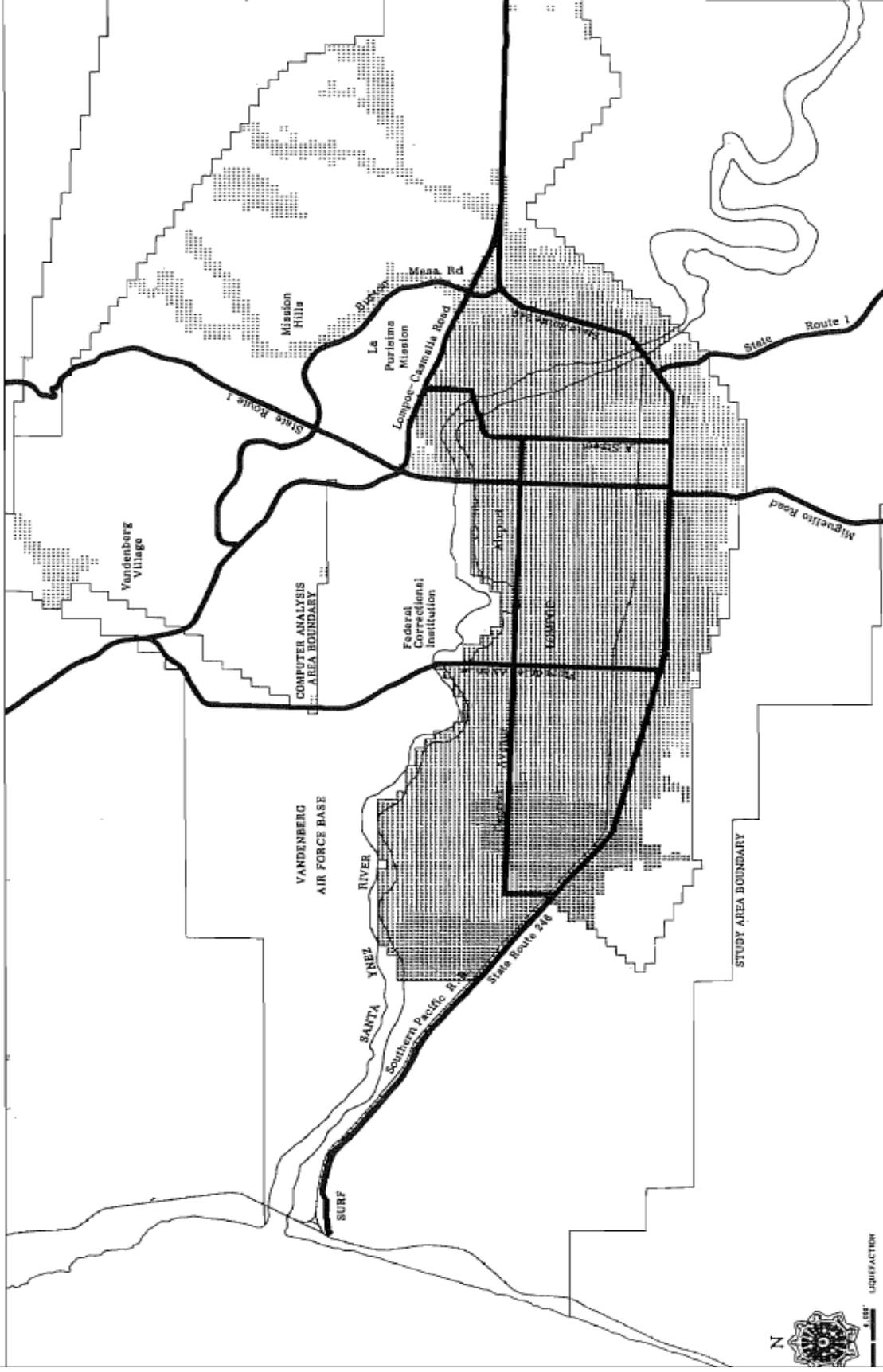
Santa Ynez Valley Study Area Liquefaction

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)

Lompoc Study Area Liquefaction

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)

LOMPOC AREA

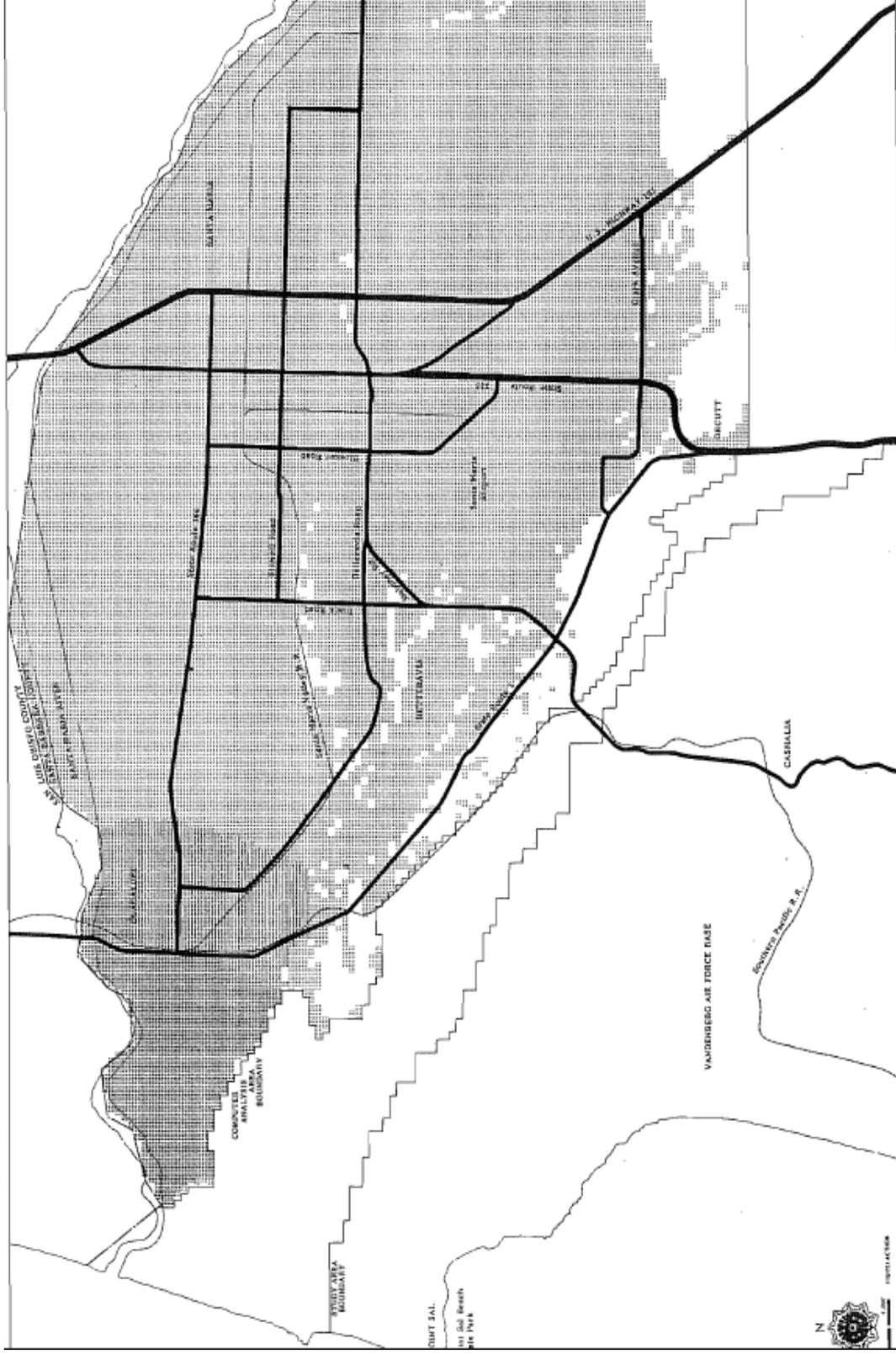


Santa Maria-Orcutt Study Area

Liquefaction

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	1. Low	1. No Variation
	1. Low	2. +1 (Moderate)
	1. Low	4. +2 (High)
	2. Moderate	2. +1 (High)
	2. Moderate	6. ±1 (Low, High)

SANTA MARIA-ORCUTT AREA



Data regarding grain size and density are generally lacking, so that the potential for liquefaction based on these criteria could not be reliably determined. It was assumed that the soil conditions were moderately conducive to liquefaction where sediments were located below a shallow ground water table.

It has been only relatively recently that testing and analysis for liquefaction has been done (and it is still not common), so there are essentially little or no data for evaluation of the problem. More information is needed regarding the soil and groundwater conditions before a determination of the liquefaction potential can be made for any particular area or site.

The areas considered to be potentially most susceptible to liquefaction are the low coastal areas with high groundwater at Carpinteria (south of the Freeway), the harbor area in Santa Barbara, the Goleta slough, the Santa Barbara airport, and the alluviated valleys along the course of the Santa Ynez River near Solvang, Buellton and Lompoc and along the Santa Maria River near Santa Maria and Guadalupe.

LANDSLIDES AND SLOPE STABILITY

One of the major problems in hillside construction is slope stability. Soil creep, which is a special type of unstable ground condition, is discussed separately. Much of Santa Barbara County is mountainous or hilly with variable and complex geologic conditions; thus slope stability can be a problem in areas of potential urban development. Concern over this problem tends to be a building and safety rather than a planning function because almost every landslide or potentially unstable area can be corrected given enough money. However, for areas of severe slope stability problems, prevention or correction of landslides can be prohibitively expensive. These problem areas would be prime candidates to be left undeveloped and designated to remain in natural open space, although cost considerations and difficulty of development would probably result in at least some of this land remaining undeveloped in any case.

The stability of slopes is a complex function of the height and steepness of slopes, the inherent strength of the basic material underlying the slopes, and the presence and orientation of geologic planes of weakness such as bedding, joints, and faults. The surface and subsurface moisture conditions, weathering and temporal effects are important factors also in determining slope stability.

Probably the best single indicator of future stability is the past record of slope stability or instability, indicated by the number of existing landslides prior to development. This is a helpful guide, although a particular development could create either stability or instability. Unstable land can be made stable, and stable land can be made unstable, depending on the amount and type of grading. Depending on the exact nature of the problem, slope stability problems or landslides can often be corrected or stabilized by remedial grading involving such techniques as flattening existing slopes, constructing compacted fill shear keys, buttresses or stability blankets, or removing the landslide mass entirely. However, a substantial amount of analysis and engineering design must

be done in such cases. This, coupled with the cost of the remedial grading, can make safe development of an existing landslide or a potentially unstable hillside area a very expensive operation.

The evaluation of slope stability was based on all known available data, but because data are scarce in many areas, emphasis was placed on existing landslides in making the ratings. Unfortunately, the existing geologic maps of Santa Barbara County are generally inadequate in terms of landslides because they were prepared with other objectives in mind, i.e., general stratigraphy, structure, and mineral resources.

Although borings are frequently required to identify and delineate ancient landslides, many can be readily identified on at least a tentative basis from the topographic form of the landscape by study of stereographic aerial photographs. Landslides may appear as uneven mounds or terraces on a hillside, often with steep escarpments at their head, and the surface of the slide may have a disturbed, hummocky appearance. Drainage courses may be disrupted and local areas of ponding may be present. Analysis of aerial photographs was the method used in this study to delineate landslides. The landslides shown on the slope stability maps which are based on aerial photo interpretation are tentative and should be confirmed by test borings or other means of exploration.

It is also possible that some slides were not detected by this method because they were subtle features, and many are too small to be detected or mapped at the scale used. Therefore, although the slope stability maps prepared in this study are considered satisfactory for land use planning or preliminary feasibility studies, they are not adequate for detailed engineering studies and an investigation should be made for specific projects.

Because of variation in the stability of different geological formations, some are much more prone to landsliding than others. In the County, the formations most susceptible to landsliding are the Rincon, Monterey, Point Sal and serpentines associated with the Franciscan Formation. Of these, the Rincon and Monterey Formations are most often encountered in or near urban areas and have by far the greatest number of landslides associated with them. For this reason, they have been given a high to moderate rating (33) irrespective of the dip of the beds, since geologic structure does not necessarily appear to be the dominant factor in instability. This is slightly more applicable to the Rincon Formation than the Monterey. All originally mapped or photo-mapped landslides were also assigned a slope stability problem rating of 33. Other formations were considered and rated based on engineering characteristics of the formation in that area, the geologic structure (bedding attitudes, absence or presence of faults or jointing), steepness of natural terrain, and occurrence of other recognizable landslides in the area. These ratings can be generalized as follows:

Low (1) – Areas with generally low or no risk. Include flatlands and low relief terrain with stable geologic formations. Any slope failures (past or future) would generally be rare and small in size.

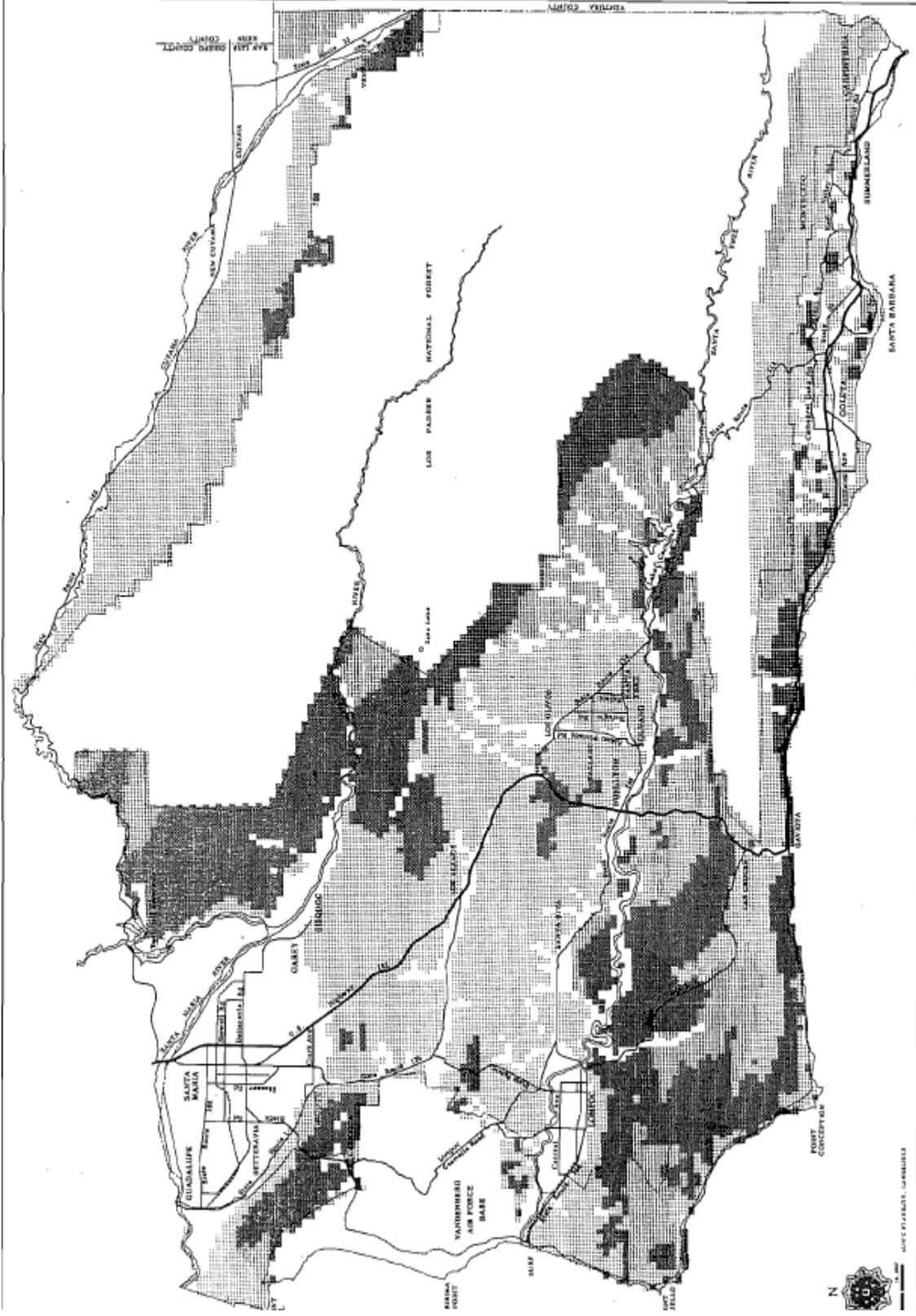
Moderate (2) – Areas of moderate relief with some existing landslides or areas of steep terrain with stable geologic formations containing some landslides, but not a large number.

High (3) - Areas of moderate to high relief with unstable geologic formations or unfavorable geologic structure, with respect to orientation to natural slopes or future cuts. May have numerous or large landslides.

Santa Barbara County Slope Stability, Landslides

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	4. +2 (High)
2. Moderate	6. +1 (Low, High)
3. High	5. -2 (Low)
3. High	3. -1 (Moderate)

SLOPE STABILITY, LANDSLIDES SANTA BARBARA COUNTY



South Coast Study Area ~ East Slope Stability, Landslides

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	3. -1 (Low)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)
3. High	3. -1 (Moderate)
3. High	1. No Variation

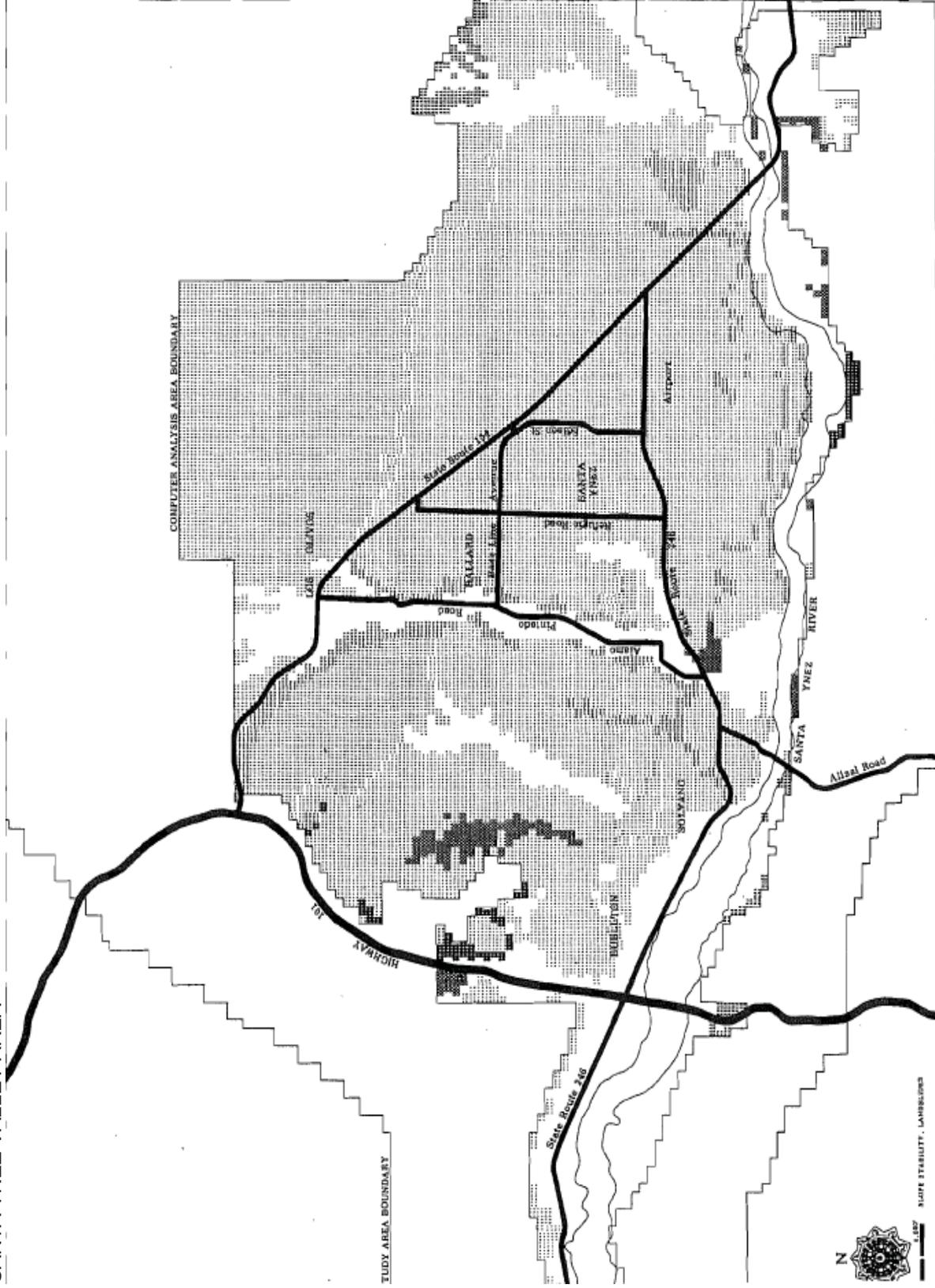
South Coast Study Area ~ West Slope Stability, Landslides

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	3. -1 (Low)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)
3. High	3. -1 (Moderate)
3. High	1. No Variation

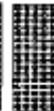
Santa Ynez Valley Study Area Slope Stability, Landslides

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	3. -1 (Low)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)
3. High	5. -2 (Low)
3. High	3. -1 (Moderate)

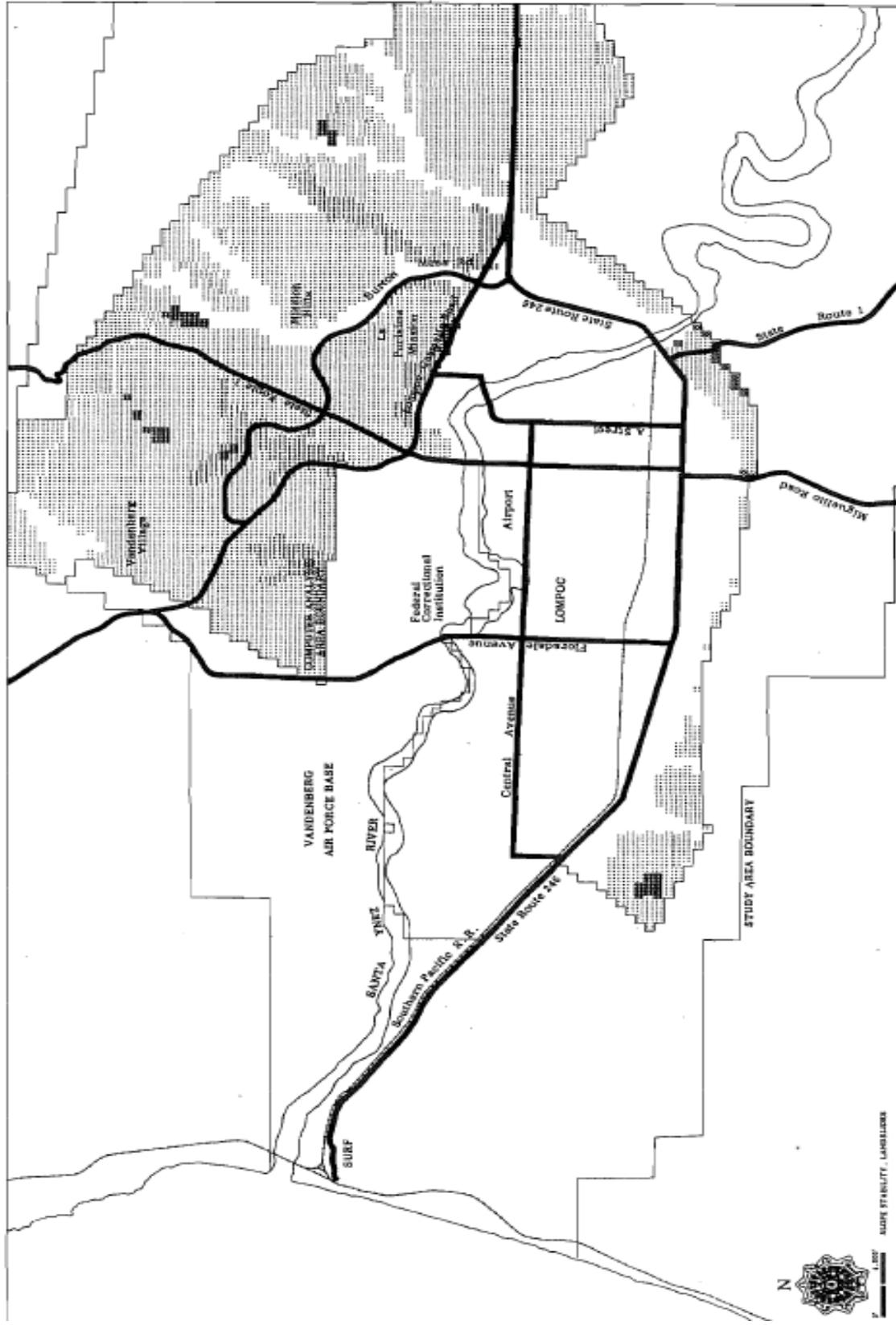
SANTA YNEZ VALLEY AREA



Lompoc Study Area Slope Stability, Landslides

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	1. Low	1. No Variation
	1. Low	2. +1 (Moderate)
	1. Low	4. +2 (High)
	2. Moderate	6. ±1 (Low, High)
	3. High	5. -2 (Low)
	3. High	3. -1 (Moderate)

LOMPOC AREA



Santa Maria-Orcutt Study Area Slope Stability, Landslides

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	6. +1 (Low, High)
3. High	3. -1 (Moderate)

Areas containing fairly severe landsliding and associated geologic formations are:

Foothills in the Summerland area (Rincon Formation)

Foothills of the South Coast - from Santa Barbara west to Gaviota Pass (Rincon and Monterey Formations)

Hope Ranch area - west of Lavigia Hill to Goleta (Rincon and Monterey Formations)

Sea cliffs along the coast from Santa Barbara to Gaviota, particularly those with out-of-slope dips (Monterey and Rincon Formations)

Solvang area south of the Santa Ynez River in the vicinity of, and east of, Alisal Ranch (Rincon, Sespe, Vaqueros, and Monterey Formations)

Areas east and northeast of Los Olivos near the Los Padres National Forest boundary (Paso Robles, Foxen and Franciscan Formations)

Lompoc area south of Santa Ynez River (Monterey and Sisquoc Formations)

Mountains south of Guadalupe and east of Point Sal (Point Sal, Foxen, Monterey, Lospe and Franciscan Formations)

EXPANSIVE SOILS

Expansive soils cause problems because they contain clay minerals that swell when the moisture content increases and shrink when the moisture decreases. Such soils are usually described as “adobe,” and form ground cracks when they are allowed to dry out. The volume changes resulting from variable moisture conditions can cause movement and cracking of structures built on expansive soils. Soils beneath concrete floor slabs tend to increase in moisture content, thus causing heave. Soils under raised floors tend to dry out and shrink, causing settlement of the structure.

Expansive soils are very common in Southern California and many other areas in the world, and as a result, damage to structures is very widespread. Because some of the symptoms listed below are also typical of settlement or landsliding, a thorough investigation is sometimes required to determine the basic cause of distress.

Examples of Distress due to Expansive Soils

- Heaved and/or cracked floor slabs or exterior slabs
- Cracks in interior and exterior walls and ceilings
- Sticking doors and, less frequently, windows

- Slabs or porch steps pulled away from the building
- Ruptured utilities (rare)
- Tilted or “settled” posts or fences due to “creep” near slopes

The effects of expansive soils can be largely alleviated by proper design, construction and grading procedures without excessive cost. The distribution of expansive soils is generally erratic even in very local areas, and any future grading could change the site conditions and distribution of soil. For these reasons, expansive soils are considered to be less critical than many other geologic or soil problems in land use planning.

Expansive soils are often associated with those geologic units which also exhibit poor to marginal stability characteristics. In particular, expansive soils on or adjacent to slopes tend to cause creep which can be more difficult to control than the effects of expansive soils on flat ground. Geologic formations that are most often associated with expansive soil problems because of the soils derived from them are the Rincon, Monterey, and Paso Robles. The Rincon siltstone and claystone and residual or transported soils associated with this formation are considered to be some of the most expansive in Southern California. Structures located in them usually require special consideration in design (reinforcement), moisture control and drainage to minimize the effects of expansive soil. The general location of these materials and knowledge of their expansive qualities is important in any proposed development.

Data regarding expansive soil characteristics and distribution in Santa Barbara County were obtained from the Soil Conservation Service. Soils with similar physical and chemical properties are grouped into the soil series. Expansive soil potential is one of the several soil characteristics used to differentiate and to classify the soil types. The primary test used by the Soil Conservation Service to determine the expansive characteristics of the soil is the coefficient of linear expansion (COLE). Based on this test, Atterberg Limit tests, and sieve analyses, the expansion for each soil type has been classified by the Soil Conservation Service as high, moderate or low. Generally, these classifications were employed in the computer model that produced the expansive soils maps. Where a particular soil series involved several layers with different characteristics, the expansion potential was rated by engineering judgment. Where soils were not classified by the Soil Conservation Service because of a lack of data or no testing (Shown in white on the Expansive soils Map), the soils were assumed to be moderately expansive with a high to low variation (26) in order to compute the Geologic Problems Index.

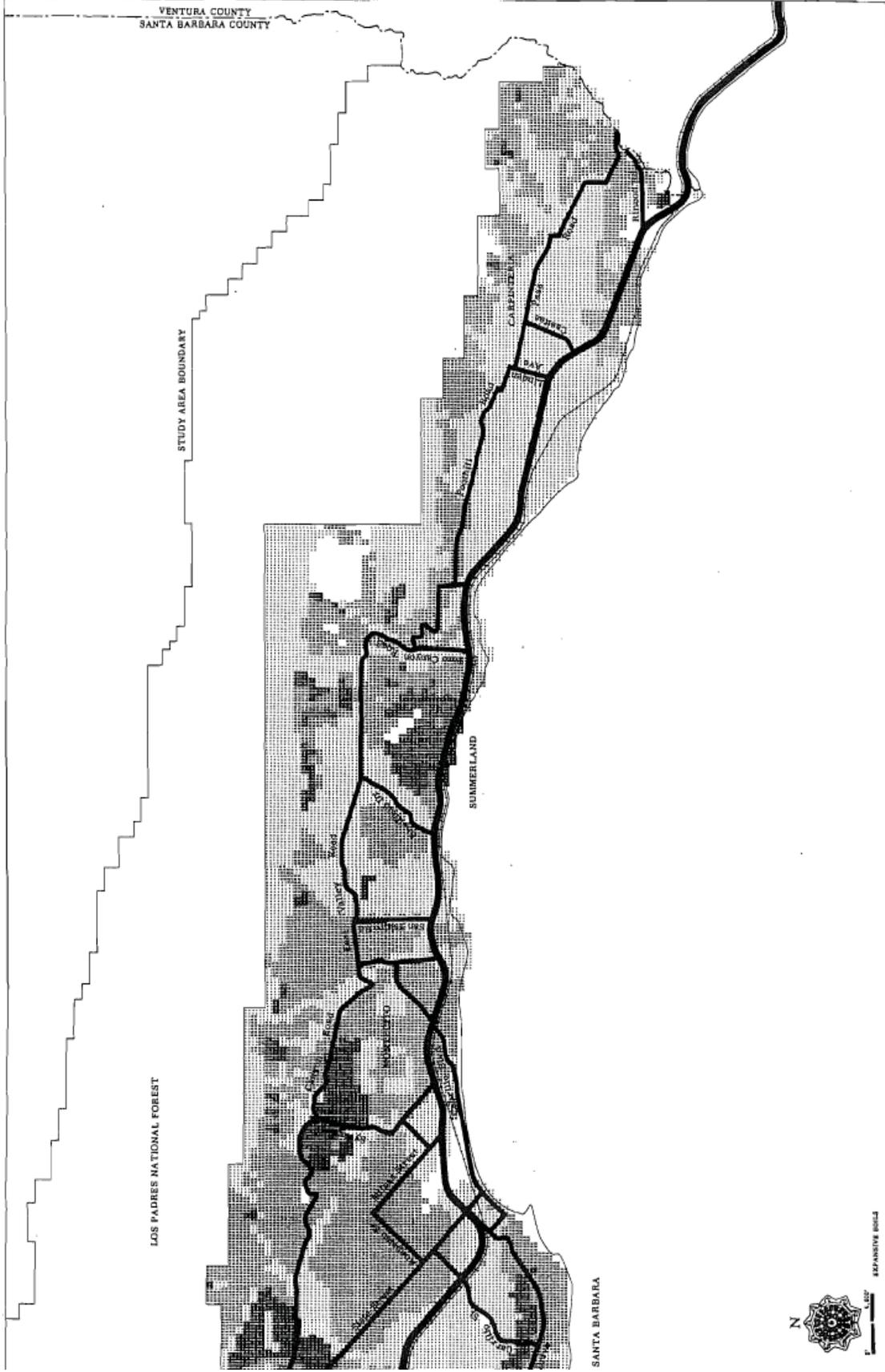
South Coast Study Area ~ East | Expansive Soils

Problem Rating

	1. Low
	2. Moderate
	3. High

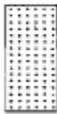
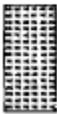
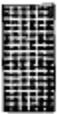
Note . Where no problem rating is shown, no Soil Conservation Service data on the characteristic were available, or no identified soil series were present.

EXPANSIVE SOILS
SOUTH COAST AREA - EAST



South Coast Study Area ~ West Expansive Soils

Problem Rating

	1. Low
	2. Moderate
	3. High

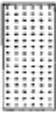
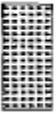
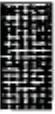
Note . Where no problem rating is shown, no Soil Conservation Service data on the characteristic were available, or no identified soil series were present.

SOUTH COAST AREA – WEST



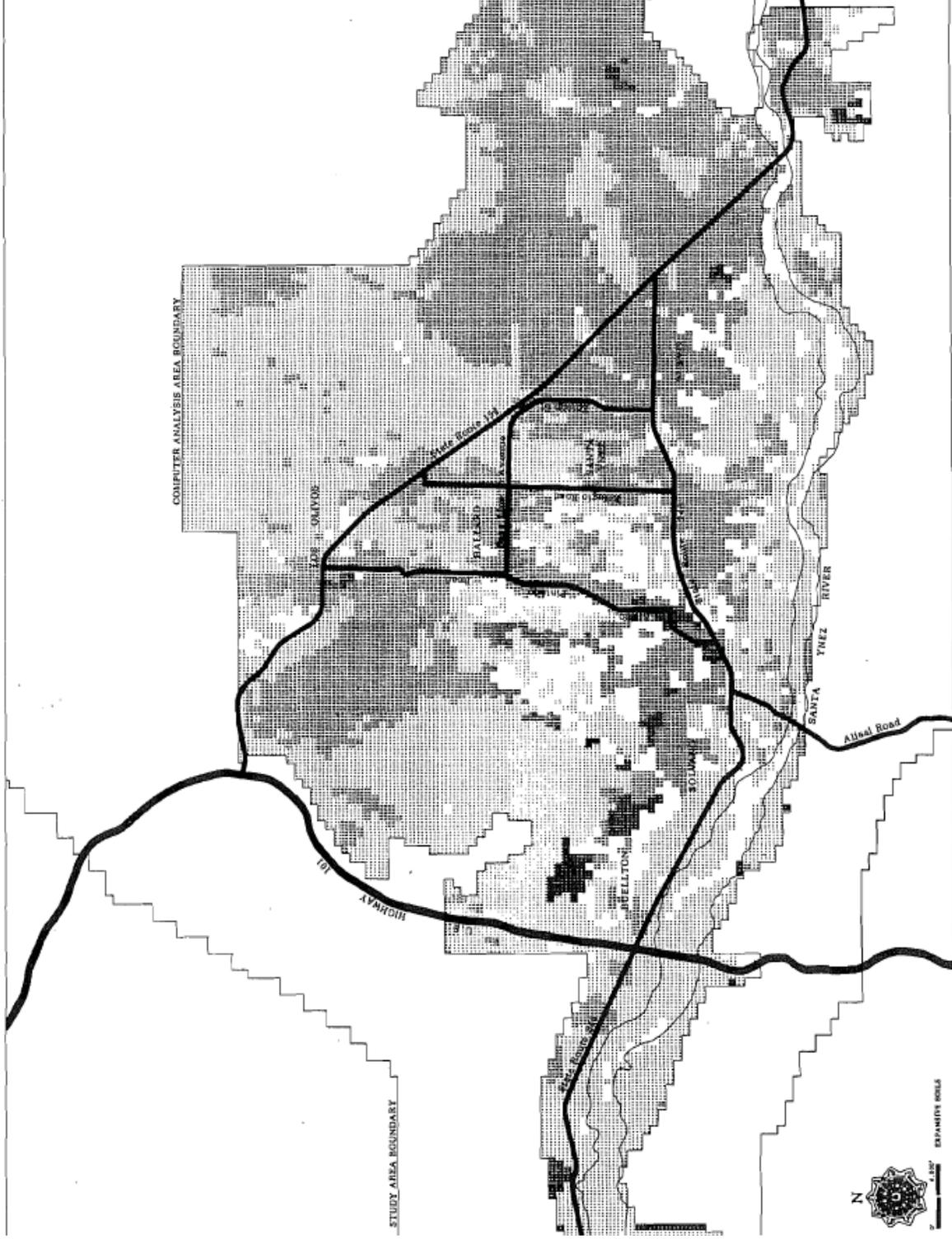
Santa Ynez Valley Study Area Expansive Soils

Problem Rating

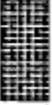
	1. Low
	2. Moderate
	3. High

Note. Where no problem rating is shown, no Soil Conservation Service data on the characteristic were available, or no identified soil series were present.

SANTA YNEZ VALLEY AREA

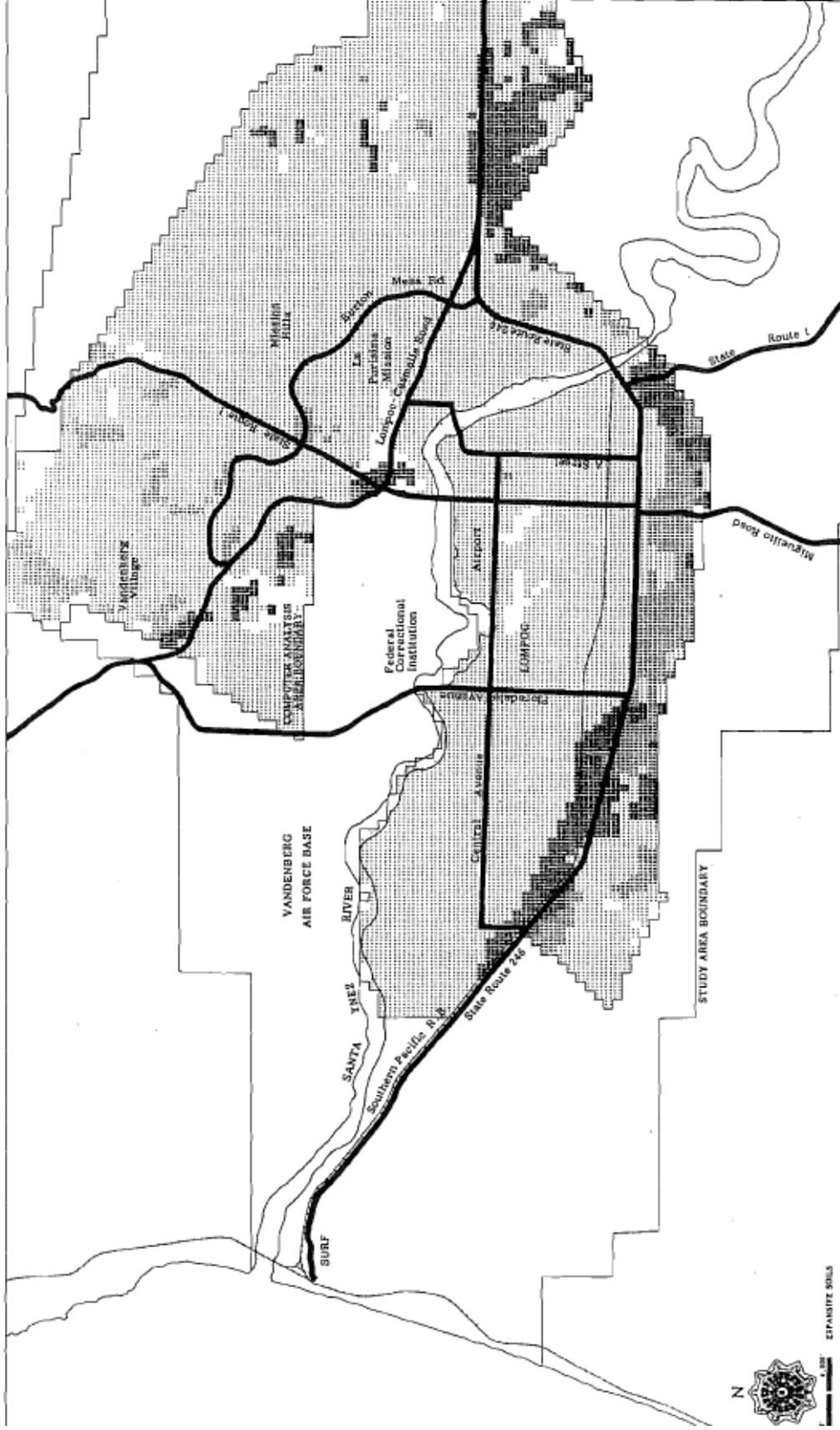


Lompoc Study Area Expansive Soils

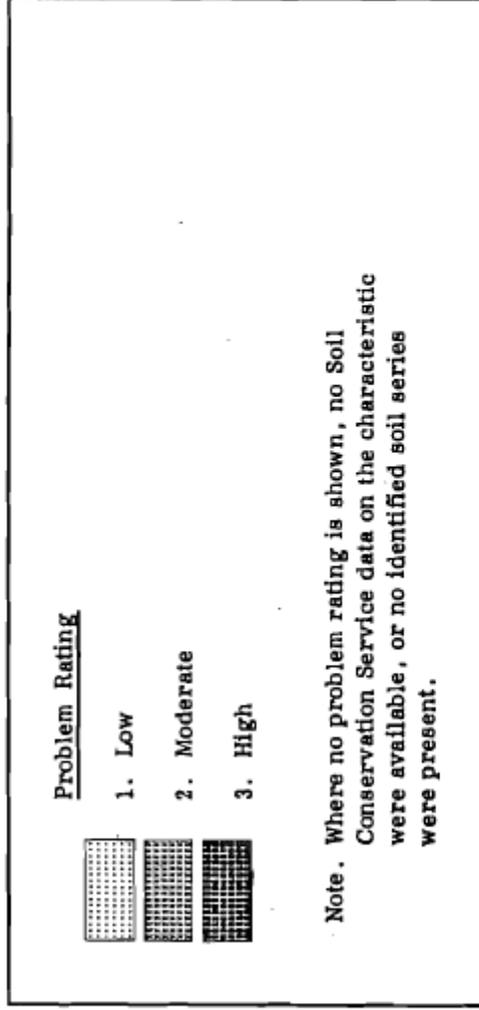
<u>Problem Rating</u>	
	1. Low
	2. Moderate
	3. High

Note. Where no problem rating is shown, no Soil Conservation Service data on the characteristic were available, or no identified soil series were present.

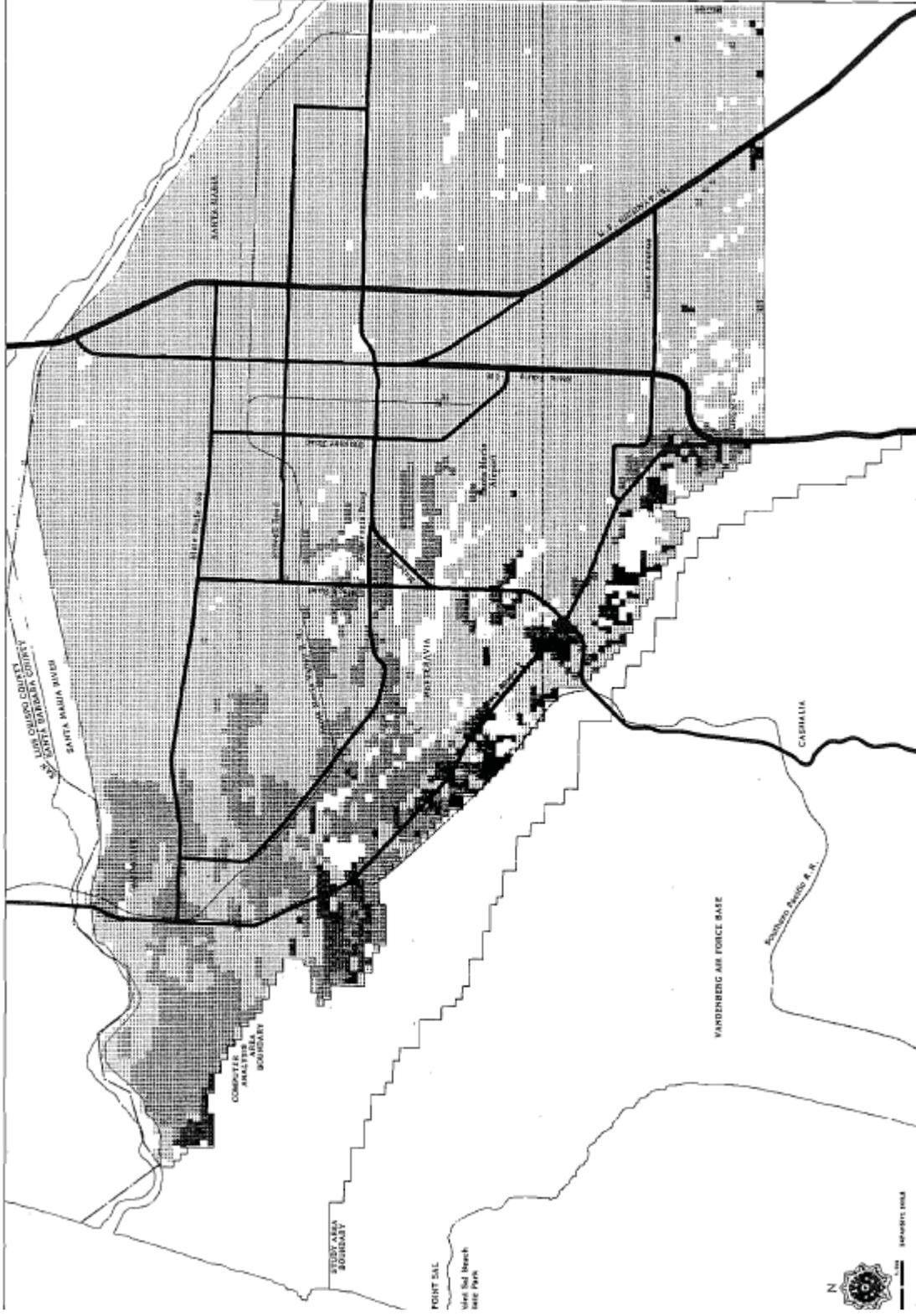
LOMPOC AREA



Santa Maria-Orcutt Study Area Expansive Soils



SANTA MARIA-ORCUTT AREA



One Expansion Index test was performed by Moore & Taber on a typical sample of siltstone from the Rincon Formation. The test measures the expansion of a sample remolded to 50 percent of saturation when saturated under a load of 144 pounds per square foot. The sample had an index of 154 (15.4 percent expansion) which is considered very high. Other data indicate that higher values have been obtained in the Rincon Formation in different areas.

Expansive soils are fairly common in Santa Barbara County and are present in areas of current development such as the foothills of the South Coast (Summerland to Gaviota) and the Santa Ynez Valley (vicinity of Los Olivos, Ballard, Santa Ynez). For more detailed information on the location, distribution and degree of expansion of the various soil series, the Soil Conservation reports and maps for the North and South County should be referred to.

SOIL CREEP

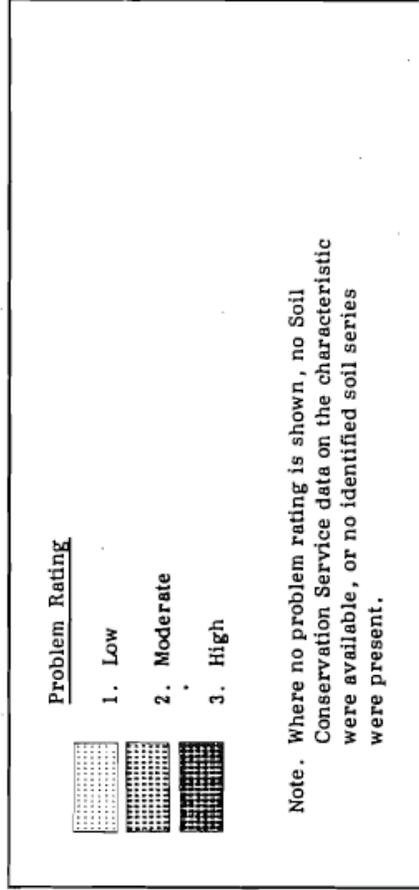
Soil creep is the slow downslope movement of surficial soils. It involves clayey soils and is due - at least in large part - to the volume changes from cyclic wetting and drying. Although it can be a serious problem, it usually occurs on slopes or within a few feet of the top of them, so that most structures are protected by the required building setbacks. During periods of heavy and prolonged rains, the soils may become saturated and slump - a small shallow form of landslide involving only the upper few feet of surficial material.

Slope creep can be related, in a general way, to expansiveness and the steepness of slope. Like expansive soils, creep is one of the soil and geologic problems that can be rated quantitatively using expansion test results and measured slope data. Expansive soils data were taken from the Soil Conservation Service. (SCS). The computer combined these two factors from previously encoded data in accordance with the table below to produce a creep model. The creep potential ratings of low, moderate, and high in the table correspond to numerical problem ratings of 1, 2 and 3 respectively as previously described.

TABLE OF CREEP POTENTIAL

Slope	Soil Expansiveness (SCS)		
	Non-Low	Moderate	High
0 - 10%	Low	Low	Moderate
11 - 20%	Low	Moderate	High
21 - 30%	Low	High	High
Over 30%	Moderate	High	High

South Coast Study Area ~East Soil Creep Potential

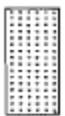
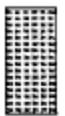
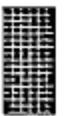


SOIL CREEP POTENTIAL SOUTH COAST AREA - EAST



South Coast Study Area ~ West Soil Creep Potential

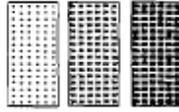
Problem Rating

	1. Low
	2. Moderate
	3. High

Note. Where no problem rating is shown, no Soil Conservation Service data on the characteristic were available, or no identified soil series were present.

Santa Ynez Valley Study Area Soil Creep Potential

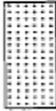
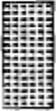
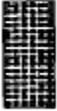
Problem Rating



1. Low
2. Moderate
3. High

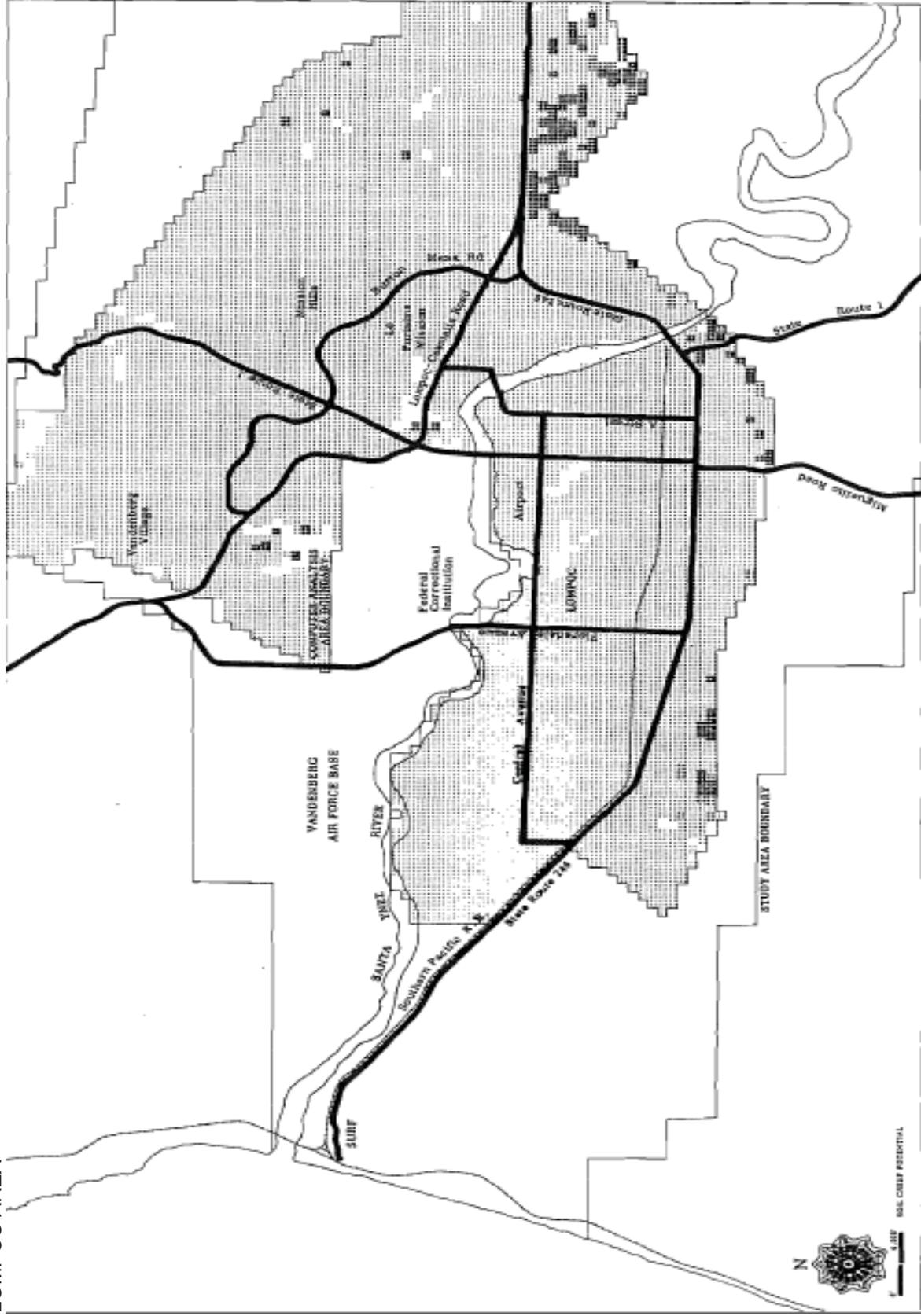
Note. Where no problem rating is shown, no Soil Conservation Service data on the characteristic were available, or no identified soil series were present.

Lompoc Study Area Soil Creep Potential

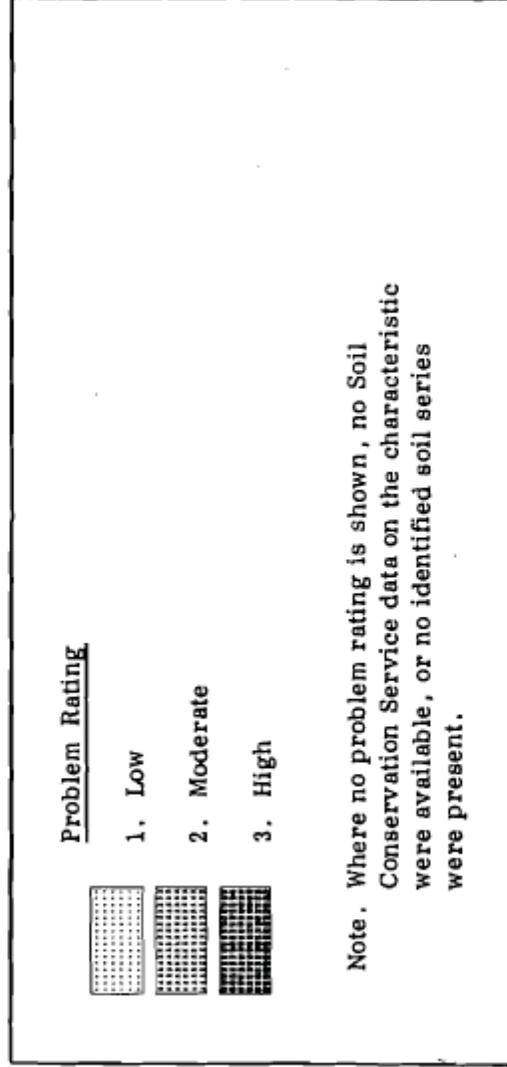
<u>Problem Rating</u>	
	1. Low
	2. Moderate
	3. High

Note. Where no problem rating is shown, no Soil Conservation Service data on the characteristic were available, or no identified soil series were present.

LOMPOC AREA



Santa Maria-Orcutt Study Area Soil Creep Potential



The evaluation above means that the creep rating is low if the expansion is low, regardless of slope, but that creep may be moderate for highly expansive soils even though the slope does not exceed 10%. Where both the slope and expansion are high, obviously the creep potential is high.

Just as highly expansive soils can be related to particular geologic formations, similarly, areas susceptible to creep because of the presence of expansive soils can also be related to the same geologic formations. The Rincon and Monterey Formations form a black thick clay soil profile (adobe) which is subject to creep. Other formations that produce cohesive soils subject to creep are the Paso Robles, Sisquoc, Foxen, Anita, Franciscan, and, to some degree, siltstone members in the Vaqueros and Sespe.

Particularly good examples of creep and shallow slumps in the Rincon and Monterey Formations can be seen in the grass covered foothills along the South Coast, in the Alisal Ranch area south of Solvang, in the low hills south of Santa Ynez River, and on the north side of Highway 1 west of U. S. 101.

COMPRESSIBLE AND COLLAPSIBLE SOILS

Compressible and collapsible soils can cause settlement and damage to structures unless adequate precautions are taken.

Compressible Soils - Compressible soils are fine-grained cohesive soils of low strength, which consolidate and cause settlement when surcharged with fill or structure loads, particularly when saturated. Settlement of soil under load occurs slowly and may continue, although at a diminishing rate, for a number of years.

Compressible soils usually result from deposition in swampy, marshy environments, often in estuaries and sloughs. Since they are frequently associated with organic matter, and even include organic matter such as peat, they are commonly dark in color. Compressible soils are not particularly common in Santa Barbara County. However, several large areas of compressible soils exist along the South Coast in the old Goleta, Carpinteria, and Santa Barbara sloughs.

Collapsible Soils - Collapsible soils are low density, fine-grained, dominantly granular soils, usually with minute pores and voids. When these soils become saturated with water, they undergo a rearrangement of their grains, resulting in substantial and rapid settlement under relatively low loads. Therefore, such soils are extremely sensitive to an increase in moisture content caused either by a rise in the groundwater table or by increased surface water infiltration.

Collapsible soils are generally light in color, often reddish-brown, due to oxidation caused by free movement of air and moisture through the pores. Collapsible soils generally result from rapid deposition close to the source of the sediment where the material has not been reworked or had contact with enough moisture to form a compact soil.

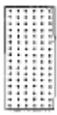
To the best of our knowledge, the only notable case of a collapsing soil problem in Santa Barbara County is in the town of New Cuyama where corrective measures have been required to halt settlement of houses apparently supported on collapsible alluvium.

Preventive Measures - Areas with compressible or collapsible soils can be safely developed with one of several preventive measures, if the problem is recognized in the planning stage. Sites can be surcharged with fill or ponded with water and left to consolidate for some time before grading, the objectionable material can be removed to a depth where the additional load caused by development will not have any significant effect upon it, or the structure can be supported on piles that transmit the load to deeper, higher strength soil or bedrock. In some cases, structures can be supported by large reinforced grid or mat foundations which more evenly distribute the load and have enough strength so that any settlement will be uniform. The cost of these preventative measures will vary a great deal, depending on the severity of the problem. If settlement does occur, the problem can be alleviated by underpinning or compaction grouting, although these are rather expensive measures.

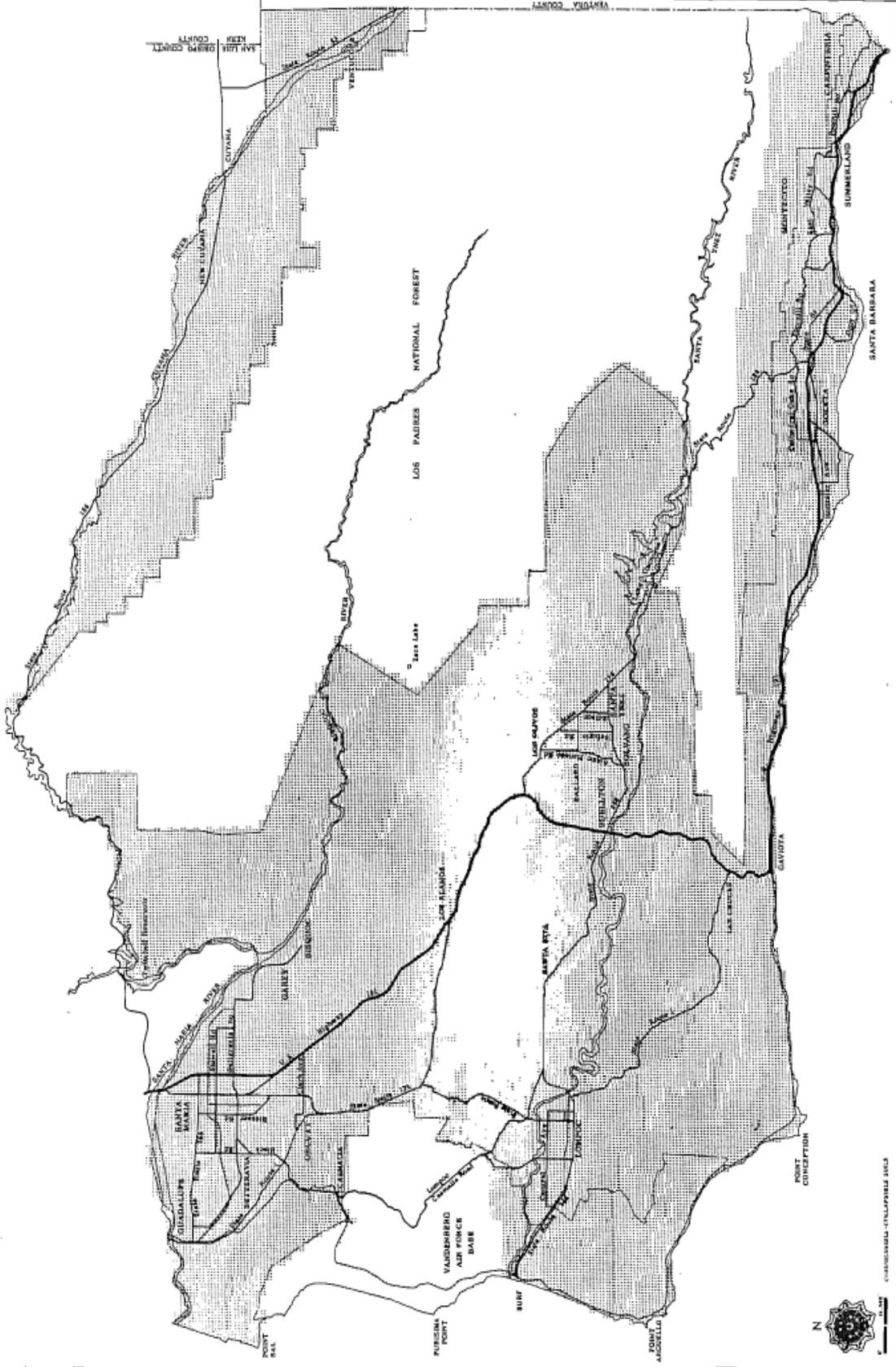
Severity Ratings - In assigning problem ratings for compressible collapsible soils, it was assumed that moderate loads would be imposed on the soil, i.e., residential structures or light industrial buildings built upon a shallow compacted fill. Structures with heavier loads present their own group of problems and nearly always require special foundation considerations. A description of the criteria used in assigning problem ratings follows.

With a few exceptions, all bedrock was given a compressible/collapsible soils problem rating of Low, generally with no variation (11) or variation to moderate (12) to allow for localized thick topsoil zones. A few of the older geologic formations which are highly fractured, subject to weathering, and may often develop thick soil profiles, were rated low with possible variation to high (14). The Rincon and Monterey Formations, which almost always develop a thick soil profile, were rated moderate to low (23), as was the older alluvial material. All landslides, including those mapped by photo reconnaissance, were rated moderate with possible variation from low to high (26) because of the generally disturbed and sometimes porous nature of landslide debris. Quaternary alluvium was rated low to high (14) except in canyons downstream from the Rincon Formation where sediment from that formation might cause a moderate problem with variation from low to high (26). Well defined slough areas of known compressible soils and high groundwater were the only areas rated high, with variation to moderate (33). A boundary zone between the sloughs and the surrounding alluvium was rated 26 because of uncertainty as to the actual limits of the compressible materials.

Santa Barbara County Compressible - Collapsible Soils

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	1. Low	2. +1 (Moderate)
	1. Low	4. +2 (High)
	2. Moderate	3. -1 (Low)
	2. Moderate	6. ±1 (Low, High)

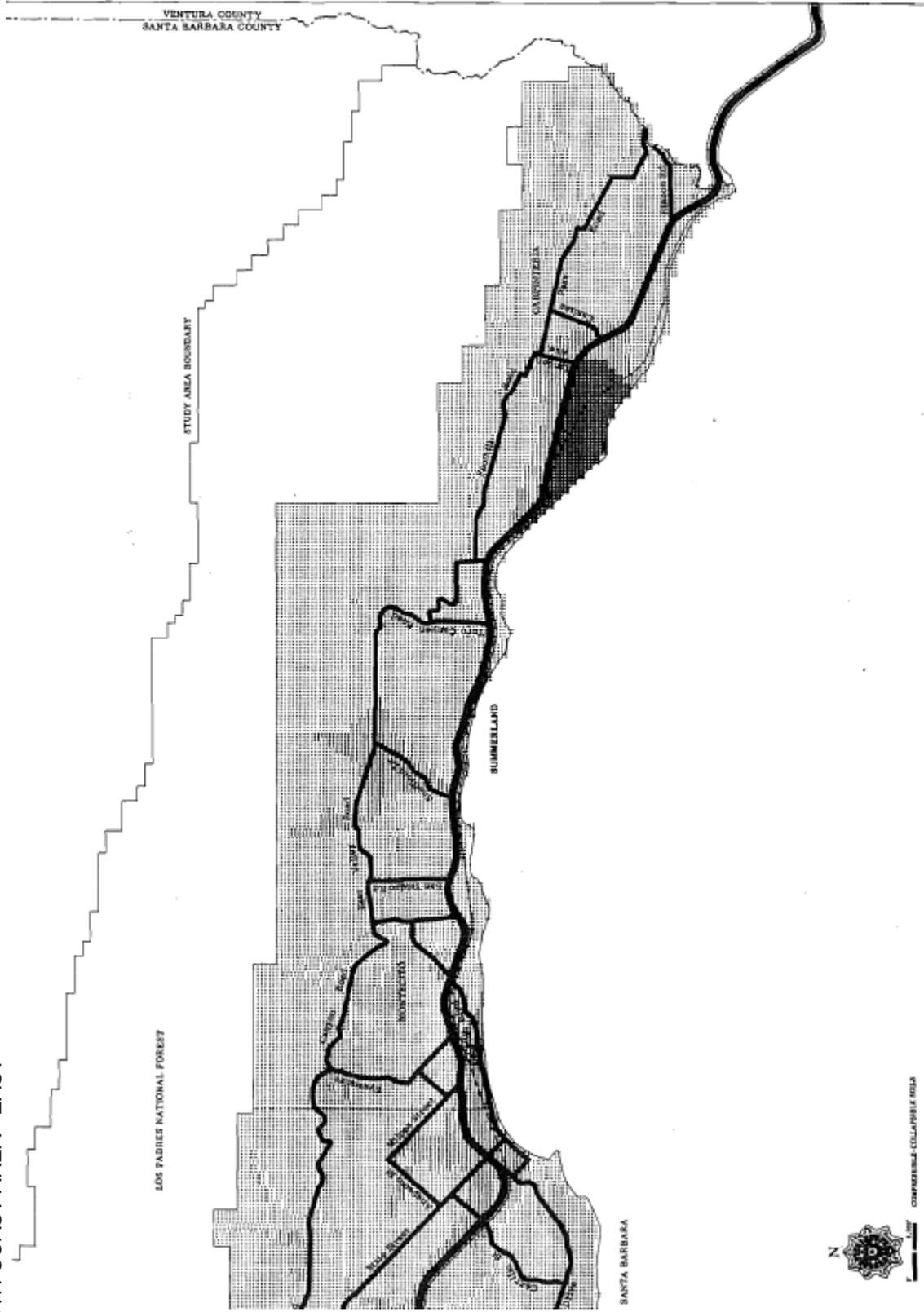
COMPRESSIBLE-COLLAPSIBLE SOILS SANTA BARBARA COUNTY



South Coast Study Area ~ East Compressible - Collapsible Soils

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	3. -1 (Low)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)
3. High	3. -1 (Moderate)

SOUTH COAST AREA - EAST



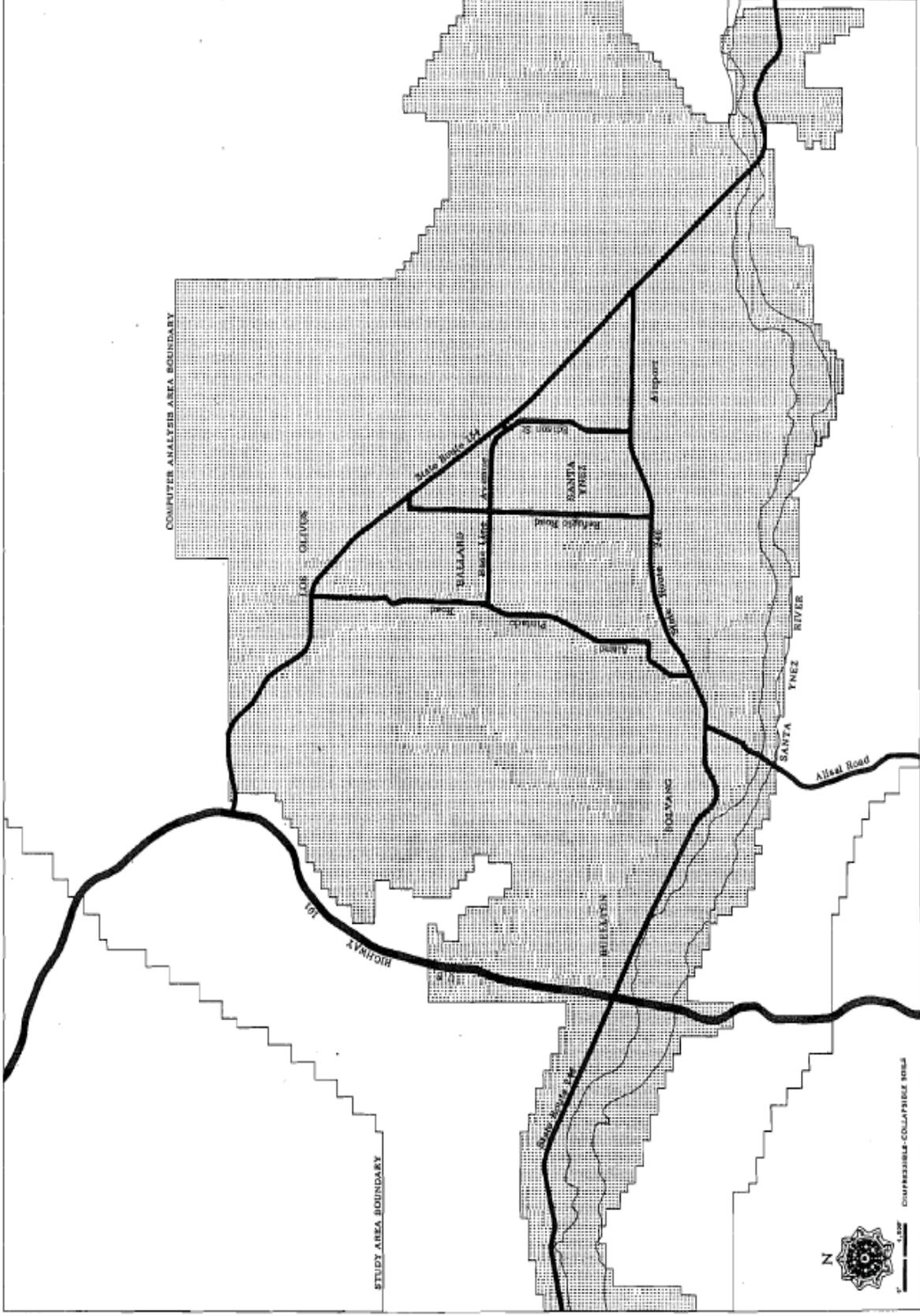
South Coast Study Area ~West Compressible - Collapsible Soils

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	3. -1 (Low)
2. Moderate	2. +1 (High)
2. Moderate	6. ±1 (Low, High)
3. High	3. -1 (Moderate)

Santa Ynez Valley Study Area Compressible - Collapsible Soils

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	3. -1 (Low)
2. Moderate	6. ±1 (Low, High)

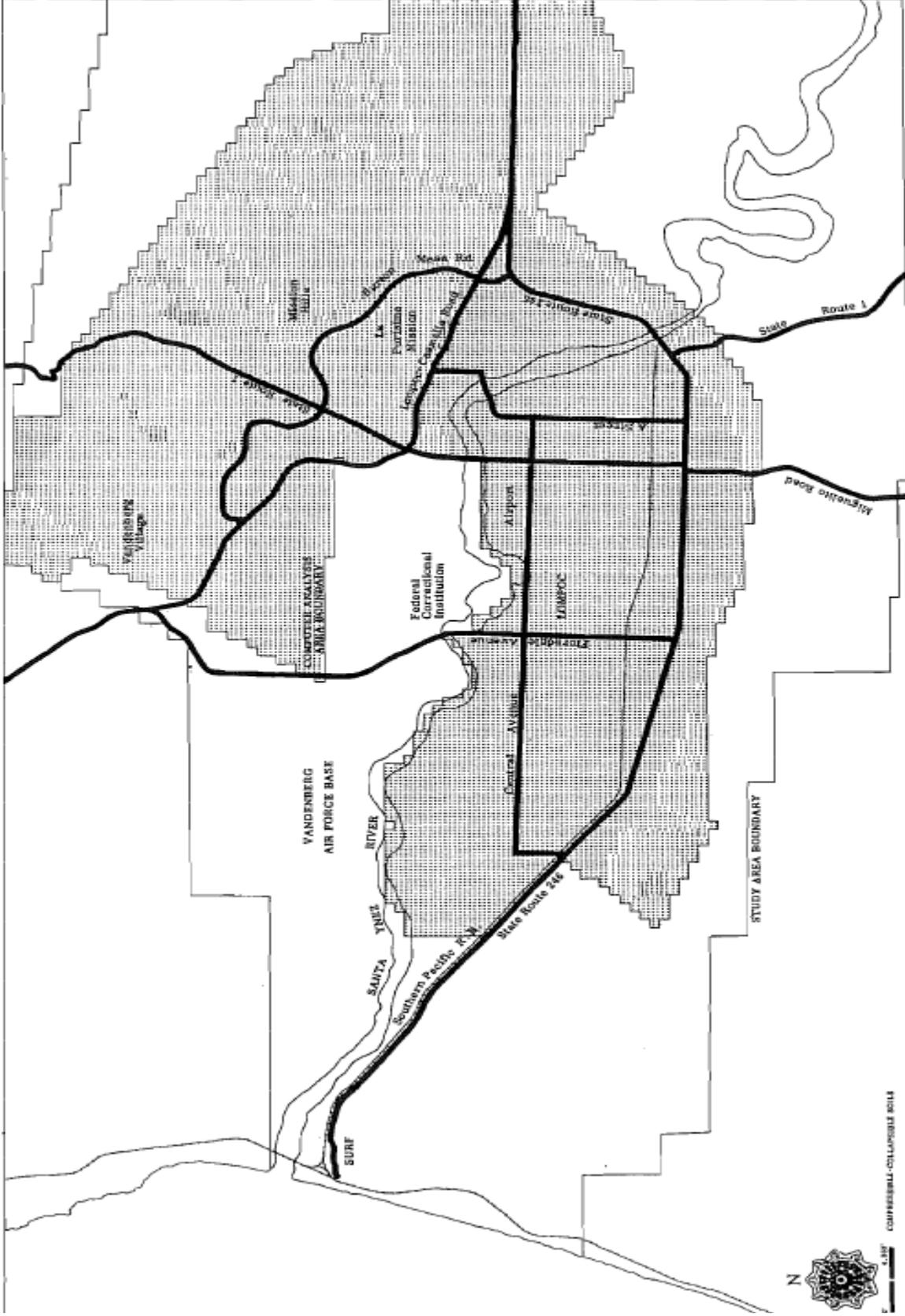
SANTA YNEZ VALLEY AREA



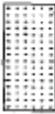
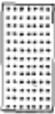
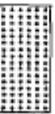
Lompoc Study Area Compressible - Collapsible Soils

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	3. -1 (Low)
2. Moderate	6. ±1 (Low, High)

LOMPOC AREA



Santa Maria-Oreutt Study Area Compressible - Collapsible Soils

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	1. Low	2. +1 (Moderate)
	1. Low	4. +2 (High)
	2. Moderate	3. -1 (Low)
	2. Moderate	2. +1 (High)
	2. Moderate	6. ±1 (Low, High)

It should be emphasized that compressible soils were considered only for the underlying natural ground (soil, alluvium and bedrock). The rating did not take into account old fills and their potential settlement. Especially in the South Coast area, many old erosional gullies and canyons have been filled in the past, frequently with poorly or marginally compacted fill, with no record kept of this fact. Identification and rating of these isolated fills is not possible at the scale of mapping and was beyond the scope of the study, but thorough searches for them should be undertaken before any development project is begun. An example of this old fill is the filled lake, marshland and channels in the City of Santa Barbara in the vicinity of Laguna Street and the Junior High School, which has necessitated pile foundations for support of large buildings. Consideration should also be given to old filled oil well sumps, which can be found where drilling has been conducted in the past. Study of old topographic maps or aerial photos can often help identify areas where uncontrolled fill has been placed.

Also of concern, and not considered in the ratings because it would require evaluation of specific grading plans, is settlement of deep fills. Present County requirements are fairly strict as far as inspection and compaction testing of fills are concerned. However, if fills are deep, even well compacted fills can consolidate to some degree and cause settlement if they become saturated. This occasionally causes detrimental differential settlement where structures are located across the contact between cut and fill or where the depth of fill under the structure varies substantially.

In summary, although settlement from compressible and collapsible soils can be prevented during development, it can cause significant property damage and can be expensive to prevent. The compressible/ collapsible soils problem rating map should help identify areas where these soils could potentially be a problem. Assimilation of further, more detailed, information as more exploration is done in these areas could make the map an even more useful tool, and should be considered for future study.

HIGH GROUNDWATER

Near-surface groundwater, either as a main aquifer or in a perched condition, can be a geologic and engineering problem from the standpoint of liquefaction, settlement, slope stability, construction difficulties, and nuisance. Groundwater as it affects liquefaction potential is covered in a preceding section.

Based on groundwater information from U. S. Geological Survey and other publications, and from several personal communications, the various areas and rock units were rated with respect to groundwater problems. Groundwater levels with respect to the ground surface were used to rate the potential severity of the problem. For example, water in the upper eight feet might impose a problem to the construction of foundations, basements, utilities and roads. It would affect the bearing value of the soil for major structures, but probably would not affect residential structures. Generally speaking, water between 8 and 15 feet could pose a problem for larger structures or deeper excavations. Water below 15 feet would not constitute any significant problem except

for the largest structures or those requiring deep excavations such as major storm drain or sewer projects.

Large or continuous groundwater bodies are not considered to be present in the bedrock formations older than uppermost Pliocene; these units generally are fairly well consolidated and contain water only in fractures or in some sandstone beds. Therefore, they have been given a groundwater problem rating of low with no variation (11).

The semi consolidated and unconsolidated formations of upper Pliocene and Pleistocene age are generally quite granular and pervious, and are often water bearing (and producing) at depth, but surface exposures of these formations are usually above the zone of saturation. However, peculiar local conditions, such as an impervious cemented zone or clay seam overlying bedrock, could cause a perched groundwater problem.

Perched water conditions in the semi-consolidated formations of upper Pliocene and lower Pleistocene age are not widespread, but can occur; these formations have been given a groundwater problem rating of low with a possible variation to high (14). (The Plio-Pleistocene formations in this category include the Orcutt, Paso Robles, Careaga, Casitas, and Santa Barbara Formations.)

The upper Pleistocene terrace deposits and conglomerates in Santa Barbara County are generally coarse grained, granular material. They may contain perched water zones, but are not considered common occurrences. They have been rated low with a possible variation to moderate (12).

In the South Coast urban-study area, Older Alluvium and the Carpinteria Formation and coastal terrace deposits are also granular, but have a much higher incidence of groundwater problems, generally perched water, especially along the coastal bluffs and mesas. These formations have been given a rating of moderate with possible variation from low to high (26).

The dune sands in the Santa Maria Valley area have a moderate incidence of perched water conditions generated by impervious cemented "hard pan" zones within the dunes - generally ferric oxide layers. Therefore, all dune sands have been rated the same as the Older Alluvium, (26).

In the two cases above, the groundwater problem rating of 26 has been applied to formations in areas which have known groundwater problems. In the case of large landslide masses, the general character of slide material - disturbed, fractured material usually underlain by a relatively impervious shear zone - lends itself to possible perched water conditions, and so all landslides which were mapped by the original authors of the sources for our geologic maps (but not the slides identified by air photo-reconnaissance) have also been given a moderate-low to high rating (26).

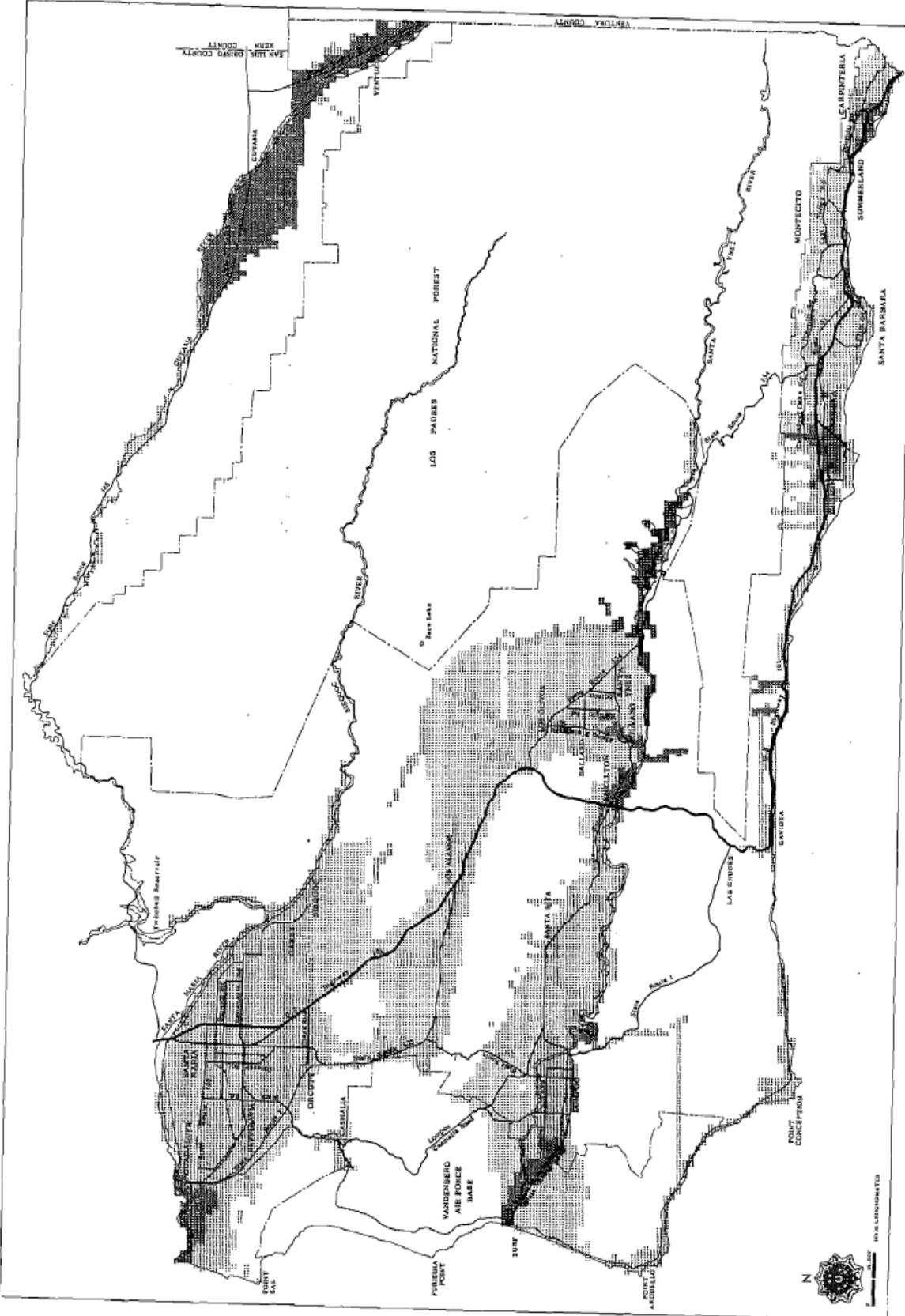
In the formations discussed above, perched water is generally the only problem encountered - the actual water table is generally deep enough so as not to pose a problem. In the areas underlain by Quaternary alluvium, however, it is possible to have the actual water table at or near the surface, or to have confined water whose piezometric surface is at, near, or even above the level of the ground surface. It was beyond the scope of this study to gather the data necessary to rate these confined water areas within the alluvium, and so all alluvial areas have been rated in the same manner, as follows. A copy was obtained of the spring, 1970 to spring, 1973 well data for wells in the U.S.G.S. monitoring program in Santa Barbara and Southern San Luis Obispo Counties (U.S.G.S. open file report/ Lamb and Mermod, 1973). This compilation consists of level data for approximately 500 wells, with anywhere from a single reading to several dozen level readings for each well during that three year period.

Three depth classifications were established: 0-8 feet, 8-15 feet, and deeper than 15 feet. The highest single level reading during the three-year period, (with some judgment applied) was used to classify all wells located within or adjacent to the four urban study areas. The well locations were plotted (nearly all were in alluvial areas), and zones of various depth to water table were drawn.

Santa Barbara County High Groundwater

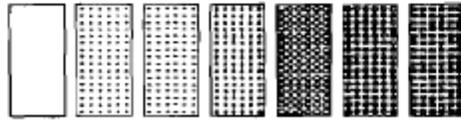
<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	4. +2 (High)
2. Moderate	6. ±1 (Low, High)
3. High	5. -2 (Low)
3. High	3. -1 (Moderate)
3. High	1. No Variation

HIGH GROUNDWATER SANTA BARBARA COUNTY

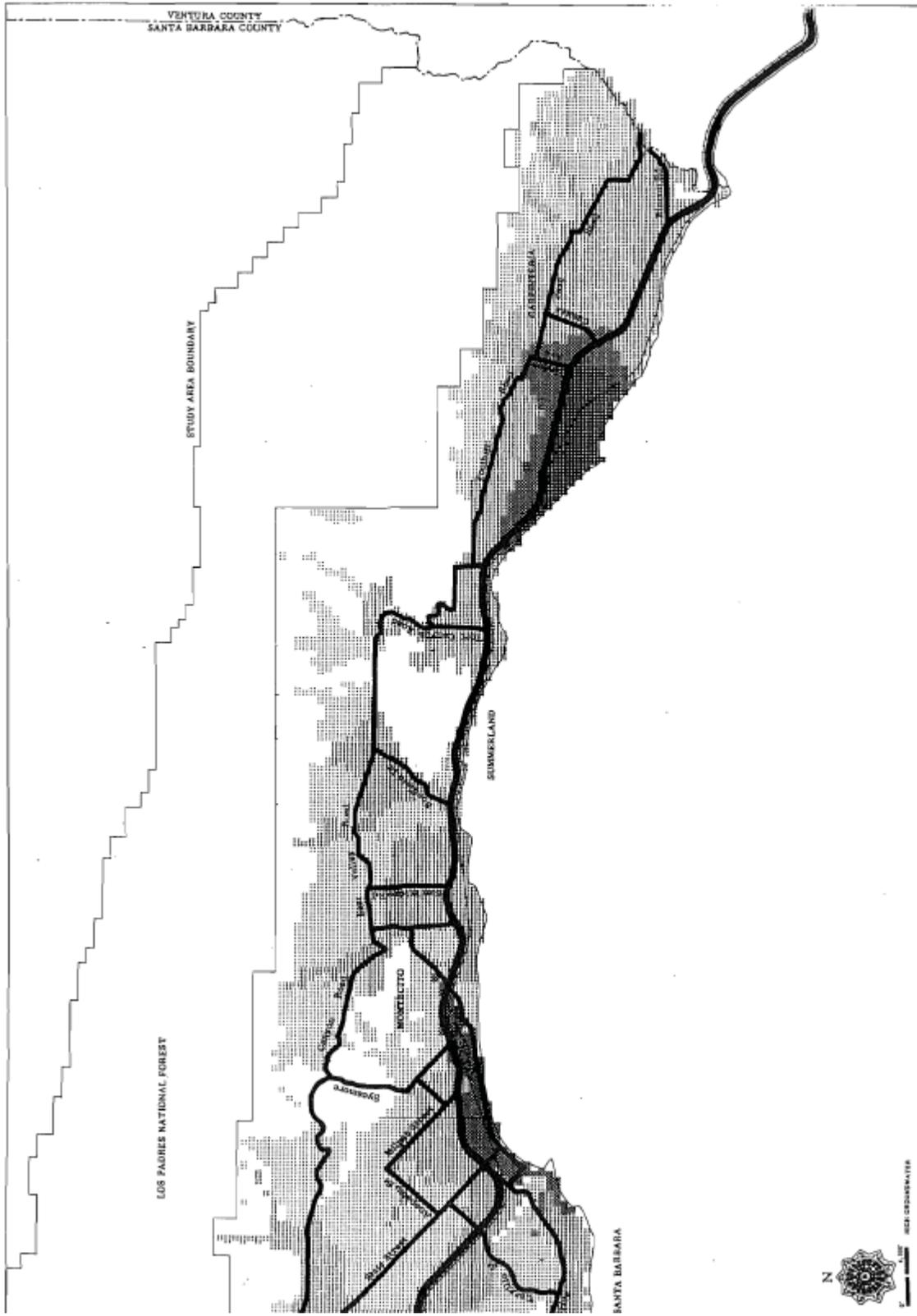


South Coast Study Area ~ East High Groundwater

<u>Problem Rating</u>	<u>Possible Variation from Assigned Value</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	6. *1 (Low, High)
3. High	5. -2 (Low)
3. High	3. -1 (Moderate)
3. High	1. No Variation



SOUTH COAST AREA - EAST



South Coast Study Area ~ West High Groundwater

<u>Problem Rating</u>	<u>Possible Variation from Assigned Value</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	6. #1 (Low, High)
3. High	5. -2 (Low)
3. High	3. -1 (Moderate)
3. High	1. No Variation

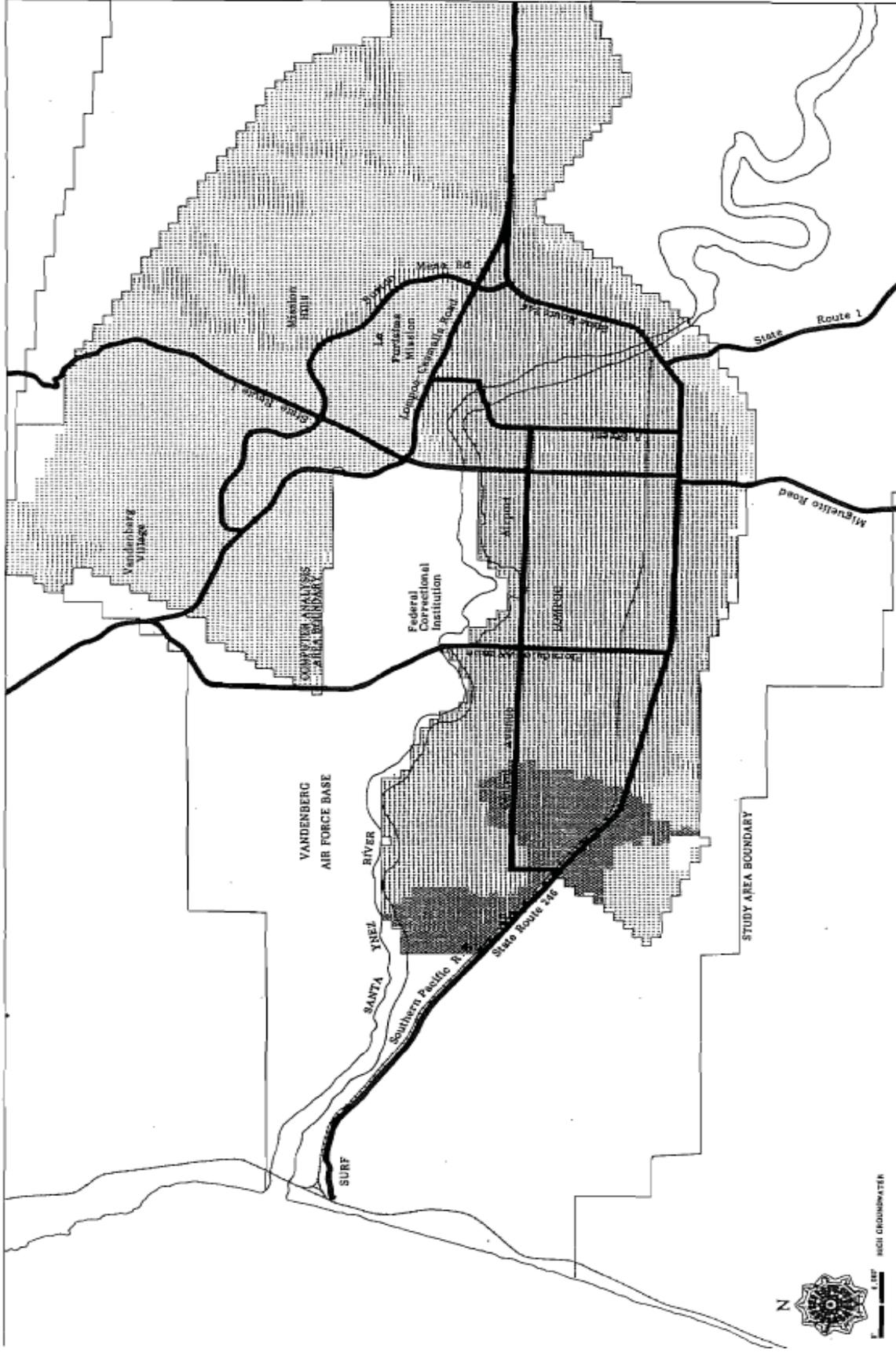
Santa Ynez Valley Study Area High Groundwater

	<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
	1. Low	1. No Variation
	1. Low	2. +1 (Moderate)
	1. Low	4. +2 (High)
	2. Moderate	6. ±1 (Low, High)
	3. High	5. -2 (Low)
	3. High	3. -1 (Moderate)

Lompoc Study Area High Groundwater

<u>Problem Rating</u>	<u>Possible Variation from Assigned Rating</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	6. ±1 (Low, High)
3. High	5. -2 (Low)
3. High	3. -1 (Moderate)

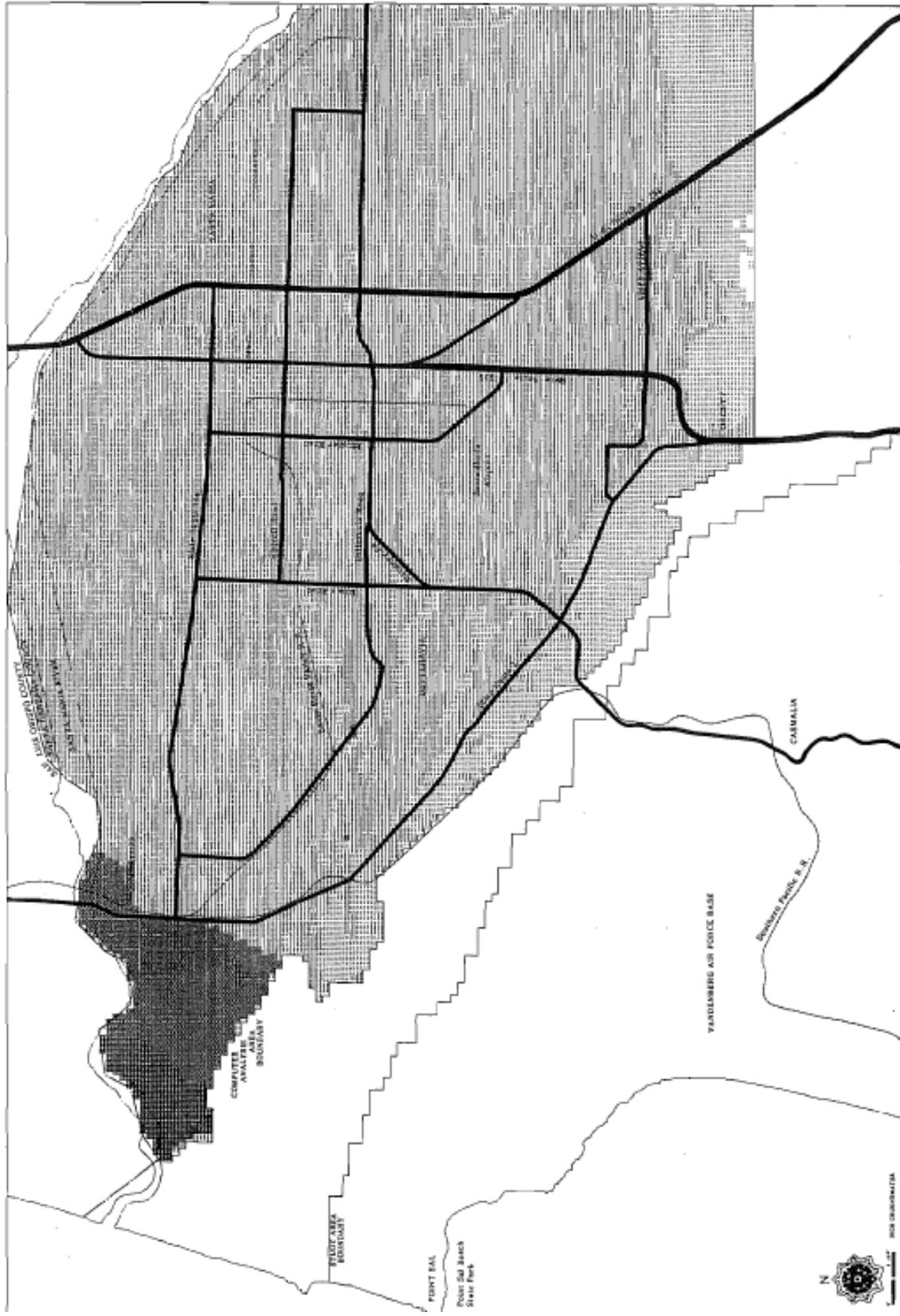
LOMPOC AREA



Santa Maria-Oreutt Study Area High Groundwater

<u>Problem Rating</u>	<u>Possible Variation from Assigned Value</u>
1. Low	1. No Variation
1. Low	2. +1 (Moderate)
1. Low	4. +2 (High)
2. Moderate	6. #1 (Low, High)
3. High	5. -2 (Low)
3. High	3. -1 (Moderate)
3. High	1. No Variation

SANTA MARIA-ORCUTT AREA



Water 0 to 8 feet deep was given a groundwater problem rating of high, with possible variation to moderate (33); water 8 to 15 feet deep was rated high with possible variation to low (35); and water deeper than 15 feet was rated moderate, low to high (26). No-data areas adjacent to areas rated 33 or 35 were given the same rating as the adjacent areas; all other no-data areas were rated 26. Obvious marsh areas shown on the U.S.G.S. topographic maps were given a rating of high-no variation (31). It should be re-emphasized in conclusion that the ratings according to depth to water surface were given only in areas underlain by Quaternary alluvium, where adequate well data were available.

In overview, it might be asked why areas with no present perched water problems have been rated the same as areas with known problems. As in the rest of this study, we have attempted to correlate the various geologic problems with rock formations. Thus, it is assumed that since some areas underlain by Older Alluvium have perched water problems, then the other areas underlain by Older Alluvium, although presently undeveloped and with no groundwater problem, also have the possibility for a perched condition when development brings new input of water (from landscape water, sewage disposal systems, altered runoff pattern, etc.). Thus, all the Older Alluvium was rated 26, and similarly the older formations were generally given a single rating for all mapped areas of that formation.

It should also be recognized that where we have rated on the basis of depth to groundwater in the alluvial areas, the water level can vary dramatically due to differing climatic conditions, changes in pumping and recharge programs, altering of runoff by development, and other factors. Therefore, ratings based on depth of water should be revised periodically to conform with new input data. The U.S.G.S. is currently in the process of computer-compiling all historically available well data on all wells (even though some wells have been destroyed or abandoned) in Santa Barbara County. When these data are available and with sufficient time allotted, they could be used to great benefit in better defining areas with potential high groundwater problems.

Areas of known high groundwater include:

- Goleta Slough
- Carpinteria Slough
- More Mesa - Hope Ranch (perched water)
- Vandenberg Village (perched water)
- Santa Maria Airport Area (perched water)
- Lowlands west of Guadalupe
- Los Alamos Area

EROSION

Erosion as discussed in this section is considered to be the result of limited water flow and thus is distinguished from major water flows associated with flood hazard, which is not within the scope of this study.

Susceptibility to erosion was not given great emphasis in the study - or included in the Geologic Problem Index because it is not very critical from a planning viewpoint; it can usually be controlled with good design at low to moderate cost. Slope planting, proper watering and maintenance, and control of drainage will substantially minimize the effects of erosion.

Erosion is a function of the soil or rock characteristics, slope gradient, and water flow, which can vary greatly in short distances. Therefore, erosion is not adaptable to mapping or rating at the generalized scales of the study. Most soils in the County are susceptible to erosion to some degree but the following geologic formations because of their basic granular characteristics - in part or whole - are considered most subject to erosion and where encountered should be evaluated for this problem: Fanglomerate, Terrace and Older Alluvium deposits, Casitas, Santa Barbara, Pico, Paso Robles, Careaga and Orcutt Formations. Recent and old sand dunes not anchored by vegetation are subject to wind erosion and considerable movement.

SHORELINE REGRESSION

An erosion related problem of more significance, but one also impractical to map on a scale of 1" = 2000' because it involves such a narrow zone, is erosion of the sea cliffs along the coast. Locally this can be quite significant, but involve such small (although quite valuable) areas that they are more appropriately the concern of Building and Safety Department review of specific projects rather than evaluation in overall planning. However, for completeness and because it can be a serious problem, shoreline regression is discussed. Cliff retreat as it relates to mass earth movement (landslides) has been included and rated on the Slope Stability maps.

Processes of Cliff Retreat

The chief processes involved in sea cliff retreat due to marine and non-marine causes are described below:

1. Undercutting. Waves act somewhat as a horizontal saw, abrading the cliff base by direct impact of water, and picking up and hurling broken rocks at the cliff base. Adversely inclined strata are undercut and left unsupported. Air compressed in the rock joints, exerts a pressure on the joint faces. As undercutting progresses, unsupported slabs above break away and add their debris to abrading materials.

2. Failure along vertical or steep joints. Where joint cracks are vertical or nearly vertical, water pressure and tree roots may gradually wedge slabs away from the cliff. This is aided, of course, by undercutting.

3. Oversteepening of cliff materials. Even where undercutting does not occur, waves may remove materials supporting the base of a cliff and produce instability because the resultant slopes are steeper than the materials can sustain.

4. Rainwash and surface weathering. Because of the steep gradients, direct wash on cliff faces may produce gullies in soft materials. Cliffs cut in soft, sandy, or gravelly beds with little interstitial cement are commonly deeply gullied or fluted by rain running down the cliff face. The Pico and Casitas Formations, and Older Alluvium and Fanglomerate are especially vulnerable. All exposed materials are subject to slow weathering and a consequent loss of strength.

5. Spring sapping. In some places, particularly where development has resulted in the planting of lawns, landscaping, and installation of private sewage disposal systems, wastewater may find its way to cliff faces where springs and seeps will occur. The continual emergence of water weakens and removes soft sedimentary materials, causing sapping near the emerging water. This process is contributing to the rapid rate of cliff retreat at More Mesa near Santa Barbara, where a rate of ten inches per year has been measured.

6. Piping. This phenomenon occurs in weakly consolidated rocks possessing systems of vertical and horizontal cracks or joints. Water enters these small channels from above, eventually emerging on the cliff face below. Owing to the ease of erosion, the channels are widened until large blocks of the cliff face may be rendered quite unstable.

7. Air slaking and weathering. Cliff faces are exposed to salt spray which can accelerate the process of weathering and deterioration of the slope.

Irrespective of rock type, all sea cliffs are subject to erosion by marine and non-marine processes as noted above. Unfortunately, most of the coastal cliffs in Santa Barbara County are cut into comparatively incompetent rocks which are subject to relatively rapid erosion and mass movement in response to wave action. The Monterey and Sisquoc Formations comprise the larger portion of the Santa Barbara County coastal cliffs. These formations readily yield to erosion, slumping, landsliding, and similar processes chiefly for the following reasons:

1. They are composed of thin-bedded sedimentary rocks, which frequently dip seaward. As waves attack the cliffs, the beds are undercut and left unsupported so that movement - slow or rapid - can occur along the bedding planes which represent surfaces of weakness.

2. Volcanic ash beds occur in both formations. These are soft and incoherent materials with little shear strength. Where such beds are adversely inclined, overlying materials

may move downslope. Moreover, where these soft beds are exposed to direct wave attack, they allow relatively rapid excavation of narrow channel-like caves, which as they enlarge, weaken the overlying cliffs.

3. Both formations are frequently tightly folded and crumpled, with resulting joint systems which extend near to the ground surface. The thin, brittle rocks respond by extensive fracturing, which may reduce large masses of rock to little .more than unstable piles of rock rubble at the toe of the cliff.

4. The abundance of bedding planes and joint cracks allows water to enter the formations at many places, further reducing shearing strength.

Rates of Cliff Retreat

The only portion of the County's coast where a systematic attempt has been made to assess rates of cliff retreat is near Goleta, between Santa Barbara and Coal Oil Point. Measurements have been made, showing that the coastal cliffs are retreating from three to ten inches a year, on the average. Six inches would be a likely average for this part of the South Coast, and it is likely that retreat of this magnitude can be expected from Rincon Point to Point Conception, although this has not been documented. These figures are averages based on observed rates over ten to thirty-five year periods and do not mean, necessarily, that six inches of cliff will be lost annually. Cliff retreat is a spasmodic phenomenon and occurs more by slab or large block failure at one time rather than by grain by grain loss. Recent examples of this type of large block or slab failure of four feet or more can be seen in the cliffs along Isla Vista.

Construction of dams and reduction or diversion of flood discharges in streams can be expected to have long-term unfavorable effects on beaches as they already have in the Los Angeles Basin area. A well developed beach is not only an important resource for its own sake but is also a highly efficient absorber of wave energy, thus providing substantial protection for shoreline cliffs.

SUBSIDENCE

The meaning of subsidence as used herein refers to deep-seated settlement due to the withdrawal of fluids (water, oil, or natural gas) and should be differentiated from settlement caused by consolidation of compressible or collapsible soils, discussed previously. Subsidence tends to cover broad areas, and the magnitude of movement can be quite large. The best examples are approximately 29 feet of subsidence which has occurred in the San Pedro - Terminal Island area associated with oil field operations and approximately 25 feet of subsidence which has been attributed to natural gas production in Italy and Japan. Subsidence usually occurs over such a wide area that it tends to be uniform and non differential within areas covered by a single structure. However, long continuous structures (aqueducts, roads, utility lines) may be subject to damage. Damage, related to subsidence, can also occur to oil, gas or water wells due

to horizontal movement at depth, and in coastal lowlands an overall lowering of the ground elevation can produce flooding.

It should be noted in spite of the major movements cited above that fluid withdrawal frequently does not result in significant subsidence.

The surest way to prevent subsidence is to halt fluid withdrawal in areas where it could create problems, or to maintain or restore pressure by injection of a different fluid. Groundwater recharge programs to replenish underground water supply have been successfully used to offset subsidence associated with fresh-water withdrawal in the Los Angeles Basin. Closely-controlled fluid injection into depleted oil or gas producing zones has had similar success in reducing subsidence.

Despite inquiries to responsible agencies, no evidence of significant subsidence or problems related to subsidence in Santa Barbara County were uncovered. However, to our knowledge, no precise level lines or surveys have been measured in oil, gas or water producing areas in Santa Barbara County. Subsidence could be occurring in these areas, but if so, it is not significant since no problems have been reported. Establishment of a grid base and precise level surveys would be needed to determine subsidence.

Sand Movement Along Coast

There is little disagreement that beach sand is moved by longshore current and beach drifting south from the mouth of the Santa Maria River (and farther north as well) to at least Point Pedernales or Point Arguello. Both the trend of the shoreline and the prevailing direction of the wind and wave approach indicate a net southerly movement on most days. Sand movement around the rocky Point Arguello headland, across the Jalama bight, and around Point Conception is strongly suspected, but not yet well-documented. Most of the published studies are based on limited data or have yielded equivocal results. A study in progress may provide good information on the magnitude of sand bypassing these headlands.

There seems little question that, eastward from Point Conception, beach sand moves easterly more than 300 days out of the year, under the influence of waves striking the shoreline obliquely as they move down the Santa Barbara Channel from the west.

Studies have shown that, in the vicinity of Santa Barbara, the volume of daily sand transport past a given point ranges from a low of about 300 cubic yards per day during the summer (quiet wave conditions) to highs of more than 4500 cubic yards per day during stormy periods in winter. The average has been found to be about 700 to 750 cubic yards daily. This persistent eastward-flowing stream of sand on the beach must be taken into account whenever beach structures or harbors are contemplated. Forty-five years of experience at Santa Barbara and Montecito have shown clearly the effects of downshore sand movement.

Although present data are too limited for adequate documentation, it is likely that the volume of sand moved along the beach increases from Point Conception to Rincon Point. In Ventura County, with similar wave conditions but with a much larger supply of river sand derived from the Ventura and Santa Clara drainages, the volumes of sand movement are at least double those of Santa Barbara. If one assumes that something less than 700 cubic yards of sand per day moves around the Point Conception headland, as seems probable, the amount of sand moved along the South Coast should rise toward the east as the contributions of more and more streams are added to the total.

Stream sand is the chief source of beach sand and in turn of coastal dune sand, where such dunes are present. For this reason, any activity or construction that reduces the amount of sand delivered by streams to the beaches can be expected to be reflected ultimately in a diminished beach width. It is already well-known that the incidence of several dry years and minor stream flows in succeeding years is followed by a narrowing of the beaches.

V. CONCLUSIONS AND RECOMMENDATIONS

MANAGING GEOLOGIC AND SEISMIC HAZARDS

The effects of geologic, soil, and seismic hazards can be minimized or eliminated only with a multi-faceted approach; no single procedure is the solution. Some problems, such as landslides, can (in general) be prevented by appropriate design; others such as ground offset along faultlines during earthquakes cannot. However, earthquake risks (ground rupture and ground shaking), along with the other problems, can be minimized by the following basic procedures:

Utilize appropriate planning so that the areas with high risk problems of an unsolvable character (such as ground rupture) are either not developed with structures or are developed at a low density and subject to strict design requirements.

Adopt adequate Grading and Building Codes so that damage is minimized.

The following conclusions and recommendations are grouped by the regulatory framework the County uses to address geologic and seismic hazards: Land use planning; subdivision procedures; grading and building codes; evacuation planning, and; military installations.

LAND USE PLANNING

Land use planning which is intended to minimize the impacts of seismic activity and geologic failures should consider the following objectives:

1. Avoid the construction of buildings of all types and most structures on or across historically active or active faults. This is not always possible with long linear structures

or facilities such as utility lines, roads, and irrigation canals. However, certain safety features such as shut-off valves, can be required to minimize damage and expedite repair. The appropriate setback distance from the trace of the fault would be variable, depending on the conditions, but normally would be a minimum of at least fifty feet on either side of the sheared zone.

2. Avoid locating critical structures (hospitals, schools, communication centers, fire and police facilities, dams, nuclear power plants, etc.) on or immediately adjacent to active or potentially active faults. It should be noted that the siting and design of hospitals, schools (except in the Coastal Zone^[pc1]), and dams are controlled by the State, and nuclear power plants by the federal government, and are thus beyond the jurisdiction of the County.

3. Active fault zones are not suitable for construction sites, therefore they should be developed for non-structural uses or left in an undeveloped natural state. In view of the normally narrow width of the zone (100 feet minimum) in which building should be avoided, the zone would be a suitable location for agriculture, trails, or narrow green belts; possibly adjacent to residential or commercial areas.

4. Areas designated Category V indicate severe problems. These areas should be given primary consideration for minimal development and use. They could be planned as natural areas, for passive recreational facilities, cultivated agriculture, or grazing agricultural use. If development is permitted, it should generally be of low density.

5. Areas designated Category IV indicate lands developable at moderately high cost. These might be left undeveloped or developed - depending on the future requirements for urban land in the County General Plan, Coastal Land Use Plan, and/or Community Plans. It should be noted that low density zoning is not necessarily the answer for all such areas - even though it is generally recommended. For example, properties prone to landslide activity may require substantial expenditures of capital for correction. The cost of these corrective measures could make low-density development, such as the construction of a single family home, infeasible. However, higher density development would allow developers to recoup the higher costs associated with developing on such a parcel. Generally speaking, different types of construction (commercial vs. residential, for example) would have no distinct advantage or disadvantage compared to one another in areas in this category.

6. Areas designated Category III would have moderate problems, but would generally be suitable for all types of development.

7. Areas designated Category I and II would have relatively minor problems (except possibly seismic shaking) and would be suitable for all types of development.

8. Slope gradient should be considered as a possible constraint to development along with geologic problems, and would significantly accentuate the problems of a Category IV or V site. The heights of cuts and fills vary depending on the level dimensions of the

lots and whether the streets are single or double frontage, but generally become excessive with slopes of approximately 30%. However, if structures are built on slopes using caissons, stepped foundations, or similarly engineered construction, steeper terrain can be utilized.

9. Where community sewer systems are not available, and private sewage disposal (such as septic systems and dry wells) will be required, densities should be low, particularly in areas subject to landslides and high groundwater.

SUBDIVISION ORDINANCE

In order to efficiently and adequately control land development, it is essential that geologic and soil engineering input be provided in the design of subdivision maps. Control only at the grading and building permit stage is too late, if conditions exist which could affect the basic tract design. Early adjustments to site and/or structural design may be the best approach to avoid hazards.

The importance of a thorough soil engineering and geologic investigation and adequate review at the tentative map stage cannot be over-emphasized. Any problem that might significantly affect tract design should be detected and taken into account at this stage to avoid serious problems for both the County and the developer later. To address this, the County utilizes engineering staff or consultants to review soil and geologic reports.

Section 21-7(d) (4) and (5) of Ordinance 2199 (County Code Chapter 21) gives the County the authority to require preliminary soil reports. In addition, the Public Works or Planning & Development departments may require a geological report of the land involved including an analysis of the proposed grading plan made by an engineering geologist acceptable to the Director of Public Works or Planning and Development. However, the Ordinance is ambiguous as to whether or not this can be required for existing ground where slopes do not exceed 10%; this should be clarified.

As a general rule, soil investigations should be required for all subdivisions. Geologic reports should generally be required when the property contains or is near an active or potentially active fault or is classified as categories III, IV, or V (moderate, moderate-severe, and severe).

GRADING CODES

Since a high percentage of building damage in Southern California is related to geologic and soil problems, Grading Codes are equally as important as Building Codes. In Santa Barbara County, grading is regulated by County Code Chapter 14-Grading, Erosion and Sediment Control which complies with Title 24 of the California Code of Regulations.

One of the most important functions of the Grading and Building Codes is to require a detailed geologic and soil investigation of the specific site under consideration. The study is usually conducted by a qualified private consultant and reviewed by the County. The site investigation is essential for all structures of any consequence, and frequently

is necessary even for a single-family residence or similar structure if located in an area with possible soil or geologic problems. The County Public Works and Planning & Development departments have the authority to require geologic and soil engineering reports. Existing requirements are worded broadly enough that they provide justification for requiring consideration of seismic hazards in design of graded slopes.

BUILDING CODES

The design of structures to resist earthquake forces is a critical factor in their ability to withstand severe earthquakes without structural failure or collapse. Although seismic shock waves can act in any direction, design concern is usually focused on lateral (horizontal) forces because buildings are inherently much weaker with respect to horizontal forces than they are to vertical forces. Santa Barbara County uses the California Code of Regulations, Title 24, Part 2 California Building Code (CBC) to regulate building design and construction in unincorporated areas of the County

EVACUATION PLANNING

Government Code §65302(g)(1) requires a Safety Element address evacuation routes as they relate to identified geologic hazards. Determining evacuation routes prior to the occurrence of a seismic or geologic event is difficult due to the unpredictability of these hazards, although some hazardous events such as seismically-induced mudslides and landslides may be preceded by precipitation that can serve as advance notice. Due to the variability and transformative nature of these hazards, the County does not prescribe fixed emergency evacuation routes for geologic or seismic emergency events. In the event of a geologic or seismic incident, law enforcement agencies, including County Sheriff's Department, the California Highway Patrol, and local police departments, are responsible for emergency or hazard related evacuations. In addition, public safety agencies comply with a Unified Command protocol to determine appropriate evacuation routes based upon conditions of the emergency event, established Memoranda of Understanding/Cooperative Agreements, and Standard Operating Procedures in place for the responding agencies.

County public safety agencies maintain emergency response protocols that include criteria and guidelines for the declaration, communication, and implementation of evacuation orders or warnings. The County also maintains protocols designed to assure that, during an evacuation event, evacuation routes remain clear, traffic moves smoothly, routes/areas are isolated as appropriate, and the risk of accidents on roadways is minimized.

The County employs a reverse 9-1-1 system to notify the public of the need to evacuate a specific area. Additionally, a Memorandum of Agreement is in place between the County, Vandenberg Air Force Base (VAFB), and the City of Lompoc for use of a dedicated base telephone and radio communication system in the event of a seismic/geologic incident or other emergency located in the Lompoc Valley or adjacent highlands.

In the event of a large scale geologic or seismic event, the County Office of Emergency Services (SBC OES) will implement the Santa Barbara County Operational Area Multi-Hazard Functional Plan (MHFP) which outlines protocols for emergency planning, management and response for the Santa Barbara County Operational Area (SBOA). Additionally, OES may activate the SBC Emergency Operations Center (EOC) to coordinate multi-agency emergency response efforts for a geologic or seismic event in compliance with the State Standardized Emergency Management System (SEMS) protocols.

MILITARY INSTALLATIONS

Government Code §65302(g)(1) requires a Safety Element address military installations as they relate to identified geologic hazards. Santa Barbara County is home to Vandenberg Air Force Base (VAFB) located on 154 square miles in the northwestern portion of the County. As a federal air force base, the County is not required by State or federal law to provide geologic or seismic related emergency response within VAFB. However, emergency response agencies within the County maintain close contact with similar units posted to VAFB, and both the County and VAFB are subject to mutual aid Memoranda of Understanding for emergency response and rescue.

GEOLOGIC AND SEISMIC GOALS AND POLICIES

This section profiles the goals, policies, and implementation measures adopted by the County which demonstrate compliance with geologic and seismic protection requirements outlined in State law.

Goals: Geologic and Seismic Hazard Protection

<p><u>Geologic and Seismic Goal 1</u></p>	<p><u>Protect the community to the extent feasible from 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, liquefaction and other seismic hazards pursuant to Government Code §65302(g)(1), Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body.</u></p>
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<u>Policies</u>	<u>Geologic and Seismic Protection</u>	<u>Implementation Measures</u>
<p><u>Geologic and Seismic Protection Policy 1</u></p>	<p><u>The County shall minimize the potential effects of geologic, soil, and seismic hazards through the development review process.</u></p>	<p><u>Geologic and Seismic Protection Implementation Measure 1-Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 2-Maintain and Enforce County Code Chapter 10-Building Regulations</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 3-Enforce the Alquist-Priolo Earthquake Fault Zoning Act</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 5-Maintain and Enforce County Code Chapter 14-Grading, Erosion and Sediment Control</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 7-Enforce the Seismic Hazards Mapping Act</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 8- Enforce the Surface Mining and Reclamation Act</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 9-Enforce the California Coastal Act</u></p>

<u>Policies</u>	<u>Geologic and Seismic Protection</u>	<u>Implementation Measures</u>
		<p><u>Geologic and Seismic Protection Implementation Measure 10- Maintain and enforce County Code Chapter 35-1-Land Use Development Code (LUDC); 35-2-Montecito Land Use Development Code; Article II Coastal Zoning Ordinance</u></p>
<p><u>Geologic and Seismic Protection Policy 2</u></p>	<p><u>To maintain consistency, the County shall refer to the California Building Code, the Land Use Development Code, County Ordinances, the Coastal Land Use Plan, and the Comprehensive General Plan when considering the siting and construction of structures in seismically hazardous areas.</u></p>	<p><u>Geologic and Seismic Protection Implementation Measure 1-Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 2-Maintain and Enforce County Code Chapter 10-Building Regulations</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 5-Maintain and Enforce County Code Chapter 14-Grading, Erosion and Sediment Control</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 10- Maintain and enforce County Code Chapter 35-1-Land Use Development Code (LUDC); 35-2-Montecito Land Use Development Code; Article II Coastal Zoning Ordinance</u></p>
<p><u>Geologic and Seismic Protection Policy 3</u></p>	<p><u>The County shall ensure compliance with State seismic and building standards in the evaluation, design, and siting of critical facilities, including police and fire stations, school facilities, hospitals, hazardous material manufacture and storage facilities, bridges, large public assembly halls, and other structures subject to special seismic safety design requirements pursuant to the California Code of Regulations, Title 24, Part 2 California</u></p>	<p><u>Geologic and Seismic Protection Implementation Measure 1-Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code</u></p> <p><u>Geologic and Seismic Protection Implementation Measure 2-Maintain and Enforce County Code Chapter 10-Building Regulations</u></p>

<u>Policies</u>	<u>Geologic and Seismic Protection</u>	<u>Implementation Measures</u>
	<u>Building Code.</u>	
<u>Geologic and Seismic Protection Policy 4</u>	<u>The County Office of Emergency Services (OES) shall continue coordinating emergency planning for the Santa Barbara Operational Area pursuant to the California Emergency Services Act of 1970.</u>	<u>Geologic and Seismic Protection Implementation Measure 6- Maintain and Enforce County Code Chapter 12-Civil Defense and Disaster</u> <u>Geologic and Seismic Protection Implementation Measure 4- Enforce the California Emergency Services Act</u>
<u>Geologic and Seismic Protection Policy 5</u>	<u>Pursuant to County Code Section 21-7(d)(4) and (5), the County shall require a preliminary soil report prepared by a qualified civil engineer be submitted at the time a tentative map is submitted. This requirement may be waived by the Planning Director if he/she determines that no preliminary analysis is necessary. A preliminary geological report prepared by a qualified engineering geologist may also be required by the Planning Director.</u>	<u>Geologic and Seismic Protection Implementation Measure 5- Maintain and Enforce County Code Chapter 14-Grading, Erosion and Sediment Control</u>
<u>Geologic and Seismic Protection Policy 6</u>	<u>The County should reference the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan when considering measures to reduce potential harm from seismic activity to property and lives.</u>	<u>Geologic and Seismic Protection Implementation Measure 11- Maintain and Implement the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan</u>

IMPLEMENTATION MEASURES

The implementation measures provided below demonstrate how policies in this Element are carried out through local ordinances, actions, procedures, or programs. A timeline for implementation and policy linkage is also provided.

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
<u>Ongoing</u>	<u>1. Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code (CBC)</u>	<u>Continue enforcement of the California Code of Regulations, Title 24, Part 2 California Building Code (CBC) which provides a minimum standard for building design, site demolition, grading activities, drainage, and construction methods to protect people and property from geologic hazards. The CBC defines different regions of California and ranks them according to their seismic hazard potential utilizing site classification (soil type) and seismic design categories (mapped spectral response) to determine structural design requirements pursuant to Chapters 16 & 18 of the CBC and Chapter 7 of the American Society of Civil Engineers (SCE). The CBC maintains six seismic design categories (category A has the least seismic potential and category F has the highest seismic potential). A majority of the County is within Seismic category D, however, soils and/or geology reports may classify the site as E or F; accordingly, all future development is required to comply with the most restrictive design category.</u>	<u>Geologic and Seismic Protection Policy 1,2,3</u>
<u>Ongoing</u>	<u>2. Maintain and Enforce County Code Chapter 10-Building Regulations</u>	<u>Continue enforcement of County Code Chapter 10-Building Regulations which provide minimum standards to safeguard life, limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of buildings and structures within the County.</u>	<u>Geologic and Seismic Protection Policy 1, 2, 3</u>
<u>Ongoing</u>	<u>3. Enforce the Alquist Priolo Earthquake</u>	<u>Continue enforcement of the Alquist-Priolo Earthquake Fault Zoning Act of 1972 which prohibits the construction of</u>	<u>Geologic and Seismic</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
	<u>Fault Zoning Act</u>	<u>buildings used for human occupancy on active surface faults (which have ruptured the ground surface in the past 11,000 years-Holocene Time).⁸ The Act specifies, in part, that new habitable building structures maintain a minimum 50-foot setback from all known active surface faults. California Geological Survey (CGS) Special Publication 42 (updated 10/2/2007 with interim revision 2007) describes Alquist-Priolo Earthquake Fault hazard zones in California and the areas of required study (Santa Barbara County has only one mapped surface fault located in the Zaca Creek quadrangle, issued in 1986).</u>	<u>Protection Policy 1</u>
<u>Ongoing</u>	<u>4. Enforce the California Emergency Services Act</u>	<u>Continue enforcement of California Emergency Services Act of 1970 which confers responsibility to the State of California to mitigate the effects of natural, man-made, or war-caused emergencies which result in conditions of disaster or in extreme peril to life, property, and the resources of the state.</u>	<u>Geologic and Seismic Protection Policy 4</u>
<u>Ongoing</u>	<u>5. Maintain and Enforce County Code Chapter 14-Grading, Erosion and Sediment Control</u>	<u>Continue maintenance and enforcement of County Code Chapter 14-Grading, Erosion and Sediment Control whose regulations, conditions and provisions constitute minimum standards and procedures necessary to protect and preserve life, limb, health, property and public welfare. The Chapter regulates new grading (excavations, i.e. cuts, fills, borrow pits, stockpiling, and compaction of fill) where the transported amount of materials exceeds 50 cubic yards or the cut or fill exceeds 3 feet in vertical distance to the natural contour of the land.</u>	<u>Geologic and Seismic Protection Policy 1, 2, and 5</u>
<u>Ongoing</u>	<u>6. Maintain and Enforce County Code Chapter 12-Civil Defense and Disaster</u>	<u>Continue maintenance and enforcement of County Code Chapter 12-Civil Defense and Disaster which provides direction of the County emergency organization (Office of Emergency Services); authorizes the preparation</u>	<u>Geologic and Seismic Protection Policy 4</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
		<u>and implementation of plans for the protection of persons and property in the event of an emergency; and requires the coordination of emergency functions of the County with all other public agencies, corporations, organizations and affected private persons.</u>	
<u>Ongoing</u>	<u>7. Enforce the Seismic Hazards Mapping Act</u>	<u>Upon completion of mapped earthquake, landslide and liquefaction zones for Santa Barbara County by the California Geological Survey (CGS) the County will commence enforcement of the Seismic Hazards Mapping Act (SHMA) of 1990 in designated zones. Enforcement of SHMA, directs the Department of Conservation, California Geological Survey to identify and map areas prone to liquefaction, earthquake-induced landslides and amplified ground shaking. The purpose of SHMA is to minimize loss of life and property through the identification, evaluation and mitigation of seismic hazards. The State of California Geologic Survey Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California (updated September 11, 2008), provides guidance for evaluation and mitigation of earthquake-related hazards for projects within designated zones of required investigations.</u>	<u>Geologic and Seismic Protection Policy 1</u>
<u>Ongoing</u>	<u>8. Enforce the Surface Mining and Reclamation Act</u>	<u>Continue enforcement of the Surface Mining and Reclamation Act of 1975 enacted by the California Legislature to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of surface mining to public health, property and the environment.</u>	<u>Geologic and Seismic Protection Policy 1</u>
<u>Ongoing</u>	<u>9. Enforce the California Coastal Act of 1976</u>	<u>Enforce the California Coastal Act of 1976 through the County's certified Local Coastal Plan, which includes provisions requiring the minimization of risks to life and property in areas of high geologic</u>	<u>Geologic and Seismic Protection</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
		<u>hazard; bluff stability and shoreline protection; minimization of geologic instability and erosion along bluffs and cliffs; and safe construction on filled lands.</u>	<u>Policy 1</u>
<u>Ongoing</u>	<u>10. Maintain and enforce County Code Chapter 35-1-Land Use Development Code (LUDC); 35-2-Montecito Land Use Development Code; Article II Coastal Zoning Ordinance</u>	<u>Continue to maintain and enforce the County Chapter 35 Zoning; Land Use and Development Code (LUDC); Montecito Land Use Development Code; and Article II Coastal Zoning Ordinance (which complies with the California Coastal Act). Chapter 35 Zoning is adopted to protect and to promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the County. The LUDC implements the policies of the Santa Barbara County Comprehensive General Plan and Local Coastal Program by classifying and regulating the uses of land and structures within the County, consistent with the Comprehensive General Plan and the Local Coastal Program.</u>	<u>Geologic and Seismic Protection Policy 1, 2</u>
<u>Ongoing</u>	<u>11. Maintain and Implement the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan</u>	<u>Continue maintenance and implementation of the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan which contains hazard identification, screening and ranking; risk and vulnerability assessment; capabilities assessment; goals, objectives, and actions to address flood, wildfire, earthquake, coastal storm surge/tsunami, landslide/coastal erosion and dam failure in the unincorporated areas of the County.</u>	<u>Geologic and Seismic Protection Policy 6</u>

V. CONCLUSIONS AND RECOMMENDATIONS

SUMMARY OF GEOLOGIC PROBLEMS

Geologic Problem Index

~~In some areas geologic, seismic, and soil conditions are major factors affecting land use and should – along with other pertinent factors – be taken into account. In order to simplify the planning process, the results of all problems – excluding ground displacement from fault offset – have been combined into a single number called a Geologic Problem Index or GPI. The GPI for a given area is obtained by multiplying each problem by a weighting factor that considers the seriousness of the problem, the difficulty of alleviating it, and – to some extent – the frequency of occurrence.~~

~~The GPI's theoretically range from a low of 100 for land with essentially no problems to a maximum of 300 for land with serious problems of all types. However, in actual application, the numbers range in Santa Barbara County from a minimum of 100 to a maximum of 236. Only a small part of the County, in the Santa Maria area, actually has a theoretically low GPI of 100. The maximum value of 300 was not possible because some of the problems evaluated are restricted to flatland areas (liquefaction, for example) and some to hilly areas (landslides).~~

Computer Classification – Severity Categories

~~To further aid the planning process, the range of GPI's was then divided into categories I through V, low, low-moderate, moderate, moderate-severe, and severe respectively.~~

~~Computer analysis areas within the study areas were divided into approximately five-acre grid cells, and the GPI calculated for each cell. The GPI was then assigned to the appropriate severity category (I through V) and displayed on a computer-produced map. The same procedure was followed for the entire County, utilizing grid cells approximately ninety acres in size. Computer analysis areas for the four study areas were defined by excluding the steeper hillsides and more remote undeveloped areas. The only areas excluded on the County wide computer map were the National Forest lands and parts of Vandenberg Air Force Base.~~

~~Thus, the computer maps reflect a summation of the ratings delineated on the eight Geologic Problems Maps, with one exception. The Seismic – Tectonic Maps have been drawn and problem ratings assigned based on a possible extension of the Big Pine fault. However, the computer maps do not reflect the GPI arising from ground shaking caused by this fault. If further investigation should confirm the existence of this fault, the GPI's should be recalculated. The effects of confirming the fault extension would be to raise – and thus eliminate – all areas with a ground shaking problem rating of 1 (low) to 2 (moderate), and to change some areas with a 2 (moderate) rating to a 3 (high) rating. Changes would occur on all but the South Coast GPI map, and would mean that a small percentage of the cells would have a GPI increase of eighteen points. Also, since there~~

would be no areas with a ground shaking problem rating of 1 (low), the lowest possible GPI would be 118 rather than 100, as is now the case for an area with all problems rated 1 (low).

The five severity categories into which the cells are divided, based on GPI, are meant to reflect the relative severity of geologic problems in one cell as compared to another, and, indirectly, the difficulty and/or expense involved in safely developing a given area. None of the categories are by themselves intended to imply that the area involved cannot or should not be developed. An additional note of caution should be injected in that — while most natural hazards were considered — flood hazard was not included in this section because this important subject warranted a separate study. (See Flood Control Chapter, p.157.)

Because ground rupture from fault offset is a nearly insurmountable problem, and hence is decisive by itself, it has been treated separately. Furthermore, faults have a linear rather than areal distribution, and, as a consequence, are not well adapted to grid cell analysis. Although a number of faults have been classified as active in this study, known ground rupture in the County due directly to faulting during historic time is limited to one or two locations, including creep along the Mesa Fault.

A bar graph has been prepared (Figure 20) showing the percentage of cells of each of the five severity categories for each of the five computer analysis areas. It should be noted that the Countywide GPI distribution will not be the sum of the distributions in the four study areas because these areas are not of equal size and comprise only a small fraction of the entire County. It is also possible to have a higher GPI in a study area than is shown on the County wide GPI map. Because of the different sizes of the cells on the respective maps, a small parcel in a study area with a high GPI may not appear on the County wide map.

As can be seen in Figure 20 and on the GPI Maps, over 90% of the Lompoc and Santa Maria computer analysis areas have been rated with geologic problems of only low or low-moderate severity. These two areas are relatively flat, eliminating problems of slope instability (landslides) or soil creep. The granular soils found in these areas are generally at worst only moderately expansive. Limited areas have high groundwater and possibly compressible soils, and may be subject to liquefaction. Lompoc and Santa Maria share primarily a moderate problem rating for ground shaking, and only very small portions of these two computer analysis areas might be subject to risk of tsunamis.

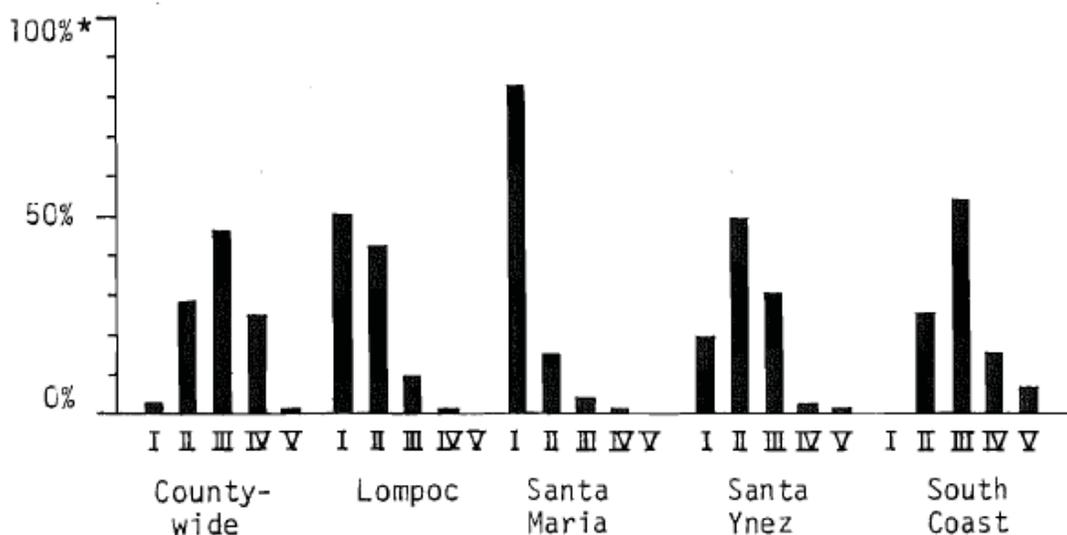


FIGURE 20

DISTRIBUTION OF SEVERITY
 CATEGORIES OF THE GEOLOGIC
 PROBLEM INDEX FOR THE FIVE
 COMPUTER ANALYSIS AREAS

* Percentage of area falling in severity category

The Santa Ynez computer analysis area is very similar in topography and geology to Lompoc and Santa Maria, but only 68% of the area has been rated less than moderate. Although there is a slightly higher incidence of high groundwater and attendant possibility of liquefaction in the Santa Ynez area, the main reason for the higher GPI's is a ground-shaking problem-rating of high (3) over much of the computer analysis area.

The South Coast computer analysis area has the most problem of the urban areas, with approximately 75% of the area moderate to severe. The flatland areas have generally similar GPI's to the other flatland areas in the County, but since nearly all of the South Coast has a ground-shaking problem-rating of high (3), there are no cells in the South Coast with a GPI falling in the low severity category. The areas with a GPI severity worse than moderate are basically the hillsides and the coastal lowlands. Coastal lowlands with high groundwater and compressible soils, and hence a possibility of liquefaction. And also with possible risk of tsunamis, have a GPI value falling in the

~~moderate-severe category. Accounting for perhaps half of the 15% of the South Coast in this category. The remainder of the area with a moderate-severe GPI and the majority of the approximately 6% of the South Coast with a GPI in the severe category, are located on the hillsides, where the geologic formations that occur are prone to landslides or slope stability problems, along with expansive soils and soil creep.~~

~~On the County-wide map, the distribution of GPI's is fairly evenly balanced on either side of the moderate category, with all varieties and combinations of geologic problems occurring in different areas. There are very few cells on the County wide map with a GPI falling in the severe category, because of the previously mentioned difficulty in rating localized severe problem areas at the County wide scale of 1" = 8000'.~~

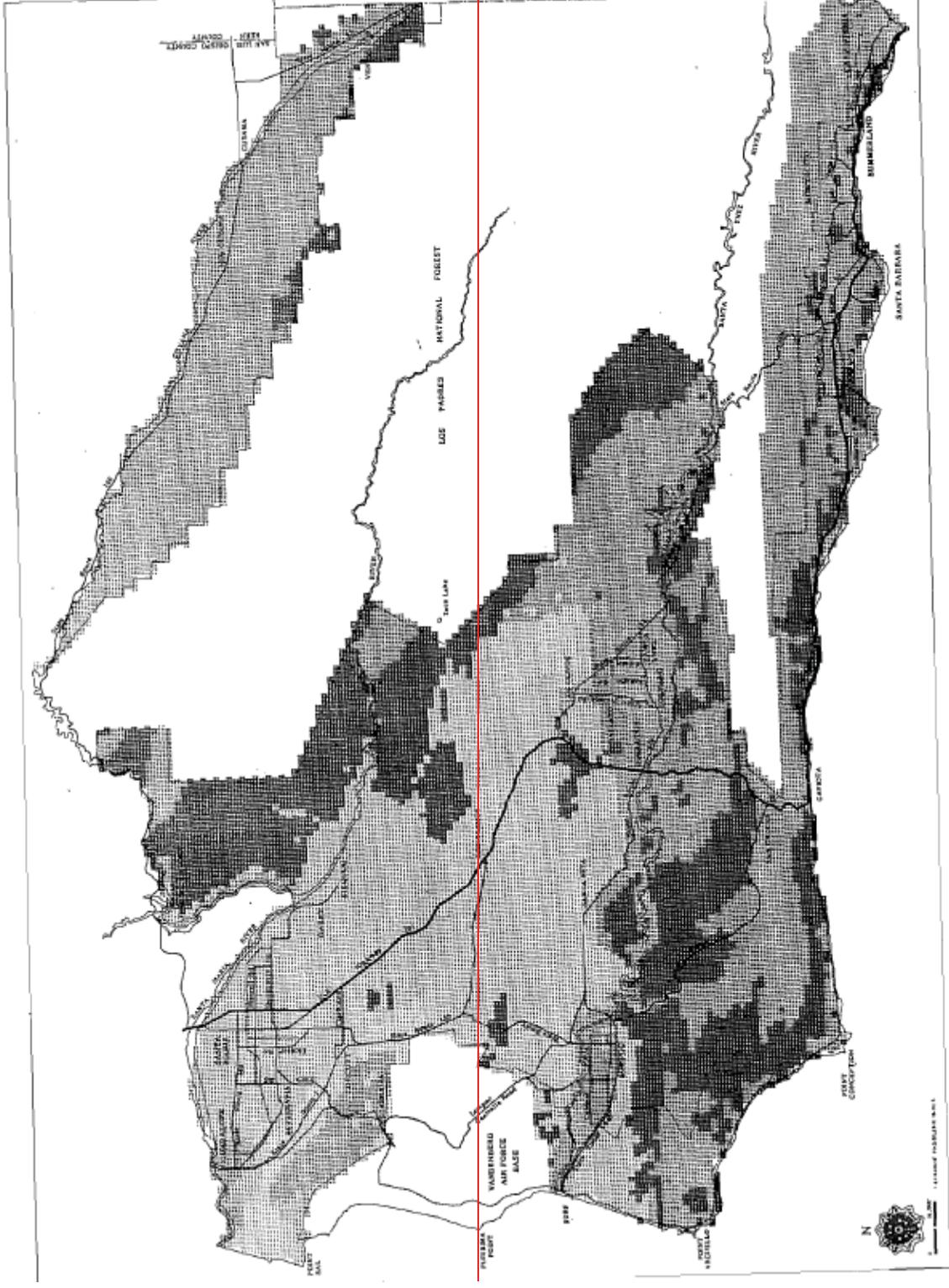
Uses of Severity Map

~~In all the work connected with the input data and methods of computation and categorization leading up to the GPI severity maps, attempts were made to make the net result as absolute as possible, so that an area rated moderate had moderate geologic problems in an absolute sense, not just relative to other parts of the County. On a broad scale, it is believed that this goal was achieved. However, limitations and inherent problems arose that prevented the application of this rating system in an absolute sense to a single cell, even though on a broad scale the ratings can be viewed as absolute.~~

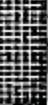
Santa Barbara County Geologic Problems Index

<u>Category</u>	<u>Problem Severity</u>	<u>GPI Range</u>
I	Low	100-125
II	Low-Moderate	126-145
III	Moderate	146-180
IV	Moderate-Severe	181-210
V	Severe	211 Up

GEOLOGIC PROBLEMS INDEX
SANTA BARBARA COUNTY



South Coast Study Area ~ East Geologic Problems Index

<u>Category</u>	<u>Problem Severity</u>	<u>GPI Range</u>
	Low-Moderate	126-145
	Moderate	146-180
	Moderate-Severe	181-210
	Severe	211 Up

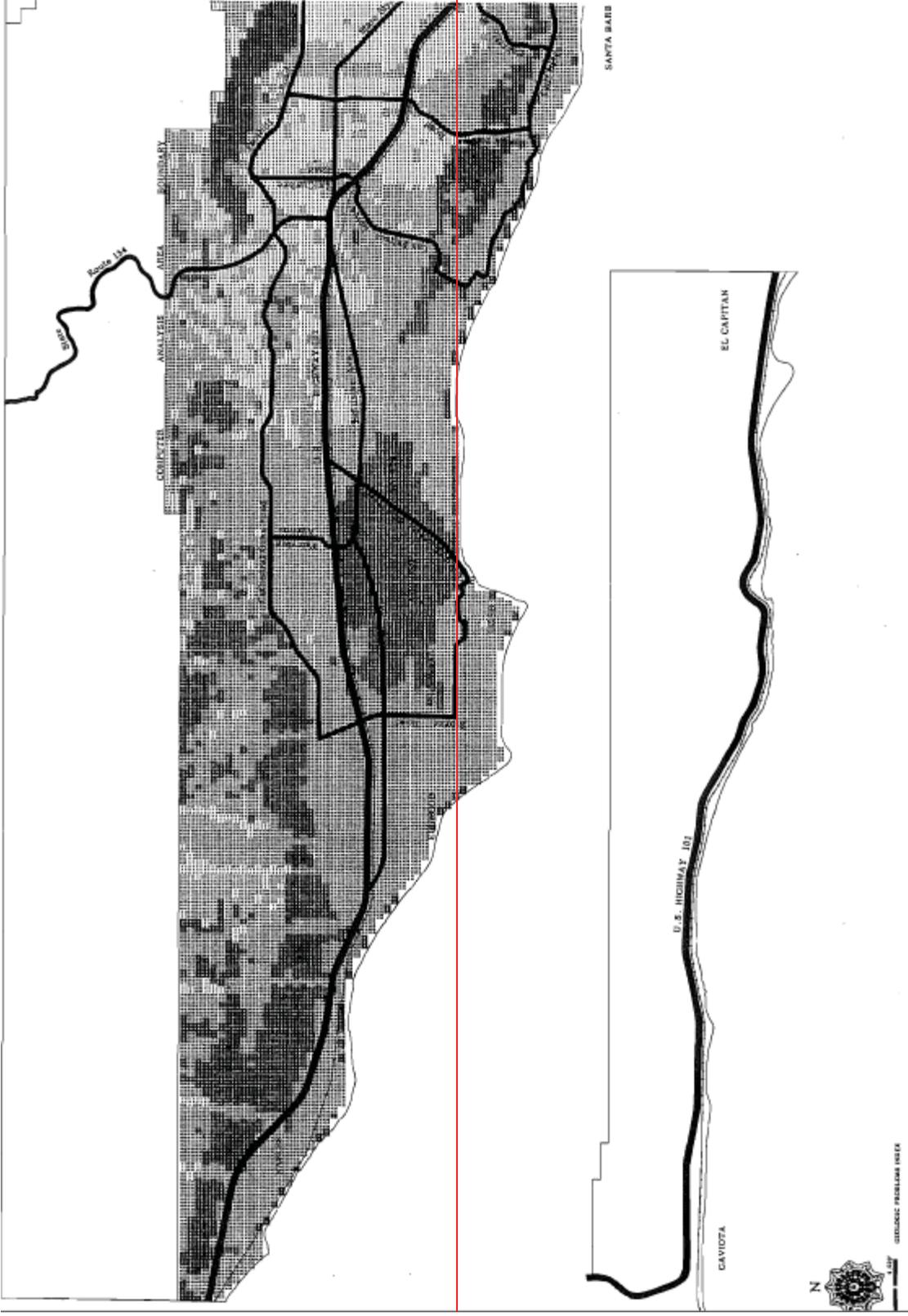
SOUTH COAST AREA—EAST



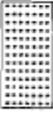
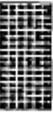
South Coast Study Area ~ West Geologic Problems Index

<u>Category</u>	<u>Problem Severity</u>	<u>GPI Range</u>
II	Low - Moderate	126 - 145
III	Moderate	146 - 180
IV	Moderate - Severe	181 - 210
V	Severe	211 Up

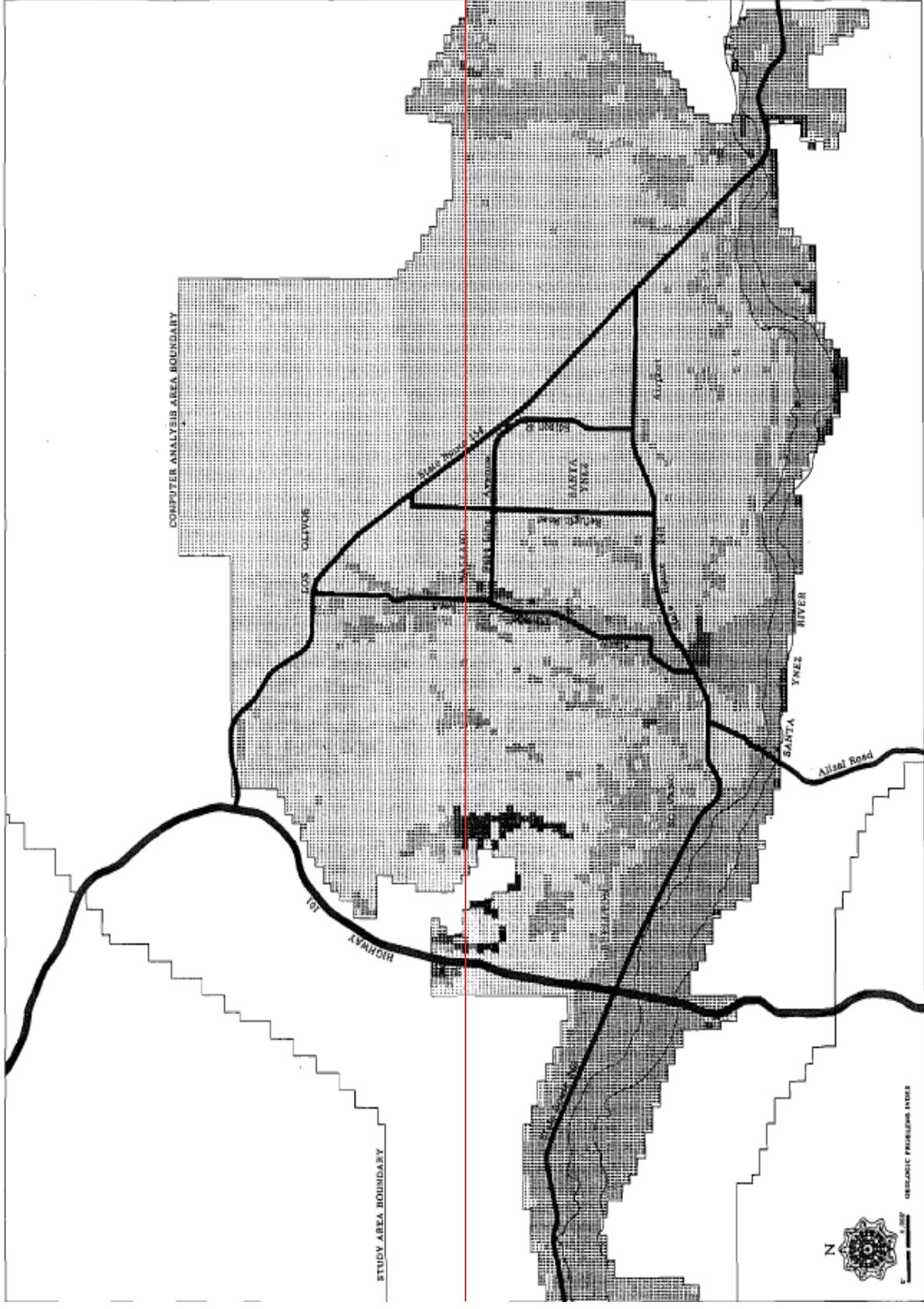
SOUTH COAST AREA - WEST



Santa Ynez Valley Study Area Geologic Problems Index

<u>Category</u>	<u>Problem Severity</u>	<u>GPI Range</u>
	Low	100-125
	Low-Moderate	126-145
	Moderate	146-180
	Moderate-Severe	181-210
	Severe	211 Up

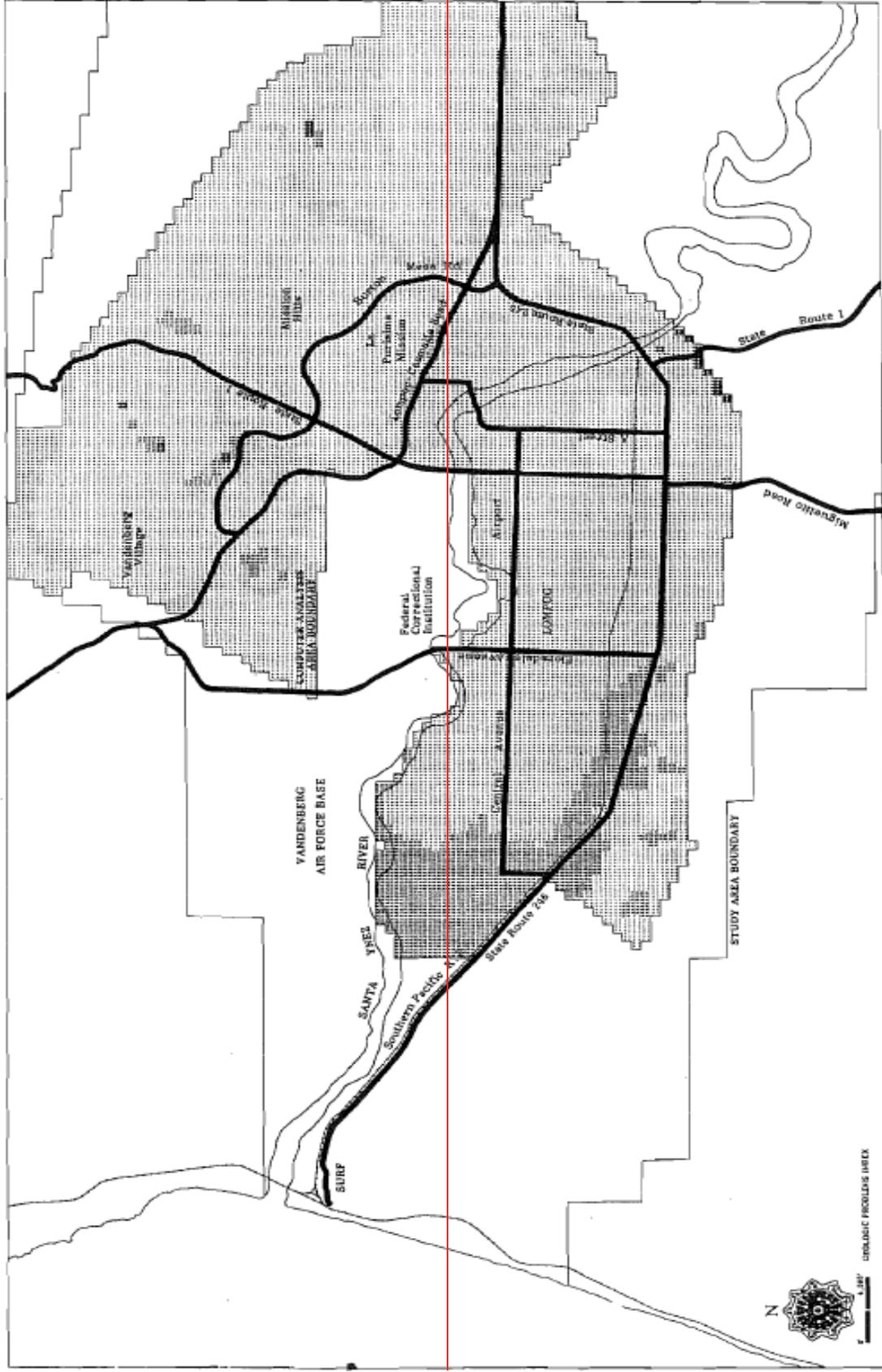
SANTA YNEZ VALLEY AREA



Lompoc Study Area Geologic Problems Index

<u>Category</u>	<u>Problem Severity</u>	<u>GPI Range</u>
I	Low	100-125
II	Low-Moderate	126-145
III	Moderate	146-180
IV	Moderate-Severe	181-210

LOMPOC AREA



Santa Maria-Oreutt Study Area Geologic Problems Index

<u>Category</u>	<u>Problem Severity</u>	<u>GPI Range</u>
I	Low	100-125
II	Low-Moderate	126-145
III	Moderate	146-180
IV	Moderate-Severe	181-210

~~In addition to previously described limitations regarding scale and accuracy of available basic data and the somewhat subjective nature of the evaluations and weighting factors, two other things should be kept in mind. First, the indicated variability of the problem ratings should be taken into account; two areas may have the same GPI, but one might have a large variability to the high side and the other to the low side. Secondly, where boundaries between different problem ratings pass through a cell, the rating chosen was the one which covered 50% or more of the area of the cell. The error in this generalization is obvious.~~

~~In spite of these conditions, we believe that the time and effort spent to develop the GPI system for Santa Barbara County has been well spent, and that the product is a very useful one. As a planning aid, it shows the range in occurrence and severity of geologic problems within the County, providing valuable input necessary to the development of an intelligent plan for land use. The individual problem rating maps can be used by developers and by the various governmental agencies responsible for their supervision and guidance as an index to the specific geologic problems that can be expected in a particular area.~~

COPING WITH THE PROBLEMS

~~The effects of geologic, soil and seismic problems and hazards can be minimized or eliminated only with a multiple approach; no single procedure is the solution. Some problems, such as landslides, can (in general) be prevented by appropriate design; others such as ground offset along faults during earthquakes cannot. However, earthquake risks (ground rupture and ground shaking), along with the other problems, can be minimized by the following basic procedures:~~

~~Appropriate planning so that the areas with high risk problems of an unsolvable character (such as ground rupture) are either not developed with structures or are developed at a low density and subject to strict design requirements.~~

~~Adequate Grading and Building Codes so that damage is minimized.~~

LAND USE PLANNING

~~Land use planning should strive for the following objectives:~~

~~1. Avoid construction of buildings of all types and most structures on or across historically active or active faults. (This is not always possible with long linear structures or facilities such as utility lines, roads, irrigation canals, etc., but certain safety features such as shut-off valves, can be required to minimize damage and expedite repair.) The appropriate setback distance from the trace of the fault would be variable, depending on the conditions, but normally would be a minimum of at least fifty feet on either side of the sheared zone.~~

~~2. Avoid locating critical structures (hospitals, schools, communication centers, fire and police facilities, dams, nuclear power plants, etc.) on or immediately adjacent to active or potentially active faults. It should be noted that the siting and design of hospitals, schools, and dams are controlled by the State, and nuclear power plants by the federal government, and are thus beyond the jurisdiction of the County.~~

~~3. Because active fault zones are not suitable for construction sites, they should be developed for non-structural uses or left in an undeveloped natural state. In view of the normally narrow width of the zone (100 feet minimum) in which building should be avoided, the zone would be a suitable location for trails or narrow green belts, possibly adjacent to residential or commercial areas.~~

~~4. Areas designated Category V indicate severe problems. These areas should be given primary consideration for minimum development and use. They could be planned as natural areas, or for recreational, cultivated agriculture, or grazing agricultural use. If development is permitted, it should generally be of low density.~~

~~5. Areas designated Category IV indicate lands developable at moderately high cost. These might be left undeveloped or developed depending on the future requirements for urban land. It should be noted in this regard that low density zoning is not necessarily the answer for all such areas even though it is generally recommended. For example, areas of large landslides may require substantial sums for correction, which could be economically feasible only if moderately dense development were permitted. Generally speaking, different types of construction (commercial vs. residential, for example) would have no distinct advantage or disadvantage compared to one another in areas in this category, except that commercial or industrial development would generally result in less landscape water entering the soil than medium density residential development.~~

~~6. Areas designated Category III would have moderate problems, but would generally be suitable for all types of development.~~

~~7. Areas designated Category I and II would have relatively minor problems (except possibly seismic shaking) and would be suitable for all types of development.~~

~~8. Slope steepness should be considered as a problem in development along with geologic problems, and would significantly accentuate the problems of a Category IV or V site. The heights of cuts and fills vary depending on the level dimensions of the lots and whether the streets are single or double frontage, but generally become excessive with slopes of approximately 30%. However, if structures are built on slopes using caissons or stepped foundations or if just the ridge tops and canyon bottoms are developed, steeper terrain can be utilized.~~

~~9. Where sewers are not available so that private sewage disposal will be required, densities should be low, particularly in areas subject to landslides and high groundwater.~~

SUBDIVISION PROCEDURES

~~In order to efficiently and adequately control land development, it is essential that geologic and soil engineering input be provided in the design of the subdivision maps. Control only at the grading and building permit stage is too late, if conditions exist which could affect the basic tract design.~~

~~The importance of a thorough soil engineering and geologic investigation and adequate review at the tentative map stage cannot be over-emphasized. Any problem that might significantly affect tract design should be detected and taken into account at this stage to avoid serious problems for both the County and the developer later. Fortunately, the County has a geological, as well as an engineering staff, to review soil and geologic reports.~~

~~Section 21-7(d) (4) and (5) of Ordinance 2199 (County Code Chapter 21) gives the authority to require preliminary soil reports.~~

~~In addition, the Director of Public Works may require a geological report of the land involved including an analysis of the proposed grading plan made by an engineering geologist acceptable to the Director of Public Works. However, the Ordinance is ambiguous as to whether or not this can be required for existing ground where slopes do not exceed 10%; this should be clarified.~~

~~As a general rule, we believe that soil investigations should be required for all subdivisions. Geologic reports should generally be required when the property contains or is near an active or potentially active fault or is classified as categories III, IV, or V (moderate, moderate-severe, and severe).~~

GRADING CODES

~~Since a high percentage of building damage in Southern California is related to geologic and soil problems, Grading Codes are equally as important as Building Codes. In Santa Barbara County, grading is regulated by Ordinance No. 1795. This is a code roughly equivalent to the Grading Code of the Uniform Building Code (Chapter 70), but is a completely separate document. Both are sound regulations based on considerable study and experience. In our opinion, the Santa Barbara County code generally provides for adequate control as far as geologic problems are concerned where grading is involved.~~

~~One of the most important functions of the Grading and Building Codes is to require a detailed geologic and soil investigation of the specific site under consideration. The study is usually made by a private consultant and reviewed by one or more governmental agencies. Site conditions vary greatly, and no code provisions can be applicable to all sites unless they allow for flexibility. The site investigation is essential for all structures of any consequence, and frequently is necessary even for a single-~~

~~family residence or similar structure if located in an area with possible problems. The County Public Works Department has authority to require geologic and soil engineering reports. We believe that the present requirements are worded broadly enough that they provide justification for requiring consideration of seismic hazards in design of graded slopes.~~

~~Based on the San Fernando earthquake and ensuing studies and deliberations by governmental agencies and professional societies, Grading Code changes have been proposed. Requirements regarding seismic analysis of slopes have been proposed by a committee of the Geotechnical Group of the Los Angeles Section of the American Society of Civil Engineers, and have subsequently been adopted by administrative order by Los Angeles County. We recommend adoption of these minimum standards for slope stability analysis by Santa Barbara County. The regulation reads as follows:~~

~~The following minimum standards for slope stability analysis will be required for all fill slopes steeper than 2:1 and cut slopes steeper than 1.5:1:~~

- ~~1. Separate calculations should be performed for static and seismic conditions.~~
- ~~2. The pseudostatic slope stability analysis would be the minimum seismic analysis accepted for design.~~
- ~~3. Conventional static methods of slope stability analysis based upon principles of mechanics may be used to analyze the stability of slopes under both static and pseudostatic loads.~~
- ~~4. The minimum acceptable factor of safety on shear strength is 1.5 for static loads and 1.1 for pseudostatic loads. The factor of safety on strength is defined as the ratio of the shearing resistance force to the actual driving force acting along the potential failure surface.~~
- ~~5. The analysis should include the effect of soil weight and seepage or pore pressure where applicable to the analysis (saturation condition for fill).~~
- ~~6. Pseudostatic loads should include the effect of static loads combined with a horizontal inertial force acting out of the slope and through the center of gravity of the potential sliding mass.~~
- ~~7. A minimum pseudostatic horizontal inertial force equal to 0.15 times the total weight of the potential sliding mass should be used. This value should be increased where the proximity to active faults and the subsoil or geologic site conditions dictate in the opinion of the private consultant(s).~~
- ~~8. Potential failure surfaces may be composed of circles, planes or other shapes considered more appropriate to the soil and geologic site conditions.~~

~~9. The critical potential failure surface having the lowest factor of safety on strength should be sought for the static case. This static surface may be assumed critical for the pseudostatic case.~~

~~10. Soil properties including unit weight and strength parameters (cohesion and friction angle) may be based on conventional field and laboratory tests. It is expected that the engineer will use considerable judgment in the selection of appropriate shear tests and in arriving at strength characteristics appropriate to the present and anticipated future slope conditions.~~

~~The above analysis for seismic conditions is not required for fills 2:1 or flatter or cuts 1.5:1 or flatter. Pseudostatic loads are dynamic loads converted to an assumed equivalent static load.~~

~~With regard to other sections of Ordinance No. 1795, we have the following comments:~~

~~Section 7. Definitions – We recommend that “certify” or “certification” be redefined to include the provision of a written geologic engineering opinion as well as merely making reference to tests, because many of the certifications required elsewhere in the Ordinance refer more to engineering analyses, judgments, and opinions than they do to specific test results. “Engineering geologist” should be redefined to correspond with the present State Geologist Act.~~

~~Section 16. Inspection and Grading Certificate – We recommend that a certification be required to be signed by the grading contractor stating that he has complied with all of the plans and specifications (as modified, if changes were approved). It is inconsistent not to require a certification from the party actually doing the work, who agrees to perform it in accordance with the plans and specifications but has the most to gain by cutting corners. Such a statement has been required by Ventura County for some time.~~

~~Section 22. Excavations – We recommend that item (a) be revised to require that a cut not be steeper than 2 horizontal to 1 vertical, but to retain the condition that a cut may be steeper if recommended by a soil engineering or engineering geology report. The trend gradually is toward limiting slopes to 2: 1, and we believe that this is a good principle provided that the responsible governmental agency permits exceptions in the numerous cases where warranted.~~

~~Section 24. Planting – Consideration should be given to requiring watering and maintenance in addition to planting of slopes.~~

~~Section 25. Building Setbacks and Construction – We believe that item (a)(1) prohibiting building foundations adjacent to slopes, and hence on slopes, is overly stringent. Foundations on slopes have been permitted elsewhere in California, and the performance record is good. This is because deep footings on slopes are specially designed by engineers, and sloping ground permits less water infiltration than flat pads. We suggest, that exceptions be allowed when justified by special geologic and~~

~~engineering studies. The County should also consider adopting the building setback table of the Uniform Building Code.~~

~~**Section 26. Drainage and Erosion Control** Under this section item (a) requires that interceptor terraces have an 8-foot width and be completely concreted. Although we concur with the bench width, we do not believe that the entire bench need be paved unless unusually heavy flows are anticipated. Leaving an outer lip of approximately 2 feet free of concrete would permit planting of bushes or trees, which might add stability by virtue of their root systems, as well as enhancing the project's appearance. Types of plants should be chosen that would not affect the integrity of the drain.~~

~~**BUILDING CODES**~~

~~The design of structures to resist earthquake forces is a very critical factor in their ability to withstand severe earthquakes without structural failure or collapse. Although seismic shock waves can act in any direction, design concern is usually focused on lateral (horizontal) forces because buildings are inherently much weaker with respect to horizontal forces than they are to vertical forces.~~

~~Santa Barbara County uses the Uniform Building Code (USC) to control building design and construction. The 1976 Code has been changed to up-grade lateral force requirements. This change will result in safer structures and reduced potential loss of life at a relatively modest increase in cost compared to the total cost of the structure.~~

~~This recommendation does not consider hazards to existing structures due to a severe earthquake. Identification and analysis of this problem should be performed as soon as possible.~~

~~**LAND STABILITY INSURANCE**~~

~~Experience has shown that distress or damage to structures will occasionally occur even with good planning, stringent codes, and the best efforts of private geological and engineering consultants and professional personnel of the regulatory governmental agencies. This may be due to one or more of the following factors: limitations in the state of the art of engineering geology and soil engineering, mistakes in judgment or oversights, the variable nature of subsurface conditions, or inadequate maintenance of surface drainage by the occupant after construction is completed. Such problems may be statistically few, but can be catastrophic to those involved.~~

~~A logical answer to this problem is some form of insurance against land movement. Such insurance coverage was dropped by conventional insurance companies as a standard part of homeowner's policies after the infamous Portuguese Bend landslide in Palos Verdes in 1956, which destroyed approximately 150 homes. It was completely unavailable for many years, until relatively recently when a specialty company was formed to provide such coverage. Subsequently at least one other company has moved into the market.~~

~~Coverage on the average value house probably would cost in the \$20-\$40 per year range for a five-year policy (substantially less than the cost of fire insurance). A requirement that such insurance be provided by the developer for a period of approximately five years would seem to be a logical procedure and is recommended. This would protect not only the homeowner but also the County, since governmental agencies issuing grading or building permits have come increasingly under attack in the courts in the last few years when damage has occurred.~~

VI. FIRE HAZARD AND FIRE SERVICES^{9, 10}

INTRODUCTION

Santa Barbara County, like much of southern and central California, experiences annual cycles of elevated fire danger. Due to its low annual precipitation rate (approximately 15 inches a year), highly flammable vegetation, and high velocity “sundowner” and “Santa Ana” winds, the County has routinely experienced major wildfires which threaten residents’ safety and property. According to statistics recorded by Santa Barbara County Fire Department (SBCoFD), 28 major fires have occurred in the County between 1922 and 2009, burning close to one million acres. Such a significant threat to the health and welfare of County residents should be examined and minimized where feasible by the policies contained within this element. To understand Santa Barbara’s problem, first the causes of wildland fires and the County’s fire history are reviewed. Then the fire hazard severity classification system developed by the California Department of Forestry and Fire Protection (Cal Fire) is explained, and its application to the County is described. Finally, the topics of fire prevention and control are analyzed in relation to land use planning.

For classification and discussion purposes, fires are classified into three broad categories: urban; wildland; and wildland-urban interface. This document primarily focuses on issues related to wildland fires. However, some general discussion of fire hazards in wildland-urban interface areas is also provided. For further information regarding fire hazards within the County’s unincorporated urban and wildland-urban interface areas, refer to the County’s Community and Area Plans (components of the Comprehensive General Plan Land Use Element and Coastal Land Use Plan). The remainder of this section discusses various fire issues including:

- Causes and History of Wildfire
- Responsible Fire Protection Agencies
- Establishing Fire Hazard Severity Areas
- Fire Hazard Reduction Measures

Fire Fact: The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels is called the wildland-urban interface.

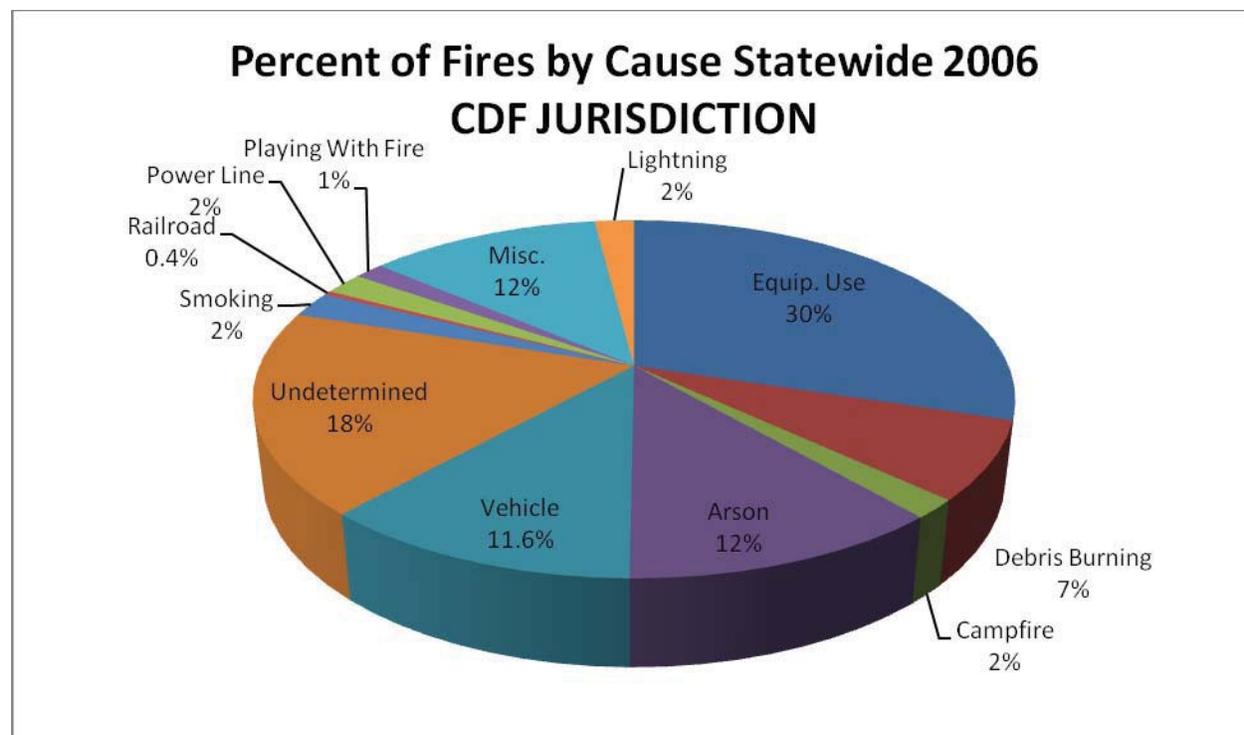
- Land Use Planning and It's Relation to Fire Hazards
- Fire Goals, Policies, and Implementation Measures

CAUSES AND HISTORY OF WILDFIRE

Understanding the root causes of wildland fires as well as the County's local fire history is a critical first step in developing the necessary policies and actions which can mitigate this threat. The causes of wildland fires are linked to two elements: 1) the ignition source which starts the fire, and 2) the fuel which the fire feeds on in order to further propagate itself.

IGNITION SOURCES

Approximately 80 percent of wildland fires result from manmade causes. The only significant natural source of fire ignition is lightning; however, lightning strikes only account for approximately 2% of wildfires. The greatest number of fires is the result of human carelessness and insensitivity to wildland fire danger, especially during the critical days of the year when the fire problem is most acute. The major causes of wildfires in the State of California, including equipment use, debris burning, and vehicle ignition, are shown in the table below. As indicated in the aforementioned table, equipment usage is the leading cause of wildfire ignition. Such equipment usage often includes powered tools which can occasionally produce sparks or friction temperatures hot enough to ignite dry vegetation. Vehicle usage in high fire hazard areas is the second leading accidental cause, followed by relatively lesser occurrences such as debris burning, out of control camp fires, improperly discarded smoking material, and persons (many being children) playing with various flammable materials.



Source: California Department of Fire (CDF): http://cdfdata.fire.ca.gov/incidents/incidents_statevents

Not all human-caused fires are accidental. Arson is another noteworthy cause of wildfires, accounting for approximately 12 percent of all fires recorded state-wide. According to data provided by Cal Fire, there were almost three thousand arson related fires set between 2000 and 2008. These arson fires resulted in over 130,000 acres of burned property and approximately 56 million dollars in fiscal damages. Despite these substantial impacts, the number of arson related fires have steadily decreased over the past forty years, falling from an annual high of 1,990 fires in 1979 to a low of 220 fires in 2008.¹¹

FUEL BEDS

The primary source of fuel for the County's wildland fires consists of large swaths of natural vegetation. Areas of flammable vegetation are commonly referred to as "fuel beds" and are often large in size due to steep topography and lack of roads or natural barriers. The average slope in the County's wildland areas is 40 percent.¹² These conditions limit fire vehicle access and increase the challenges of wildland fire fighting in the County. Modern firefighting techniques generally allow wildland fires in remote and unpopulated areas to burn off excessive fuel loads as long as the fire poses no danger to structural development or public safety.

Chaparral provides the most widespread wildland fuel threat in Santa Barbara County. It can be found on the slopes of the Santa Ynez Mountains, throughout the Sierra Madre and San Rafael mountain ranges, in the Casmalia, Soloman, Purisima, and Santa Rosa Hills, and in the Lompoc and Tranquillion Peak areas of Vandenberg Air Force Base. These chaparral communities are characterized by woody shrubs of chamise,

ceanothus and manzanita, which dominate dry rocky slopes and provide erosion control and watershed protection. A unique chaparral community, the Burton Mesa Chaparral, occurs on the sandy terraces north of Lompoc in the Santa Ynez River watershed. This chaparral community includes plants of special concern such as manzanita, ceanothus, a rare form of coastal live oak, and other species of botanic value. Additionally, numerous grasslands and fields are located in the County and present the potential for fast moving wildland fires that can transition into heavier fuel beds and tree canopies.¹³

HISTORY OF WILDLAND FIRES

The SBCoFD maintains records of all wildland fires in Santa Barbara County. This section provides a statistical profile of wildland fires in the County from 1970 through 2009. The table below provides a summary of the total number of fires and total acres burned.

Recorded Fire Size Distribution 1970-2008

<u>YEAR*</u>	<u>Total Acres</u>	<u>300- 1000 Acres Burned</u>	<u>1,000- 5,000 Acres Burned</u>	<u>Over 5,000 Acres Burned</u>	<u>Total Fires</u>
1970	697	1	0	0	1
1971	17,529	2	1	1	4
1972	17,326	0	0	1	1
1975	3,398	1	2	0	3
1976	1,650	2	0	0	2
1977	20,685	1	1	2	4
1978	804	1	0	0	1
1979	15,587	4	5	0	9
1980	6,829	2	0	1	3
1981	37,366	4	4	3	11
1982	1,342	2	0	0	2
1983	6,593	3	1	0	4
1984	177,200	2	4	2	8
1987	1,117	3	0	0	3
1989	3,565	2	2	0	4
1990	6,997	4	1	0	5
1991	2,849	0	1	0	1
1992	2,929	2	1	0	3
1993	48,179	4	1	1	6
1994	58,982	1	3	1	5
1996	119,539	1	5	1	7
1997	63,780	11	4	1	16
1998	7,394	0	2	0	2
1999	59,989	2	3	1	6
2000	15,198	1	2	0	3
2002	7,503	0	0	1	1

Recorded Fire Size Distribution 1970-2008

<u>YEAR*</u>	<u>Total Acres</u>	<u>300- 1000 Acres Burned</u>	<u>1,000- 5,000 Acres Burned</u>	<u>Over 5,000 Acres Burned</u>	<u>Total Fires</u>
2004	8,645	1	1	1	3
2006	19,244	0	1	1	2
2007	242,393	4	0	1	5
2008	11,373	0	1	1	2
2009**	8,733	0	0	1	1
Total	2,918,012	157	120	80	357

*Excludes years with no fires over 300 acres

Source: Santa Barbara County Fire Department, 2009

**Data as of July 2009

Major fires (over 500 acres) in the County are frequently referred to by their designated fire name. The table of provided below includes a summary of major fires from 1922 through 2009. The SBCoFD maintains information on major fires for use in developing fire prevention and protection programs. This information is also used by the County Planning & Development and Public Works departments for use in the development review process.

Major Fires in Santa Barbara County

<u>Year</u>	<u>Fire Name</u>	<u>Acres Burned</u>
1922	Kelley Ranch	59,600
1923	Oso Canyon	70,000
1928	Aliso Canyon	42,880
1933	Indian Canyon	30,800
1950	San Marcos	9,500
1953	Big Dalton	73,450
1955	Refugio	84,770
1964	Coyote	67,000
1966	Wellman	93,600
1971	Romero	14,538
1977	Sycamore Canyon	805
1977	Hondo Canyon	8,087
1979	Spanish Ranch	1,190
1979	Eagle Canyon	3,765
1990	Paint	4,424
1993	Marre	43,864
1994	Oak Hill	2,130
1997	Santa Rosa	3,074
1999	Spanish	22,296
1999	Camuesa	180
2000	Harris	8,684
2002	Sudden	7,500
2004	Gaviota	7,197
2006	Perkins	14,923
2007	Zaca	240,207
2008	Gap	9,443
2008	Tea	1,940
2009	Jesusita	8,733

Major Fires in Santa Barbara County

<u>Year</u>	<u>Fire Name</u>	<u>Acres Burned</u>
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Source: U. S. Forest Service, Santa Barbara County Fire Department, 2009

As illustrated in the preceding table, although the County has a consistent history of frequent wildfires, the three year period from 2007 through 2009 proved to be particularly devastating. This brief time period included the County's largest acreage wildfire in recorded history, the Zaca Fire, followed by three fires, the Gap, Tea, and Jesusita Fires, which in acreage were much smaller but resulted in the highest level of structural damage in almost 20 years. The Tea and Jesusita fires combined destroyed more than 350 structures. These events illustrate the need for policies and actions which can help mitigate the threats of future wildland fires.

RESPONSIBLE AGENCIES AND HAZARD SEVERITY

Wildland fires frequently cover large areas and cross jurisdictional boundaries. Accordingly, most fires are fought by a combination of agencies. Wildland fire protection in California is the responsibility of either the local, State, or Federal government and virtually all fire-fighting agencies are signatories to mutual aid agreements. These documents represent legal arrangements between agencies and jurisdictions, where each entity agrees to cooperate with others when needed during fire or other hazardous events. Mutual aid agreements ensure that most, if not all, agencies within striking distance of a wildland fire can be involved in its suppression. A wildland fire event frequently resembles a "domino-effect," as the stations closest to a fire will deploy to the scene, and units from farther away will re-staff empty fire stations. As the fire grows, this re-deployment spreads further away from the center of activity. In some cases, equipment and staff will come from hundreds of miles away to support local firefighters. Use of mutual aid agreements frequently results in wildland fires being fought by agencies from every level of government.

FIRE RESPONSIBILITY AREAS

Despite the use of mutual aid agreements and other various mechanisms to increase the effectiveness of fire suppression resources, local, State, and Federal agencies do have legally defined areas of responsibility. According to the guidelines established by the California Disaster and Civil Defense Master Mutual Aid Agreement (November 1950), fire response agencies are required to be part of the first alarm to respond to fires in their designated responsibility area. Local Responsibility Area (LRA) fire protection is typically provided by city fire departments, fire protection districts, counties, and by Cal Fire if it is under contract to local government. For unincorporated areas of the County, as well as smaller cities with cooperative agreements with the County, fires in LRAs are generally the responsibility of the SBCoFD. However, Montecito and Carpinteria-Summerland Fire Protection Districts provide fire suppression within their respective communities.

Fire protection on State owned lands or State Responsibility Areas (SRA) is under the jurisdiction of Cal Fire. Privately owned land not covered by an established local fire department in SRAs is also the responsibility of Cal Fire. The County maintains a contract with the State of California to provide wildland fire protection in SRAs within the County. As such, the SBCoFD functionally operates as a unit of Cal Fire and is responsible for all California Fire Plan activities within the County.

Federal Responsibility Area (FRA) fire protection on federal land is addressed by a number of federal agencies, depending on which agency is designated as responsible for the land. In the County, the U.S. Forest Service is responsible for national forest land (which includes the Los Padres National Forest), while the United States Air Force is responsible for fire and emergency incidents that occur on Vandenberg Air Force Base (VAFB). VAFB encompasses 154 square miles in the northwestern portion of the County. As a federal military installation, the County is not required by State or Federal law to provide emergency response associated with potential fire hazards within VAFB¹⁴. However, emergency response agencies within the County maintain close contact with similar units posted to VAFB, and both the County and VAFB are subject to mutual aid agreements for fire prevention, rescue, and hazardous materials response.

According to Cal Fire, Santa Barbara County has 686,688 acres of SRA, the bulk of which is covered with fire prone vegetation. Additionally, there are 877,728 acres of FRA and 191,744 acres of LRA.

FIRE HAZARD SEVERITY ZONES

To assist each fire agency in addressing its responsibility area, Cal Fire utilizes a severity classification system to identify areas or zones of severity for fire hazards within the State. Cal Fire is required to map these zones for SRAs and identify Very High Fire Hazard Severity Zones (VHFHSZ) for LRAs¹⁵. In January 2008, Cal Fire updated these Fire Hazard Severity Zone (FHSZ) maps to reflect revised VHFHSZ for LRAs throughout the State. The County of Santa Barbara participated in this update to ensure the accuracy of mapped areas within the County's LRA.

FHSZ maps identify moderate, high, and very high hazard severity zones using a science-based and field-tested computer model that assigns a hazard score based on the factors that influence fire likelihood and fire behavior.¹⁶ Factors considered include fire history, existing and potential fuel (natural vegetation), flame length, blowing embers, terrain, and typical weather for the area. The maps are used to:

- Implement wildland-urban interface building standards;
- Create property development standards such as road widths, water supply, and signage for use in city or county general plans.
- Establish defensible space clearance requirements around buildings; and
- Provide natural hazard real estate disclosure at time of sale.

The Santa Barbara County FHSZ map is adopted through *County Code Chapter 10-Building Regulations* and used by several County departments for hazard planning, mitigation and response, land use planning, and in the development review process. Copies of the Santa Barbara County FHSZ map are available at the County's Planning & Development Department and the office or website of the State Fire Marshal.

HAZARD REDUCTION MEASURES

Control measures designed to reduce fire hazards within the County must be comprehensive rather than single purpose. Efforts should be aimed at minimizing the occurrence of fires and containing fires once they start, but equally important is reducing fuel loadings and exposure of vulnerable land uses and buildings to wildfires. The County's current efforts to reduce the hazards of wildland fires include the following major activities:

- Defensible Space Enforcement 365 Days a Year
- Development of Fuel/Fire Breaks
- Continual Use of Controlled Burning
- Implementation of Local Fire Hazard Reduction Projects
- Ongoing Fire Prevention Measures
- Monitoring Available Emergency Fire Services
- Establishment and Maintenance of Fire Management Plans
- Use of Evacuation Planning

The use of these measures assists the County in minimizing the threat wildland fires pose to its residents' lives and property. The development and use of each measure is further described below. These measures are broken into two broad categories: Planning and Implementation.^[NJE2]

PLANNING

Fire Emergency Services

The SBCoFD maintains a protocol for evaluating the adequacy of fire level of service to population ratios, response times, equipment condition levels, emergency service training and other relevant emergency service information consistent with State standards. The SBCoFD is also a partner in the Santa Barbara Operational Area-All Risk Mutual Aid Plan which is an extension of, and supportive document to, the California Fire Service and Rescue Emergency Mutual Aid Plan. Additionally, the County has adopted the Standardized Emergency Management System for responding to large scale disasters requiring a multi-agency response. The County has also established fire defense zones for critical public safety and emergency service assets at risk in the absence of responding fire forces. Finally, the SBCoFD maintains a protocol

for wildfire defense zones for emergency services which include fuel breaks, back fire areas, and staging areas that support safe fire suppression activities.

Fire Management Plans

The SBCoFD is responsible for maintaining and updating the Santa Barbara County Communities Wildfire Protection Plan (CWPP). The CWPP fulfills the State requirements of a Unit Fire Management Plan for entities such as Santa Barbara County that act as an agent to Cal Fire. The CWPP also fulfills regulatory compliance of the 2003 Healthy Forests Restoration Act which requires the development of community wildfire protection plans for local jurisdictions. The Plan describes the SBCoFD planning process; administrative activities required for wildfire protection; identification of wildfire hazards; completion of a wildfire risk assessment; and identification of at-risk communities and target planning blocks. Copies of the County's current CWPP are available upon request from SBCoFD offices.

Evacuation Plans

The SBCoFD does not prescribe fixed emergency evacuation routes for fire events due to the variability and transformative nature of fires. However, SBCoFD does maintain Standard Operating Procedures which outline the protocols for fire-induced evacuations based on individual emergency scenarios. During fire emergencies in LRAs, the SBCoFD is responsible for assessing hazard areas to identify evacuation requirements. For areas that are imminently affected by fire an order to evacuate may be issued. For areas where a fire is expected to affect residents, but the threat is not imminent, a warning to evacuate may be issued. In SRAs, County agencies and departments cooperate with Cal Fire to assure that residents are evacuated when necessary.

At a Countywide level, law enforcement agencies including the Sheriff's Department, the California Highway Patrol, and local police departments are responsible for implementing emergency evacuations. In addition, public safety agencies comply with a Unified Command protocol to determine appropriate evacuation routes based upon conditions of the emergency event, established Memoranda of Understanding/Cooperative Agreements, and Standard Operating Procedures in place for the respective responding agencies. County public safety agencies maintain emergency response protocols that include criteria and guidelines for the declaration, communication, and implementation of evacuation orders or warnings. The County also maintains protocols designed to assure that during an evacuation: routes remain clear, traffic moves smoothly, routes/areas are isolated as appropriate, and the risk of accidents on roadways is minimized.

The County employs a reverse 9-1-1 system to notify the public of the need to evacuate a specific area. Additionally, a Memorandum of Agreement is in place between the County, VAFB, and the City of Lompoc for use of a dedicated base telephone and radio communication system in the event of fire or other emergency in this region of the County.

In the event of a large scale fire, the Santa Barbara County Office of Emergency Services (SBC OES) may implement the Santa Barbara County Operational Area Multi-Hazard Functional Plan (MHFP) which outlines protocols for emergency planning, management, and response for the County operational area. Additionally, OES may activate the SBC Emergency Operations Center (EOC) to coordinate multi-agency emergency response efforts for a fire event in compliance with the State Standardized Emergency Management System (SEMS) protocols. The use of these plans and protocols are critical in administering numerous aspects of emergency response, including evacuations.

IMPLEMENTATION MEASURES

Fuel Breaks

Due primarily to environmental concerns the fire department no longer maintains a system of permanent fire breaks in wilderness areas. Instead the fire department maintains fire access roads which can serve as fire breaks in addition to providing emergency ingress and egress. However, the SB CoFD, CalFire, and the US Forest Service will create new fire breaks as part of the emergency response to large wildland fires. Ultimately, these fire breaks are allowed to be re-colonized by native vegetation.

Controlled Burning

Another fire prevention measure that has been used successfully in many areas of the state is controlled burning. Within the County, private organizations such as the Range Improvement Association (an organization of ranchers in the central and northern portion of the County and in the Cuyama Valley) submits plans to the SB CoFD for controlled burns aimed mainly at restoring lands for grazing. Fuelbreaks are established as part of the controlled burns. The SB CoFD assists by reviewing the burn proposals, inspecting the fuel breaks, and making personnel available to assist the Association during the burns. Additionally, the SB CoFD, US Forest Service, and fire protection officials on Vandenberg Air Force Base conduct controlled burns within their respective jurisdictions. These controlled burns provide a reduction in hazardous fuel loads, provide defensible space for communities at risk, and help rejuvenate natural ecosystems which are dependent upon fire activity to maintain a healthy balance.

General Fire Prevention Measures

Other fire prevention measures that the County has adopted are derived mainly from the Uniform Fire Code, the Public Resources Code, Government Code, and the California Fire Code. Currently, the County has the authority to regulate the location of bulk storage tanks such as those used to store gas and oil. In addition, bonfires and outdoor rubbish fires are allowed only under permit; incinerator burning is restricted to certain hours; and spark arrestors are required on all chimneys. Open flame devices are prohibited in hazardous fire areas except by permit. Also, in fire hazard areas, fuel reduction zones 30 to 100 feet wide around structures are required in order to minimize the risk of property damage and to improve accessibility in case of fire.

Local Fire Hazard Reduction Projects

The SBCoFD is responsible for the development and implementation of fire control measures within LRAs and, by contract with the State of California, for SRAs of the unincorporated areas of the County. This section provides an overview of adopted SBCoFD fire prevention and protection control measures which comply with the requirements of State law. In addition, the SBCoFD offers additional recommended, non-mandatory control measures designed to assist the community in fire prevention and protection. For a complete list of all current SBCoFD prevention and protection control measures, contact the County Fire Department.

The SBCoFD is responsible for the development and implementation of countywide control measures designed to reduce fire hazards. These control measures may take the form of projects, activities, and infrastructure which reduce the threat of factors such as fuel loading, slope, and urbanization that compound existing fire hazards. Activities may include:

- The removal of dense vegetation from neighborhoods, roadways, and transition zones;
- Construction of fire prevention and protection facilities;
- Clearing fuel breaks; and
- Clearing drainage areas.

SBCoFD staff work with homeowner associations, Fire Safe Councils, the Range Improvement Association, and other interested groups to develop and complete these fire hazard reduction projects.

In post-fire burn areas, the SBCoFD may develop fire recovery and maintenance plans to facilitate comprehensive recovery and fire safe maintenance of an area. Working in collaboration with the SBCoFD, County Public Works Department staff identifies areas of flood and landslide vulnerability related to post-wildfire conditions and develops and implements projects designed to mitigate flood and landslide hazards. These projects include, but are not limited to: drainage crossing debris maintenance, control of storm runoff in burn areas, and revegetation of burn areas. In open space areas, the SBCoFD conducts prescribed burning, clears fuel breaks, and performs vegetation thinning and removal. The SBCoFD also works with the County's Planning & Development Department to ensure that land use programs and policies do not conflict with fire prevention and protection requirements of State law. These programs and policies seek to limit the threat from fire hazards to the maximum extent feasible while balancing the need for responsible levels of development.

LAND USE PLANNING

DEVELOPMENT IN HAZARDOUS AREAS

In areas of high or extreme fire hazard, fire protection measures alone will not solve the problem. Land use planning must recognize the hazards and treat them as constraints in the planning process. Under the California Environmental Quality Act, local County action is directed to achieve a balance between natural processes and urban uses in order to create and maintain conditions of productive harmony. The law requiring a Safety Element in general plans repeats the same theme in relation to the concept of acceptable and unacceptable risk. Consequently, the County has ample legal authority to regulate land use and development in order to reduce fire hazard.

Land development in fire hazard areas will not only increase the degree of risk by bringing more people into a hazardous area, but also may increase the hazard by altering the vegetation and landform. On private lands within the National Forest, this problem is complicated by the fact that the Forest Service is not chartered and normally is not equipped to protect structures, its primary mission in this area being wildland fire prevention and control.

The County uses planning to minimize these fire hazards by requiring elevated development standards within especially vulnerable areas. These standards include the requirement for fire resistive construction materials, development of adequate emergency access routes, access to fire suppression water supplies (fire hydrants or water tanks), and zones of vegetation clearance around structures. The implementation of these standards will help minimize, but not entirely eliminate, the hazards from wildland fires.

FIRE DEVELOPMENT STANDARDS

State Law¹⁷ also requires the use of ignition resistant building methods and materials as a fire prevention control measure for new buildings located in any Fire Hazard Severity Zone within SRAs, any local agency VHFHSZ, or any Wildland-Urban Interface Fire Area designated by the enforcing agency. Planning & Development Department staff refers to the most current and adopted County of Santa Barbara Fire Hazard Severity Zone maps to identify the Fire Hazard Severity Zones and Wildland-Urban Interface Fire Areas for the unincorporated County.

SBCoFD Fire Prevention Division maintains Development Standards which serve as control measures designed to promote fire protection and comply with State law.¹⁸ The Development Standards, codified in County Code Chapter 15-Fire Prevention, cover a range of development topics required for new construction. The table below provides a summary of Development Standards 1 through 7. These Development Standards are updated by the SBCoFD as needed to ensure compliance with State law. To secure copies of all current Development Standards in their entirety, contact Santa Barbara County Fire Department.

<u>Santa Barbara County Fire Department Development Standards¹⁹</u>	
<u>Development Standard #1 Private Roadway and Driveway Standards</u>	<u>Establishes minimum standards for driveways and private roads. These standards outline minimum road widths and vegetation clearance designed to provide fire vehicles access to residences and associated structures.</u>
<u>Development Standard #2 Fire Hydrant Spacing and Water Flow Rates</u>	<u>Establishes fire hydrant spacing, discharge outlet configuration and flow rate requirements. Flow rate standards are used when calculating peakload water supply requirements for one-and-two family dwelling units.</u>
<u>Development Standard #3 Stored Water Fire Protection Systems Serving One and Two-Family Dwellings</u>	<u>Establishes standards for stored water fire protection systems serving one and two-family dwellings.</u>
<u>Development Standard #4 Automatic Fire Sprinkler System Standards</u>	<u>Establishes standards for automatic fire sprinkler systems.</u>
<u>Development Standard #5 Automatic Alarm System Standards</u>	<u>Establishes standards for automatic alarm systems.</u>
<u>Development Standard #6 Vegetation Management Plan</u>	<u>Establishes standards for vegetation management plans.</u>
<u>Development Standard #7 Access Gates</u>	<u>Establishes standards for gates on private roads and private driveway access points.</u>
<u>Source: County Fire Department, 2009</u>	

Government Code §65302(g)(1) requires that the Safety Element address peakload water supply requirements and minimum road widths and clearances around structures, as those items relate to identified fire hazards. The Development Standards adopted by the County Fire Department comply with these requirements of State law. SBCoFD Standard #1 provides minimum standards for road widths and vegetation clearance on driveways and private roads designed to provide fire vehicles access to residences and associated structures. Additionally, SBCoFD requires fire apparatus access roads comply with minimum widths pursuant to the California Fire Code §503.2.1. Development Standards for road widths for fire emergencies are maintained and updated as needed by SBCoFD to comply with State law. SBCoFD Development Standards #2 and #3 provide guidelines for stored water fire protection systems, fire hydrant spacing and water flow rate standards for one-and-two family dwelling units. Development Standards for water storage and delivery for fire emergencies are maintained and updated as needed by SBCoFD to comply with State law.

DEFENSIBLE SPACE/CLEARANCE AROUND STRUCTURES

Establishing defensible space or clearances around structures is a powerful tool for preventing fire hazards and is therefore required by both County regulations and State law.²⁰ Cal Fire defines defensible space as:

The area within the perimeter of a parcel where basic wildfire protection practices are implemented, providing the key point of defense from an approaching wildfire

*or escaping structure fire. The area is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures.*²¹

SBCoFD has recently amended County Code 15-Fire Prevention and SBCoFD Development Standards to comply with State law.²² Adherence to SBCoFD Development Standard #6 meets defensible space requirements of the Public Resources Code and Government Code. The Development Standard requires completion of a vegetation management plan for new construction of, or in some cases the expansion of existing, residential structures. This plan describes all actions that will be taken to prevent fire from being carried toward structures. SBCoFD will continue to update County Codes and Fire Development Standards to maintain consistency with any changes in State law.

FIRE GOALS, POLICIES, AND IMPLEMENTATION MEASURES

This section profiles the goals, policies, and implementation measures adopted by the County which demonstrate compliance with fire prevention and protection requirements outlined in State law.

Goals: Fire Protection and Prevention

<u>Goal 1</u>	<u>Protect the community from unreasonable risks associated with the effects of wildland and urban fires pursuant to Government Code 65302 (g)(1).</u>
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<u>Policies</u>	<u>Fire Protection</u>	<u>Implementation Measures</u>
<u>Fire Policy 1</u>	<u>Continue to pursue and promote County fire prevention programs and control measures.</u>	<u>Fire Implementation Measure 1- Maintain and Enforce Fire Prevention Programs and Plans</u> <u>Fire Implementation Measure 2- Continue Development Review Process</u> <u>Fire Implementation Measure 3- Enforce Title 24 of the California Code of Regulations, Part 9 California Fire Code</u> <u>Fire Implementation Measure 4- Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code</u> <u>Fire Implementation Measure 5- Maintain and Enforce County Code Chapter 10-Building Regulations</u> <u>Fire Implementation Measure 6- Maintain and Implement the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan</u> <u>Fire Implementation Measure 8- Maintain and Enforce County, Carpinteria, and Montecito Fire Department Development Standards where applicable.</u> <u>Fire Implementation Measure 15- Maintain and Enforce County Code Chapter 15-Fire Prevention</u>
<u>Fire Policy 2</u>	<u>The County shall use California Department of Forestry and Fire Protection-Fire Hazard Severity</u>	<u>Fire Implementation Measure 5- Maintain and Enforce County Code Chapter 10-Building Regulations</u>

<u>Policies</u>	<u>Fire Protection</u>	<u>Implementation Measures</u>
	<u>Zones to determine appropriate construction materials for new buildings in State Responsibility Areas (SRA), local agency Very-High Fire Hazard Severity Zones and designated Wildland-Urban Interface areas pursuant to the California Code of Regulations Title 24, Part 2, California Building Code.</u>	<u>Fire Implementation Measure 4- Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code</u> <u>Fire Implementation Measure 15- Maintain and Enforce County Code Chapter 15-Fire Prevention</u>
<u>Fire Policy 3</u>	<u>Fire Hazard Severity Zone Maps, as maintained by the California Department of Forestry and Fire Protection, shall be used to illustrate the official areas of Very High Fire Hazard Severity Zones (VHFHSZ) in the Local and State Responsibility Areas.²³</u>	<u>Fire Implementation Measure 7-Enforce County of Santa Barbara maps for Very High Fire Hazard Severity Zones (VHFHSZ).</u> <u>Fire Implementation Measure 5- Maintain and Enforce County Code Chapter 10 Building Regulations</u> <u>Fire Implementation Measure 15- Maintain and Enforce County Code Chapter 15-Fire Prevention</u>
<u>Fire Policy 4</u>	<u>To reduce the potential for fire damage, the County shall continue to require consistency with County Fire Department Development Standards pursuant to the California Fire Code, Public Resource Code §4291, and Government Code §51175-51188.</u>	<u>Fire Implementation Measure 5- Maintain and Enforce County Code Chapter 10 Building Regulations</u> <u>Fire Implementation Measure 8- Maintain and Enforce County, Carpinteria, and Montecito Fire Department Development Standards where applicable.</u> <u>Fire Implementation Measure 15- Maintain and Enforce County Code Chapter 15-Fire Prevention</u>
<u>Fire Policy 5</u>	<u>The County shall continue to require defensible space clearance around all structures in unincorporated Local Responsibility Areas pursuant to Public Resource Code §4291, and Government Code §51175-51188.</u>	<u>Fire Implementation Measure 8- Maintain and Enforce County, Carpinteria, and Montecito Fire Department Development Standards where applicable.</u> <u>Fire Implementation Measure 15- Maintain and Enforce County Code Chapter 15-Fire Prevention</u>
<u>Fire Policy 6</u>	<u>The County should continue to collaborate with the California Department of Forestry and Fire Protection in the revision of Fire</u>	<u>Fire Implementation Measure 7-Enforce County of Santa Barbara maps for Very High Fire Hazard Severity Zones (VHFHSZ).</u>

<u>Policies</u>	<u>Fire Protection</u>	<u>Implementation Measures</u>
	<u>Hazard Severity Zone Maps.</u>	<u>Fire Implementation Measure 5- Maintain and Enforce County Code Chapter 10-Building Regulations</u>
<u>Fire Policy 7</u>	<u>The County should strive to maintain partnerships with tribal governments, state, local, and federal agencies to identify, prioritize, and implement fire prevention and protection measures in the County.</u>	<u>Fire Implementation Measure 12- Continue to Encourage Interagency Agreements</u>
<u>Fire Policy 8</u>	<u>The County Office of Emergency Services (OES) shall continue coordinating emergency planning for the Santa Barbara Operational Area pursuant to the California Emergency Services Act of 1970.</u>	<u>Fire Implementation Measure 12- Continue to Encourage Interagency Agreements</u> <u>Fire Implementation Measure 13- Maintain and Enforce County Code Chapter 12- Civil Defense and Disaster</u> <u>Fire Implementation Measure 14- Enforce the California Emergency Services Act</u>
<u>Fire Policy 9</u>	<u>The County shall minimize the potential effects of fire hazards through the development review process pursuant to State law.</u>	<u>Fire Implementation Measure 2- Continue Development Review Process</u> <u>Fire Implementation Measure 3- Enforce Title 24 of the California Code of Regulations, Part 9 California Fire Code</u> <u>Fire Implementation Measure 4- Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code</u> <u>Fire Implementation Measure 5- Maintain and Enforce County Code Chapter 10-Building Regulations</u> <u>Fire Implementation Measure 6- Maintain and Implement the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan</u> <u>Fire Implementation Measure 8- Maintain and Enforce County, Carpinteria, and Montecito Fire Department Development Standards where applicable.</u> <u>Fire Implementation Measure 15-</u>

<u>Policies</u>	<u>Fire Protection</u>	<u>Implementation Measures</u>
		<u>Maintain and Enforce County Code Chapter 15-Fire Prevention</u>
<u>Fire Policy 10</u>	<u>The County should reference the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan when considering measures to reduce potential harm from fire-related activity to property and lives.</u>	<u>Fire Implementation Measure 6-Maintain and Implement the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan</u>

The implementation measures listed below demonstrate how the policies of this Element are carried out through local ordinances, actions, procedures, or programs. A timeline for implementation and policy linkage is also provided.

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
<u>Ongoing</u>	<u>1. Maintain and Enforce Fire Prevention Programs and Plans</u>	<p><u>Continue to pursue and promote the following fire prevention programs:</u></p> <ul style="list-style-type: none"> • <u>County Fire Department Places of Assembly: General Regulations and Guidelines</u> • <u>County Fire Department Red Flag Alert Plan</u> • <u>Regular inspection and code enforcement by County Fire Department.</u> • <u>Santa Barbara County Wildfire Action Plan</u> • <u>Living with Fire Homeowners Guide</u> • <u>Tent and Canopy Permit Program</u> • <u>County Fire Development Standards</u> • <u>County Code and ordinance development</u> • <u>County Fire Hazardous materials process and inspection</u> • <u>Training and planning</u> • <u>County Fire investigation and data analysis</u> 	<u>Fire Policy 1</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
		<ul style="list-style-type: none"> • <u>Public education and information</u> • <u>Santa Barbara County Communities Wildfire Protection Plan</u> 	
<u>Ongoing</u>	<u>2. Continuation of Development Review Process</u>	<u>Continue County Planning and Development referral of development proposals to the County Fire Department for review and comment. The review process shall consider the provision of access to lands for fire fighting, street access to structures, peakload water supply, fire prevention programs, and the enforcement of County ordinances, State building and fire codes.</u>	<u>Fire Policy 1</u>
<u>Ongoing</u>	<u>3. Enforce Title 24 of the California Code of Regulations, Part 9 California Fire Code</u>	<u>Continue enforcement of the California Fire Code (CFC), which provides specifications and standards for fire safety and prevention. The Code specifies the quantity of water needed for fire protection, early warning devices, automatic detection and reporting devices, and smoke detectors as required preventative measures designed to reduce the risk of fire.</u>	<u>Fire Policy 1</u>
<u>Ongoing</u>	<u>4. Enforce Title 24 of the California Code of Regulations, Part 2 California Building Code</u>	<u>Continue enforcement of the California Building Code (CBC) which provides minimum standards for building design, construction techniques, wiring standards, building materials, roofing specifications and fire detection/warning devices to minimize risk of structural fire damage. The CBC requires the use of ignition resistant building methods and materials as a fire prevention control measure for 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.</u>	<u>Fire Policy 1, 6</u>
<u>Ongoing</u>	<u>5. Maintain and Enforce County Code Chapter 10-Building Regulations</u>	<u>Maintain and continue enforcement of County Code Chapter 10-Building Regulations which provide minimum building standards to safeguard life, limb,</u>	<u>Fire Policy 1, 2, 4, 6</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
		<u>health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of buildings and structures within the County. Chapter 10 includes adoption of the California Department of Forestry and Fire Protection Very High Fire Hazard Severity Zone (VHFHSZ) maps which identify areas of medium, high and very high fire hazard.</u>	
<u>Ongoing</u>	<u>6. Maintain and Implement Multi-Hazard Mitigation Plan</u>	<u>Maintain and continue implementation of the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan which focuses on the assessment of identified risks and implementation of loss reduction measures to insure critical County services and facilities survive a disaster. Topics covered in the plan include flood, wildfire, earthquake, coastal storm surge/tsunami, landslide/coastal erosion and dam failure in the unincorporated areas of the County. Each topic has been assessed to identify, screen and rank hazards; assess the vulnerability of hazards and capabilities for response to and reduction of hazards. Additionally, a series of goals, objectives, and actions to address each hazard is included.²⁴</u>	<u>Fire Policy 1, 10</u>
<u>Existing</u>	<u>7. Enforce Very High Fire Hazard Severity Zones (VHFHSZ).</u>	<u>Continue to enforce use of California Department of Forestry and Fire Protection Very High Fire Hazard Severity Zone (VHFHSZ) maps which identify areas of medium, high and very high fire hazard.</u>	<u>Fire Policy 3, 4, 6, 7</u>
<u>Ongoing</u>	<u>8. Maintain and Enforce County, Carpinteria, and Montecito Fire Department Development Standards where applicable.</u>	<u>Continue to maintain and enforce County, Carpinteria, and Montecito Fire Department Development Standards required to protect the community from unreasonable risk associated with urban and wildland fires pursuant to Title 24 of the California Code of Regulations, Part 9 California Fire Code.</u>	<u>Fire Policy 1, 4, 5</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
<u>Ongoing</u>	<u>12. Encourage Interagency Agreements</u>	<u>Continue coordinating with other local, regional, tribal and state agencies (inclusive of federal land managers from the National Forest and representatives from Vandenberg Air Force Base) to develop and maintain mutual aid agreements.</u>	<u>Fire Policy 7, 8</u>
<u>Ongoing</u>	<u>13. Maintain and Enforce County Code Chapter 12-Civil Defense and Disaster</u>	<u>Continue enforcement of County Code Chapter 12-Civil Defense and Disaster provides for the direction of the County emergency organization (Office of Emergency Services); preparation and implementation of plans for the protection of persons and property in the event of an emergency; and the coordination of emergency functions of the County with all other public agencies, corporations, organizations and affected private persons.</u>	<u>Fire Policy 8</u>
<u>Ongoing</u>	<u>14. Enforce California Emergency Services Act</u>	<u>Continue enforcement of California Emergency Services Act of 1970 which confers responsibility to the State of California to mitigate the effects of natural, man-made, or war-caused emergencies which result in conditions of disaster or in extreme peril to life, property, and the resources of the State.</u>	<u>Fire Policy 8</u>
<u>Ongoing</u>	<u>15. Maintain and Enforce County Code Chapter 15-Fire Prevention</u>	<u>Continue to maintain and enforce County Code Chapter 15-Fire Prevention which includes adoption of the California Fire Code, fire Development Standards, standards for weed abatement, fire protection mitigation fees, Carpinteria-Summerland Fire Protection District fire protection mitigation fee ordinance, Orcutt Fire Protection District fire protection mitigation fees, Goleta Fire Protection District fire protection mitigation fees, automatic fire sprinkler systems, fees, violations, Fire Department administration of hazardous materials/wastes laws, and fireworks.</u>	<u>Fire Policy 1,4</u>

CONCLUSION

Wildland fire hazards represent an important constraint that must be considered in the land use planning and development process in order to reduce the risk of occurrence, the potential damage, and the threat of injury or death. Programs for fuel management and hazard reduction, as well as for fire prevention and control, will play an important role in the County's efforts to cope with its wildland fire problem.

VI. FIRE HAZARD AND FIRE SERVICES

INTRODUCTION

Every summer Santa Barbara County residents live with a wildfire problem that is unique in the world. On dry, extremely windy summer days, the woodland, brush land, and chaparral and grasslands become volatile tinder boxes. A carelessly built campfire, a spark from a chimney or from an off road vehicle, a fallen power line, or an arsonist's torch can start a fire that will spread across thousands of acres in thirty to forty hours, if unchecked. In these circumstances, the threat to life and property is enormous. Only because California has the best financed and equipped fire protection organization in the world has the potential destruction from wildfires been minimized. The threat, however, persists. If present fire management practices continue, County residents can expect fewer but larger fires to occur in the future. Unfortunately, most of the County lies within an area of extreme fire hazard, and very few areas are immune from wildland fire hazards.

To understand Santa Barbara's problem, first the causes of wildland fires and the County's fire history are reviewed. Then the fire hazard severity classification system developed by the State Division of Forestry is explained, and its application to the County is described. Finally, the topics of fire prevention and control are analyzed in relation to land use planning.

CAUSES OF WILDLAND FIRES

Over 90 per cent of wildland fires are caused by man. Each year only a very few fires are started by lightning throughout the state. By far the greatest number of fires are the result of human carelessness and insensitivity to wildland fire danger, especially during the critical days of the year when the fire problem is most acute. Arson is a second important cause of wildfires, accounting for 22 per cent of all fires recorded state-wide as well as for 22 per cent of all fires burning more than 5,000 acres, termed "conflagrations" by the State Division of Forestry. Despite the criminal penalties, the incidence of deliberately set fires has been rising state-wide at a rate greater than that of population growth. In 1970, incendiarism and arson are estimated to have caused \$25 million in property loss, \$5 million in additional fire suppression costs, and several lives lost, according to the State Resource Agency's Task Force on California's Wildland Fire Problem.

Power line failure has been cited as another important cause of California fires that burned over 5,000 acres. The high winds that can blow a fire out of control so quickly also can bring down power lines or cause breaks in distribution lines. While more than 23 per cent of conflagrations in the state are considered to be

~~caused by power line failures, only 3 per cent of all fires are attributed to this cause.~~

~~Two other major causes of wildland fires are debris burning and “machine use”. More than 6 per cent of all conflagrations statewide originated with debris burning in incinerators, at dump sites, or at land development or construction sites. The category of “machine use” includes off-road recreation vehicles, construction equipment, and other power-driven equipment used in industry, agriculture, and recreation. Together, machines and mechanical equipment caused close to 16 per cent of the state’s conflagrations in the past 10 years (Task Force on California’s Wildland Fire Problem, 1972). Finally, it has been noted that over one third of all wildland fires originate alongside roads and highways, probably as a result of cigarettes or matches being thrown from cars and trucks.~~

~~Wildland fires also can originate in developed areas. A leading cause of fires in suburban and rural areas has been children playing with matches. Bonfires or rubbish burning or sparks from chimneys are often cited as sources of wildland fires. During critical fire weather, a small structural fire can spread quickly to adjacent brush and timber lands.~~

~~HISTORY OF WILDLAND FIRES~~

~~For statistical purposes, the U.S. Forest Service records all fires that burn on or pose a threat to National Forest lands or other lands under protection, and that require suppression effort to control.~~

~~From 1911 to 1973, approximately 525 fires were recorded by the Forest Service that occurred within the Santa Barbara County. Of this total, 67 burned 300 acres or more. The average size of these fires in this period was 11,580 acres. However, the average size during the first 30 years was 7,740 acres, while in the period since 1934 the average size was 16,390 acres - more than double the previous average. During the latter time period, the annual fire frequency dropped by over 60 per cent. Over the full 63 year period, one fire occurred on the average every year. However, during the first 30 years approximately 1.6 fires occurred each year while during the last 33 years the rate fell to 0.55 fires per year. Table I summarizes the recorded fire size distribution and historical trends in Santa Barbara County, according to the classifications of the California Division of Forestry.~~

~~If the data on individual fires are examined closely, an increase in the frequency of fires burning more than 30,000 acres also is evident. From 1911 to 1931, three fires burned over 30,000 acres. In the next 20-year period only one fire over 30,000 acres was recorded, while in the last 23-year period four fires burned more than 30,000 acres each. These data indicate that in the absence of small fires the likelihood of large fires (conflagrations over 5,000 acres) increases because the brush and hardwood age, thereby increasing hazardous fuel loadings on hills and mountainsides and in canyons.~~

TABLE 1. RECORDED FIRE SIZE DISTRIBUTION AND HISTORICAL TRENDS IN SANTA BARBARA COUNTY

Time Period	Acreage Burned	Number of Fires by Class				Total
		300-1,000 Acres Burned	1,000-5,000 Acres Burned	over 5,000 Acres Burned		
1911-13	17,060	8	1	1	10	
1914-16	2,460	4	-	-	4	
1917-19	3,135	1	-	-	2	
1920-22	83,880	2	3	3	8	
1923-25	92,475	1	4	2	7	
1926-28	72,690	2	6	3	11	
1929-31	8,053	1	1	1	3	
1932-34	30,800	-	-	1	1	
1935-37	4,800	-	1	-	1	
1938-40	7,965	-	2	-	2	
1941-43	2,000	-	1	-	1	
1944-46	14,325	-	2	1	3	
1947-49	0	-	-	-	0	
1950-52	13,920	-	1	1	2	
1953-55	158,694	-	-	2	3	
1956-58	0	-	-	-	0	
1959-61	800	-	-	-	1	
1962-64	68,685	-	-	1	3	
1965-67	98,065	-	-	1	3	
1968-70	0	-	-	-	0	
1971-73	15,638	-	-	1	2	
1974-76	1,515	-	-	-	1	
1977	12,630	1	1	1	3	
Total	709,560	24	28	19	71	

Source: U.S. Forest Service

~~Major historic fires burning more than 20,000 acres are listed in Table 2, along with the total acreage burned.~~

TABLE 2. MAJOR HISTORIC FIRES IN SANTA BARBARA COUNTY

<u>Year</u>	<u>Fire</u>	<u>Acres Burned</u>
1922	Kelley Ranch	59,600
1923	Oso Canyon	70,000
1928	Aliso Canyon	42,880
1933	Indian Canyon	30,800
1953	Big Dalton	73,450
1955	Refugio	84,770
1964	Coyote	67,000
1966	Welman	93,600

Source: U.S. Forest Service

~~In contrast to these large fires, the Sycamore fire of July 26-27, 1977 only burned 805 acres. Yet the cost was over \$30 million, with 216 homes destroyed and 64 others damaged. The December 20-21, 1977 Vandenberg AFB fire burned over 10,000 acres and caused three deaths. Wildland fires in Santa Barbara County clearly have had a tremendous impact over the past 60 years. If present trends continue, the County is likely to experience fewer, larger fires in the future. However, opportunities exist for the County to influence these trends, and these will be discussed in the section on Control Measures. First, a system for identifying fire hazard areas in the County will be presented.~~

~~FIRE HAZARD AREAS~~

~~To assist land use planners to identify areas of high fire hazard, the State Division of Forestry published a report on Fire Hazard Severity Classification System for California's Wildlands in 1973. The Division's systematic approach to the wildland fire problem was utilized in conjunction with the County Fire Department's and U.S. Forest Service's maps of fire hazard areas in preparing the Countywide Fire Hazard map for this report. The availability of more detailed data on vegetation and slope permitted a finer delineation of areas of fire hazard than had been possible previously.~~

~~Three principal factors determine an area's fire hazard severity classification: fuel loading, fire weather, and slope. The first factor, fuel loading, takes into account the age, type, and density of vegetation as well as the mix of living vegetation and deadwood or debris, and usually is represented by an index of tons per acres for~~

~~each age-type class. Because County-wide data on age and density of vegetation are not available, vegetation alone was taken as the proxy measure for potential fuel loading in preparing the Fire Hazards map. Three levels of fuel loading severity in the County were assumed. Grass lands, with an assumed average fuel loading of 2.2 tons per acre, were classified as light and assigned a fuel severity index of 1. Scrub brushlands and light chaparral have been combined in order to form the second category of medium fuels, with an assumed average fuel loading of 17.3 tons per acre and a fuel severity rating of 8. The heavy fuels include scrub oak, woodlands, and forest, with an assumed average fuel loading of over 36 tons per acre and a fuel severity index of 16. The estimates of average fuel loading for major vegetative types were based on a study of fuel loading in southern California conducted by the State Division of Forestry in 1955. The specific vegetative types studied and their average fuel loadings correlate closely with the vegetative types found in Santa Barbara County that have been previously listed in the chapter on Ecological Systems in the Conservation Element.~~

~~The fire weather concept is characterized by an index representing the expected number of critical fire weather days. The State Division of Forestry's historical record for each of its 151 Fire Danger Rating Areas provides background data from which these index numbers were derived. Of the three classes of critical fire weather frequency in California, only the top two occur in Santa Barbara County. In areas ranked as Class II, the critical fire weather frequency is termed high because from 1 to 9.5 critical fire weather days per year are likely to occur. In any area where the annual average of critical fire weather days exceeds 9.5, the fire weather severity is judged to be extreme, and a Class III designation is assigned. In the County, areas falling in Class II, which are indicated on the Fire Hazard map, include lands mapped on 10 U.S. Geological Survey 7.5 minute quadrangles: Carpinteria, Santa Barbara, Goleta, Dos Pueblos, Tajiguas, Gaviota, Hildreth, Little Pine Mountain, Big Pine Mountain, and Santa Maria. The remainder of the County lies in Class III.~~

~~In conjunction with the California Interagency Wildland Fire Danger Rating System, Fire Occurrence Indices and Burning Indices were developed by the State Division of Forestry for each of the state's Fire Danger Rating Areas and combined into a daily Fire Load Index. The cutoff point between the High (or Class II) and the Extreme (or Class III) critical fire weather frequency classes was assigned after careful analysis by the Division of Forestry's experts. It turns out that in Class III areas the average Fire Load Index is five times greater than the average Fire Load Index in Class II areas, a clear indication of the greater hazard associated with a Class III designation.~~

~~Topography, the final factor included in the fire hazard severity classification system, is important not only because fires spread more quickly on steeper slopes, but also because fire control is so much more difficult in rugged terrain.~~

~~Generally, fires spread more rapidly up a slope than down a slope, except in rare instances when the fuel-loading and fire weather combine to produce conditions where fires spread equally quickly up and down slopes. Slope factors in the context of the fire hazard severity classification system modify critical fire weather frequency values and fuel loading values; the greater the slope, the greater the multiplier of severity.~~

~~All other factors being equal, a slope from 40 to 60 per cent would have a multiplier of 1.6, and a slope over 60 per cent would have a multiplier of 2.0 for purposes of computing a Fire Hazard Severity Index.~~

~~The results of applying this rating system to the County are shown on the Fire Hazards map. Three areas of fire hazard are identified. Areas exposed to moderate fire hazard include existing agriculture, grasslands with a Class II or High Critical Fire Weather Frequency classification, and grasslands with a Class III or Extreme Critical Fire Weather Frequency classification and where the predominant slope is less than 40 per cent. Scrub and woodlands with less than 40 per cent slope that fall within the boundaries of the Critical Fire Weather Frequency Class II were classified as high fire hazard areas. Except for existing urban areas, which were not included in the analysis of wildland fire hazards, all of the remaining land in the County is exposed to extreme fire hazard.~~

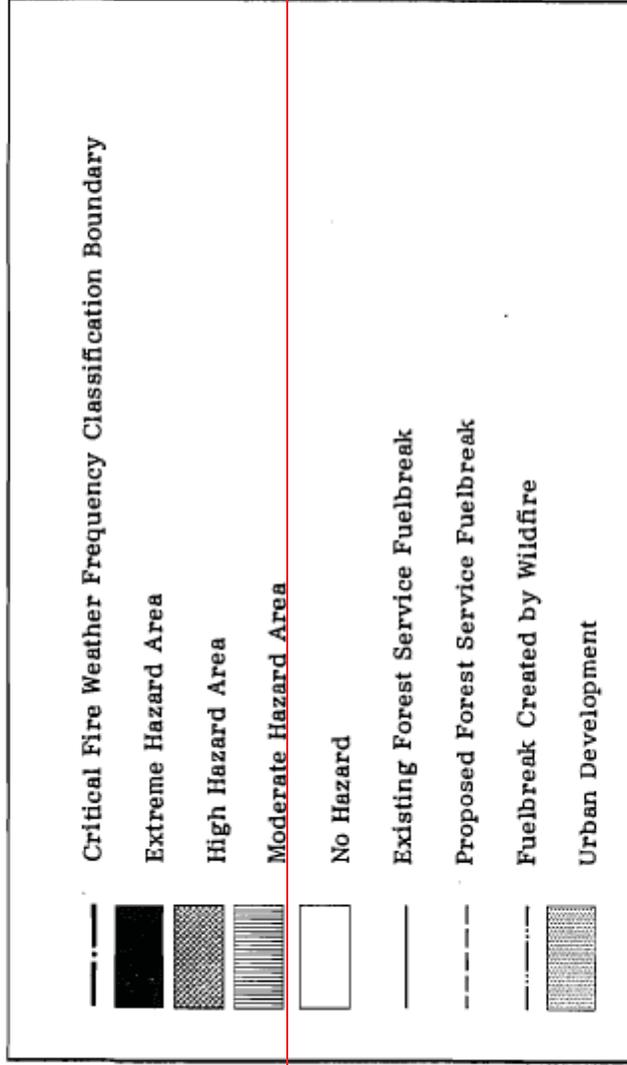
~~According to the State Division of Forestry's fire severity classification system, much more of the County is exposed to fire hazards than had been indicated previously on the County Fire Department's map of "high hazard areas". On the County's official map, all of the land outside National Forest boundaries lying north of the Santa Ynez River and northwest of Buellton and Solvang was excluded from the high hazard areas. However, on the County wide Fire Hazards map, it can be seen clearly that most of this area has been classified in the extreme fire hazard category, with the remaining non-urban portions indicated either in the high fire hazard or moderate fire hazard category.~~

CONTROL MEASURES

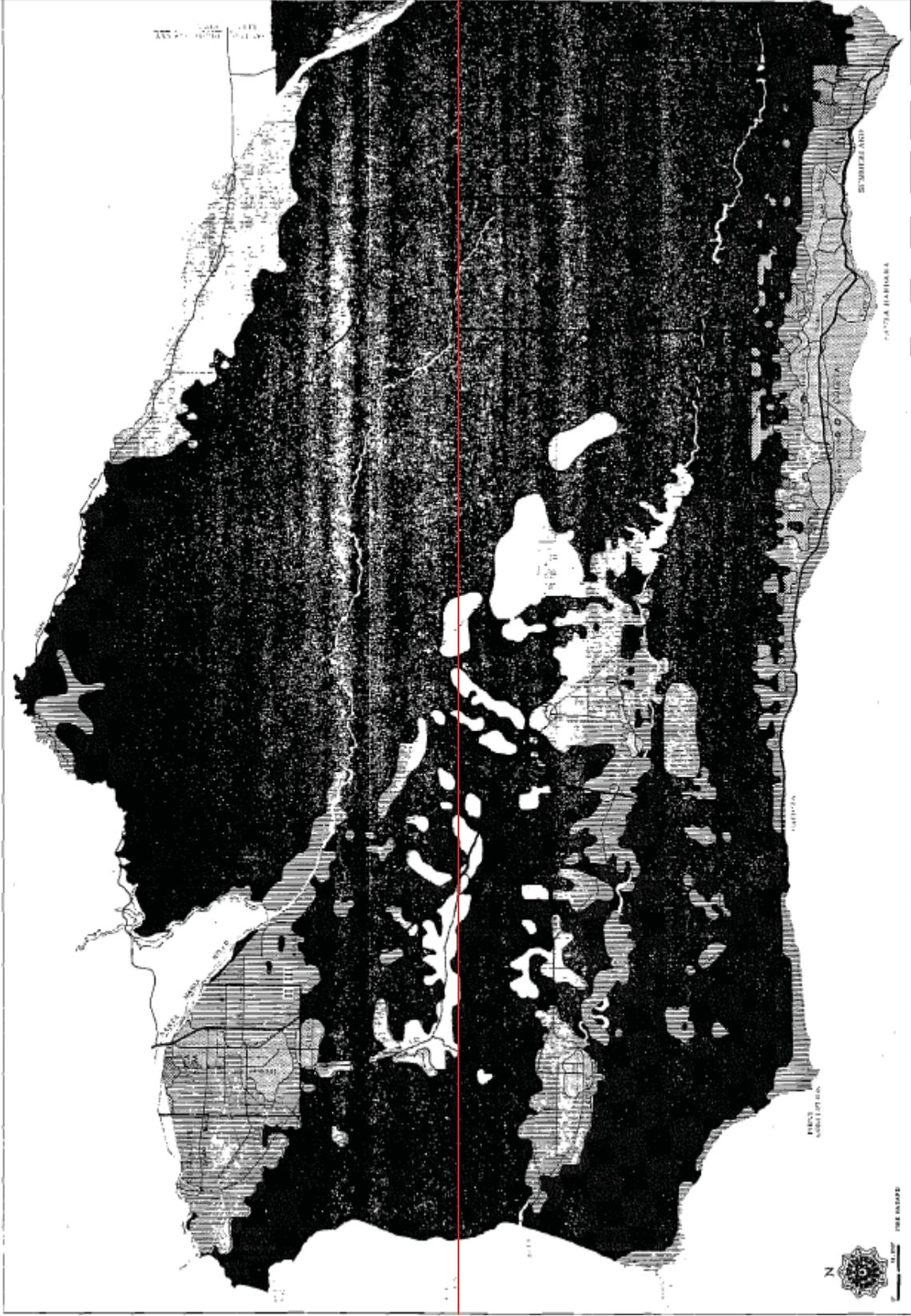
~~Control measures designed to reduce fire hazards within the County must be comprehensive rather than single purpose. Efforts should be aimed at minimizing the occurrence of fires and containing fires once they start, but equally important is reducing fuel loadings and exposure of vulnerable land uses and buildings to wildfires. A program to cope with the wildland fire problem should include five major activities: fire prevention, fire control, fuel management and hazard reduction, land use planning, and building codes, and construction materials requirements.~~

~~One important control measure designed to reduce the rate of spread and extent of wildland fires is the fuel break or firebreak system. The existing and proposed fuelbreak systems developed by the U.S. Forest Service for the National Forest are shown on the Fire Hazards map. Over 87 miles of fuel breaks, of which 17 miles on the South Coast have been created by wildfires, currently are established.~~

Santa Barbara County Fire Hazard



**FIRE HAZARD
SANTA BARBARA COUNTY**



~~The Forest Service eventually intends to add 217 miles of fuel breaks. Outside of the National Forest, the County does not have an organized system of fuel breaks primarily because of complex multiple ownership patterns and difficulties in securing owners' cooperation, according to the County Fire Prevention Officer. However, a significant number of fuelbreaks have been established by the initiative of some of the large property owners.~~

~~Other fire prevention measures that the County has adopted are derived mainly from the Uniform Fire Code. Currently, the County has the authority to regulate the location of bulk storage tanks such as are used to store gas and oil. In addition, bonfires and outdoor rubbish fires are allowed only under permit, incinerator burning is restricted to certain hours, and spark arrestors are required on all chimneys. Open flame devices are prohibited in hazardous fire areas except by permit. Also, in fire hazard areas, firebreaks 30 to 100 feet wide around structures are required in order to minimize the risk of property damage and to improve accessibility in case of fire. The width of the firebreak is set by the County Fire Chief in each case depending on the degree of hazard.~~

~~Another fire prevention measure that has been used successfully in many areas of the state is controlled burning. Currently, there is no County-directed program of control led burns to reduce fire hazard. However, much has been accomplished through the activities of the Range improvement Association, an organization of ranchers in the central and northern portion of the County and in the Cuyama Valley. The Association submits plans to the County Fire Department for control led burns aimed mainly at restoring lands for grazing. Fuelbreaks are established as part of the controlled burns. The County Fire Department assists by reviewing the burn proposals, inspecting the fuel breaks, and making personnel available to assist the Association during the burns.~~

~~The concept of fire and fuel management incorporating control led burning has been extensively studied by research foresters of the U.S. Forest Service. One program, outlined by Dr. Charles W. Philpot at a symposium in 1973, involves a five step approach to fire management. He proposed that a program of fire management be instituted in conjunction with multiple use planning for recreation and open space functions, as well as for fire management, in order to achieve an acceptable and realistic level of fire occurrence and fire size based on ecological, social, and economic considerations. The intent of this program is to break the large continuous areas of chaparral fuels into mosaics of different aged chaparral plant communities by a series of prescribed burns. Thus most of the area would be maintained in the chaparral ecosystem. Type conversions and fuel breaks would only be constructed as appropriate to contain the prescribed fires and provide wildfire control. Once this pattern has been achieved, it would be possible to set large planned fires with loosely defined, but predictable boundaries. These fires would be subject to moderate, but not stringent~~

~~suppression measures as long as they met the goals and objectives of the fire management plan. At the same time, responsible public agencies would continue to improve their suppression and prevention capabilities. Fuelbreak systems would be established to segregate the age type class boundaries.~~

~~The result of this system would be to increase the frequency of fires burning over 100 acres, but to reduce the occurrence of conflagrations after the transitional period during which the program would be instituted. The chaparral ecosystem would be maintained throughout the County, and consequently, watershed damage and flood potential conceivably could be reduced. Dr. Philpot's proposal, which involves acceptance of more fires in the County, should be analyzed in detail to determine whether the potential benefits to the County would outweigh the costs of implementation.~~

~~In areas of high or extreme fire hazard, fire protection measures alone will not solve the problem. Land use planning must recognize the hazards and treat them as constraints in the planning process. Under the California Environmental Quality Act, public action is directed to achieve a balance between natural processes and urban uses in order to create and maintain conditions of productive harmony. The law requiring a Safety Element in general plans repeats the same theme in relation to the concept of acceptable and unacceptable risk. Consequently, the County has ample legal authority to regulate land use and development in order to reduce fire hazard.~~

~~Land development in fire hazard areas will not only increase the degree of risk by bringing more people into a hazardous area, but also may increase the hazard by altering the vegetation and landform. Whenever brush land is cleared and the debris pushed into piles on slopes or in canyons, the fire hazard during critical fire weather periods is far greater than it has been previously, because the fuel load has been concentrated. On private lands within the National Forest, this problem is complicated by the fact that the Forest Service is not chartered and normally is not equipped to protect structures, its primary mission in this area being wildland fire prevention and control.~~

~~Within the National Forest boundaries, development on privately held lands poses a particularly difficult problem. In that portion of the National Forest known as the Santa Barbara Front lying north of the South Coast plain and below the crest of the Santa Ynez Mountains, the issue is especially acute because more than 28,000 acres of mainly contiguous lands within the National Forest boundaries are privately owned. Historically, this mix of public and private ownerships developed when the Forest Service established "Forest Preserves" that include both publicly and privately held lands within the boundaries of areas designated for watershed protection. As the boundaries were adjusted over time~~

~~and as acquisition programs proceeded, this problem generally diminished in importance. Today, mixed ownership remains a critical issue only where development pressures persist within the National Forest boundaries. If there had been no development on these lands, in all likelihood the Forest Service would continue to offer the same level of wildland fire protection that it has in the past. Unfortunately, this is not the case. Development on private lands within the National Forest boundaries has occurred in the San Marcos Pass area, around Painted Cave, and at other locations north of Santa Barbara, Montecito, and Carpinteria. If development within the National Forest boundaries continues at the same rate as it has in the recent past, the Forest Service has indicated that it might relinquish its responsibility for wildlands fire protection on the Santa Barbara Front, in which case the responsibility would fall on the County Fire Department.~~

~~To alleviate the potential threat that further land development within the National Forest would pose, not only by accelerating the fire flood cycle but also by increasing erosion, stream encroachment, and adverse ecological impacts, several proposals have been put forward to the U.S. Forest Service and to the County. One alternative, advanced in the 1972 report Santa Barbara Front Development Economic Study, would be for the Forest Service to acquire all of the private land over 30 percent slope lying within the current National Forest boundary approximately 23,000 acres. In support of this concept, the Board of Supervisors went on record as encouraging federal purchase of watershed lands within the National Forest. Another approach would be to impose zoning and other development regulations that take into account not only the extreme fire hazard, but also other environmental factors such as flood control and seismic, geologic, and soils problems, along with commonly accepted principles of watershed protection. It also has been proposed that the Forest Service acquire "development rights" from the property owners, as has been done in other National Forest areas, to preserve important scenic values. Clearly, whatever approach that finally is accepted by the County and the Forest Service must take into account the extreme fire hazard on the Santa Barbara Front. The Implementation Program will evaluate alternative development regulations for private lands within the National Forest with a view toward minimizing fire hazard.~~

~~Short of prohibiting all land development in areas of extreme fire hazard, the most reasonable solution to this problem, both within the National Forest and elsewhere in the County, is to require that all development proposals be accompanied by a plan showing the measures that will be taken to meet County regulations to minimize fire hazard. Issues that should be addressed include access to the site, water supply, buffer strips and firebreaks around structures, and a contingency plan covering human activities during periods of critical fire weather. Detailed requirements should be worked out jointly by the County and responsible state and federal agencies. The recommendations of the Task Force~~

~~on California's Wildland Fire Problem provide useful guidelines for prescribing a specific set of criteria.~~

~~In any area of high or extreme fire hazard the cumulative impacts of land development have to be assessed, as well as the individual impacts of specific proposals. In this sense, the issue really is, what is a minimum acceptable area-wide density of human activity throughout the year as well as during critical fire weather periods. Some concerned people have contended that no development, or, at most, no more than one dwelling for each hundred acres should be permitted in areas of extreme fire hazard, while others have advocated densities of one dwelling for each forty acres or one for each twenty acres. Because no definitive studies of this subject have been made and because the circumstances vary greatly from case to case, no overall density standards can be prescribed for extreme fire hazard areas.~~

~~When an urban area is adjacent to an area of high or extreme fire hazard, a buffer strip or greenbelt several hundred feet wide can provide the means to contain fires that originate in developed areas and to prevent them from reaching the wildlands. In areas of moderate fire hazard, the greenbelt concept is equally applicable. Greenbelts already exist in the extensive moderate hazard areas used for irrigated agriculture.~~

~~Buffer strips can be used, along with the fuelbreak system, for recreation trails and to serve other open space functions, as long as the level of activity anticipated would not increase the fire hazard. During periods of critical fire weather, many activities might have to be curtailed. Opportunities for multiple use of buffer strips and fuelbreaks will be explored in the Open Space Element and the Recreation Element.~~

CONCLUSIONS AND RECOMMENDATIONS

~~Wildland fire hazards represent an important constraint that must be considered in the land use planning and development process in order to reduce the risk of occurrence, the potential damage, and the threat of injury or death. Programs for fuel management and hazard reduction, as well as for fire prevention and control, will play an important role in the County's efforts to cope with its wildland fire problem. To further this aim, the County and the cities should adopt the following policies on fire hazards and undertake the recommended studies:~~

- ~~○ The County-wide Fire Hazards map should be adopted as the official "hazardous fire areas" map prescribed in County Ordinance 2528 because it shows fire hazard severity in the County more precisely than the present map.~~

~~Specific regulations for land use and development in fire hazard areas should be revised to reflect the degree of severity in each of the areas indicated on the map.~~

~~○ All land development (including grading and clearing) in high fire hazard or extreme fire hazard areas should be subject to conditional use permit regulations, and review by the County Fire Prevention Officer and, where appropriate, by responsible federal or State agencies.~~

~~○ The County should require that land development proposals in each of the fire hazard areas shown on the County-wide Fire Hazards map be accompanied by detailed plans for fire prevention and control prepared in accord with prescribed County regulations. Separate criteria for the preparation of these plans should be prescribed for each of the three fire hazard areas in consultation with responsible federal and State agencies. Once these criteria have been adopted, existing development should be evaluated to determine whether it conforms with the regulations. Owners whose property does not comply with the regulations should be required to make necessary improvements within a reasonable time, or to submit an alternate plan for fire prevention and control that is acceptable to the County Fire Prevention Officer.~~

~~○ The County should require community firebreaks under Section 21-47 of the Subdivision Regulations in areas of extreme fire hazard rather than leave them up to the discretion of the subdivider. Criteria for judging the adequacy of community firebreaks should be set by the County Fire Prevention Officer.~~

~~○ The County should initiate a study in cooperation with the U.S. Forest Service to determine what limits should be placed on private development within National Forest boundaries, and to evaluate alternate means to reduce the extent of private inholdings and to phase out existing development if necessary to reduce fire hazard to an acceptable level. Until the study has been completed, all development (including grading and clearing) in these areas should be subject to review under the conditional use permit procedure previously recommended.~~

~~○ The County should initiate a study in cooperation with the U.S. Forest Service and the California Division of Forestry to determine whether a program of fire and fuel management incorporating controlled burns and a County-wide system of fuelbreaks that would be designed to maintain the chaparral ecosystem would be beneficial to the County. If this program proves feasible, an implementation program also should be prepared.~~

~~○ The County should review, and, if necessary, revise the Fire Hazards map at least once every two years to take into account new data on recent burns, age-type class boundaries for vegetation, and vegetation density.~~

VII. FLOOD CONTROL²⁵

INTRODUCTION

Along with daily exposure to several natural hazards, including seismic activity and wildland fires, the County experiences periodic exposure to flooding hazards. The risks of hazardous flooding in the County are particularly acute in years with heavy precipitation combined with areas of recent fire activity. To address potential flood hazards this section includes a discussion of the following issues:

- The Location and History of Flood Hazards in the County
- Common Types of Flood Hazards in the County
- Measures Used to Mitigate Potential Flood Hazards
- The County's Flood Goals, Policies, and Implementation Measures

Ultimately, the purpose of this discussion is to supply County staff, residents, and other related agencies with information necessary to reduce the impacts of one of the most common and disruptive natural hazards in the region.

SETTING AND HISTORY

AREAS COMMONLY SUBJECTED TO FLOODING

As can be expected, hazardous flood events commonly occur in close proximity to rivers, creeks, and other smaller drainage corridors. Within the County, localized drainage problems result from increased flow as well as ponding, which cause flash flooding, inundation, and other flooding problems.²⁶ Other high-hazard flood zones are concentrated in coastal areas, including bays, coastal inlets and estuaries, and in watershed areas connecting local mountain ranges to the coastal region where flash floods may occur.

The cause and extent of flood hazards differ between geographic regions in the County. Flood hazards in the County's northern valleys (Santa Ynez, Lompoc, and Santa Maria) are typically associated with two major rivers, the Santa Maria River and the Santa Ynez River, as well as their major tributaries. Watersheds in the northern part of the County begin in the higher mountain ranges and broaden into level valley floors. These drainages are characterized by longer duration but less intense storms than the southern coastal areas, creating wide meandering streams and broad floodplains.

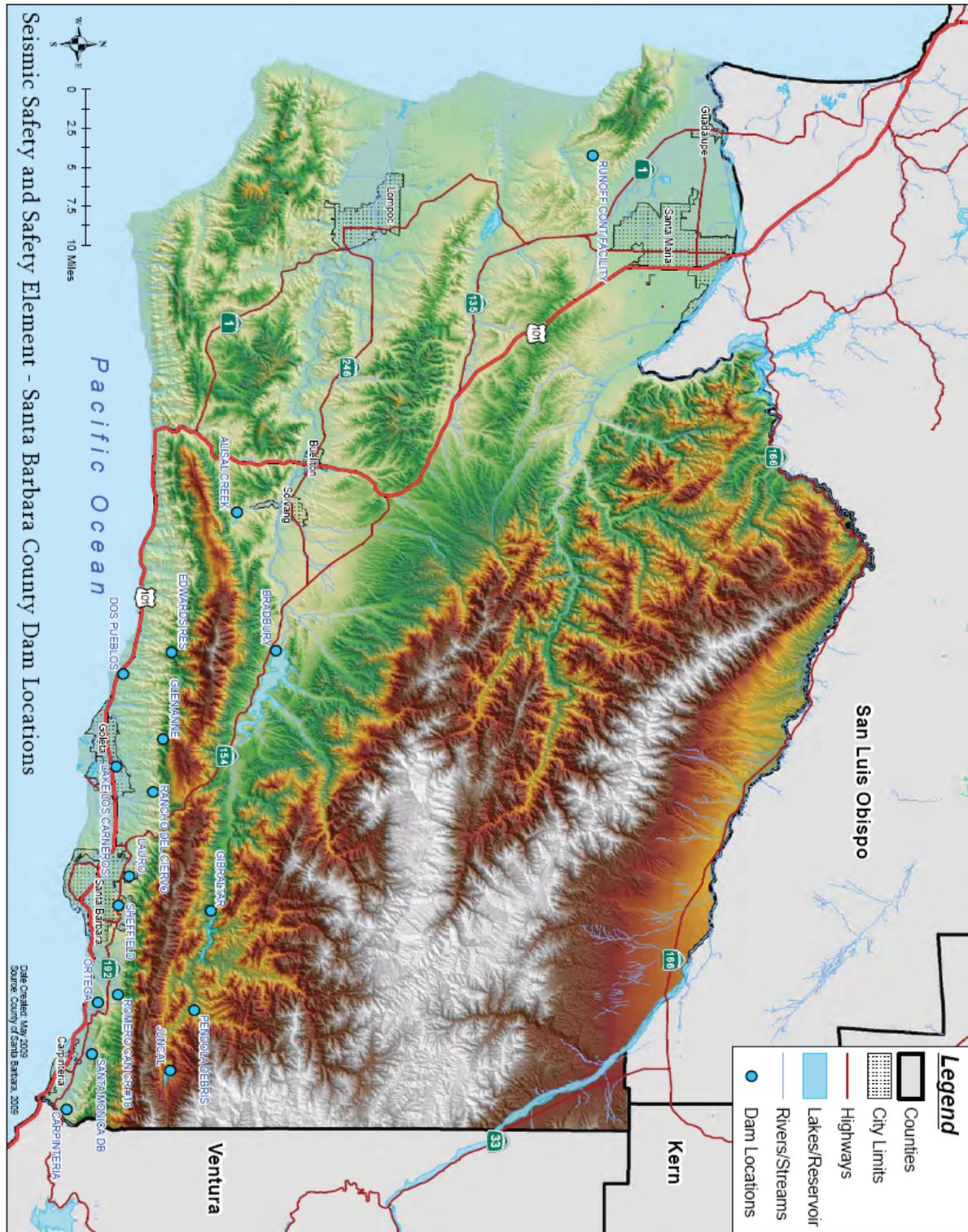
Flooding hazards along the South Coast are primarily due to storm surge and high water flows in the numerous smaller streams which discharge directly to the Pacific Ocean. These streams are subject to high flows following periods of intense precipitation, and the flood waters resulting from these high flows can impair the

suitability of certain lands for various uses. Drainages in the South County are characterized by high intensity, short duration runoff events. These types of events can cause inundation along banks, debris that clogs culverts, erosion, and loss of channel capacity. One of the principal drainage problem areas in the County is a low-lying coastal area in the City of Santa Barbara.

Other possible locations for flood events include areas downstream from the County's various dams. As discussed in more detail later in this section, the inundation or outright failure of a dam could produce a brief but devastating flood event. The table below lists the location and management agency for the dams associated with the County's four largest reservoirs. Failure of these dams could pose a danger to populated areas, roads and highways, public facilities, agricultural crops, and other land uses.

<u>Santa Barbara County Reservoirs</u>		
<u>Reservoir</u>	<u>Location</u>	<u>Managing Agency</u>
<u>Bradbury Dam</u>	<u>Located along the Santa Ynez River (includes Lake Cachuma).</u>	<u>Bureau of Reclamation</u>
<u>Gibraltar Dam and Gibraltar Lake</u>	<u>Located along the Santa Ynez River, upstream of Bradbury Dam.</u>	<u>City of Santa Barbara</u>
<u>Juncal Dam</u>	<u>Located along the Santa Ynez River, includes Jameson Lake.</u>	<u>Montecito Water District</u>
<u>Twitchell Dam and Twitchell Reservoir</u>	<u>Located on the Cuyama River, upstream of its confluence of the Sisquoc River, which form the Santa Maria River (Twitchell Reservoir is empty much of the time, as it was constructed primarily to control the flow of the Cuyama River).</u>	<u>Bureau of Reclamation</u>

In addition to these four large dams, many smaller dams, and the Santa Maria Levee, are located in the unincorporated County. Twitchell Dam is located in the northwestern area of the County, while Bradbury Dam and Alisal Dam are located in the central region. Gibraltar Dam and Juncal Dam are located in the south eastern County. Smaller dams, including Dos Pueblos, Glen Anne, Rancho Del Ceirvo, and Ortega are all located closer to the City of Santa Barbara. Other small dams are located within, and are operated by, the City of Santa Barbara or other incorporated cities. The map located below illustrates dam locations, lakes, reservoirs, rivers, and streams within the County. County staff also references Federal Emergency Management Agency (FEMA) and the California Emergency Management Agency (Cal EMA) dam inundation zone maps when considering emergency planning and response, during the development review process, and for land use planning.



Santa Barbara County Dam Locations

HISTORICAL FLOOD EVENTS

River, Creek, and Drainage Course Inundation

Flooding is a major hazard in the County, with riverine flooding and flash flood events being historically the most damaging²⁷. The 1952 floods on the South Coast destroyed fifty homes along Mission Creek and caused large-scale evacuations, and eight of the fourteen significant County floods between 1862 and 1998 received federal disaster declarations. Most damaging among these was flooding in 1995, which produced record flows on major channels in Goleta, the City of Santa Barbara, Montecito, and Carpinteria; this flooding activity caused \$50 million in damages. In 1998, many areas were reported to receive over 600 percent of normal February rainfall. Both in 1995 and 1998, transportation throughout the County was disrupted through the closure of roads, train service, and the Santa Barbara Airport.²⁸

Dam Failure

Dam failure has the potential to cause significant loss of life and property or environmental damage. The County has experienced one incident of catastrophic dam failure, which occurred in the community of Mission Canyon. The Sheffield Dam, built in 1917, failed in 1925 during a 6.3 magnitude earthquake, releasing 30 million gallons of water.²⁹ The dam failed due to liquefaction of the underlying soil bed. This event is particularly unique as it is one of the few instances in the United States when a dam failed during an earthquake; as a result it is used as a case study for designing dams which are reinforced to resist seismic activity.

FLOOD HAZARDS

Although the severity and type of flood hazards can vary greatly based on variables such as topography, soil type, depth of the water table, and microclimate, the County is subject to four major flood events:

- High Flow Rates in Rivers, Creeks, and other Drainages
- Pooling and Inundation
- Storm Surge
- Dam Failure

In addition to these major flooding hazards, high levels of precipitation can compound other hazards such as liquefaction and high groundwater. These other secondary hazards are discussed in more detail in the Seismic Safety and Safety Element's Geologic Hazards Section.

River, Creek, and Drainage Course Inundation

According to a recent analysis using FEMA's Hazards U.S. (HAZUS) modeling methods, a 100-year flood event in Santa Barbara County could produce over \$600 million in residential property loss, \$4 billion in commercial property loss, and directly affect 34,000 people. In the same analysis, risk exposure of critical infrastructure and services was estimated at over \$4 billion, including damages to airports, bridges, emergency response facilities, hospitals, transportation (roads, rail) and schools.³⁰ The potential for riverine flood events are most likely to occur in close proximity to major rivers, such as the Santa Maria River and Santa Ynez River, and in the vicinity of major urban creeks such as Orcutt Creek and Mission Creek.

Flood Water Pooling

In addition to the flood problems resulting from the inability of stream channels to convey the full amount of flood flows, localized drainage problems exist in areas where water ponds and is unable to escape rapidly enough to prevent inundation. Among the principal drainage problem areas is a low-lying coastal area, south of Highway 101 between Castillo and Garden Streets, in the City of Santa Barbara.

Storm Surge/Tsunami

Flooding hazards can result from surging ocean levels that are caused by major storm events or seismically induced tsunamis. A majority of the unincorporated County's coastline includes topography (such as coastal bluffs) and a lack of direct coastal development which helps to reduce the potential impacts of these events. However, areas of the South Coast, in close proximity to the City of Santa Barbara, include the combination of relatively level coastal topography and high levels of structural development which is vulnerable to this particular hazard. For further discussion of storm surge and tsunami hazards refer to the Geologic Hazards Section of this element.

Dam Failure

Dam inundation may be caused by dam failure or overtopping (due to severe rains or snow melt) or a levee failure that releases a large amount of water in a limited drainage basin. Dams may also fail as a result of structural damage caused by seismic events, erosion, structural design flaws, rapidly rising floodwater, landslides flowing into a reservoir, or malicious actions. A Safety Evaluation of Existing Dams (SEED) report released in 1983 contained seismotectonic studies which suggested that Twitchell Dam is in an area of potential seismic activity³¹. It is located near "blind thrust" faults capable of quakes of 7.0 magnitude or more. Since this report was released, the dam has been seismically reinforced so that the safety and classification grade of the dam is satisfactory. In 2005 and 2006, the Santa Barbara County Civil Grand Jury conducted an investigation of the County Public Works Department to determine the effectiveness of the Department's flood control programs in protecting the County.³² The investigation revealed that the U.S. Bureau of Reclamation, responsible for oversight of all the federal

dams in the County, responds quickly and efficiently when a problem is identified. The Bureau of Reclamation has improved systems to ensure that peak releases during heavy inflows do not result in excessive downstream flows, which reduces the possibility of inundation from overflows.

Former Flood Hazard Categories

To assess the extent of constraint that flood hazards impose upon land use development, the Seismic Safety and Safety Element (originally adopted in 1979) classified lands within the County into eleven categories. These categories were:

- Category 1: Stream Channels
- Category 2: Floodway Area
- Category 3: 100-Year Flood Plain with Proposed Improvements Constructed
- Category 4: 100-Year Flood Plain with Existing Improvements Only
- Category 5: Standard Project or 500 Year Flood Plain
- Category 6: Local Drainage Problem Areas with Proposed Improvements Constructed
- Category 7: Local Drainage Problem Areas with Existing Improvements Only
- Category 8: No Flood Hazard
- Category 9: Areas Which May Be in 500-Year or Standard Project Flood Plain
- Category 10: Unknown Flood Hazard
- Category 11: Unknown Drainage Hazard

These categories do not include the most current FEMA information and therefore they no longer provide valid identification of potential hazards, and are thus obsolete. However, since these former hazard categories are discussed throughout other elements of the County's Comprehensive General Plan they have been retained within this section for general reference purposes only. These obsolete hazard categories have been effectively replaced by FEMA Flood Zone Designations, examples of which are provided later in this section.

MITIGATION OF FLOOD HAZARDS

The extent of damage from flooding can be mitigated in multiple ways, including identification and avoidance of flood prone areas, planning emergency response and short term reactions to flood hazards, and implementing flood control projects. These primary means for reducing flood hazard exposure are summarized below.

IDENTIFICATION AND AVOIDANCE OF FLOOD HAZARDS

A substantial amount of flood related impacts can be mitigated by the proper identification and avoidance of areas which are routinely subjected to flooding. This involves a significant amount of data collection and analysis which yields maps that identify areas most likely to become inundated with flood water. Delineating these areas

is especially valuable for isolating new structural development from flood events. In accordance with this effort, the County uses the flood maps and management plans to limit which, if any, structures may be constructed in flood prone areas. The methods by which the County implements this mapping and land use planning process are discussed below.

Floodplain Management

The County Public Works Department is responsible for providing floodplain management for the unincorporated areas of the County. The Floodplain Management Program contains several components including, but not limited to:

- Compliance with the National Flood Insurance Program;
- maintenance and enforcement of the floodplain management ordinance;
- construction and maintenance of flood control projects; and
- floodplain planning.

This section discusses various components of the County's floodplain management program related to flood hazards, land use planning, development, and emergency response.

The National Flood Insurance Program

In 1979, the County became a participating community in the National Flood Insurance Program (NFIP). The NFIP provides County property owners and renters with federally backed flood insurance, reduces flood damage through a mandatory local floodplain management ordinance, and identifies and maps County flood hazards.³³ The NFIP requires the County to maintain a floodplain management ordinance based upon current FEMA Flood Insurance Rate Maps (FIRM). These maps identify Special Flood Hazard Areas (SFHA), or land subject to inundation by a flood that has a 1% probability of being equaled or exceeded in any given year.³⁴ FIRMs are used by the County to show the limits of mapped flood hazard areas, illustrate insurance zone designations used in the determination of flood insurance rates and premiums, and provide minimum regulatory 100-year flood elevations on which the County floodplain management ordinance is based. FIRMs can also be used to affect the design and construction of new buildings, the improvement and repair of existing buildings, and additions to existing buildings. In coastal areas FIRMs show the expected elevation of flood waters and wave effects during a 100-year flood, called Base Flood Elevations (BFEs).³⁵ The table located below provides a summary of FEMA flood zone designations and associated risk areas.³⁶

To secure a copy of the most recent Santa Barbara County Flood Insurance Rate Maps, visit the FEMA Map Service Center website or the County Department of Public Works.

FEMA Flood Zone Designations	
<u>Moderate to Low Risk Areas</u>	
<u>In communities that participate in the National Flood Insurance Program flood insurance is available to all property owners and renters in these zones:</u>	
<u>Zone</u>	<u>Description</u>
<u>B, C, and X</u>	<u>Areas outside the 1% annual chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is not required in these zones.</u>
<u>High Risk Areas</u>	
<u>In communities that participate in the National Flood Insurance Program mandatory flood insurance purchase requirements apply to all of these zones:</u>	
<u>Zone</u>	<u>Description</u>
<u>A</u>	<u>Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.</u>
<u>AE, A1-A30</u>	<u>Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. In most instances, base flood elevations derived from detailed analyses are shown at selected intervals within these zones.</u>
<u>AH</u>	<u>Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.</u>
<u>AO</u>	<u>River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.</u>
<u>AR</u>	<u>Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.</u>
<u>A99</u>	<u>Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.</u>
<u>High Risk - Coastal Areas</u>	
<u>In communities that participate in the National Flood Insurance Program mandatory flood insurance purchase requirements apply to all of these zones:</u>	
<u>Zone</u>	<u>Description</u>
<u>V</u>	<u>Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year</u>

FEMA Flood Zone Designations	
	<u>mortgage. No base flood elevations are shown within these zones.</u>
<u>VE, V1 - 30</u>	<u>Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.</u>
<u>Undetermined Risk Areas</u>	
<u>Zone</u>	<u>Description</u>
<u>D</u>	<u>Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.</u>

Floodplain Management Ordinance

As a condition of participation in the National Flood Insurance Program (NFIP), the County adopted County Code Chapter 15A-Floodplain Management and Chapter 15B-Development Along Watercourses, which meet the requirements of the NFIP and the Federal Emergency Management Agency for development in flood-prone areas.

The purpose of County Code Chapter 15A-Floodplain Management (commonly referred to as the Floodplain Management Ordinance) is to promote public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas with provisions designed to:

Protect human life and health; minimize expenditure of public money for costly flood control projects; minimize the need for rescue and relief efforts associated flooding and generally undertaken at the expense of the general public; minimize prolonged business interruptions; minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard; help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas; insure that potential buyers are notified that property is in an area of special flood hazard; and to ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.³⁷

County Code Chapter 15B-Development Along Watercourses outlines the controls which the County imposes on development adjacent to watercourses in unincorporated areas. These controls are necessary to prevent undue damage or destruction of development by flood waters and to prevent development on one parcel from causing undue detrimental impact on adjacent or downstream parcels.³⁸ These Codes are amended as needed to maintain compliance with state and federal regulations.

County Code Chapters 15A-Floodplain Management and 15B-Development Along Watercourses are required to comply with State law.³⁹ The following table provides a summary of how the County Floodplain Management Ordinance and County Floodplain Management Program specifically meet the applicable Government Code sections.

<u>Floodplain Management Ordinance-Regulatory Consistency</u>			
<u>Government Code §65302(g)(2)(A) Identify information regarding flood hazards, including, but not limited to, the following:</u>	<u>County Code Chapter 15A-Flood Plain Management</u>	<u>County Code Chapter 15B-Development Along Watercourses</u>	<u>County Public Works Department Floodplain Management Program</u>
<u>(i) Flood hazard zones. As used in this subdivision, "flood hazard zone" means an area subject to flooding that is delineated as either a special hazard area or an area of moderate or minimal hazard on an official flood insurance rate map. The identification of a flood hazard zone does not imply that areas outside the flood hazard zones or uses permitted within flood hazard zones will be free from flooding or flood damage.</u>	<u>Section 15A-5 Definitions.</u> <u>Section 15A-7 Basis for establishing the areas of special flood hazard.</u>	<u>Section 15B-2 Definitions</u>	
<u>(ii) National Flood Insurance Program maps published by FEMA.</u>	<u>Section 15A-5 Definitions.</u> <u>Section 15A-7 Basis for establishing the areas of special flood hazard.</u>		
<u>(iii) Information about flood hazards that is available from the United States Army Corps of Engineers.</u>			<u>County Public Works and Planning and Development Departments utilize the current and available flood hazard maps from the U.S. Army Corps of Engineers when considering flood hazards and proposed development.</u>
<u>(v) Dam failure inundation maps prepared pursuant to Section 8589.5 available from the Office of Emergency Services.</u>			
<u>(vi) Awareness Floodplain Mapping Program maps and 200-year flood plain maps that are or may be available from, or accepted by, the Department of Water Resources.</u>			<u>County Public Works and Planning and Development Departments utilize the current and available dam inundation maps from the Federal Emergency Management Agency (FEMA) and California Emergency Management Agency (CAL EMA) when considering flood hazards and proposed development.</u>

Floodplain Management Ordinance-Regulatory Consistency			
<u>Government Code §65302(q)(2)(A) Identify information regarding flood hazards, including, but not limited to, the following:</u>	<u>County Code Chapter 15A-Flood Plain Management</u>	<u>County Code Chapter 15B-Development Along Watercourses</u>	<u>County Public Works Department Floodplain Management Program</u>
<u>(vii) Maps of levee protection zones.</u>			<u>County Public Works and Planning and Development Departments utilize the current and available California Department of Water Resources Flooding Awareness Maps (available for portions of the County) when considering flood hazards and proposed development.</u>
<u>(viii) Areas subject to inundation in the event of the failure of project or non-project levees or floodwalls.</u>			<u>County Public Works and Planning and Development Departments utilize the current and available California Department of Water Resources Levee Flood Protection Zone Maps when considering flood hazards and proposed development.</u>
<u>(ix) Historical data on flooding, including locally prepared maps of areas that are subject to flooding, areas that are vulnerable to flooding after wildfires, and sites that have been repeatedly damaged by flooding.</u>			<u>County Public Works and Planning and Development Departments utilize the current and available FEMA Flood Insurance Rate Maps, California Department of Water Resources Flooding Awareness Maps (available for portions of the County) and Levee Flood Protection Zone Maps, and U.S. Army Corps of Engineers and California Emergency Management Agency (CAL EMA) flood hazard maps when considering flood hazards and proposed development.</u>
<u>(x) Existing and planned development in flood hazard zones, including structures, roads, utilities, and essential public facilities.</u>			<u>The County Public Works Department maintains historical data and maps on flooding including areas previously flooded and subject to repeated damage by flooding; areas that are vulnerable to flooding after wildfires; and sites that have been repeatedly damaged by flooding. The Department also maintains records that identify existing and proposed projects located in flood hazard zones. Records include development projects such as roads, utilities, essential public facilities, and structures.</u>

<u>Floodplain Management Ordinance-Regulatory Consistency</u>			
<u>Government Code §65302(q)(2)(A) Identify information regarding flood hazards, including, but not limited to, the following:</u>	<u>County Code Chapter 15A-Flood Plain Management</u>	<u>County Code Chapter 15B-Development Along Watercourses</u>	<u>County Public Works Department Floodplain Management Program</u>
(xi) Local, state, and federal agencies with responsibility for flood protection, including special districts and local offices of emergency services.	<u>Section 15A-4 Methods of reducing flood losses,</u> <u>Section 15A-17 Standards for utilities,</u> <u>Section 15A-18 Standards for subdivisions,</u> <u>Section 15A-19 Standards for manufactured homes</u>	<u>Section 15B-5 Development standards,</u> <u>Section 15B-7 Conditions for extended setback</u>	<u>The County Public Works Department maintains records that identify existing and proposed projects located in flood hazard zones. Records include development projects such as roads, utilities, essential public facilities, and structures.</u> <u>The County Public Works Department and County Office of Emergency Services are responsible for providing flood protection services to unincorporated areas of the County.</u>

Floodplain Planning

The County Public Works Department is responsible for floodplain development review and flood hazard reduction in unincorporated areas of the County. The Department maintains a County Floodplain Management Plan (FMP), approved by FEMA, which describes how the County will address flood hazards and protect natural and beneficial functions of floodplains. Included in the plan are discussions on flood history, flood hazard identification, risk and capabilities assessment, and flood mitigation strategies. In addition, the Department designs, constructs and maintains flood control projects throughout the County in cooperation with federal agencies including the U.S. Army Corps of Engineers and the U.S.D.A. Natural Resources Conservation Service. Projects are funded primarily through taxes and benefit assessments in each flood zone using the amount of stormwater runoff generated by an individual parcel to calculate the cost of assessment.

Additionally, the County OES, in cooperation with the Public Works Department, has prepared the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) which provides additional planning and direction for flood hazards in the County.⁴⁰ The MJHMP focuses on the assessment of identified risks and implementation of loss reduction measures to ensure critical County services and facilities survive a disaster. Topics covered in the plan include flood, wildfire, earthquake, coastal storm surge/tsunami, landslide/coastal erosion, and dam failure in the unincorporated areas of the County. Each topic has been assessed to identify, screen, and rank hazards; assess the vulnerability of hazards; and identify the capabilities for response to, and reduction of, hazards. Additionally, a series of goals, objectives, and actions to address each hazard is included.⁴¹

In addition to the information and maps contained in the Floodplain Management Plan and the MJHMP, the County Public Works Department maintains historical data and maps of areas previously flooded and subject to repeated flood damage and areas that are vulnerable to flooding after wildfires. The Department also maintains records that identify existing and proposed projects located in flood hazard zones. Records include development projects such as roads, utilities, essential public facilities, and structures.

Historic as well as ongoing collection of flood hazard information is used for program and policy development by County Public Works Department and the Planning & Development Department. Areas that are potentially vulnerable to flooding or at increased risk of flooding as a result of wildfires are also analyzed during the development review process.

EMERGENCY RESPONSE TO FLOOD EVENTS

The County's emergency responses to flood events typically consist of efforts to reduce loss of life, rather than damage to physical property. These responses occur during a major storm event and County officials generally have between minutes and hours to formulate a response, not days or weeks. As a result the County's emergency response to flood emergencies includes a two pronged approach: 1) Monitor flood levels and determine when an evacuation is warranted, and 2) institute a well orchestrated and timely evacuation in threatened areas. This multistage process is described in more detail below. These emergency responses are most often employed in areas of the County where existing development in hazardous flood areas preceded the County's regulatory authority to limit additional development in high risk areas.

Storm Monitoring

The County Public Works Department maintains and operates a multi-component storm monitoring system. The purpose of the system is to provide advanced warning of impending flooding and to reduce the damages that may result. The system incorporates the collection of "real time" rainfall and stream flow data, computer modeling of river and reservoir systems, and coordination with the National Weather Service (NWS), Emergency Services, and other agencies.

The ALERT (Automated Local Evaluation in Real Time) Network consists of "real time" gages located throughout the county that transmit weather and other hydrologic data to the Flood Control District Operations Center. These gages allow for monitoring of rainfall, stream flow, reservoir releases, wind, as well as other essential data during a storm event. Using this data, Flood Control officials work to anticipate the location and timing of flooding. Emergency crews may be directed to problem areas and the appropriate warnings and advisories are issued through the NWS. In addition, the ALERT network is instrumental in guiding reservoir operations to simultaneously abate flooding downstream and maximize water supply.

Evacuation Planning

Evacuation planning during a flood event is coordinated through the County Public Works Department, County OES, and law enforcement agencies. An evacuation area is determined based on storm intensity, stream gauge information, field observations, weather forecasts, and stream channel clearance. The threat of flooding typically worsens over a period of time, allowing emergency response agencies to track data and prepare for an evacuation. Following the issuance of an order or warning to evacuate, evacuation routes are determined based upon the conditions of the individual flood event.

Law enforcement agencies including the County Sheriff's Department, the California Highway Patrol, and local police departments are responsible for emergency evacuations in the County. In addition, public safety agencies comply with a Unified Command protocol to determine appropriate evacuation routes based upon conditions of the emergency event, established Memoranda of Understanding/Cooperative Agreements, and Standard Operating Procedures in place for the respective responding agencies. County public safety agencies maintain emergency response protocols that include criteria and guidelines for the declaration, communication, and implementation of evacuation orders or warnings. The County also maintains protocols designed to assure that during an evacuation, designated routes remain clear, traffic moves smoothly, routes/areas are isolated as appropriate, and the risk of accidents on roadways is minimized.

The County employs a reverse 9-1-1 system to notify the public of the need to evacuate a specific area. In the event of a large scale flooding event, OES may implement the Santa Barbara County Operational Area Multi-Hazard Functional Plan (MHFP) which outlines protocols for emergency planning, management, and response for the County operational area. Additionally, OES may activate the County Emergency Operations Center (EOC) to coordinate multi-agency emergency response efforts for a flood event in compliance with the State Standardized Emergency Management System (SEMS) protocols.

FLOOD CONTROL PROJECTS

The final category of the County's active efforts to limit the negative impacts of flooding includes the development of local flood control projects. The most prominent example of these projects would consist of the mechanisms used to limit flooding risks to the Santa Maria Valley. The amount of the peak floodwater in the Santa Maria River is first reduced by the storage of flood waters in Twitchell Reservoir on the Cuyama River (the major tributary of the Santa Maria River). Secondly, levees have been constructed on the valley floor to contain the flood waters originating below Twitchell Reservoir as well as the releases from that reservoir. The Santa Marie Levee, owned and maintained by the County Public Works Department, was built by the U.S. Army Corps of Engineers in 1963 to control flooding from the Santa Maria River which endangered the City of Santa Maria. In 2009, the U.S. Army Corps of Engineers secured \$40 million in American

Recovery and Reinvestment Act (ARRA) funding to perform improvements to the levee necessary to protect the major urbanized areas of the Santa Maria Valley and the City of Santa Maria. The Corps will execute completion of these ARRA funded improvements with coordination from the County. No major facilities specifically designed for the purpose of flood control exist on the Santa Ynez River. However, a substantial amount of storage is provided for water conservation purposes, particularly in the U.S. Bureau of Reclamation's Cachuma Reservoir. Although this storage is not specifically for purposes of flood control, it does offer incidental flood control benefits. However, this does not provide assured flood protection, and in circumstances such as the 1969 floods which occurred when the reservoir was essentially full, there is very little diminution of flood hazard.

Additional improvements to stream channels in the populated portions of the South Coast and Lompoc areas have been built by the Santa Barbara County Flood Control and Water Conservation District, the U.S. Corps of Engineers, and by the U.S.D.A. Natural Resources Conservation Service.

FLOOD GOALS, POLICIES, AND IMPLEMENTATION MEASURES

This section profiles the goals, policies, objectives, and implementation measures adopted by the County to limit the negative effects of flooding and demonstrate compliance with applicable State laws.⁴²

<u>Goal: Flood Protection</u>		
<u>Flood Goal 1</u>	<u>Protect the community from unreasonable risks of flooding pursuant to government code §65302(g) et. Seq.</u>	
<u>Flood Objective 1</u>	<u>Pursuant to County Code Chapter 15A-Flood Plain Management, promote the public, health, and general welfare, and minimize public and private losses due to flood conditions.</u>	
<u>Policies</u>	<u>Flood Protection</u>	<u>Implementation Measures</u>
<u>Flood Policy 1</u>	<u>The County shall avoid or minimize risks of flooding to development through the development review process pursuant to Government Code §65302(3)(g)(2)(i).</u>	<u>Flood Implementation Measure 1- Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u> <u>Flood Implementation Measure 2- Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u> <u>Flood Implementation Measure 5- Continue P&D Development Review Process</u>
<u>Flood Policy 2</u>	<u>The County shall evaluate whether development should be located in flood hazard zones, and identify construction methods or other methods to minimize damage if development is located in flood hazard zones pursuant to Government Code §65302(3)(g)(2)(ii).</u>	<u>Flood Implementation Measure 1- Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u> <u>Flood Implementation Measure 2- Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u> <u>Flood Implementation Measure 5- Continue P&D Development Review Process</u>
<u>Flood Policy 3</u>	<u>The County shall maintain the structural and operational integrity of essential public facilities during flooding pursuant to Government Code §65302(3)(g)(2)(iii).</u>	<u>Flood Implementation Measure 1- Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u> <u>Flood Implementation Measure 2- Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u>

<u>Policies</u>	<u>Flood Protection</u>	<u>Implementation Measures</u>
<u>Flood Policy 4</u>	<u>The County shall locate, when feasible, new essential public facilities outside of flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities or identify construction methods or other methods to minimize damage if these facilities are located in flood hazard zones pursuant to Government Code §65302(3)(g)(2)(iv).</u>	<u>Flood Implementation Measure 1- Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u> <u>Flood Implementation Measure 2- Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u> <u>Flood Implementation Measure 5- Continue P&D Development Review Process</u>
<u>Flood Policy 5</u>	<u>The County shall establish cooperative working relationships among public agencies with responsibility for flood protection pursuant to Government Code §65302(3)(g)(2)(v).</u>	<u>Flood Implementation Measure 3- Maintain and Implement the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan</u> <u>Flood Implementation Measure 4- Encourage and Coordinate Interagency Agreements</u> <u>Flood Implementation Measure 11- Continue Participation in the Public Works Mutual Aid Agreement (PWMAA)</u>
<u>Flood Policy 6</u>	<u>The County shall review current National Flood Insurance Program maps and state and local sources of information on a regular basis and utilize the data to assure that measures are taken to reduce potential risks from flooding pursuant to the National Flood Insurance Program of 1968.</u>	<u>Flood Implementation Measure 6- Comply with the National Flood Insurance Program</u> <u>Flood Implementation Measure 1- Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u> <u>Flood Implementation Measure 2- Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u>
<u>Flood Policy 7</u>	<u>All proposed surface mining operations shall demonstrate that they will not exacerbate or significantly alter the floodplain in which they are located. For projects that cannot meet this standard, a Letter of Map Amendment or Letter of Map</u>	<u>Flood Implementation Measure 1- Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u> <u>Flood Implementation Measure 2- Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u>

<u>Policies</u>	<u>Flood Protection</u>	<u>Implementation Measures</u>
	<u>Revision shall be obtained from FEMA prior to construction pursuant to the Surface Mining and Reclamation Act of 1975.</u>	<u>Flood Implementation Measure 5- Continue P&D Development Review Process</u>
<u>Flood Policy 8</u>	<u>The County Public Works Department should continue working with the County Office of Emergency Services in updating flood information in the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan.</u>	<u>Flood Implementation Measure 3- Maintain and Implement the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan</u>
<u>Flood Policy 9</u>	<u>The County shall utilize information on areas included in wildfires to determine areas subject to increased risk of flooding, including mudslides and flash flooding.</u>	<u>Flood Implementation Measure 1- Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u> <u>Flood Implementation Measure 2- Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u> <u>Flood Implementation Measure 5- Continue P&D Development Review Process</u> <u>Flood Implementation Measure 9- Maintain and Update County Land Use Development Code</u>
<u>Flood Policy 10</u>	<u>The County should review the floodplain improvement projects identified in the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan annually for progress and necessary revisions.</u>	<u>Flood Implementation Measure 6- Maintain and Implement the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan</u>
<u>Flood Policy 11</u>	<u>The County Office of Emergency Services (OES) shall continue coordinating emergency planning for the Santa Barbara Operational Area pursuant to the California Emergency Services Act of 1970.</u>	<u>Flood Implementation Measure 7- Maintain and enforce County Code Chapter 12-Civil Defense and Disaster</u> <u>Implementation Measure 8-Enforce California Emergency Services Act</u>
<u>Flood Policy 12</u>	<u>The County should reference the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan when considering measures to reduce potential harm from flood-</u>	<u>Flood Implementation Measure 3- Maintain and Implement the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan</u>

<u>Policies</u>	<u>Flood Protection</u>	<u>Implementation Measures</u>
	<u>related activity to property and lives.</u>	

IMPLEMENTATION MEASURES

The implementation measures listed below demonstrate how the policies of this Element are carried out through local ordinances, actions, procedures, or programs. A timeline for implementation and policy linkage is also provided.

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
<u>Ongoing</u>	<u>1. Maintain and Enforce County Code Chapter 15A-Flood Plain Management</u>	<u>Continue maintenance and enforcement of County Code Chapter 15A-Flood Plain Management, which outlines specifications and standards for development designed to minimize public and private losses due to flood conditions. Areas covered include, but are not limited to methods of reducing flood losses; applicable County lands, areas of special flood hazard; compliance requirements; establishment of development permits, standards of construction, standards for utilities, subdivisions, manufactured homes, and recreational vehicles; floodways, and variances. The County will update County Code Chapter 15A as needed to maintain state and federal regulatory compliance</u>	<u>Flood Policy 1,2,3,4,6,7,9</u>
<u>Ongoing</u>	<u>2. Maintain and Enforce County Code Chapter 15B-Development Along Watercourses</u>	<u>Continue maintenance and enforcement of County Code Chapter 15B-Development Along Watercourses, which outlines controls on development adjacent to watercourses in unincorporated areas. Areas covered include, but are not limited to limitation on development, approvals, development standards, procedures, conditions for extended setback, and adoption of flood insurance study and maps. The County will update County Code Chapter 15B as needed to maintain state and federal regulatory compliance</u>	<u>Flood Policy 1,2,3,4,6,7,9</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
<u>Ongoing</u>	<u>3. Maintain and Implement the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan</u>	<u>Continue maintenance and implementation of the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan which contains hazard identification, screening and ranking; risk and vulnerability assessment; capabilities assessment; goals, objectives, and actions to address flood, wildfire, earthquake, coastal storm surge/tsunami, landslide/coastal erosion and dam failure in the unincorporated areas of the County.</u>	<u>Flood Policy 5, 8,10, 12</u>
<u>Ongoing</u>	<u>4. Encourage and coordinate Interagency Agreements</u>	<u>Continue encouraging and coordinating with other local, regional, tribal governments, state and federal agencies (inclusive of federal land managers from the National Forest and representatives from Vandenberg Air Force Base) to develop and maintain mutual aid agreements. These agreements generally state the responsibilities and processes used during emergencies to assure that property and lives are protected pursuant to the California Emergency Services Act of 1970.</u> <u>The County will work with other agencies and private landowners to identify areas which, due to their proximity to rivers, streams, floodplains, and/or riparian corridors, may be subject to hazardous flood events. Development in these areas may require careful site and structural design in order to minimize exposure to flood hazards and to be consistent with the Coastal Land Use Plan or Land Use Element policies. Specific policies and infrastructure designs contained within the Conservation Element regarding flood water and runoff shall be implemented to the extent feasible.</u>	<u>Flood Policy 5</u>
<u>Ongoing</u>	<u>5. Continue P&D Development Review</u>	<u>Continue P&D referral of development proposals that may have a direct or</u>	<u>Flood Policy 1, 2, 4, 5, 7,</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
	<u>Process</u>	<u>indirect impact on flood protection to the County Public Works Department for review and comment. All development shall be reviewed in accordance with the requirements of Chapter 15A-Flood Plain Management, and Chapter 15B- Development Along Watercourses of the County Code.</u>	<u>9</u>
<u>Ongoing</u>	<u>6. Comply with the National Flood Insurance Program</u>	<u>Continue compliance and County participation in the National Flood Insurance Program (NFIP). This includes adoption and implementation of updated Federal Emergency Management Agency (FEMA) model ordinances and Flood Insurance Rate Maps (FIRM)</u>	<u>Flood Policy 6</u>
<u>Ongoing</u>	<u>7. Maintain and Enforce County Code Chapter 12 Civil Defense and Disaster</u>	<u>Continue maintenance and enforcement of County Code Chapter 12-Civil Defense and Disaster provides for the direction of the County emergency organization (Office of Emergency Services); preparation and implementation of plans for the protection of persons and property in the event of an emergency; and the coordination of emergency functions of the County with all other public agencies, corporations, organizations and affected private persons.</u>	<u>Flood Policy 11</u>
<u>Ongoing</u>	<u>8. Enforce the California Emergency Services Act of 1970</u>	<u>Continue enforcement of California Emergency Services Act of 1970 which confers responsibility to the State of California to mitigate the effects of natural, man-made, or war-caused emergencies which result in conditions of disaster or in extreme peril to life, property, and the resources of the state.</u>	<u>Flood Policy 11</u>
<u>Ongoing</u>	<u>9. Maintain and Update County Land Use Development Code</u>	<u>Continue to maintain and update as appropriate the Santa Barbara County Land Use and Development Code (LUDC) which carries out the policies of the Santa Barbara County Comprehensive General Plan and Local Coastal Program by classifying and</u>	<u>Flood Policy 9</u>

<u>Timeline</u>	<u>Implementation Measure</u>	<u>Description</u>	<u>Policy Linkage</u>
		<u>regulating the uses of land and structures within the County, consistent with the Comprehensive General Plan and the Local Coastal Program. The LUDC is adopted to protect and to promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the County</u>	
<u>Ongoing</u>	<u>10. Encourage and Coordinate Public Works Mutual Aid Agreement (PWMAA)</u>	<u>Continue participation in the Public Works Mutual Aid Agreement (PWMAA) with the Counties of Los Angeles, Orange, San Luis Obispo and Ventura and the cities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria and Solvang</u>	<u>Flood Policy 5</u>

CONCLUSIONS AND RECOMMENDATIONS

The flood control Conclusions and Recommendations developed in 1979 for the Seismic Safety and Safety Element did not consider the most current and available Federal Emergency Management Agency (FEMA)-Federal Insurance Rate Maps (FIRM) for Santa Barbara County. These Conclusions and Recommendations were deleted in 2009 and replaced by the preceding Flood Goals and Policies section as part of a regulatory update to demonstrate compliance with the Federal Emergency Management Administration (FEMA) (42 U.S.C. 4022) and Government Code Sections 65302, 65560 and 65800 and replaced with the Flood Goals and Policies section. This updated set of goals and policies should give the County agencies and residents the information and tools necessary to limit the negative effects that major flood events have on physical property and the public's health, safety, and general welfare.

VIII. County Office of Emergency Services

The California Emergency Management Agency (CalEMA) coordinates the implementation of the California Emergency Plan (CEP), a statewide planning document designed to coordinate federal, state and local government emergency response efforts.⁴³ The CEP is implemented locally through the Santa Barbara County Operational Area Multi-Hazard Functional Plan (MHFP) which is maintained by the County Office of Emergency Services (OES). The objective of the MHFP is to “provide in an expedient manner, fire, rescue, emergency medical services, hazardous materials, urban search and rescue or other expertise in the form of resources and qualified personnel as would be necessary to manage a major incident or disaster that would have exceeded the capabilities of a single agency.” The MHFP covers the Santa Barbara Operational Area (SBOA) which includes all fire, law enforcement, search and rescue, medical and other emergency response agencies within the County. Members also include:

- all County incorporated cities;
- Vandenberg Air Force Base;
- U.S. Forest Service (Los Padres National Forest);
- special districts, fire districts, sanitary districts, school districts, vector control districts, and water districts;
- volunteer organizations, and;
- industry groups, the petroleum industry mutual aid group, and other industrial associations.

The MHFP requires OES to coordinate disaster plans and exercises with all incorporated cities; assist County departments in developing department and facility emergency plans to address disaster response; maintain the County Emergency Operations Center (EOC) in a state of operational readiness; maintain a trained cadre of Emergency Operations Center (EOC) team members; provide ongoing training for County department emergency coordinators; and participate in public education and outreach. OES also provides tri-County coordination with the Office of Emergency Services in Ventura and San Luis Obispo Counties

CalEMA has divided the State into various regions for emergency coordination and response. Santa Barbara County is part of Region I which includes San Luis Obispo, Ventura, Los Angeles, and Orange Counties. Region I members have developed mutual aid agreements which provide for emergency fire, medical and law enforcement services within local operational areas as well as supporting member jurisdictions outside of the individual operational areas. Mutual aid agreements cover a range of topics and may include but are not limited to the Law Enforcement Mutual Aid Plan; the Swiftwater/Flood Search and Rescue Plan; the Public Works Mutual Aid Plan; and the Fire Service and Rescue Emergency Mutual Aid Plan. These Mutual Aid Plans are designed to provide for the systematic mobilization, organization and operation of law enforcement, fire, medical, and search and rescue agencies within Region I.

SANTA BARBARA COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

The County Office of Emergency Services has prepared the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) pursuant to the Disaster Mitigation Act of 2000.⁴⁴ The plan complies with the requirements of the Federal Emergency Management Agency (FEMA) and CalEMA. The MJHMP focuses on the assessment of identified risks and implementation of loss reduction measures to ensure critical County services and facilities survive a disaster. Topics covered in the plan include flood, wildfire, earthquake, coastal storm surge/tsunami, landslide/coastal erosion and dam failure in the unincorporated areas of the County. Each topic has been assessed to identify, screen, and rank hazards. The vulnerability of hazards has been assessed and capabilities for response to, and reduction of, these hazards have been identified. Additionally, a series of goals, objectives, and actions to address each hazard is included.⁴⁵

By completing, updating and maintaining the MJHMP the County becomes eligible for funding and technical assistance from state and federal hazard mitigation programs, such as the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Competitive and Flood Mitigation Assistance programs. By adopting a local hazard mitigation plan with the Seismic Safety and Safety Element the County increases their eligibility for state and federal hazard mitigation programs. As such, in 2009 the County Board of Supervisors adopted the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan with the Seismic Safety and Safety Element pursuant to Government Code §65302.6 (a).

While the MJHMP is not required under Government Code 65302(g), as is the Seismic Safety and Safety Element, the two documents are mutually supportive. The data, goals, objectives, policies, actions, and recommendations from one document should be referenced in support of each other, and should remain consistent throughout both documents. The MJHMP is updated every five years pursuant to the Disaster Mitigation Act of 2000. Therefore, when reviewing the Seismic Safety and Safety Element the most current, adopted MJHMP should also be referenced.

VII. FLOOD CONTROL

INTRODUCTION

~~Santa Barbara County is traversed by two major rivers (the Santa Maria River and the Santa Ynez River) as well as by numerous tributaries of these two rivers and numerous smaller streams which discharge directly to the Pacific Ocean. These streams are subject to high flows following periods of intense precipitation, and the flood waters resulting from these high flows can impair the suitability of certain lands for various uses.~~

~~The extent of damage from flooding can be mitigated by the construction of facilities for the control of flood flows. A federal flood control project has been constructed in the Santa Maria Valley. The amount of the flood peak in the Santa Maria River is reduced by storage of flood waters in Twitchell Reservoir on the Cuyama River (the major tributary of the Santa Maria River). Levees have been constructed on the valley floor to contain the flood waters originating below Twitchell Reservoir as well as the releases from that reservoir.~~

~~No major facilities specifically designed for the purpose of flood control exist on the Santa Ynez River. However, a substantial amount of storage is provided for water conservation purposes, particularly in the U.S. Bureau of Reclamation's Cachuma Reservoir. Although this storage is not specifically for purposes of flood control, it does offer incidental flood control benefits. However, this does not provide assured flood protection, and in circumstances such as the 1969 floods which occurred when the reservoir was essentially full, there is very little diminution of flood hazard.~~

~~Improvements to stream channels in the populated portions of the South Coast and Lompoc areas have been built by the Santa Barbara County Flood Control and Water Conservation District, the U.S. Corps of Engineers, and by the U.S. Soil Conservation Service.~~

~~In addition to the flood problems resulting from inability of stream channels to convey the full amount of flood flows, localized drainage problems exist in areas where water ponds and is unable to escape sufficiently rapidly to prevent inundation. Among the principal drainage problem areas is a low-lying coastal area in the City of Santa Barbara.~~

FLOOD HAZARDS

The lands within the County have been classified into eleven categories to assess the extent of impairment of suitability for development due to flood hazard. The County wide and study area maps show the lands in each category. A brief explanation of each of the categories follows.

Category 1, Stream Channels -- Areas were categorized as stream channels if review of U.S. Geological Survey quadrangle sheets indicated that the area drained by the stream is significant. Generally, streams with significant drainage area identified on the quadrangles by name, or canyons identified in a similar manner, were plotted in this category. In most areas, the scale of the maps precluded indication of the channel width. However, major streams, such as the Santa Ynez and the Santa Maria rivers, were plotted with a definite width as indicated on the quadrangle sheets. The specific limits of the area occupied by the stream channel, and of any area to be reserved for protection of the channel, must be established by detailed evaluation of any specific development proposal. Reservoirs also were included in Category 1.

Category 2, Floodway Area -- The floodway is defined in connection with the federal Flood Insurance Program as "the channel or water course, and that portion of the adjacent flood plain required for the passage of the 100-year frequency discharge (discharge having a one percent chance of occurrence) with an insignificant effect on water surface above that of the pre-floodway condition." The floodway represents the area into which there should be permitted no encroachment that would impair the ability to convey flows. Areas in this category generally were defined by the U.S. Corps of Engineers. The floodway plotted is for the once-in-a-hundred-year event; and where no data exist to the contrary, the total area inundated by the 100-year flood was assumed to be in the floodway.

Category 3, 100-Year Flood Plain with Proposed Improvements Constructed -- Category 3 represents the flood fringe for the 100-year flood, i.e., that portion of the flood plain which is outside of the flood-way (Category 2). Where the flood plain can be reduced by proposed flood control improvements, only that portion of the flood plain that will continue to exist after such improvements is included in Category 3. For purpose of categorization, a reasonable proposed flood control improvement was considered as a project that is presently under construction, that is presently planned, or that has been demonstrated to be feasible by planning studies. Where no reasonable proposed flood control improvement exists, the entire flood fringe area is considered to be in Category 3.

~~Category 4, 100-Year Flood Plain with Existing Improvements Only -- Areas are shown as being in this category only when the 100-year flood plain may be reduced by additional reasonable proposed flood control improvements, the amount of the reduction in flood plain is known, and the amount of the reduction is of sufficient size to appear on the map. Proposed projects considered are additional flood control improvements on Franklin and Santa Monica Creeks near Carpinteria, and the authorized U.S. Corps of Engineers' flood control project in the Goleta area.~~

~~Category 5, Standard Project or 500 Year Flood Plain -- Category 5 represents those lands that are outside the flood plain of the 100-year flood, but that may be inundated by the 500-year flood or the standard project flood. The U.S. Corps of Engineers defines the standard project flood to be that which would result if the maximum storm of record in Southern California were to be centered over the watershed area of the particular stream being considered, with the watershed in a saturated condition. The standard project flood does not lend itself to frequency evaluation but it is generally considered that the recurrence interval is roughly 200 to 300 years. The Corps of Engineers, in connection with its participation in the federal Flood Insurance Program, has determined the 500-year flood events in some areas of the South Coast. The Corps of Engineers also has defined the flood plain area of the standard project flood on the Santa Ynez River. For stream channels that are deeply incised and have essentially vertical walls of confinement, the difference between the inundated area for the 100-year flood event and the 500-year or standard project flood event is quite small. Accordingly, in many cases, the scale of the maps does not permit definition of the Category 5 areas.~~

~~Category 6, Local Drainage Problem Areas with Proposed Improvements Constructed -- Drainage problem areas were distinguished from areas with flood hazard, primarily because problems are less severe and generally can be remedied with a minimum of expense. Building homes on pads or utilizing a minimum amount of grading and land leveling are examples of procedures used to avoid drainage problems. Category 6 is analogous to Category 3. Category 6 areas (as well as Category 7 areas) were defined in consultation with the County Flood Control Engineer and Public Works officials of the cities of Lompoc and Santa Maria.~~

~~Category 7, Local Drainage Problem Areas with Existing Improvements Only -- Category 7 bears the same relationship to Category 6 that Category 4 bears to Category 3. Reasonable proposed drainage improvements include those in the cities of Santa Barbara and Santa Maria.~~

~~Category 8, No Flood Hazard -- Areas in this category generally are those where flood problems would not be a constraint on development. Areas in this category are located on mesas such as those along the South Coast or in areas with relatively steep slopes, allowing rapid drainage of flood waters. Based on discussions with the County Flood Control Engineer, it was determined that lands above 250 foot elevation in the Carpinteria area would be free from flood hazard. North of Montecito, from Romero Canyon to Cold Spring Canyon, lands above a 750 foot elevation are considered to be free from flood hazard. From Barger Canyon or Arroyo Burro Creek west, lands above 250 foot elevation or the elevation of the base of the hills, whichever is lower, are considered to be free from flood hazard. The limits of other areas classified as Category 8 lands were established on the basis of our judgments. In areas where either the 500-year or standard project flood plains were defined, lands lying outside of these flood plains are considered to be in Category 8, unless it is believed that flood hazards might arise from tributaries to the stream for which the flood plain is defined.~~

TABLE 3. DISTRIBUTION OF LAND IN FLOOD HAZARD CATEGORIES^a

Category	South Coast		Santa Ynez		(000's Acres)		County-wide Study Area ^c
	Coast	Ynez	Lompoc	Santa Maria	Agres	María	
1. Stream channels	8.6 ^b	5.7 ^b	2.3 ^b	6.7 ^b			347.5 ^b
2. Area (in addition to Category 1) within floodway of 100-year flood, assuming floodway to occupy entire flood plain in the absence of information to the contrary.	1.7	1.5	3.5	1.2			6.2
3. Area (in addition to Categories 1 and 2) within 100-year flood plain, after any reasonable proposed flood control improvements are completed. (Assumed to be same as Category 4 in the absence of data to the contrary.)	2.3	0.6	1.3	---			2.7
4. Area (in addition to Categories 1, 2, and 3) within 100-year flood plain with existing flood control improvements only.	0.6	---	---	---			0.4
5. Area (in addition to Categories 1, 2, 3, and 4) within standard project flood or 500-year flood plain.	0.3	0.4	0.2	---			0.3
6. Local drainage problem areas (in addition to Categories 1, 2, 3 and 4) after proposed drainage improvements are completed.	0.2	0.1	---	1.0			1.1
7. Local drainage problem areas (in addition to Category 6) with existing facilities only.	0.2	---	---	0.9			0.7
8. Areas without potential flood hazard.	32.8	28.9	14.6	15.8			533.3
9. Areas outside 100-year flood plain which may or may not be in 500-year or standard project flood plain. (Areas which cannot be classified in Categories 5 and 8.)	8.7	---	4.4	---			6.9

TABLE 3. DISTRIBUTION OF LAND IN FLOOD HAZARD CATEGORIES (CONTINUED) a

Category	(000's Acres)				
	South Coast	Santa Ynez	Lompoc	Santa Maria	County-wide Study Area ^c
10. Areas with possible flood hazard not subject to evaluation. (Areas which cannot be classified in Categories 4, 5, and 8.)	3.1 ^b	2.1 ^b	1.5 ^b	3.8 ^b	26.1 ^b
11. Areas with possible local drainage problems, not presently determined. (Areas which cannot be classified in Categories 6, 7, and 8.)	---	5.2	---	39.1	34.8
Total	58.5	44.5	27.8	68.5	960.0

- (a) Estimated acreages derived from tabulation of the number of grid cells in each category.
- (b) Represents total acreage for all grid cells in which stream channels are located, and not actual acreage occupied by the stream channel.
- (c) Includes urban study areas.

~~Category 9, Flood Plain which flood on standard Areas Which May Be in 500-Year or Standard Project Flood Plain -- Areas in this category generally are those for studies have defined the 100-year event only, and data project or 500-year flood plains are not available.~~

~~Category 10, Unknown Flood Hazard -- For many streams in Santa Barbara County, particularly those remote from population centers, data on potential flood hazard are not available. These areas are classified in Category 10. In mountain valleys, Category 10 areas are assumed to extend to the base of the surrounding hills. As a prerequisite to development of Category 10 lands, detailed evaluation of flood potential should be required.~~

~~Category 11, Unknown Drainage Hazard -- Lands in this category have potential drainage problems which have not been evaluated. Discussions with the County Flood Control Engineer indicate that, as developments take place, special procedures must be followed to resolve problems that may result. These problems manifest themselves in increased downstream runoff, erosion hazard, and inadequate slope to carry away drain water. These areas were defined by the County Flood Control Engineer.~~

~~Table 3 summarizes the distribution of areas within each of the eleven flood hazard categories.~~

~~DEGREE OF CONSTRAINT ON DEVELOPMENT~~

~~The degree of constraint on urban, agricultural, or recreational development of lands in the various flood hazard categories shown below, is presented on a 0-10 scale, with 0 indicating that lands in a particular category are unsuitable for the indicated use, and 10 indicating no constraint on the particular use, at least within the accuracy of a scale of 0 to 10.~~

TABLE 4. DEGREE OF CONSTRAINT ON DEVELOPMENT DUE TO FLOOD HAZARD.

Category	DEGREE OF CONSTRAINT ON DEVELOPMENT ^a		
	Agricultural	Recreation ^c	Urban
1	1	2	0
2	6	5	0
3	8 ^b	7 ^b	3 ^b
4	8	7	3
5	10	10	9
6	7 ^b	7 ^b	4 ^b
7	7	7	4
8	10	10	10
9	10	10	9 ^b
10	6 ^b	5 ^b	0 ^b
11	7 ^b	7 ^b	4 ^b

(a) 0 = unsuitable, 10 = no constraint.

(b) Could be less restrictive value if necessary improvements are constructed or if the propriety of higher classification is demonstrated by further detailed study.

(c) Represents suitability for intensive recreational use involving substantial improvements.

~~In this context, recreational development refers to intensive recreation activities requiring substantial physical improvements (e.g., golf courses, campgrounds, intensively developed parks, etc.).~~

~~The degree of flood hazard to lands in certain of the categories is unknown. Under these circumstances, the degree of constraint shown in Table 4 is that appropriate for the most severe flood hazard condition which might exist, recognizing that more detailed studies could justify shifting a particular parcel of land to a less restrictive category. Similarly, in certain categories where the extent of flood hazard would be mitigated by the construction of improvements, the degree of constraint on development could be reduced if and when the proposed improvements are constructed. The following paragraphs discuss in greater detail the degree of constraint for the various categories.~~

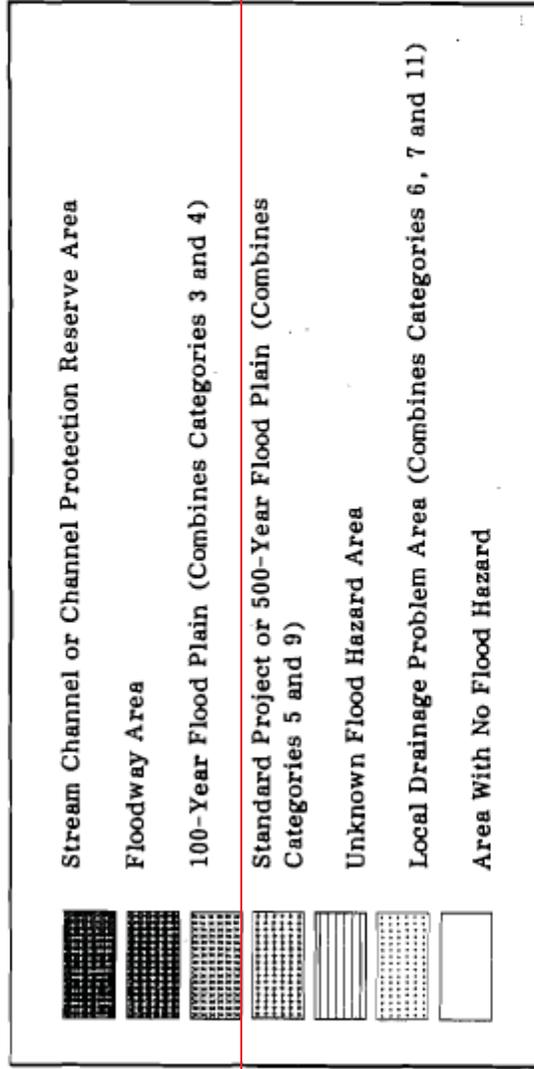
~~Category 1, Stream Channels - Recreational and agricultural usage could be permitted within stream channels. However, such usage would have to be subject to controls which ensure that the activity does not endanger life or property and does not interfere with the integrity of the stream channel for its primary purpose,~~

~~the conveyance of water. Recreational use such as hiking could be permitted in many stream channels during periods when flows are small or nonexistent. Heavier recreational use, such as golf courses or developed campgrounds, obviously would have to be on a much more restrictive basis. The primary considerations with respect to agricultural use would be limiting it to types that do not impair the stream channel's ability to carry water and that do not involve activities that create erosion problems. In all cases, the extent of the liability which might be assumed by the owner of the stream channel would have to be given heavy weight. Conceivably, necessary restrictions on the use of stream channels would make only light recreational activities practical in most instances.~~

~~Category 2, Floodway Area - The floodway area is the area in which no encroachment of man-made improvements should be permitted. No problems are likely to occur with light recreational use of such areas. However, in the case of heavy recreational activities or agricultural usage, all structures would have to be kept out of the floodway and, in addition, any grading would have to be controlled rigidly. Essentially, the problems would be similar to those in Category I, but less severe.~~

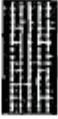
~~Categories 3 and 4, 100-Year Flood Plain - These two categories refer to the flood plain (outside of the floodway area) as it presently exists and as it will exist in the future with further flood control improvements. Raising of the land surfaces above the flood level by grading, or protection from floods by levees would be acceptable, but the development costs obviously would be greater than for lands outside of the flood plain.~~

Santa Barbara County Flood Hazard



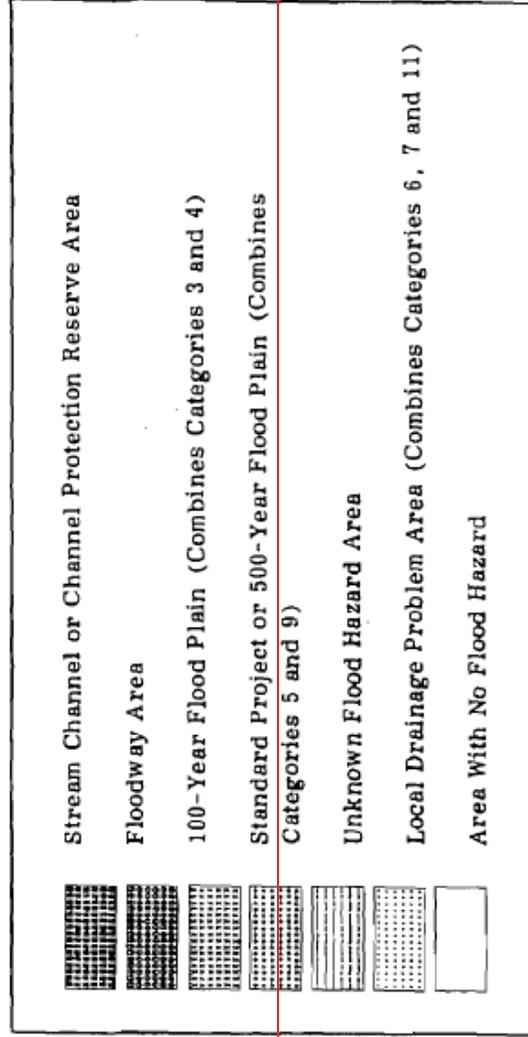
**FLOOD HAZARD
SANTA BARBARA COUNTY**

South Coast Study Area ~ West Flood Hazard

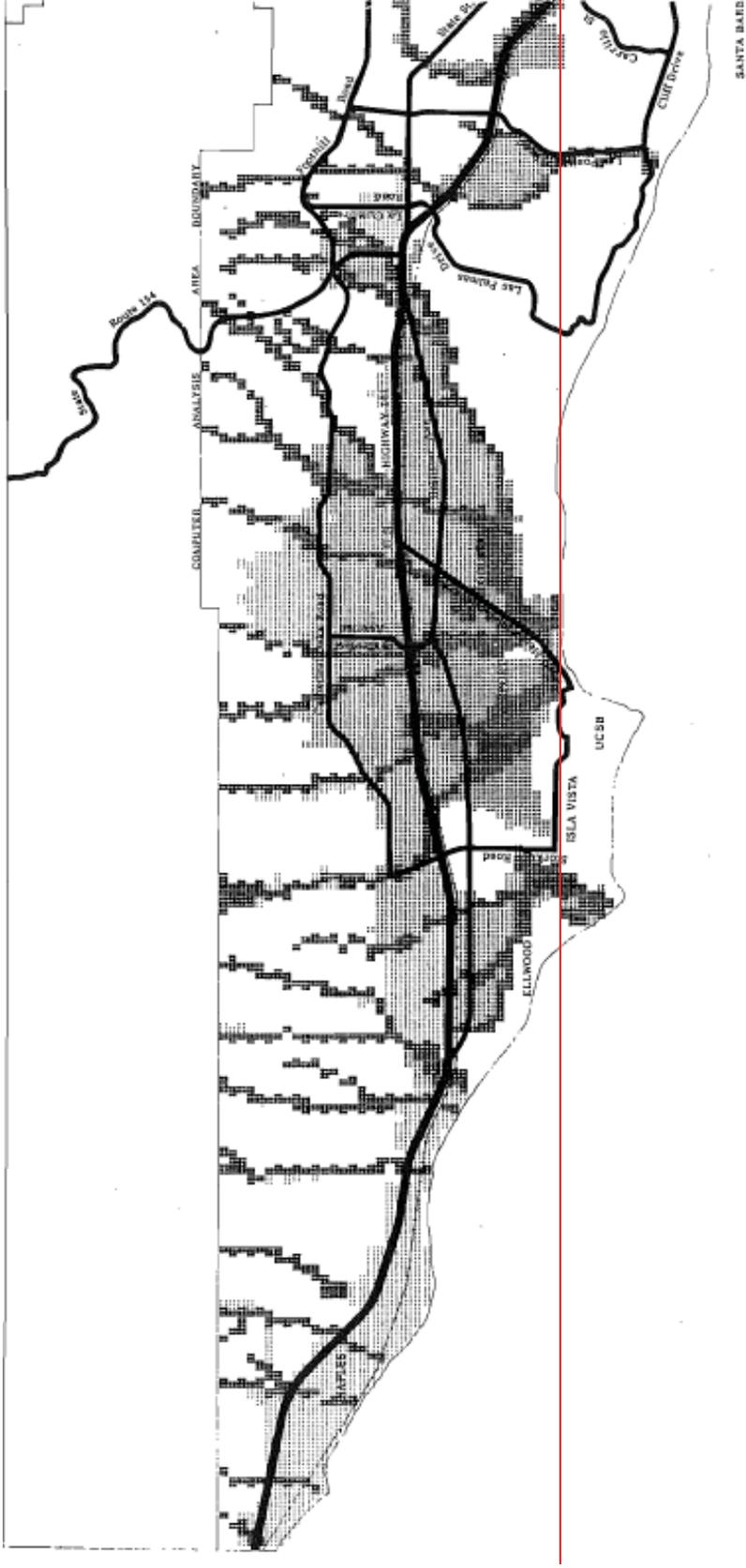
	Stream Channel or Channel Protection Reserve Area
	Floodway Area
	100-Year Flood Plain (Combines Categories 3 and 4)
	Standard Project or 500-Year Flood Plain (Combines Categories 5 and 9)
	Unknown Flood Hazard Area
	Local Drainage Problem Area (Combines Categories 6, 7 and 11)
	Area With No Flood Hazard

SOUTH COAST AREA -- EAST

South Coast Study Area ~ East Flood Hazard



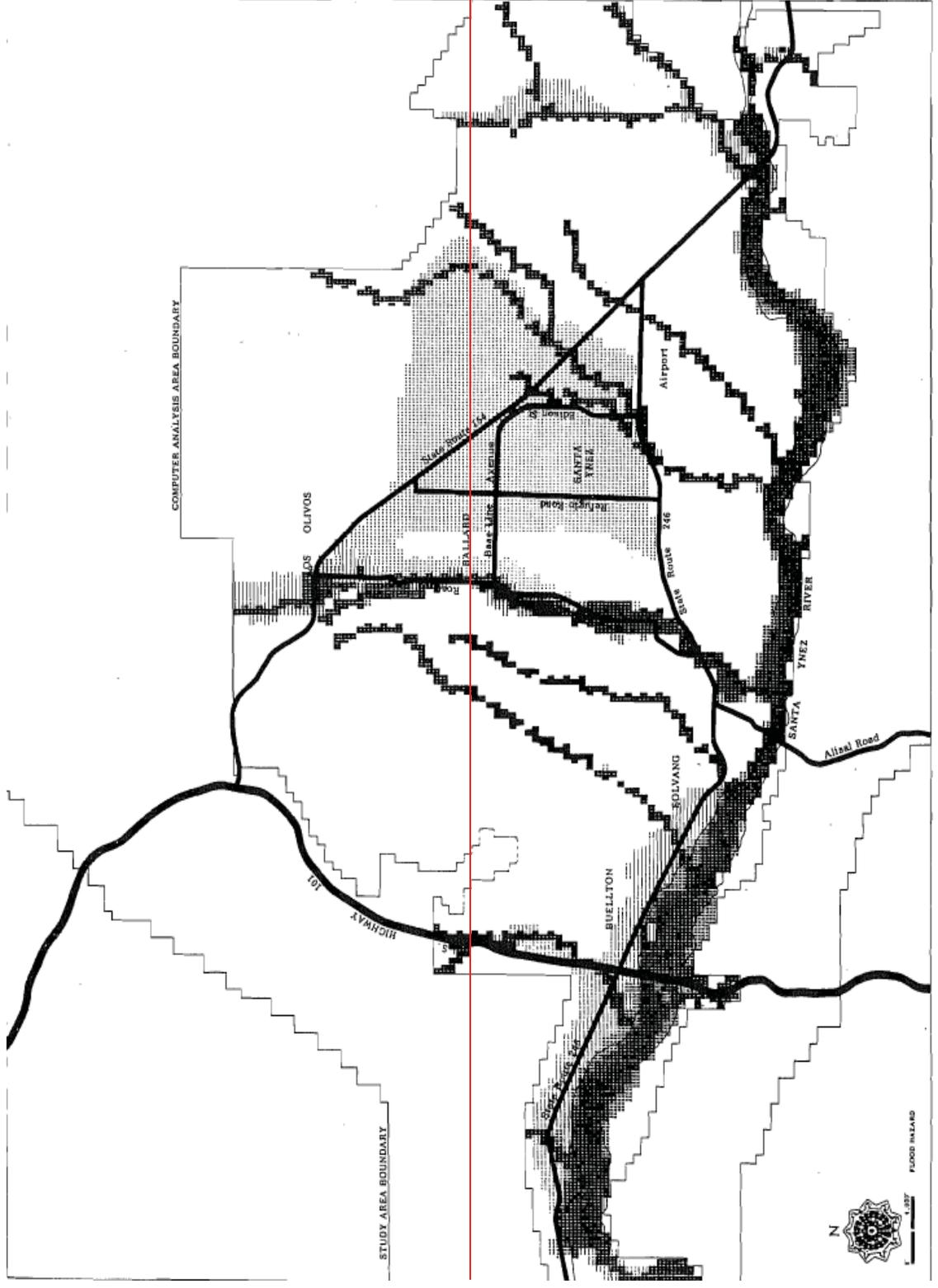
SOUTH COAST AREA -- WEST



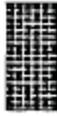
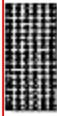
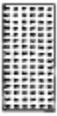
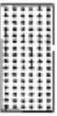
Santa Ynez Valley Study Area Flood Hazard

	Stream Channel or Channel Protection Reserve Area
	Floodway Area
	100-Year Flood Plain (Combines Categories 3 and 4)
	Standard Project or 500-Year Flood Plain (Combines Categories 5 and 9)
	Unknown Flood Hazard Area
	Local Drainage Problem Area (Combines Categories 6, 7 and 11)
	Area With No Flood Hazard

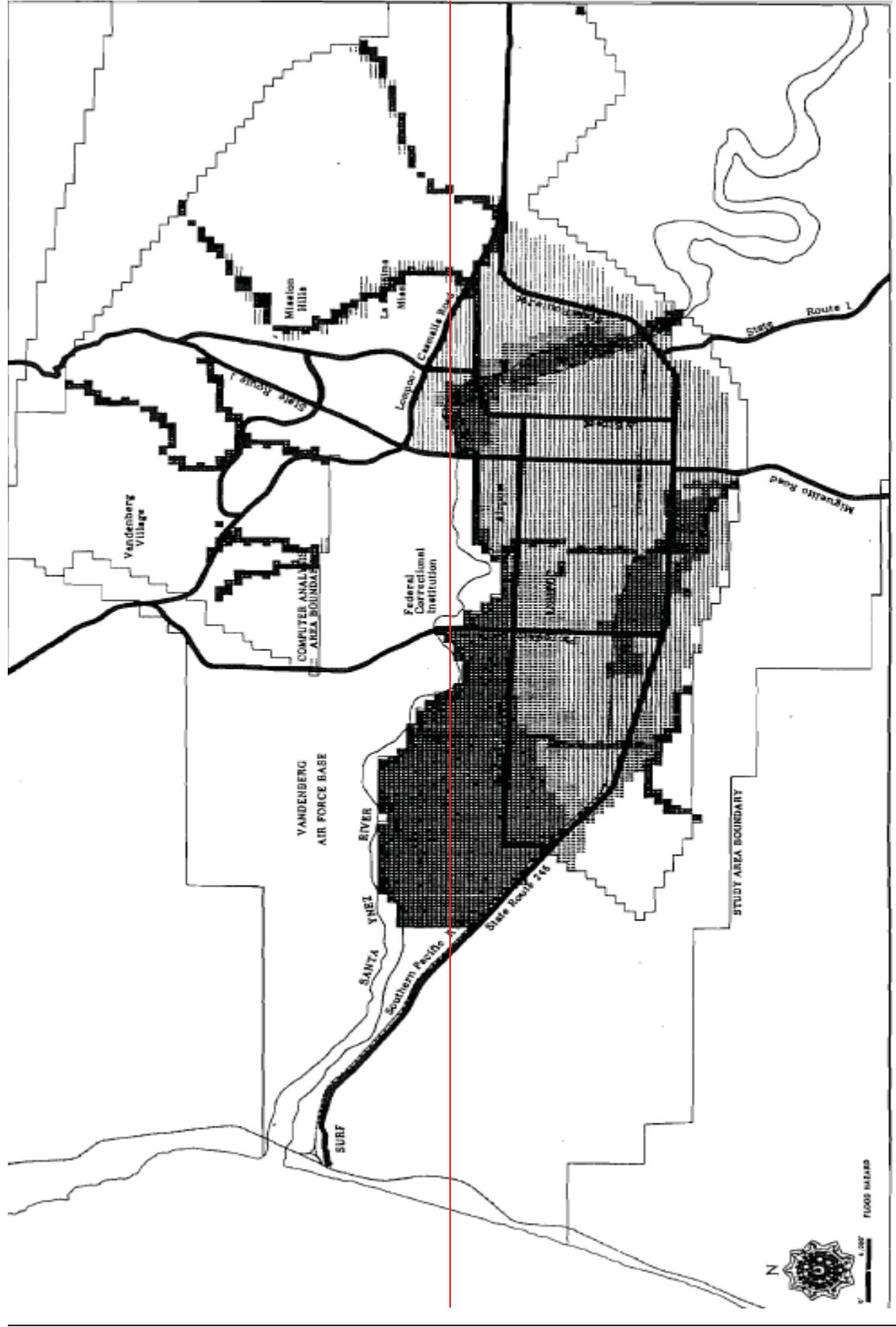
SANTA YNEZ VALLEY AREA



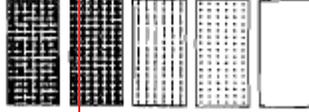
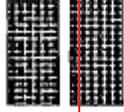
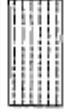
Lompoc Study Area Flood Hazard

	Stream Channel or Channel Protection Reserve Area
	Floodway Area
	100-Year Flood Plain (Combines Categories 3 and 4)
	Standard Project or 500-Year Flood Plain (Combines Categories 5 and 9)
	Unknown Flood Hazard Area
	Area With No Flood Hazard

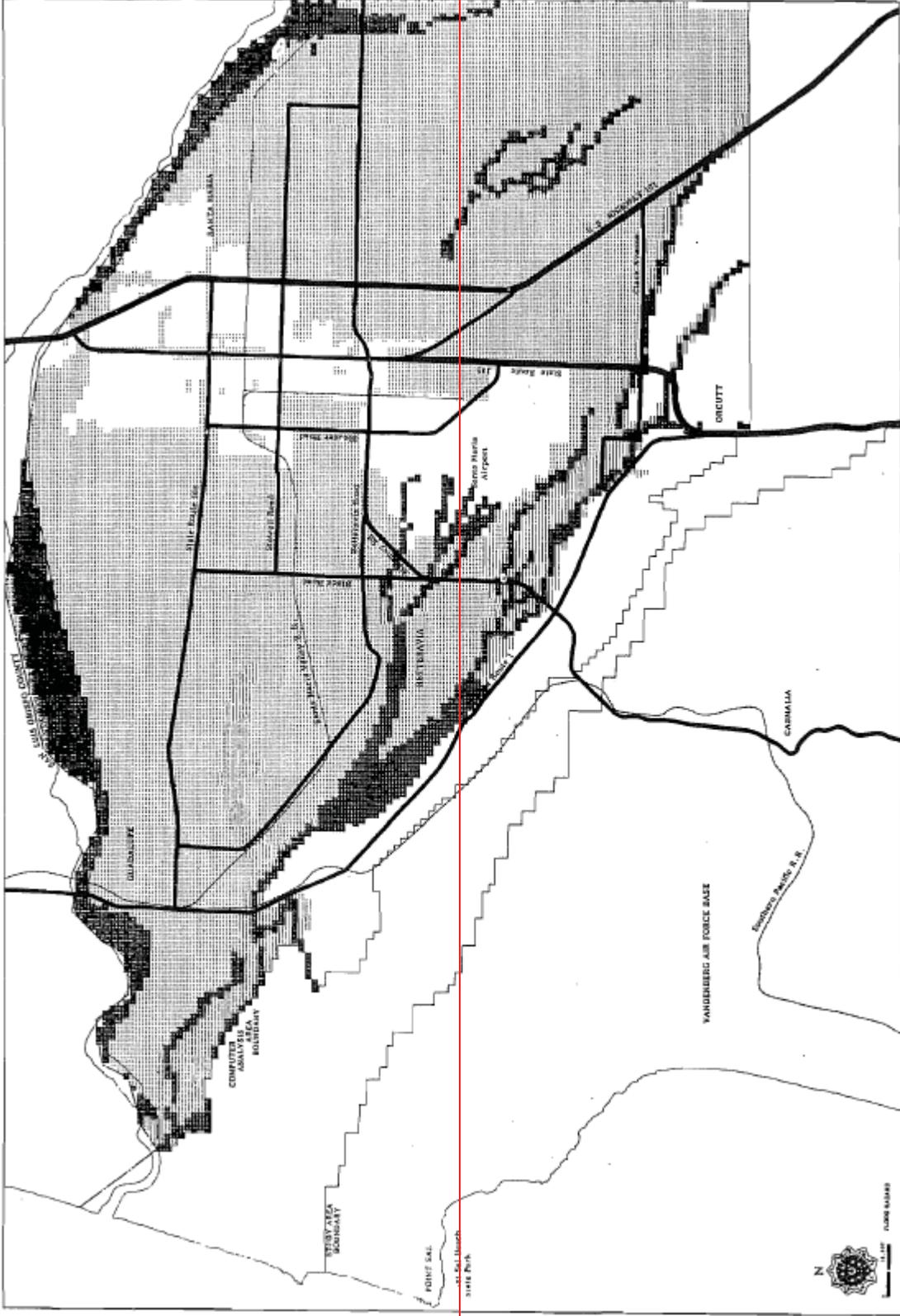
LOMPOC AREA



Santa Maria-Orcutt Study Area Flood Hazard

	Stream Channel or Channel Protection Reserve Area
	Floodway Area
	Unknown Flood Hazard Area
	Local Drainage Problem Area (Combines Categories 6, 7 and 11)
	Area With No Flood Hazard

SANTA MARIA-ORCUTT AREA



~~Category 5, Standard Project or 500-Year Flood Plain - This category includes lands that, although not in the 100-year flood plain area, conceivably could be inundated by a still larger flood. In this case it would appear that the degree of risk to improved recreational sites or agricultural uses would be so light as not to pose any particular problems. On the other hand, in the case of urban development, either some costs would have to be incurred to remove the lands from the flood plain or some small risk would have to be assumed for property damage in the event of a very rare large flood. Not only is the chance of inundation of lands in Category 5 small, but also the depth of such inundation probably would not be great. Accordingly, the degree of constraint on Category 5 lands for urban development is not major, although it does exist.~~

~~Categories 6 and 7, Local Drainage Problem Areas - These two categories cover the drainage problem areas that exist at present, and those that will exist in the future if proposed improvements are built. In general, the comments regarding Categories 3 and 4 also apply to Categories 6 and 7.~~

~~Category 8, No Flood Hazard - Lands in this category are not subject to development constraints caused by flood hazards.~~

~~Category 9, Areas Which May Be in 500-Year or Standard Project Flood Plain - The comments applying to Category 5 also apply to Category 9. However, the likelihood of problems is even more remote than it is in Category 5, because much of the land in Category 9 probably is not even within the 500-year or standard project flood plain.~~

~~Category 10, Unknown Flood Hazard - Areas in this category require more detailed study prior to development. Until such studies are made, Category 10 lands should be subject to the same restraints as Category 2.~~

~~Category 11, Unknown Drainage Hazard - Lands classified in Category II may have drainage problems, or may experience such problems in the future. Accordingly, in the absence of remedial actions or in the absence of technical findings demonstrating that no problem exists, the lands should be subject to the same restraints as Categories 6 and 7.~~

~~AREA ANALYSIS OF FLOOD HAZARDS~~

~~Outside of the four study areas, most of the lands are hilly or mountainous and consequently have been classified in Category 8, without potential flood hazard.~~

~~In valley areas and along canyon bottoms some degree of flood hazard may exist. However, data generally are not available as to the degree of flood hazard or as to the areal extent of such lands. Accordingly, these valley floor and canyon bottoms outside of the urban study areas, the major portion of which are in the Cuyama Valley and along San Antonio Creek, have been shown in Category 10, unknown flood hazard. More detailed studies could indicate that a substantial portion of these Category 10 lands are subject to no flood hazard or minimal flood hazard.~~

~~In the South Coast area, most of the mountainous lands fall in Category 5, no flood hazard, although canyon bottoms are shown as being in Category 10, unknown flood hazard. In the developed portion of the South Coast area, generally the coastal plain from Goleta easterly, most lands are in Category 5, no flood hazard, or Category 9, areas outside the 100-year flood plain which mayor may not be within the 500-year or standard project flood plains. Most of the Category 9 lands in the South Coast area have been so classified because of lack of data on the limits of the 500-year or standard project flood plain. With additional study, these areas might be classified as having no flood problem.~~

~~Even within the developed portion of the South Coast area, there are lands subject to varying degrees of flood hazard. These lands generally lie in narrow strips along stream channels, although significant areas are subject to inundation near the Santa Barbara Airport in Goleta, in the low lying coastal portions of the City of Santa Barbara and in much of the Carpinteria area. However, completion of federal flood control projects would eliminate a significant portion of the flood hazard near Carpinteria and in the Goleta area. The Goleta flood control project would include improvement of the channels of Carneros, Tecolotito, San Pedro, Las Vegas, San Jose, Atascadero, and Maria Ignacia creeks. Those lands in the City of Santa Barbara lying below a 10 foot elevation are subject to flooding. Under a proposed joint program of the City of Santa Barbara and the County Flood Control District, drainage facilities to alleviate this problem would be constructed.~~

~~Most of the Santa Ynez Valley study area is in Category 5, no flood hazard. However, serious flood hazards do exist along the Santa Ynez River and along Alamo Pintado Creek. Flood hazards of unknown degree also may exist along other tributaries of the Santa Ynez River, and lands adjacent to these tributaries therefore are shown in Category 10. A large area of Alamo Pintado Creek and north of State Highway 150 has been classified in Category 11 because local drainage problems may develop in the future unless proper mitigating measures are taken during development of these lands.~~

~~In the Lompoc urban study area, the hillside areas surrounding the valley flood generally have no flood problems, except for lands adjacent to certain stream channels which may be subject to flood hazards of an unknown degree and, therefore, have been classified in Category 10. On the valley floor, a significant area is subject to inundation from the Santa Ynez River, including a flood plain which is up to one-half mile in width in the eastern end of the valley and which broadens out to encompass a major portion of the western end of the valley. Even outside of the Santa Ynez River flood plain, the valley floor has been shown in Category 9 or Category 10 because of lack of data on possible flooding tributaries of the Santa Ynez. There are also possible localized flood problems in the southern portion of the Lompoc Plain resulting from runoff from La Salle Canyon, Sloans Canyon, and San Miguelito Creek. A federal project has been authorized to alleviate potential flooding adjacent to San Miguelito Creek. However, this program has not been funded, and there is no indication as to when it may be funded.~~

~~In the Santa Maria urban study area, flood hazards from the main stem of the Santa Maria River largely have been eliminated by water storage in Twitchell Reservoir and channelization of the river on the valley floor. Flood problems of unknown extent may exist in the southern end of the Santa Maria Valley, around Orcutt and Betteravia, resulting from runoff from the hills to the south. Most of the Santa Maria Valley is subject to potential local drainage problems which could occur if proper preventive measures were not taken prior to development of the lands. Drainage problems already exist at several locations in the valley, including some areas within the City of Santa Maria. The City currently is constructing additional storm drainage facilities to alleviate these problems on a staged basis.~~

CONCLUSIONS AND RECOMMENDATIONS

~~The County's and the cities' decisions on land use and development projects should be based on the following flood control considerations:~~

~~In stream channels or floodway areas (Categories 1 and 2), no structures should be built, and any agricultural or recreational uses should be subject to controls so that the flood carrying capacity of the stream is not impaired. However, utilizing more detailed engineering studies, applicants for development permission should be allowed to demonstrate to the satisfaction of the Flood Control Engineer that the boundaries of Category 1 or Category 2 areas should be adjusted.~~

~~In the case of lands classified in Categories 3,4,6,7, 10 or 11, areas which are or may be inundated by a 100-year flood, a prerequisite to permitting any construction should be either a demonstration that the site, in fact, will not be inundated by the 100-year flood, or a demonstration that such construction will be carried out in a manner that will protect the site from the 100-year flood. Governmental constraints on agricultural or recreational use of lands in the foregoing categories are unnecessary except where structures are involved.~~

~~No controls over development of lands in Categories 5, 8, or 9, areas which are outside of the 100-year flood plain, are necessary.~~

~~Adequate setbacks from flood channels should be required to provide access for operation and maintenance of the channels, to provide public access, to protect the stream channels and floodways from encroachment, and to create a buffer zone where bank erosion can be tolerated without threatening structures. The amount of such setback should be determined by the Flood Control engineer for each specific instance, and the lands in the setback should be publicly owned. A positive program for delineation and acquisition of these lands should be undertaken.~~

~~Additional studies should be undertaken to define the proper classification of lands with respect to flood hazards in those areas where adequate data presently are not available.~~

~~Flood plain zoning or other similar measures to prevent construction in high flood risk areas should be implemented.~~

~~Where investigations indicate the desirability and feasibility of additional flood control works, these projects should be constructed as soon as possible.~~

~~RECOMMENDATIONS FOR FUTURE STUDY~~

~~The Seismic Safety and Safety Element attempts to investigate and evaluate in a general way all significant geologic, fire and flood problems. It also identifies subjects requiring investigation beyond the scope of this study because of the inadequacy of available information. Some of these are discussed below. It should be noted that tectonic seismic studies currently being made by the U.S. Geological Survey may provide useful data regarding some of these items, but these studies may also raise new questions.~~

~~Although investigations relative to development of specific sites will often provide useful information regarding the fundamental problems listed, overall studies of these problems should be made to provide broad guidance for effective planning and for building and safety control. This objective cannot be accomplished by relying solely on data from individual site investigations.~~

~~Some of the investigations recommended probably would involve significant expenditures, but the costs would be minor compared to the possible benefits. The amounts now being spent on seismic and geologic research are miniscule compared to past and potential future losses.~~

~~1. Basic Geologic Map Coverage~~

~~The geologic maps of the County, which were used in this study, were based primarily on field work done in the 1930's and 1940's by T. W. Dibblee, Jr. (1950,1966) and others (Woodring and Bramlette, 1950) of the U.S. Geological Survey. Although the quality of the work was good, the mapping was done at a different scale and to standards for different purposes than those needed currently for land use planning and development control. There are some significant geologic discrepancies at the boundaries of maps done at different times, even by the same investigator. These differences should be resolved and the work should be updated. In particular, more emphasis should be placed on mapping landslides, active faults (including the age of last movement), and other geologic hazards to be considered in land use planning. Subsequent to publication of the principal map sources utilized in the study, work in many local areas has been done by graduate students and consultants. These findings should be considered in preparing revised maps.~~

~~2. Index Map and Reference~~

~~In order to make the Bibliography of this report more useful, an index map should be compiled showing the areas covered by the various geologic reports and maps.~~

~~An up-to-date air-photo index showing air-photograph dates, scale, responsible agency, and coverage should be compiled. These data would be valuable to planners and to consultants in land planning, geologic, soil, and agricultural studies.~~

~~3. Possible Westerly Extension of the Big Pine Fault~~

~~Based largely on thesis work in progress by S. C. Comstock, a graduate student at the University of California at Santa Barbara, and an interpretation of ERTS-1 high altitude photos, we have postulated a westward extension of the Big Pine fault. This is considered a major active fault, and its extension would have a major effect on evaluating the seismicity of western Santa Barbara County. An investigation should be made to determine if the extension exists and if the fault is active as assumed. If not, a search should be made to locate the fault that caused the intense earthquakes of 1902 and 1915 in the area near and west of the town of Los Alamos. Remote sensing techniques or seismic survey lines across San Antonio Valley at several locations between Los Alamos and the coast might be helpful in locating the fault if it exists. The placement of a seismograph in the Vandenberg area and in the vicinity of Los Alamos should be considered. Precise level lines and small triangulation nets could be established to provide a base for future measurements.~~

~~4. Mesa Fault~~

~~Additional investigation of the Mesa fault is needed, particularly with respect to possible creep movement. This fault has been the subject of a study by Dr. Arthur Sylvester and graduate students at the University of California, Santa Barbara, and Mr. Phillip Olson, instructor of geology at Santa Barbara City College. Their continued work should be encouraged to more precisely locate the fault and determine its activity. In conjunction with these investigations, a study should also be made of the More Ranch fault, the western counterpart of the Mesa fault, to more precisely determine its location and seismic activity. Subsurface investigations, such as borings and trenching, instrumentation, and survey lines would be useful.~~

~~5. Red Mountain Thrust Fault~~

~~There is apparently some evidence of geologically recent movement of the Red Mountain thrust fault in Ventura County and concern that it may be the most dangerous fault in the South Coast area. It should be closely examined in the field in Santa Barbara County to determine if it should be reclassified from potentially active to active.~~

~~6. Instrumentation~~

~~An evaluation of the seismic history of Santa Barbara County has been handicapped by the lack of seismic records. A number of major earthquakes have occurred since the development of seismographs, but there is still a shortage of~~

~~seismic instruments in critical areas of the County. More instrumentation is needed in addition to the present network of seismograph stations (8) established in the Santa Barbara area by the U. S. Geological Survey, Caltech, and the California Department of Water Resources (Figure 19). Survey methods used in the investigation of crustal movements in California (Greensfelder, 1972) should also be expanded and encouraged. We recommend that a study be made to determine the desirable location, number, type and distribution of additional instruments and survey methods in Santa Barbara County. Such a study should be coordinated with the various governmental agencies, universities, and individuals presently acquainted with and involved in this work.~~

~~In addition to the previously recommended seismograph stations at Vandenberg and Los Alamos, seismographs in the Cuyama Valley and in the area of the intersection of the Big Pine and Nacimiento faults would be valuable. Lee and Vedder (1973) have also indicated a "few ocean-bottom seismographs placed in the middle of the channel would greatly improve the ability to locate earthquakes with precision."~~

~~7. Liquefaction and Collapsible Soils~~

~~Although we are not aware of any historic evidence of liquefaction in Santa Barbara County, fundamental data regarding groundwater level and soil characteristics necessary to make such an evaluation are generally lacking. Certain lowland areas with apparent high groundwater levels should be investigated to determine the real potential for liquefaction. Areas suggested for special study are Carpinteria slough, Santa Barbara Harbor area, Goleta slough, Cuyama, and the large alluvial areas in the Santa Ynez, Lompoc, and Santa Maria Valleys. Collapsible soil problems have been reported in certain areas of the Cuyama Valley. Although not one of the urban study areas, possible future development in this area would justify a study of collapsible soils.~~

~~8. Sand and Gravel Deposits~~

~~Sand and gravel deposits are very important to the construction industry and the future development of Santa Barbara County. Such deposits should be conserved, and at the same time consideration should be given to the possible detrimental effects of their removal from stream channels. Since sand and gravel pits are almost invariably located in the alluvial deposits of major channels, removal of these materials reduces the amount of sediment deposited at the mouths of major rivers. This reduction in the sediment supply for wave transport down the coastline presumably means that the waves are "under-nourished" and have a greater tendency to pick up sand, thus increasing coastline erosion. An~~

~~associated problem is the degradation of river channels above the point of removal. This is a complex problem deserving investigation well beyond the scope of this study.~~

~~9. Inundation Maps~~

~~If active faults pass through a dam or reservoir, a potentially severe effect of fault movement would be failure of the dam and inundation of the land downstream. Considering the faults designated active or potentially active in this study, only one intersects a reservoir of significant size. The Santa Ynez fault crosses the Juncal dam area and impounded Jameson Lake. We have no specific information indicating the possibility of dam failure, but in view of the apparent lack of definite evidence to the contrary, we believe that it should be considered possible.~~

~~The function of inspecting and approving dams of a size large enough to be hazardous is the responsibility of the Division of Safety of Dams of the Department of Water Resources of the State of California. The following information was obtained from them. The dam, owned by the Montecito County Water District, actually consists of a main gravity dam and a separate subsidiary concrete multiple arch dam. The dam was constructed in 1930 based on a geologic report by Bailey Willis.~~

~~The Santa Ynez fault apparently passes through a narrow ridge in an east-west direction near the left abutment of the multiple arch (south side of the lake). From the data available, it is not clear how much consideration was given to the possible seismic activity of the Santa Ynez fault and its effect on the proposed dam. An inspection report made during the heavy rains of early 1969 recommended additional study, but a comprehensive study apparently has not been made. An investigation of this problem is beyond the scope of this Seismic Safety Element, but it would appear that the matter deserves more study, and we would recommend that the State Department of Water Resources be encouraged to look more closely into the possible consequences on the dam in the event of movement on the Santa Ynez fault. In the interim, development should be restricted in the inundation area. Because the reservoir volume is not unusually large (6283 acre feet) and because the area downstream is essentially undeveloped, dam failure does not appear to be a major threat to developed areas. Consideration has apparently already been given to an emergency plan in the event of failure and this should probably be reviewed. The Santa Barbara County Flood Control District presently has Inundation Maps as required by the Office of Emergency Services for Juncal and Gibraltar Dams. Inundation Maps for Twitchell and Bradbury Dams are not yet available. However, the Flood Control District has prepared a report entitled "Emergency Procedures for the Santa Ynez~~

~~River Flood Plain” which describes the potential downstream flooding as a result of the collapse of Bradbury Dam.~~

~~10. Coastal Zone~~

~~A report entitled “Geology” with supplemental policies and findings has been prepared by the South Central Regional Commission (April 18, 1974) with various recommendations and guidelines for development on coastal bluffs with respect to geologic hazards. However, a more detailed study should be undertaken in a narrow zone along the coast to delineate specific geologic problems or hazard areas. At the map scale used for this Seismic Safety study, this zone is not much wider than a pencil line, but is quite important because of potential bluff instability, beach erosion, and tsunamis protection. In particular, such a study should delineate the areas where the absence of a sea cliff provides no tsunami protection to inland development.~~

~~11. Up-date of the Seismic Safety and Safety Element~~

~~We recommend that the Seismic Safety/safety Element be up-dated in approximately three years. By that time, many constructive comments on the present study and much additional technical information should be available. In particular, new information on fault location and recurrence intervals from studies now in progress by U.S. Geological Survey” should be available. The additional soil and geologic data obtained over the intervening period could be utilized to modify the various problem ratings and redefine mapped boundaries. The Geologic Problem Index should be applied at a more detailed scale in areas of particular concern; i.e., Los Alamos, New Cuyama, Coastal Zone.~~

~~The Seismic Safety and Safety Element up-date should include an analysis of hazardous land use relationships with particular regard to hazards from the transportation, storage and use of fuels and other dangerous chemicals and explosives. As part of this study, an inventory of existing structures should be performed to determine their physical condition and location relative to potential fire, flood, geologic and hazardous land use safety problems. Additionally, the up-date should recognize hazards related to public protection and supply of emergency services in remote areas of the County, and define the roles of the various public safety agencies in an overall safety program.~~

~~Information on the Alisal Lake and dam should be added to this element once it becomes available from the completed environmental document for the proposed development on Alisal Ranch.~~

VIII. APPENDIX

GLOSSARY

The following are definitions of selected geological and seismological terms commonly used in practice and in this report. The meanings are intended as general definitions. Geological terms not in the glossary can be found in a standard dictionary or in the Glossary of Geology (American Geological Institute, 1973).

Acceleration: The time rate of change of velocity. In association with seismicity and ground motion, it is generally expressed in terms of the acceleration of gravity, "g" (32.2 feet per second per second), e.g., a ground acceleration of 0.2g.

Accelerogram: A graphic record depicting the time history of ground acceleration during a seismic event.

Alluvium: Unconsolidated gravel, sand, and finer sediments deposited principally by running water.

Amplification: The increase in earthquake ground motion that may occur to the principal components of seismic waves as they enter and pass through different earth materials.

Amplitude: The extent of an oscillation or a vibratory movement. On graphic recording, it is the distance from the zero datum to the crest of the plot.

Anticline: A fold, the core of which contains the stratigraphically older rocks; it is convex upward.

Attenuation: The decrease in earthquake ground motion (acceleration, velocity, etc.) that may occur as the seismic waves travel away from the energy source or as they enter and pass through different earth materials.

Bedrock: Consolidated, undisturbed rock material of any sort, in place either at surface or beneath surficial soil deposits.

Collapsible Soil: Soils which exhibit sudden settlement due to load application and introduction of water. Generally loose deposits with particles cemented by soluble materials or clay. Wetting can destroy interparticle cementation with a resulting collapse of the soil structure.

Compaction: The densification of a sediment by means of a mechanical manipulation.

Creep: Gravitational creep is the slow downslope movement of soil or other surficial material.

Damping: A resistance to vibration that causes a progressive reduction of motion with time or distance.

Duration: Interval of time (seconds) in which significant strong ground shaking occurs during an earthquake. Usually the time interval between first and last acceleration peaks above some defined acceleration value (e.g. greater than 0.5g or 25-30% of maximum acceleration).

Epicenter: That point on the earth's surface directly above the point of origin (focus) of an earthquake.

Expansive Soil: Generally cohesive or fine-grained soils which increase (decrease) in volume as a result of water absorption (reduction) in the soil structure.

Fanglomerate: Consolidated deposits of an alluvial fan; a variety of conglomerate which is coarse, moderate to well graded and contains angular to rounded rocks.

Frequency: The number of repetitions of a periodic process in a unit of time.

Frequency of Vibration - Number of complete waves which pass a given point per second (cycles per second).

Frequency of Occurrence - Number of seismic events (earthquakes) occurring in a given time.

Fault: A fracture or fracture zone in the earth's crust along which failure has occurred in response to the accumulation of stress in the rocks and the materials on opposite sides have been displaced relative to one another parallel to the fracture. The displacement may range from a few inches to many miles.

Historically Active Faults are those on which destructive earthquakes have occurred within historic times and which are reasonably well documented.

Active Faults are those that show evidence of displacement or activity during the most recent epoch of geologic time (Holocene- last 11,000 years).

Potentially Active Faults are those which displace deposits of late Pleistocene age (11,000 to 500,000 years) and show no evidence of Holocene (0-11,000 years) movement. Inactive Faults are those that only displace rocks of early Pleistocene Age or older (500,000 years or older) and show no signs of more recent movement.

Fault Creep: Apparently continuous displacement along a fault at a slow but varying rate, usually not accompanied by felt earthquakes (see also tectonic creep). Fault creep is not necessarily tectonic in origin; it may result from artificial withdrawal of fluids or solids.

Fault Displacement: Relative movement of the two sides of fault, measured in any specified direction.

Normal Fault - A vertical to steeply inclined fault along which the block above the fault has moved downward relative to the block below; also includes vertical faults with vertical slip.

Reverse Fault - A steeply to slightly inclined fault in which the block above the fault has moved upward relative to the block below the fault (Thrust Fault).

Left-lateral Fault - A fault on which relative movement is generally horizontal and in which the block across the fault from the observer has moved to the left.

Right-lateral Fault - A fault on which relative movement is generally horizontal and in which the block across the fault from the observer has moved to the right.

Strike-slip Fault - A fault in which the movement is principally horizontal and is approximately in the direction of the strike of the fault.

Fault Sag: A narrow tectonic depression common in strike-slip fault zones. Fault sags are generally closed depression less than a few hundred feet wide and approximately parallel to the fault zone; those that contain water are called sag ponds.

Fault Scarp: A cliff or relatively steep slope formed by displacement of the ground surface along a fault.

Fault Trace: The line of intersection of a fault plane with the earth's surface.

Focus: That point within the earth which is the center of an earthquake and the origin of its elastic waves (Hypocenter).

Fold: A curve or bend of rock strata resulting from deformation in the earth's crust.

Formation: A geological formation is a rock unit of distinctive characteristics which formed over a limited span of time and under generally uniform conditions. A rock body of some considerable areal extent which can be recognized, named, and mapped.

Fracture: A general term for discontinuities in rock, includes faults, joints, and other breaks.

Fundamental Period: The longest period (duration in time of one full cycle of oscillatory motion) for which a structure or soil column shows a response peak - commonly the period of maximum response.

Graben: A fault block, generally long and narrow, that has been dropped down relative to the adjacent blocks by movement along the bounding faults.

Ground Failures: Include mudslide, landslide, liquefaction, subsidence.

Ground Lurching: Surface cracking or distortion due to motions of the ground during an earthquake. Not necessarily directly connected to a fault plane.

Ground Rupture: Lateral or vertical displacements along a fault plane in the upper few feet of soil or rock due to movement on that fault plane.

Ground Shaking: Motions of the soil or rock during an earthquake. May or may not result in rupture, lurching or other ground failure.

Ground Water: In a broad sense, all free water located below the ground surface, including perched and static water levels.

Holocene: Geologic age, equivalent to Recent Epoch (0-11,000 years).

Hypocenter: That point along a fault within the earth where rupture begins and from which earthquake waves originate. (Focus)

Intensity: A subjective measure of the force or size of an earthquake at a particular place as determined by its effects on persons, structures, and earth materials. The principal scale used in the United States today is the Modified Mercalli Intensity Scale.

Landslide: The downward and outward movement of slope-forming materials, such as rock, soil, artificial fill, or combinations of these materials; the topographic feature and the deposit resulting from such movement.

Liquefaction: The sudden loss of strength and decrease of the shearing resistance of a saturated cohesionless soil resulting from high water pressure between soil grains produced by intense ground shaking. This loss of strength leads to a "quicksand" condition in which objects can either sink or float depending on their density.

Magnitude: A measure of the strength of an earthquake or the strain energy released by the earthquake as determined by measuring the amplitudes produced on standardized recording instruments (seismograph).

Microearthquake: An earthquake having a magnitude of 2 or less on the Richter scale.

Microseismic Event: Earthquake or man induced vibrations observable only with instruments.

Modified Mercalli Scale: (See Intensity)

Period: The time necessary to complete one cycle of a cyclic function.

Plastic Deformation: A permanent change, excluding rupture, in the shape of a 501 id.

Pleistocene: An epoch within the Cenozoic Era of the geologic time scale usually taken to cover the last two million years.

Predominant Period: The period at which the spectral acceleration reaches a maximum.

Remote Sensing: The acquisition of information or measurement of some property of an object by a recording device that is not in physical or intimate contact with the object under study. The technique employs such devices as the camera, lasers, infrared and ultraviolet detectors, microwave and radio frequency receivers, and radar systems.

Response Spectrum: A graphical tool of structural dynamic analysis relating the response of a structure (in the forms of deflections, velocities and accelerations) to ground motions (including those resulting from an earthquake).

Richter Scale: A scale of earthquake magnitude based on the logarithm (base 10) of the amplitudes of the deflections created by earthquake waves and records by a seismograph.

Sag Pond: Enclosed depression, generally occupied by water, formed when movement along a fault has disturbed the surface or subsurface continuity of drainage.

Sand Ridges, Boils, Volcanoes: Low ridges or accumulations of sand resulting from increased groundwater pressures where saturated cohesion less materials are compacted by earthquake ground vibrations.

Seiche: Wave generated in a lake, reservoir or pond by an earthquake or landslide. Periodic oscillation of a body of water.

Seismic: Pertaining or related to an earthquake or earth vibration, including those that are artificially induced.

Seismograph: An instrument that scribes a permanent continuous record of earth vibrations.

Seismometer: A device that detects vibrations of the earth, and whose physical constants are known sufficiently for calibration to permit calculation of actual ground motion from the seismograph.

Shear: A mode of failure whereby two adjacent parts of a solid slide past one another parallel to the plane of failure.

Shear Wave: A distortional, secondary or transverse wave.

Strain: Deformation in the dimensions or shape of a body resulting from applied stress. The change in length per unit of length in a given direction.

Stress: In a solid, the force per unit area, acting on any designated plane within it.

Strong Motion: Ground motion produced by a “strong” earthquake or one capable of producing damage to structures. The magnitude of such an earthquake may vary considerably according to the character of the earthquake.

Subsidence: A local mass movement that involves mainly the gradual downward settling or sinking of the solid earth’s surface with little or no horizontal motion.

Syncline: A fold, the core of which contains the stratigraphically younger rocks; it is concave upward.

Tectonic: Of, pertaining to, or designating the rock structure and external forms resulting from deep-seated crustal and subcrustal forces in the earth. Pressures causing such deformations often result in earthquakes.

Tectonic Creep: Slow, apparently continuous movement along a fault, resulting from deformation of the earth’s crust as opposed to an earthquake in which movement is relatively rapid; also called slippage.

Tectonic Stress: Stress caused in rock structures as a result of deformation of the earth’s crust.

Tsunami: Sea wave generated by a submarine earthquake, land slide or volcanic action. Commonly referred to as tidal waves or seismic sea wave.

Water Table: The level beneath the ground surface below which all openings in rocks or sediments are filled with water.

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CITATIONS

¹ [Resolution No. 79-43A](#) (78-GP-5), Adopted January 22nd, 1979 (Adopting Resolution of Seismic Safety Element)

² [Resolution No. 00-56](#) (Case No. 97-GP-002) Adopted February 1st, 2000 (Adopting Resolution for Safety Element Supplement)

³ Council on Intergovernmental Relations, September 1973, p. III-7.

⁴ p. IV-27.

⁵ Late Mesozoic - 140 to 70 million years before present; Cenozoic - 70 million years to the present.

⁶ This name has been applied to several different faults. We follow the usage of the California Division of Mines & Geology, as shown on the 1:250,000 state geologic map sheets (Los Angeles, San Luis Obispo).

⁷ The Cameros fault was so named by M. L. Hall in 1932. The canyon for which it was named was evidently incorrectly shown on a topographic map used by Hill. Upson, in 1951, shows the name as Carneros, which is the correct name for the canyon.

⁸ Single-family wood or steel framed dwellings less than two stories in height and not part of a development of four or more dwellings are exempt from the Alquist-Priolo Act (including mobile homes, apartment to condominium conversions, seismic retrofitting, any development or structure in existence prior to May 4, 1975; except structural alterations that exceed the value limit and additions to any structure where the alteration does not exceed 50 percent of the value of the structure).

⁹ [Resolution No. 83-359](#) Amended August 15th, 1983 (Amend Section to read "Fire Hazard and Fire Services")

¹⁰ In 2010, Section VI: Fire Hazard and Fire Services was amended by the County Board of Supervisors to demonstrate regulatory compliance with the requirements of the Public Resources Code, Government Code, and Title 24 of the California Code of Regulations.

¹¹ California Department of Fire (CDF): http://cdfdata.fire.ca.gov/incidents/incidents_stateevents

¹² Santa Barbara County Fire Department (2005). *Santa Barbara Communities Wildfire Protection Plan*.

¹³ *Ibid*

¹⁴ Government Code §65302(g) (1) requires that Safety Elements address military installations as they relate to identified fire hazards.

¹⁵ Pursuant to Public Resources Code §§ 4201-4204 and Government Code §§ 51175-51188

¹⁶ Santa Barbara County Fire Department (2005). *Santa Barbara Communities Wildfire Protection Plan*.

¹⁷ Fire Ignition Resistant Construction Methods California Code of Regulations, Title 24, Part 2-California Building Code (CBC)

¹⁸ Requirement of Title 24 of the California Code of Regulations, Part 9 California Fire Code. Additionally, Section 13108.5(c) of the Health and Safety Code allows local agencies to revise development standards contained in the California Fire Code in order to meet unique local conditions.

¹⁹ Alternative development standards may be applicable within the jurisdiction of the Montecito and Carpinteria-Summerland Fire Protection Districts.

²⁰ Required pursuant to Government Code, Section 2, 51182(a)(1-6) and Public Resources Code 4291.

²¹ California Department of Forestry and Fire Protection (2006 May). *General Guidelines for Creating Defensible Space*. .

²² SB 1595 revised Government Code, Section 2, 51182(a)(1-6) and Public Resources Code 4291 amending defensible space requirements and clearance around structures.

²³ Pursuant to Government Code, Sections 51178 through Section 51182 and SB 1595

²⁴ Santa Barbara County Office of Emergency Services (2004 November). *Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan*.

²⁵ In 2010 the County amended the Flood Control section of this Element to demonstrate regulatory compliance with the requirements of the Federal Emergency Management Administration (FEMA) (42 U.S.C. 4022) and Government Code Sections 65302, 65560 and 65800.

²⁶ Santa Barbara County Office of Emergency Services (2004 November) *Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan*

²⁷ Santa Barbara County Office of Emergency Services (2004 November) *Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan*

²⁸ *Ibid*

²⁹ *Ibid*

³⁰ Santa Barbara County Office of Emergency Services (2004 November) *Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan*

³¹ National Academy of Sciences (1983) *Safety of Existing Dams- Evaluation and Improvement*.

³² Santa Barbara County Flood Control and Water Conservation District (2006) *Flood Control and Water Conservation District – Prepared for Winter Storms, report of the 2005-2006 Santa Barbara County Civil Grand Jury*.

³³ FEMA (2009 June). *The National Flood Insurance Program*.
<http://www.fema.gov/about/programs/nfip/index.shtm>.

³⁴ FEMA. *Technical Fact Sheet No. 3-Using a Flood Insurance Rate Map (FIRM); Home Builder's Guide to Coastal Construction*.

³⁵ *Ibid*

³⁶ FEMA. Map Service Center. <http://msc.fema.gov>.

³⁷ County of Santa Barbara, Planning and Development Department. *County Code Chapter 15A-Flood Plain Management*.

³⁸ County of Santa Barbara, Planning and Development Department. *County Code Chapter 15B-Development Along Watercourses*.

³⁹ Pursuant to Government Code §65302(g)(2).

⁴⁰ Santa Barbara County Office of Emergency Services (2004 November) *Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan*

⁴¹ *Ibid*

⁴² Pursuant to Government Code §65302(g)(2)(B) and (C).

⁴³ Pursuant to the California Emergency Services Act of 1970

⁴⁴ Authority to create the MJHMP is derived from Disaster Mitigation Act of 2000; Public Law 106-390, Section 322 and the associated Interim Final Rule, 44 CFR Parts 201 and 206, published in the Federal Register on February 26, 2002.

⁴⁵ Santa Barbara County Office of Emergency Services (2004) *Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan*,

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

Santa Barbara County, CA



Participating Jurisdictions:

County of Santa Barbara

City of Buellton
City of Carpinteria*
City of Goleta
City of Guadalupe
City of Lompoc*
City of Santa Maria*
City of Santa Barbara*
City of Solvang*

Prepared for:



FEMA
Region IX

November, 2004

*Section 5 Goals, Objectives, and Mitigation Actions are Pending



SANTA BARBARA COUNTY
MULTI-JURISDICTION HAZARD
MITIGATION PLAN
SANTA BARBARA COUNTY, CALIFORNIA

PREPARED FOR:
COUNTY OF SANTA BARBARA

URS CORPORATION

NOVEMBER 16, 2004

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TABLE OF CONTENTS

Section 1	Introduction.....	1-1
	1.1 Plan Description/Purpose of Plan	1-1
	1.2 Plan Purpose and Authority	1-3
	1.3 Community Description.....	1-3
	1.3.1 The County of Santa Barbara.....	1-3
	1.3.2 Local Jurisdictions	1-6
Section 2	Multi-Jurisdictional Participation Information	2-1
	2.1 List of Participating and Non-Participating Jurisdictions.....	2-1
	2.2 Description of Each Jurisdiction’s Participation in the Planning Process	2-1
Section 3	Planning Process	3-1
	3.1 Description of Planning Committee Formation.....	3-1
	3.2 Hazard Mitigation Working Group Meetings.....	3-2
	3.3 Planning Process.....	3-4
	3.4 Public Involvement.....	3-5
	3.5 Existing Plans or Studies Reviewed	3-10
Section 4	Risk AND VULNERABILITY Assessment	4-13
	4.1 Overview of the Risk Assessment Process.....	4-13
	4.1.1 Identifying Hazards.....	4-13
	4.1.2 Profiling Hazards	4-13
	4.1.3 Identifying Assets	4-14
	4.1.4 Assessing Vulnerability	4-14
	4.1.5 Analyzing Development Trends	4-14
	4.2 Hazard Identification, Screening, and Ranking	4-14
	4.2.1 List of Hazards.....	4-14
	4.2.2 Hazard Identification Process	4-15
	4.2.3 Hazard Identification Sources.....	4-17
	4.2.4 Hazard Ranking.....	4-19
	4.3 Hazard Profiling, Risk, And Vulnerability Assessment	4-20
	4.3.1 Flood	4-21
	4.3.2 Wildfire Fire.....	4-37
	4.3.3 Earthquake	4-49
	4.3.4 Coastal Storm Surge and Tsunami.....	4-63
	4.3.5 Rain-Induced Landslide and Coastal Erosion.....	4-73
	4.3.6 Dam Failure	4-80
	4.4 Analysis of Land Use.....	4-87
	4.5 Analysis of Development Trends	4-90
Section 5	Goals, Objectives and Actions	5-92
	5.1 Overview.....	5-92
	5.2 Regional Considerations.....	5-95
	5.3 County of Santa Barbara.....	5-95

TABLE OF CONTENTS

5.3.1	Capabilities Assessment.....	5-97
5.3.2	Goals, Objectives and Actions	5-116
5.4	City of Buellton	5-179
5.4.1	Capabilities Assessment.....	5-180
5.4.2	Goals, Objectives and Actions	5-194
5.5	City of Carpinteria	5-205
5.5.1	Capabilities Assessment.....	5-206
5.5.2	Goals, Objectives and Actions	5-207
5.6	City of Goleta	5-209
5.6.1	Capabilities Assessment.....	5-210
5.6.2	Goals, Objectives and Actions	5-216
5.7	City of Guadalupe.....	5-237
5.7.1	Capabilities Assessment.....	5-239
5.7.2	Goals, Objectives and Actions	5-251
5.8	City of Lompoc.....	5-263
5.8.1	Capabilities Assessment.....	5-264
5.8.2	Goals, Objectives and Actions	5-264
5.9	City of Santa Barbara.....	5-267
5.9.1	Capabilities Assessment.....	5-268
5.9.2	Goals, Objectives and Actions	5-268
5.10	City of Santa Maria.....	5-271
5.10.1	Capability Assessment	5-272
5.10.2	Goals, Objectives and Actions	5-272
5.11	City of Solvang.....	5-275
5.11.1	Capabilities Assessment.....	5-276
Section 6	Plan Maintenance.....	6-1
6.1	Monitoring, Evaluating and Updating the Plan	6-1
6.1.1	Plan Monitoring	6-1
6.1.2	Plan Evaluation	6-1
6.1.3	Plan Updates	6-2
6.1.4	Implementation through Existing Programs	6-2
6.1.5	Continued Public Involvement.....	6-2

TABLE OF CONTENTS

Tables

Table 3.1-1	Members of the Mitigation Advisory Committee
Table 3.2-2	Mitigation Advisory Committee Meetings Summary
Table 3.4-3	Public Participation In The Planning Process
Table 4.2-1	Summary of Hazard Identification Results
Table 4.2-2	Summary of Hazards Excluded from Hazard Profiling
Table 4.2-3	Hazard Ranking and Planning Consideration
Table 4.3-1	Historical Records of Large Floods in Santa Barbara County
Table 4.3-2	Santa Barbara County Watersheds
Table 4.3-3	Santa Barbara County Flooding Hazards
Table 4.3-4	Abbreviations and Costs Used for Critical Facilities and Infrastructure
Table 4.3-5	Population Exposure and Potential Loss Estimates from 100-Year Flood Hazard by Jurisdiction
Table 4.3-6	Potential Exposure to Critical Facilities and Infrastructure from 100-Year Flood Hazard by Jurisdiction
Table 4.3-7	Major Wildfires in Santa Barbara County
Table 4.3-8	Potential Exposure from Extreme Wildfire Hazard by Jurisdiction
Table 4.3-9	Potential Exposure from Very High Wildfire Threat by Jurisdiction
Table 4.3-10	Potential Exposure from High Wildfire Hazard by Jurisdiction
Table 4.3-11	Potential Exposure from Moderate Wildfire Hazard by Jurisdiction
Table 4.3-12	Potential Exposure to Critical Facilities and Infrastructure from Extreme Wildfire Hazard by Jurisdiction
Table 4.3-13	Potential Exposure to Critical Facilities and Infrastructure from Very High Wildfire Hazard by Jurisdiction
Table 4.3-14	Potential Exposure to Critical Facilities and Infrastructure from High Wildfire Hazard by Jurisdiction
Table 4.3-15	Potential Exposure to Critical Facilities and Infrastructure from Moderate Wildfire Hazard by Jurisdiction
Table 4.3-16	Loss Estimates from 2000-year Earthquake Hazard by Jurisdiction, Residential Buildings
Table 4.3-17	Loss Estimates from 2000-year Earthquake Hazard by Jurisdiction, Commercial Buildings
Table 4.3-18	Potential Loss to Critical Facilities and Infrastructure from 2000-year Earthquake Event
Table 4.3-19	Loss Estimates from 500-year Earthquake Hazard by Jurisdiction, Residential Buildings
Table 4.3-20	Loss Estimates from 500-year Earthquake Hazard by Jurisdiction, Commercial Buildings
Table 4.3-21	Potential Exposure to Critical Facilities and Infrastructure from 500-year Earthquake Hazard by Jurisdiction
Table 4.3-22	Potential Shelter Needs from 2000-year Earthquake Hazard by Jurisdiction
Table 4.3-23	Potential Shelter Needs from 500-year Earthquake Hazard by Jurisdiction
Table 4.3-24	Casualties from 2000-year Earthquake Hazard by Jurisdiction and General Building Type
Table 4.3-25	Casualties from 500-year Earthquake Hazard by Jurisdiction and General Building Type
Table 4.3-26	Potential Exposure from Tsunami Hazard by Jurisdiction
Table 4.3-27	Potential Exposure from Coastal Surge by Jurisdiction
Table 4.3-28	Potential Exposure to Critical Facilities and Infrastructure from Tsunami Hazard by Jurisdiction
Table 4.3-29	Potential Exposure from Coastal Storm/Erosion Hazard by Jurisdiction
Table 4.3-30	Potential Exposure to Critical Facilities and Infrastructure from Dam Failure Hazard by Jurisdiction

TABLE OF CONTENTS

Table 4.3-31	Potential Exposure to Critical Facilities and Infrastructure from Dam Failure Hazard by Jurisdiction
Table 5-1	STAPLE/E REVIEW AND SELECTION CRITERIA FOR ALTERNATIVES
Table 5.3-1	Summary of Potential Hazard-Related Exposure/Loss in Santa Barbara County
Table 5.3-2	Non-Building Earthquake Loss Estimates in Unincorporated Santa Barbara County
Table 5.3-3	Flood Policies in Comprehensive Plan
Table 5.3-4	County of Santa Barbara: Administrative and Technical Capacity
Table 5.3-5	County of Santa Barbara: Legal and Regulatory Capability
Table 5.3-6	County of Santa Barbara: Fiscal Capability
Table 5.4-1	Summary of Potential Hazard-Related Exposure/Loss in Buellton
Table 5.4-2	Non-Building Earthquake Loss Estimates in Buellton
Table 5.4-3	Buellton’s Administrative and Technical Capacity
Table 5.4-4	Buellton’s Legal and Regulatory Capability
Table 5.4-5	Buellton’s Fiscal Capability
Table 5.5-1	Summary of Potential Hazard-Related Exposure/Loss in Carpinteria
Table 5.5-2	Non-Building Earthquake Loss Estimates in Carpinteria
Table 5.6-1	Summary of Potential Hazard-Related Exposure/Loss in Goleta
Table 5.6-2	Non-Building Earthquake Loss Estimates in Goleta
Table 5.6-3	Goleta’s Administrative and Technical Capacity
Table 5.6-4	City of Goleta’s Legal and Regulatory Capability
Table 5.6-5	Goleta’s Fiscal Capability
Table 5.7-1	Summary of Potential Hazard-Related Exposure/Loss in Guadalupe
Table 5.7-2	Non-Building Earthquake Loss Estimates in Guadalupe
Table 5.7-3	City of Guadalupe: Administrative and Technical Capacity
Table 5.7-4	City of Guadalupe: Legal and Regulatory Capability
Table 5.7-5	City of Guadalupe: Fiscal Capability
Table 5.8-1	Summary of Potential Hazard-Related Exposure/Loss in Lompoc
Table 5.8-2	Non-Building Earthquake Loss Estimates in Lompoc
Table 5.9-1	Summary of Potential Hazard-Related Exposure/Loss in Santa Barbara
Table 5.9-2	Non-Building Earthquake Loss Estimates in Santa Barbara
Table 5.10-1	Summary of Potential Hazard-Related Exposure/Loss in Santa Maria
Table 5.10-2	Non-Building Earthquake Loss Estimates in Santa Maria
Table 5.11-1	Summary of Potential Hazard-Related Exposure/Loss in Solvang
Table 5.11-2	Non-Building Earthquake Loss Estimates in Solvang

Figures

Figure 3-1	Public Response – Why People Do Not Have Flood Insurance
Figure 3-2	Public Response – Hazard Reduction Alternative Priority
Figure 3-3	Public Response – Most Effective Way to Receive Information About Making Property Resistant to Hazards
Figure 3-4	Agency Responses – Hazard Reduction Alternative Priority
Figure 4.3.1-A	Floodplains and Critical Facilities, Plate 1
Figure 4.3.1-B	Floodplains and Critical Facilities, Plate 2
Figure 4.3.1-C	Floodplains and Critical Facilities, Plate 3
Figure 4.3.2-A	Wildfire Threat Categories
Figure 4.3.3-A	Ground Shaking Potential and Fault Lines
Figure 4.3.4-A	Coastal Storm Surge/Tsunami

TABLE OF CONTENTS

Figure 4.3.4-B	Coastal Storm Surge/Tsunami
Figure 4.3.4-C	Coastal Storm Surge/Tsunami
Figure 4.3.4-D	Coastal Storm Surge/Tsunami
Figure 4.3.5-A	Landslide and Coastal Erosion
Figure 4.3.6-A	Dam Location and Inundation Map
Figure 4.4-A	Land Use
Figure 4.5-A	Population Density
Figure 5.3-1	County of Santa Barbara, Abbreviated Organizational Chart
Figure 5.7-1	City of Guadalupe Organizational Chart

Appendices

Appendix 3-A	MAC/Public Meeting Information
Appendix 3-B	Survey and Summary of Responses
Appendix 4-A	Data Matrix
Appendix 4-B	Hazard Identification and Ranking Worksheet
Appendix 4-C	Damage Locations, Amounts and Public Assistance Requests from FEMA for past Presidential Disaster Declarations
Appendix 4-D	Flood Loss Estimation Table
Appendix 4-E	Description of Landslide Prone Areas
Appendix 5-A	Mitigation Projects Implementation Matrix
Appendix 5-B	Earthquake Retrofit of Courthouses Project Supporting Materials

TABLE OF CONTENTS

Commonly Used Acronyms and Abbreviations

AIR	Airport facilities
APN	Assessor Parcel Number
BRDG	Bridges
Buellton	City of Buellton
BUS	Bus facilities
Carpinteria	City of Carpinteria
CCR	California Code of Regulations
CERT	Community Emergency Response Team
CGC	California Government Code
CEQA	California Environmental Quality Act
COM	Communication facilities and utilities
ELEC	Electric Power facility
EMER	Emergency Centers, Fire Stations and Police Stations
EOC	Emergency Operations Center
Goleta	City of Goleta
GOVT	Government Office/Civic Center
Guadalupe	City of Guadalupe
GIS	Geographic Information Systems
HOSP	Hospitals/Care facilities
HWY	Highway
INFR	Kilometers of Infrastructure. Includes:
Lompoc	City of Lompoc
LPG	Local Planning Group
MAC	Mitigation Advisory Committee
NOAA	National Oceanic and Atmospheric Administration
OCA	Offsite Consequence Analysis
og	Oil/Gas Pipelines
Plan	Santa Barbara Multi-Jurisdictional Multi-Hazard Mitigation Plan
PORT	Port facilities
POT	Potable and Waste Water facilities
PSI	pound per square inch
RAIL	Rail facilities
RMP	Risk Management Program
RTR	Railroad Tracks
Santa Barbara	City of Santa Barbara
Santa Maria	City of Santa Maria
SCH	Schools
SERP	Site Emergency Response Plans
Solvang	City of Solvang
Unincorporated County	County of Santa Barbara

TABLE OF CONTENTS

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SECTION 1 INTRODUCTION

Across the United States, natural and manmade 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. Santa Barbara County, California recognizes the consequences of disasters and the need to reduce the impacts of natural hazards. The elected and appointed officials of the County also know that with careful selection, mitigation actions in the form of projects and programs can become long-term, cost effective means for reducing the impact of natural hazards.

This *Multi-Jurisdictional Multi-Hazard Mitigation Plan* for Santa Barbara County, California (the Plan), was prepared with input from County residents, responsible officials, URS Corporation consultants, and with the support of the State of California Governor's Office of Emergency Services (CA OES) and the Federal Emergency Management Agency (FEMA). The process to develop the Plan included nearly a year of coordination with representatives from all of the jurisdictions in the region. The Plan will guide the County toward greater disaster resistance in harmony with the character and needs of the County and its communities.

This section of the Plan includes an overview of its content, a discussion of the Plan's purpose and authority, and a description of the eight incorporated cities and the unincorporated County within the Santa Barbara region.

1.1 PLAN DESCRIPTION/PURPOSE OF PLAN

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on jurisdictional policies and actions that will produce successive benefits over time.

The impact of expected yet often unpredictable natural and human-caused events can be reduced through planning. History has demonstrated that it is less expensive to prevent disaster damage than to repeatedly repair damage after a disaster has struck. A mitigation plan states the aspirations and specific courses of action Jurisdictions intend to follow to reduce vulnerability and exposure to future hazard events. This plan was formulated through a systematic process centered on the participation of citizens, businesses, public officials and other stakeholders, to the extent possible.

It is the County's hope the plan will be used as a tool for all stakeholders to increase public awareness of local hazards and risks, while at the same time providing information about options and resources available to reduce those risks. Teaching the public about potential hazards will help the County and Cities protect themselves against the effects of the hazards, and will enable informed decision making on where to live, plan and locate homes and businesses.

The emphasis of the plan is on the assessment and avoidance of identified risks, implementing loss reduction measures for existing exposures and insuring critical services and facilities survive a disaster.

Hazard mitigation strategies and measures avoid losses by limiting new exposures in identified hazard areas, alter the hazard by eliminating or reducing the frequency of occurrence, avert the hazard by redirecting the impact by means of a structure or adapt to the hazard by modifying structures or standards.

Federal legislation has historically provided funding for disaster preparedness, relief, recovery, and mitigation. The Disaster Mitigation Act of 2000 (DMA 2000) is the latest legislation to improve the delivery of mitigation programs through sound and viable planning (Public Law 106-390). The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, DMA 2000 establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP).

Section 322 of DMA 2000 specifically addresses mitigation planning at the state and local levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive, enhanced mitigation plan prior to a disaster. States and communities must have an approved mitigation plan in place prior to receiving post-disaster HMGP funds. County, local and tribal mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to and the capabilities of the individual communities.

State governments have certain responsibilities for implementing Section 322, including:

- Preparing and submitting a standard or enhanced state mitigation plan;
- Reviewing and updating the state mitigation plan every three years;
- Providing technical assistance and training to local governments to assist them in applying for HMGP grants and in developing local mitigation plans; and
- Reviewing and approving local plans if the state is designated a managing state and has an approved enhanced plan.

DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. It encourages and rewards local and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance. This enhanced planning network is intended to enable local and state governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

FEMA prepared an Interim Final Rule, published in the Federal Register on February 26, 2002 (44 CFR Parts 201 and 206), which establishes planning and funding criteria for states and local communities.

The Plan has been prepared to meet FEMA and CA OES requirements thus making the County eligible for funding and technical assistance from state and federal hazard mitigation programs, such as HMGP, Pre-Disaster Mitigation-Competitive, and Flood Mitigation Assistance programs.

1.2 PLAN PURPOSE AND AUTHORITY

Authority to create this Plan is derived from Public Law 106-390, Section 322, commonly known as the Disaster Mitigation Act of 2000 (DMA 2000), and the associated Interim Final Rule, 44 CFR Parts 201 and 206, published in the Federal Register on February 26, 2002. This federal law and associated regulation establishes planning and funding criteria for states and local communities. The Plan is intended to serve many purposes, including:

- *Enhance Public Awareness and Understanding* – to help residents of the County better understand the natural hazards that threaten public health, safety, and welfare; economic vitality; and the operational capability of important institutions;
- *Create a Decision Tool for Management* – to provide information that managers and leaders of local government, business and industry, community associations, and other key institutions and organizations need to take action to address vulnerabilities to future disasters;
- *Promote Compliance with State and Federal Program Requirements* – to insure that Santa Barbara County and its incorporated cities can take full advantage of state and federal grant programs, policies, and regulations that encourage or mandate that local governments develop comprehensive hazard mitigation plans;
- *Enhance Local Policies for Hazard Mitigation Capability* – to provide the policy basis for mitigation actions that should be promulgated by participating jurisdictions to create a more disaster-resistant future; and
- *Provide Inter-Jurisdictional Coordination of Mitigation-Related Programming* – to ensure that proposals for mitigation initiatives are reviewed and coordinated among the participating jurisdictions within the County.
- *Achieve Regulatory Compliance* – To qualify for certain forms of federal aid for pre- and post-disaster funding, local jurisdictions must comply with the federal DMA 2000 and its implementing regulations (44 CFR Section 201.6). DMA 2000 intends for hazard mitigation plans to remain relevant and current. Therefore, it requires that State hazard mitigation plans are updated every three years and local plans, including Santa Barbara County's, every five years. This means that the Hazard Mitigation Plan for Santa Barbara County uses a "five-year planning horizon". It is designed to carry the County through the next five years, after which its assumptions, goals, and objectives will be revisited and the plan resubmitted for approval. In Section 6.0, Santa Barbara County has outlined a more aggressive approach to ensuring the plan is implemented, evaluated, monitored and updated.

1.3 COMMUNITY DESCRIPTION

1.3.1 The County of Santa Barbara

Santa Barbara County, one of 58 counties in the State of California, was established on February 18, 1850. The County is located approximately 300 miles south of San Francisco and 100 miles north of Los Angeles, and covers 3,789 square miles, nearly 28% of which is water. Elevation ranges from sea level to

6,820 feet at Big Pine Mountain. A corner of Kern and San Luis Obispo Counties border it to the north, Ventura County to the east, and the Pacific Ocean to the west and south. The County has 110 miles of coastline, and one third of the land area is located in the Los Padres National Forest.

Santa Barbara County is comprised of eight incorporated cities and 14 unincorporated communities including Vandenberg Air Force Base. The County's total population in 2002 was estimated to be nearly 408,000 with a median age of 33 years (Census 2000). Santa Barbara is the 19th most populous County in the state.

The following subsections provide an overview of the *Economy*, *Physical Features*, *Infrastructure*, and *Jurisdictional Summaries* for the County of Santa Barbara.

1.3.1.1 Economy

Santa Barbara can be subdivided into two or three regions, including North County and South County, as well as the Santa Ynez Valley. Each region has unique features which influence the economics of the area.

North County is part of the central California coastal region. It is defined by the Santa Maria Valley and Lompoc Valley, and includes several different communities, including Vandenberg Air Force Base. The presence of the base in the area has generated a variety of business opportunities, causing the region to evolve away from a strictly agriculture-based economy into one that is more diverse.

The South County's economy is based largely on tourism, education, and services. Several educational institutions are located in the South County including Westmont College and the University of California-Santa Barbara. Many festivals in the South County attract visitors throughout the year. In addition to education and tourism, a variety of technological and agricultural enterprises reside in Goleta and Carpinteria. The City of Santa Barbara is the retail center of the region. The result is a healthy and diverse economy in the South County.

The Santa Ynez Valley is known primarily for its vineyards, horse ranches, and Bed-and-Breakfasts. Visitors come to the Los Padres National Forest for a variety of outdoor activities, including boating, fishing, hiking, and rock climbing. The Danish village of Solvang also attracts a number of tourists to the region throughout the year. Rising housing costs and decreasing housing availability in the South County are contributing to a population increase in the Valley as people migrate to the area.

1.3.1.2 Employment

Santa Barbara's unemployment rate as of September 2004 was 3.4%. Employment in the County increased by nearly 21,000 jobs between 1996 and 2001, however 1,400 jobs have been lost (primarily in the manufacturing, wholesale trade, and information industries) since then. Job growth in the non-farm



sector dropped 0.4% in 2002. Most new jobs are expected in the services industries, especially consumer services, as well as in education. In the next 15 years, employment in durable manufacturing is expected to continue to decrease, while employment in services is expected to continue to increase.

1.3.1.3 Physical Features

Santa Barbara County has a mountainous interior, made up of three primary mountain ranges; the Santa Ynez Mountains, the San Rafael Mountains, and the Sierra Madre Mountains. Most of the mountainous region is within the Los Padres National Forest. The forest contains the San Rafael Wilderness and the Dick Smith Wilderness. The valleys, especially those along the coast, contain most of the population. The cities of Santa Barbara, Goleta, and Carpinteria are all along the south coast, in the valley south of the Santa Ynez Mountains. The Cuyama Valley in the north part of the County is less populated and more arid; oil production, ranching, and agriculture are the dominant land uses there. The County also includes four Channel Islands in the Pacific Ocean. These include San Miguel Island, Santa Barbara Island, Santa Cruz Island, and Santa Rosa Island. Santa Cruz Island is the only one of the four that is privately owned. The Nature Conservancy has owned it since 1987. The other islands are part of the Channel Islands National Park.

The climate in the Santa Ynez Valley is considered one of the finest in California; temperatures in the winter range from an average of 33-degree lows at night to 55-degree highs during the day. In the summertime the daytime highs range in the 70s and 80s with lows ranging in the 50s and 60s. The Cuyama Valley has consistently warm days and cold nights, with gentle breezes keeping temperatures mild in the afternoon, and down-valley breezes cooling things off at night. In the mountains the climate is still considered Mediterranean, with mild rainy winters and warm dry summers.

Due to the Mediterranean climate of Santa Barbara County and the variability of rainfall, stream flow throughout the County is highly variable and directly impacted from rainfall with little snowmelt or base flow from headwaters. Most streams in the County are dry during the summer months. Many streams in the County have flows that rise and fall in response to precipitation. Watercourses can experience a high amount of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years.

The drainages in the southern part of the County are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. The drainages in the northern part of the County are contained in the upper mountain areas, but broaden out into level valley floors. The drainages in the northern part of the County are generally characterized by longer duration and less intense storms than the southern coastal areas. The majority of streams in Santa Barbara County only flow during winter months.

There are four major reservoirs located in the County; Lake Cachuma, Twitchell, Gibraltar, and Jameson Lake. Lake Cachuma, Gibraltar Reservoir, and Jameson Lake are located along the Santa Ynez River, in the South County. Lake Cachuma is the largest reservoir along the Santa Ynez River, with a drainage area of 421 square miles upstream of the Bradbury Dam. Gibraltar Reservoir has a drainage area of 214 square miles upstream of Gibraltar Dam and Jameson Lake has a drainage area of 14 square miles upstream of Juncal Dam.

In the North County, the Twitchell Reservoir is located along the Cuyama River. The Cuyama River Basin has a drainage area of approximately 1,140 square miles and it is the confluence of the Cuyama and Sisquoc Rivers that form the Santa Maria River. The Twitchell Reservoir has a drainage area of 1,135 square miles above Twitchell Dam.

The County is divided into five major watersheds; Santa Maria, Cuyama, San Antonio, Santa Ynez River and South Coast. The Santa Maria Watershed includes the Cuyama and Sisquoc watersheds. The drainage areas for these watersheds are:

Watershed	Drainage Area
Santa Maria	1,845 square miles
Cuyama	1,140 square miles
San Antonio	165 square miles
Santa Ynez River	900 square miles
South Coast	416 square miles

1.3.1.4 Infrastructure

The infrastructure of Santa Barbara County supports the industries and the residents of the County. The Public Works Department maintains over 1,668 lane miles of major roads and local streets in the unincorporated portions of the County, including over 112 bridges. There are five airports in the County of Santa Barbara; Lompoc Airport, Santa Barbara Airport, Santa Barbara Municipal Airport, Santa Maria Public Airport, and Santa Ynez Airport. The County has been producing oil and gas since the late 1800's. It was in 1896 that oil producers constructed piers to access the underwater portion of the Summerland Oil Field, marking the beginning of offshore oil production. Several operational oil platforms are located along the Coast of Santa Barbara County, including one in the tidewaters. Groundwater is the primary source of potable water for many County residents. However, river water and rain water is collected into reservoirs and treated, serving the majority of the South County population. The Cachuma and Twitchell Reservoirs are owned by the federal government, administered by the Water Resources Division, and operated by local water purveyors. The Gibraltar Reservoir is owned and operated by the City of Santa Barbara, and serves its residents. Jameson Reservoir is operated by the Montecito Water District. Its water is delivered to the south coast via three tunnels through the Santa Ynez Mountains.

1.3.2 Local Jurisdictions

1.3.2.1 *Buellton (Population: 3,828)*

Buellton is located on US Highway 101 in the Santa Ynez Valley, 40 miles northwest of Santa Barbara and 360 feet above sea level. The City of Buellton was incorporated on February 1, 1992. Buellton enjoys a Mediterranean coastal climate with mild, dry summers and cool, wet winters. Buellton is transitioning from a crossroads commercial center for automobile travelers to a unique community offering full services to its residents and visitors. Located within commuting distance to the more populous coastal areas, Buellton is home to many commuters. It is also expected to grow. With real

estate prices at an all time high, more and more people are locating to the Santa Ynez Valley and other previously undeveloped areas to find more affordable housing.

1.3.2.2 *Carpinteria (Population: 14,194)*

The City of Carpinteria is a thriving business community, with proximity to strategic business centers and an idyllic seaside location. It is approximately 12 miles southeast of Santa Barbara and 80 miles from Los Angeles. It covers a land area of 2.6 square miles, and an ocean area of 4.7 miles. The City's average temperatures range from 45 to 72 degrees with more than 275 days of sunny weather per year. Average yearly rainfall is 17.9 inches. The industries employing the largest number of workers in the City are services, retail, and durable manufacturing. Prominent service industries that support tourist activities include recreation and amusement, hotels and lodging, and local transportation services.

1.3.2.3 *Goleta (Population: 30,538)*

As a recently incorporated city (February 2002), Goleta is in the unique position of defining not who they are, but who they want to be. According to the vision statement from the Goleta Valley Vision, Goleta would like to be part old-fashioned suburb, and part high-tech entrepreneurial business area, with a history of cutting-edge environmentalism. The city is located in the commercial and industrial heart of the County and has in recent years drawn many high technology companies to the area. The City is located about eight miles west of the City of Santa Barbara, with a swath of unincorporated urban area between the two cities. Located along the coast, the town has 7.9 square miles of land area, comprising a total of 5,075 acres. Goleta is in an excellent position, as it develops its policies and governance through planning and regulatory development, to institutionalize mitigation into its government operations.

1.3.2.4 *Guadalupe (Population: 5,659)*

Guadalupe is located several miles off the coast, and about 10 miles west of Santa Maria. It is 85 feet above sea level, and contains a land area of 1.4 square miles. The median age in Guadalupe is 26.7, and the median household income in the year 2000 was \$31,205. Guadalupe boasts one of the lowest crime rates in California, with zero murders and only two robberies total for 2001 and 2002. Guadalupe is home to two museums; the Guadalupe Cultural Arts & Educational Center and the Guadalupe Historical Society. The Cultural Arts & Heritage is a new center which will be opening soon. Several events are held each year in downtown Guadalupe, including various festivals and the Rodeo Ring. Guadalupe Beach is a popular place for fishing, and the Dunes Center provides hiking with a variety of natural wonders. Agriculture is the primary economic driver in Guadalupe.

1.3.2.5 *Lompoc (Population: 41,103)*

Lompoc is located 155 miles northwest of Los Angeles and 270 miles southeast of San Francisco. The approximate elevation of the City is 88 feet above mean sea level, with the coast located nine miles west of downtown. The City was incorporated on August 13, 1888. The growth and diversification of Lompoc was due in part to the establishment and growth of Camp Cooke Army Base, now Vandenberg Air Force Base, which is located just seven miles west of Lompoc. The city is also famous for its flower fields, and hosts a Flower Festival every year. In addition, Lompoc is home to one of the 21 Franciscan Missions in

California. La Purisima Mission is one of only three preserved Missions within the State Park System. It is well known as the most fully restored mission, in its most original setting.

1.3.2.6 *Santa Barbara (Population: 92, 325)*

The City of Santa Barbara is located on the south coast of the County. Due to the Santa Ynez mountain range that blocks colder air from the north, Santa Barbara enjoys some of the most mild and pleasant weather in California. It sits at an elevation of roughly 50 feet above sea level and has a land area of 19 square miles. The median age in the city is 34.6 and the median income was \$47,498 in 2000. The city received its name when the California mission Santa Barbara was founded there in 1786. The mission was known as the Queen of the Missions due to its beauty and the beauty of its surroundings. Attractions in Santa Barbara include the Santa Barbara Museum of Natural History, the Santa Barbara Zoo, and Old Spanish Days – Fiesta Santa Barbara. Santa Barbara is the retail, tourism and government center of the County. It is home to the Santa Barbara Municipal Airport, which services the majority of the County.

1.3.2.7 *Santa Maria (Population: 77,423)*

The City of Santa Maria is located approximately 250 miles south of San Francisco and 170 miles north of Los Angeles. It lies within the Santa Maria River Valley in a fertile plain, surrounded by rolling hills on three sides and the Pacific Ocean to the west. The median age in the city is 29.2, and the median income in the year 2000 was \$36,541. Since 1957, the population of the City of Santa Maria has more than doubled; this growth may be attributable to the relatively affordable housing prices. For most of the 20th Century, the City's area remained roughly four square miles. Annexations beginning in August 1954 have increased the city's physical size to slightly over 20 square miles. Agriculture has always played an important role in the City's economy however other important sectors of the local economy are growing, including the aerospace industry; communications; high-technology research and development; energy production; military operations; and various manufacturing industries.

1.3.2.8 *Solvang (Population: 5,332)*

Solvang was founded in 1911 by a group of Danish teachers. Danish for “Sunny Fields”, Solvang is now a popular tourist destination. Located in the Santa Ynez Valley, it is home to a variety of Danish festivals, the Hans Christian Andersen Park, Danish pastries and Danish-themed shops. Solvang was incorporated as a city on May 1, 1985. It is located just off the south coast of the County, at an elevation of roughly 496 feet. The median resident age in Solvang is 43.2, and the median income in the year 2000 was \$45,799. Solvang, like the rest of the Santa Ynez Valley continues to experience growth as people migrate from the coastal areas looking for affordable real estate within commuting distance to the more populous areas of the County.

1.3.2.9 *Unincorporated County of Santa Barbara (Population: 128,872)*

As mentioned previously, Santa Barbara County was established on February 18, 1850. The unincorporated portions of the County are largely agricultural, although some urban areas exist. There are also several unincorporated towns in the County, including Cuyama, IslaVista, Los Alamos, Los Olivos, Mission Canyon, Mission Hills, Montecito, New Cuyama, Orcutt, Santa Ynez, Summerland, Toro Canyon, and Vandenberg Air Force Base and Village.

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SECTION 2 MULTI-JURISDICTIONAL PARTICIPATION INFORMATION

2.1 LIST OF PARTICIPATING AND NON-PARTICIPATING JURISDICTIONS

The following jurisdictions participated in the development of the Plan:

- Santa Barbara County
- Buellton
- Carpinteria
- Goleta
- Guadalupe
- Lompoc
- Santa Barbara
- Santa Maria
- Solvang

There were no non-participating jurisdictions, although participation varied, as described in more detail, below. Representatives from all participating jurisdictions as well as local business, various public and private non-profit agencies, media, and the general public, provided input during plan preparation. Local jurisdictional representatives included but were not limited to fire chiefs/officials, police chiefs/officials, planners and other jurisdictional officials/staff.

2.2 DESCRIPTION OF EACH JURISDICTION'S PARTICIPATION IN THE PLANNING PROCESS

As described in more detail in the Section 3 - Planning Process, there were three principal groups involved in the preparation of this plan: the Santa Barbara County Mitigation Advisory Committee (MAC), the Floodplain Management Planning Committee (FMPC) and Local Planning Groups (LPGs) from the City Jurisdictions. The County established the MAC to facilitate the development of the Plan and retained URS Corporation and subcontractor Dewberry & Davis, LLC to assist. A representative from each incorporated city was designated by their jurisdiction as the MAC member. Each MAC member identified a Local Planning Group (LPG) for their jurisdiction that included decision-makers from police, fire, emergency services, community development/planning, transportation, economic development, public works and emergency response/services personnel. The jurisdiction-level Local Planning Group assisted in identifying the specific hazards/risks that are of concern to each jurisdiction and to prioritize hazard mitigation measures. The MAC members brought this information to MAC meetings held regularly to provide jurisdiction-specific input to the multi-jurisdictional planning effort and to assure that all aspects of each jurisdiction's concerns were addressed. A list of the lead contacts for each participating jurisdiction is included in Section 3.2.

All MAC members were provided an overview of hazard mitigation planning elements at the MAC meetings, which led the MAC members through the process of defining the jurisdiction's assets, vulnerabilities, capabilities, goals and objectives, and action items. The County, with support from its

consultants, was responsible for facilitating the planning process and developing the Hazard Identification and Risk Assessment (HIRA) with input from the MAC and LPGs. The Local Planning Groups were responsible for setting their goals and objectives, conducting a capabilities assessment and developing their own mitigation strategies, or “action plans” as outlined by jurisdiction in Section 5.0.

MAC members also participated in the public workshops held to present the risk assessment, preliminary goals, objectives and actions. In addition, several MAC members met with URS staff specifically to discuss hazard-related goals, objectives and actions. Preliminary goals, objectives and actions developed by jurisdiction staff were then reviewed with their respective City Council, City Manager and/or representatives for approval.

Throughout the planning process, the MAC members were given maps of the profiled hazards as well as detailed jurisdiction-level maps that illustrated the profiled hazards and critical facilities. Data received from MAC members were added to the hazard database and used in the modeling process described in the Risk Assessment portion of the Plan (Section 4).

The planning process included the full engagement of the MAC, including representation by the LPGs. All nine jurisdictions were full participants in the development of the Hazard Identification and Risk Assessment, presented in Section 4.

Four of the nine jurisdictions completed Section 5, Goals, Objectives, Capabilities and Mitigation Actions to be full participants in the Multi-Jurisdictional Plan. Full Participants include:

- Santa Barbara County
- City of Buellton
- City of Goleta
- City of Guadalupe

The County and these cities are submitting this plan for full approval by CA OES and FEMA, Region IX.

The remaining jurisdictions were partial participants and will either continue with their LPGs to develop their Goals, Objectives, Capabilities and Mitigation Strategies (Section 5) and resubmit for later approval, or will extract their portion of this plan, including their involvement to date in the planning process, complete plans and submit for a single jurisdiction plan. A list of partially participating cities includes:

- City of Carpinteria
- City of Lompoc
- City of Santa Barbara
- City of Santa Maria
- City of Solvang

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SECTION 3 PLANNING PROCESS

3.1 DESCRIPTION OF PLANNING COMMITTEE FORMATION

The planning process began with the formation of a County Floodplain Management Plan, as required by the National Flood Insurance Programs (NFIP) Community Rating System. A Floodplain Management Planning Committee (FMPC) was formed to complete that plan in November of 2003. Shortly into the planning process, the County made a decision to expand that committee to form a MAC to complete the Multi-Hazard Mitigation Plan. The MAC was formed in January of 2004 and included the FMPC as a sub-group focused on flooding issues. During the winter, the project was further expanded to become a Multi-Jurisdictional Multi-Hazard Mitigation Plan and City representatives of the LPGs were added to the MAC. The MAC was led by Santa Barbara County Public Works Department and Santa Barbara County Fire, Office of Emergency Services and facilitated by the consultants. Table 3.1-1 includes a list of participants who served on the committee(s).

Table 3.1-1 Members of the Mitigation Advisory Committee

Names	Organization
David Rickard, Chair	Disaster Recovery Manager, County Public Works Department
Bruce Carter	Emergency Manager, County Fire – OES
Richard Abrams	Emergency Svc. Supervisor, County Fire - OES
Michael J. Parker, CFM	Santa Barbara County Flood Control District, Public Works
Zacharias Hunt	County Surveyor’s Office, GIS Services
Tenell Matlovsky	County Surveyor’s Office, GIS Services
Dace Morgan	Transportation Division, County Public Works Department
Christian Doolittle	Geologist, County Public Works Department
Stephen Carlson	Pitts & Bachmann Realtors – Resident*
Steve Shively	Dennis Bethel & Associates – Resident*
Justin Van Mullen, MCRP	ON Design Architects – Resident*
Tom Wright, P.E.	MNS Engineers, Inc. – Resident*
Scott Choquette, CFM	Consultant (Dewberry & Davis, LLC)
Jennifer Marr	Consultant (URS Corporation)
LPG Representative	Jurisdictional Affiliation
Linda Reid, OES Coordinator	City of Buellton
Yolanda McGlinchey, Fire Department Dale Lipp	City of Carpinteria

LPG Representative	Jurisdictional Affiliation
Steve Wagner, Community Services Director, Kimberly Nilsson, Consultant	City of Goleta
Carolyn Galloway-Cooper, City Manager	City of Guadalupe
Linual White, Fire Chief	City of Lompoc
Mitch Jan, Police Department	City of Santa Barbara
Jack Owens, Fire Chief	City of Santa Maria
Dwight Pepin, Fire Chief	City of Solvang

* Served primarily on FMPC, with review role for Multi-Hazard Plan
 Full membership in the LPGs is included in Section 5.0 for each jurisdiction.

3.2 HAZARD MITIGATION WORKING GROUP MEETINGS

During the planning process, the MAC met several times between November 2003 and October 2004, and convened weekly conference calls with LMP members throughout the summer season. Topics and agendas covered the steps in the planning process, data collection, capabilities assessment, hazard identification, profiling and vulnerability assessment, goals and objectives, mitigation strategies and prioritization of strategies. The committee coordinated and consulted with other entities and stakeholders through out the process. Table 3.2-2 identifies the dates the MAC and its sub groups met and the topics covered during the meetings.

Table 3.2-2 Mitigation Advisory Committee Meetings Summary

Meeting Dates	Summary of Discussions
11/19/03	FMPC Kick-Off Meeting - During the first meeting, a brief presentation summarizing the CRS program and the County's participation was given to the committee members. The committee discussed what the CRS requirements for a Floodplain Management Plan were and what the County's plan should cover. The planning process and schedule, participation/role of committee members and others, and the resolution formally recognizing the committee were also discussed. Repetitive losses areas are a major concern for Santa Barbara County It was determined the plan should focus on repetitive losses. Lastly, the committee discussed the multi-hazard surveys that were distributed to the public and agencies to solicit their input. Public Invited.
12/09/03	County Board of Supervisors passes resolution at public meeting formally establishing the committee
02/12/04	MAC Meeting with LPGs- Establishment of MAC and assignment of responsibilities was the topic of the meeting. The meeting was also held to discuss progress on the plan to date, via the work done toward completion of the floodplain management plan and the work already started by the County

Meeting Dates	Summary of Discussions
	and consultants. The committee reviewed past hazard events in the County, planning process, public involvement strategy, goals and objectives, and a “homework” assignment on mitigation actions. The committee also reviewed the results of the public and agency multi-hazard surveys. After reviewing the survey results and County hazards, the committee discussed goals and objectives for the plan and mitigation strategies that could accomplish these goals. Members of the public were invited and attended this meeting, including RL property owners, by direct mailing.
04/07/04	<p>MAC Meeting with LPGs - During the meeting, the committee focused on reviewing critical facility and “hot spot” maps and discussing possible mitigation strategies. The project schedule was also discussed. The committee reviewed the critical facilities and “hot spot” maps. There was significant discussion on how the multiple jurisdictions would participate through LPGs. A schedule for completing the HIRA and for developing mitigation strategies was discussed. Public was invited.</p> <p>After this meeting, the committee planned to schedule more (better advertised) public meetings and one meeting for the adoption of the plan.</p>
04/08/04	<p>FMPC (subcommittee) – Met to review preliminary flooding hazard profiling, critical facility inventory, asset inventory and to develop mitigation projects as follow up to the “homework” assignment from the previous meeting. The FMPC was formed prior to the MAC to work on the NFIP/CRS floodplain management plan. For that reason it was ahead of the MAC and the decision was made to leave it intact as a subcommittee of the MAC. As the committee reviewed the maps, mitigation strategies for each mapped area were discussed. The following categories of floodplain management and mitigation strategies were discussed: floodplain mapping, County coordination with the Cities and State, involvement in FEMA’s Cooperating Technical Partner Program, community flood education and public outreach, structure auditing, flood warning systems, and regulatory changes.</p>
08/04/04	<p>MAC Meeting - The meeting was held to review the mitigation strategies identified in the plan and to review the draft plan and develop a schedule for implementation, prior to two scheduled public review meetings. The preliminary HIRA was discussed and some mitigation projects were ranked and evaluated against the STAPLE/E criteria discussed further in Section 5.</p>
07/08/04 thru 10/14/04	MAC and LPG Weekly Coordination Conference Calls
08/04/04	A South County public meeting was held in Santa Barbara to present the Hazard Mapping, Risk Assessment and Mitigation Alternatives.
08/05/04	A North County public meeting was held in Santa Maria to present the Hazard Mapping, Risk Assessment and Mitigation Alternatives. Press invited and attended.
8/4-8/6/04	Individual meetings with consultant and each LPG were held throughout the County
10/19/04	MAC meeting to finalize Goals, Objectives and Mitigation Strategies and review final HIRA
10/19/04 & 10/20/04	Consultant meetings with individual County Departments and Goleta LPG to finalize Mitigation Strategies
10/28/04	Distribution of Draft Final Plan
TBD	A Board of Supervisors Public Notification and Review meeting was held (public meeting)
TBD	A Board of Supervisors Public Meeting to Adopt the Plan was held

See Appendix 3-A for sign-in sheets, meeting agendas, and meeting minutes.

Other meetings included individual meeting with jurisdictions, presentations to local planning teams/City Councils, and public hearings by individual jurisdictions for adoption of the Plan. Each of the partially participating jurisdictions will take the plan through its own public hearing and adoption process and resubmit to CA OES for final approval.

3.3 PLANNING PROCESS

Santa Barbara County generally followed the planning process recommended by FEMA in the *FEMA State and Local Mitigation Planning How-to-Guide* (How-to-Guide). The process followed the 10 general steps below:

1. Conduct project kick off meeting with newly formed MAC
2. Develop goals
3. Gather initial available data and conduct interviews
4. Gather additional relevant data from external sources
5. Perform Hazard Identification and Risk Assessment
6. Conduct Vulnerability Assessment
7. Conduct Capabilities Assessment
8. Develop objectives and mitigation strategies
9. Draft Plan
10. Adoption

Many of the steps listed above are self explanatory.

The *Hazard Identification and Risk Assessment*, detailed in Section 4, involved working with the MAC to identify the hazards the County and other jurisdictions perceived as threatening and deciding on whether or not to include man-made hazards, and which ones. Section 4 describes the analysis of hazards present throughout the County. It includes historical data from past occurrences and establishes a hazard ranking based upon frequency, probability, potential magnitude and impact. The hazard identification and ranking form the foundation for prioritizing mitigation actions.

The *Vulnerability Assessment* was conducted via investigative research and the use of Geographical Information System (GIS) technology. Based on historical research, previous studies, community interviews and state and state and national datasets, the hazards identified and ranked for inclusion in the plan were mapped, or profiled. Once draft hazard maps were developed, extensive outreach was conducted with County departments, outside parties and through public meetings during which many of the preliminary hazard maps were ‘red-lined’ and subsequently modified. Once confident that the maps accurately reflected hazard areas, focus switched to quantifying what is at risk in those areas, in terms of assets, infrastructure and population. Exposure analysis was conducted for all hazards and actual loss estimation for particular events for both earthquake and flooding.

The *Capability Assessment* included a comprehensive assessment of the County’s capacity to implement meaningful mitigation actions based on past performance, current programs and political will. Staff and organizational capability, technical capability, policy and program capability, fiscal capability and legal authority were all considered. The purpose of the assessment was to find existing gaps and weaknesses or conflicting demands or interests of different programs that could hinder mitigation program development and project execution, as well as to build upon local programs, codes and existing plans to establish a significant and cohesive local loss reduction program. Each city jurisdiction was responsible for its own capability assessment.

Based on hazard identification, risk and vulnerability assessments and the capability assessment a meaningful *Hazard Mitigation Strategy* (action plan) was developed. Again, the city jurisdictions were responsible for completing their own mitigation strategies. The efforts involved in assessing risks and vulnerabilities and programmatic needs, which were centered on the jurisdictions’ goals, helped in creating meaningful objectives and mitigation actions that can be realistically implemented.

From late 2003 to late fall 2004, the MAC held regular meetings and continually worked on the plan. The Committee coordinated and consulted with other entities and stakeholders to identify and delineate natural and manmade hazards within the County to assess the risks and vulnerable property in identified hazard areas. From the start, every attempt was made to establish an open public process to provide an opportunity for all sectors of the overall community to be involved in the planning process. In some cases direct public input was successful and in others the residents were represented in the process by their jurisdictions staff, by necessity.

3.4 PUBLIC INVOLVEMENT

There were several opportunities during the planning process for the public to provide input and participate in the development of the Plan. Table 3.4-3 summarizes opportunities for public input. As noted above, meeting agendas and minutes for the public meetings are provided in Appendix 3-A.

Table 3.4-3 Public Participation in the Planning Process

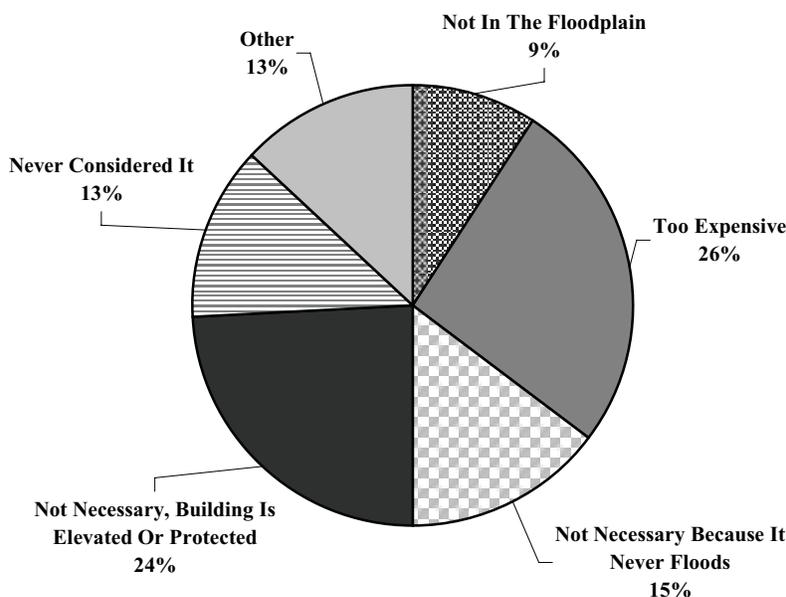
Dates	Summary of Methods
11/12/03	Invitation letter sent to approximately 300 floodplain residents advising date of first public kick off meeting of the FMPC (which shortly became a subcommittee of the MAC). Additionally, a mailing went out to business community leaders. Three subsequently joined the FMPC.
11/19/03	During the first meeting, a brief presentation summarizing the CRS program and the County’s participation was given to the committee members. The planning process and schedule, participation/role of committee members and others, and the resolution formally recognizing the committee were also discussed. It was determined that the Committee would involve three members of the public with knowledge of floodplain management issues. Two members of the public participated.
12/03/04	Based on the poor turn out from the public at the first meeting, the committee decided to distribute a survey to over 400 random residents throughout the County and various adjoining jurisdictions, federal and state agencies and special interests (see below and Appendix 3-B). In anticipation of

Dates	Summary of Methods
	forming the MAC, the County chose to make the survey multi-hazard. Survey had an excellent response.
12/09/03	County Board of Supervisors passes resolution at public meeting formally establishing the committee
02/12/04	The first combined MAC/FMPC meeting was held to discuss progress on the plan to date. Public who attended 11/19/03 meeting were invited back. The committee also reviewed the results of the public and agency surveys. Members of the public were invited and attended this meeting, including RL property owners.
Mid July, 2004	Upcoming Public Meetings posted on Santa Barbara County website, specifically developed for Mitigation Planning
07/25 – 08/04/04	Notice of Upcoming Public Meetings in Santa Barbara News-Press
07/25 – 08/04/04	Public Meeting Notice on Channel 20 Government Access Television
08/04/04	A South County public meeting was held in Santa Barbara to present the Hazard Mapping, Risk Assessment and Mitigation Alternatives for both the floodplain management plan and multi-hazard plan – one member of the public attended.
08/05/04	A North County public meeting was held in Santa Maria to present the Hazard Mapping, Risk Assessment and Mitigation Alternatives for both the floodplain management plan and multi-hazard plan – Good public and press attendance, including elected officials and Santa Maria Times.
08/06/04	Article in Santa Maria Times
TBD	LPGs advertise and hold public meetings to review plans in each of the eight cities
TBD	Plan posted on County web site and in other public locations in the County and in each participating jurisdiction
TBC	Internet, newspaper and Channel 20 Government Access Television announcement of upcoming public review meetings
TBD	A Board of Supervisors Public Notification and Review meeting was held (public meeting)
TBD	Individual Public City Council Meetings to Adopt the Plan
TBD	A Board of Supervisors Public Meeting to Adopt the Plan was held

This plan was developed with input from meetings, telephone conversations, and survey input received from residents in Santa Barbara County. The Santa Barbara chapter of the Surf Rider Foundation, Cachuma Resource Conservation District, US Army Corp of Engineers, US Geologic Survey and other state and federal agencies were surveyed in addition to residents, businesses and the eight cities. Follow up telephone calls were made by the URS consulting team to increase responses. Copies of the surveys distributed to the public are provided in Appendix 3-B. Although the many surveys were sent to people in flood hazard areas, 63% of the people in those areas are only somewhat concerned about being impacted by a natural hazard. Based on public survey input, residents of Santa Barbara County are primarily concerned with earthquakes (29%), floods (34%), and wildfires (24%). Residents of the County are also concerned about drought (11%). Other (2%) hazards identified by members of the community included, transporting hazardous materials, un-pruned trees, and crime.

Surveys were distributed throughout the County to home or business owners from the tax assessor’s database. Of those residents of floodplains who were surveyed, 11% of responded they were not located in the floodplain and 11% were not sure if they were located in the floodplain. Therefore, 78% of the people surveyed knew they are located in the floodplain, but only 52% of these people have flood insurance. Reasons stated for not having flood insurance are summarized in Figure 3-1.

Figure 3-1. Public Response - Why People Do Not Have Flood Insurance



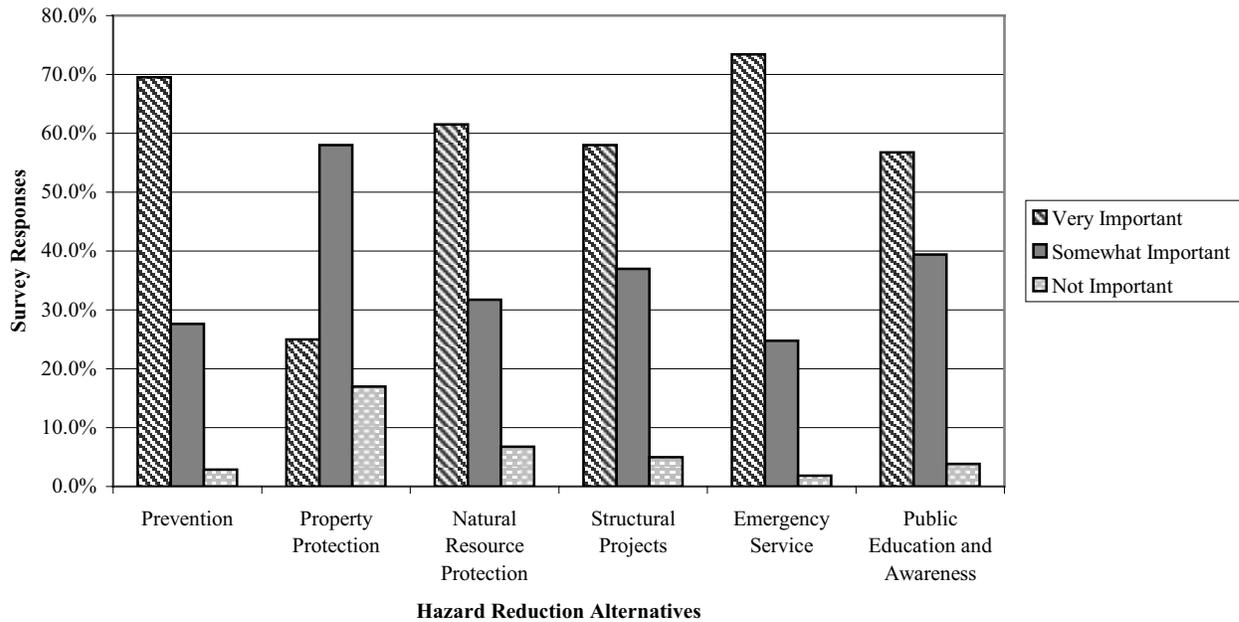
Note: Other responses included flood insurance was not available, flood insurance was not necessary because there were no structures on the property, and chances of flood damage were low.

A large percentage of the respondents surveyed (75%) stated they have taken precautions for making their homes and businesses more resistant to hazards. Many of the respondents have taken some of the following precautions, performed creek or channel maintenance, such as removing dead trees or limbs and cutting brush; rebuilt creek walls; installed drains and sump pumps in yard; clean storm drains; had structures elevated; installed diversion structures; completed drainage improvements; and maintain a supply of sand bags. Precautions for other hazards included structure seismically retrofitted, adding earthquake restraints to tall furniture and water heaters, installed auto shut-off on gas meter, installed fire resistant roof, increased vegetation distance from homes, planted drought resistant plants, and purchased standby generators. Seventy-eight percent of the people who responded were interested in making their homes and businesses more resistant to natural hazards.

The public was also asked what hazard reduction alternatives were important to them. The hazard reduction alternatives included 1) Prevention (i.e., planning and zoning, building codes, open space preservation, and vegetative fuel clearing); 2) Property Protection (i.e., acquisition, relocation, elevation, structural retrofits, and storm shutters); 3) Natural Resource Protection (i.e., floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management); 4) Structural Projects (i.e., dams, levees, seawalls, detention/retention basins, channel modification, retaining walls, and storm sewers); 5) Emergency Services (i.e., warning systems, evacuation planning, emergency response

training, and protection of critical facilities); 6) Public Education and Awareness (i.e., outreach projects, school education programs, library materials, and demonstration events). Figure 3-2 summarizes public input for hazard reduction alternatives.

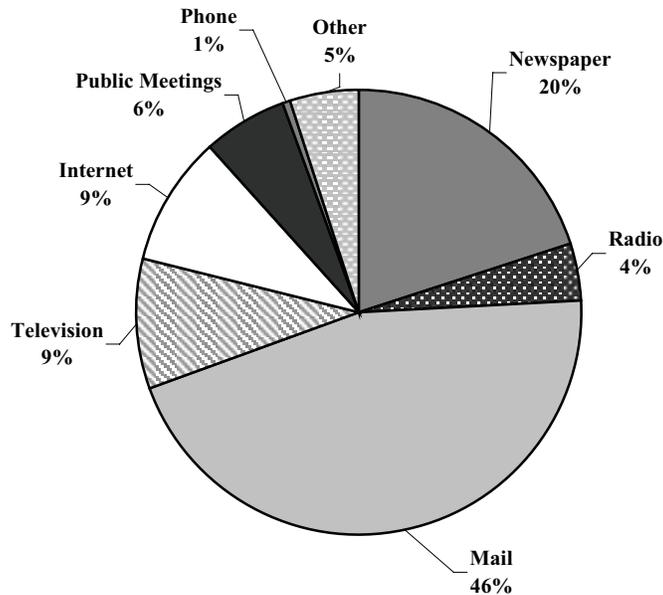
Figure 3-2. Public Response - Hazard Reduction Alternative Priority



Administrative or regulatory actions that influence the way land is developed and buildings are built, such as planning, zoning, building codes, open space preservation, and floodplain regulations were also considered a high priority by public respondents. Emergency actions that protect people and property during and immediately after a hazard event, such as warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems were considered the highest priority, according to public survey respondents.

Finally, the public was asked in what manner they would like to receive notices from the County on how to make their homes and business more resistant to hazards. The results are summarized in Figure 3-3. Although the most requested way to receive notices from the County was by mail, it is not economically or logistically feasible to contact residents of the County by mail on a regular basis. The County will utilize the other more popular methods to notify the public (i.e., newspaper notices, television, and internet postings).

Figure 3-3. Public Response - Most Effective Way to Receive Information About Making Property Resistant to Hazards

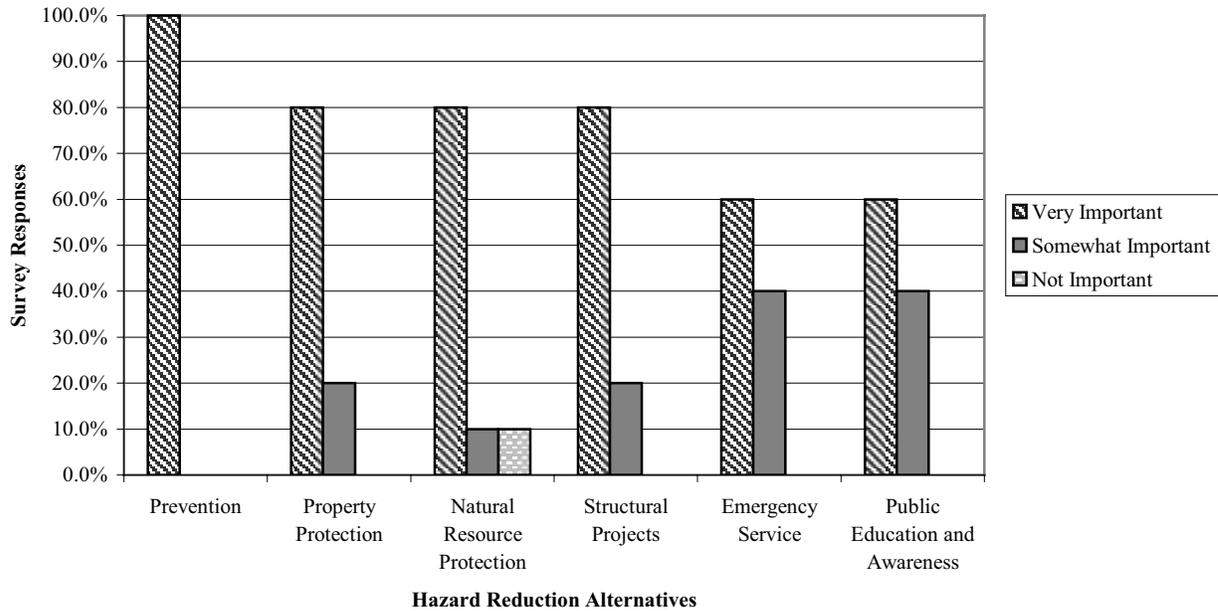


Note: Other responses included notification via friends, email, and the Montecito Emergency Response and Recovery Action Group (MERRAG).

A summary table containing survey responses can be found in Appendix 3-B. The public’s input was greatly appreciated and was considered and incorporated into this Plan.

A similar survey was distributed to local, state and federal agencies with the potential to address hazard mitigation or emergency response in Santa Barbara County. The agencies surveyed addressed a variety of natural hazards and some agencies dealt with several forms of natural disasters; drought (30%), earthquake (30%), extreme heat (10%), flood (90%), and wildfire (20%). The agencies were asked similar questions as the members of the public regarding hazard reduction alternatives, their responses are summarized in Figure 3-4.

Figure 3-4. Agency Responses - Hazard Reduction Alternative Priority



Agency input was greatly appreciated and was considered and incorporated into this Hazard Mitigation Plan.

Section 6 describes how the County will keep the public and other stakeholders involved in implementation and future updates of the plan.

3.5 EXISTING PLANS OR STUDIES REVIEWED

MAC team members and the corresponding Local Planning Groups prior to and during the planning process reviewed several plans, studies, and guides in addition to regulations/ordinances and policies. These plans included FEMA documents, emergency services documents as well as County and local general plans, community plans, local codes and ordinances, and other similar documents. These included:

- Santa Barbara County/Cities General Plans
- Various Local Community Plans
- Various Local Codes and Ordinances
- Various Emergency Response Plans
- Various Precipitation Reports
- County and City Operating Budgets

- State and Local Mitigation Planning How-to-Guide, FEMA 386-2, August 2001
- Interim Hazard Mitigation Planning Guidance for California Local Governments
- FEMA CRS-DMA2K Mitigation Planning Requirements
- Crosswalk Reference Document for Review and Submission of Local Mitigation Plans to the State Hazard Mitigation Officer and FEMA Regional Office

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SECTION 4 RISK AND VULNERABILITY ASSESSMENT

4.1 OVERVIEW OF THE RISK ASSESSMENT PROCESS

Risk Assessment requires the collection and analysis of hazard-related data in order to enable local jurisdictions to identify and prioritize appropriate mitigation actions that will reduce losses from potential hazards. The *FEMA State and Local Mitigation Planning How-to-Guide* (How-to-Guide) identifies five Risk Assessment steps as part of the hazard mitigation planning process, including: 1) identifying hazards, which involves determining those hazards posing a threat to a study area, 2) profiling hazards, which involves mapping identified hazards and their geographic extent, 3) identifying assets, which assigns value to structures and landmarks in the identified hazard areas, 4) assessing vulnerability, which involves predicting the extent of damage to assets, and 5) analyzing development trends, which assesses future development and population growth to determine potential future threat from hazards. These steps are described in detail in the following sections.

4.1.1 Identifying Hazards

Natural hazards identification is the process of recognizing natural events that threaten a particular planning area. A natural event causes a hazard when it harms people or property or interferes with commerce and human activity. Such events would include floods, earthquakes, tornadoes, tsunamis, coastal storms, landslides, and wildfires that strike populated areas. Natural hazards that have harmed the County in the past are likely to happen in the future; consequently, the process of identifying hazards includes determining whether or not the hazard has occurred previously. Approaches to collecting historical hazard data include researching newspapers and other records, conducting a planning document and report literature review in all relevant hazards subject areas, gathering hazard-related GIS data, and engaging in conversation with relevant experts from the community. In addition, a variety of sources were used to determine the full range of all potential hazards within Santa Barbara County, including internet research. Even though a particular hazard may not have occurred in recent history in Santa Barbara County, it is important during the hazard identification stage to consider all hazards that may potentially affect the planning area.

4.1.2 Profiling Hazards

Hazard profiling involves describing the physical characteristics of past hazards such as magnitude, duration, frequency, and probability. This stage of the hazard mitigation planning process involves creating base maps of the study area and collecting and mapping hazard event profile information obtained from various Federal, State, and local government agencies. The extent to which hazards are profiled is dependent on the availability of data. Some hazard profiles provide significantly more information than others based on the amount of prior research and data production identified. The MAC and consultant team obtained national maps available online from sources such as the United States Geological Survey (USGS), National Oceanographic and Atmospheric Administration (NOAA), FEMA and the California Governor's Office of Emergency Services (CAOES). Many useful data were also available from the County's own GIS Services within Public Works. The hazard data was mapped to determine the geographic extent of the hazards in each participating jurisdiction. The level of risk

associated with each hazard in each jurisdiction was also estimated and assigned a risk level of high, medium or low (or variations thereof) depending on several factors unique to that particular hazard.

4.1.3 Identifying Assets

The third step of the risk assessment process is to identify the assets in each jurisdiction which will be affected by each hazard type. Assets include any type of structure or critical facility such as hospitals, schools, and public infrastructure. An inventory of existing and proposed assets within the County was generated. The assets were then mapped to show their locations and to determine their vulnerability to each hazard type. The MAC also considered potential future development, based upon a review of the County's and City's General Plans. As with profiling, identification of assets is limited to best available and usable data.

4.1.4 Assessing Vulnerability

An asset is vulnerable if it is susceptible to damage from a hazard. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. A vulnerability analysis can also predict the extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment identifies the effects of hazards by estimating the relative exposure of population, land development, and infrastructure to hazardous conditions. This includes consideration of indirect effects of hazards, which can be much more widespread and damaging than direct effects. For example, the loss of commerce due to road closures for an amount of time could significantly outweigh the cost of repairing the road. The assessment helps set mitigation priorities by allowing the County and local jurisdictions to focus attention on areas most likely to be damaged or most likely to require early emergency response during a hazard event.

4.1.5 Analyzing Development Trends

The final step of the risk assessment merges hazard information with proposed land uses and planned development within the County. Due to the difficulty in predicting where future development will take place this section is not intended to provide a thorough analysis of future hazard areas. However, it does provide the groundwork for proposing mitigation strategies in the most likely locations and an opportunity to evaluate codes, regulations and standards within a hazard context to determine appropriate changes to protect from damage to future development.

4.2 HAZARD IDENTIFICATION, SCREENING, AND RANKING

4.2.1 List of Hazards

The MAC reviewed hazards listed in the How-to-Guide and determined the prevalence of each hazard in Santa Barbara County and whether each hazard should be included in the Plan. All hazards identified by FEMA in the How-To-Guides were reviewed. They include: avalanche, coastal storm, coastal erosion, dam failure, drought/water supply, earthquake, expansive soils, extreme heat, flooding, hailstorm, house/building fire, land subsidence, landslide, liquefaction, severe winter storm, tornado, tsunami, wildfire, windstorm, and volcano.

4.2.2 Hazard Identification Process

The MAC worked with the consultant team to narrow the all-inclusive list of hazards to those most threatening to the Santa Barbara region. Consideration was also given to which hazards could realistically be addressed in terms of mitigation during the screening process. The screening effort required input from a variety of MAC members, including representatives from City governments and County departments. It also considered the results of the two surveys, addressed in Section 3. Meetings with the general public were also held to confirm that the decision of the MAC were inclusive of public sentiment regarding which hazards pose the most significant threat and/or were realistic to address within the scope of this plan.

Coastal storm surge and tsunami hazards are profiled together because the same communities in the County have the potential to be affected and the nature of the hazard is very similar. Landslide and coastal erosion, although not necessarily taking place in the same areas, are similar hazards in many ways so they too are analyzed together.

The final list of hazards to be profiled for Santa Barbara County was determined as Flood, Wildfire, Earthquake, Coastal Storm Surge/Tsunami, Landslide/Coastal Erosion, and Dam Failure.

Table 4.2-1 shows a summary of the hazard identification results for Santa Barbara County.

**Table 4.2-1
Summary of Hazard Identification Results**

Hazard	Representative Data Collected for Hazard Identification	Justification for Inclusion
Flood	<ul style="list-style-type: none"> • FEMA FIRM Maps • FEMA Q3 Flood Hazard Layer • Topography • Base flood elevations (FEMA) • Historical flood records and recent damage location maps • Santa Barbara County Water Conservation and Flood Control District • Santa Barbara County Floodplain Management Plan • FEMA Hazards website 	<ul style="list-style-type: none"> • Much of Santa Barbara County is located within the 100-year floodplain • Flash floods and other flood events occur regularly during rainstorms due to terrain and hydrology of Santa Barbara County • Every Jurisdiction within the County, except Guadalupe has FEMA mapped flood hazard areas • There have been 10 Proclaimed Disaster Declarations as a result of flooding in Santa Barbara County
Wildfire	<ul style="list-style-type: none"> • CDF-FRAP • USFS • CDFG • Topography • County Fire/OES • Historical fire records • FEMA Hazards website 	<ul style="list-style-type: none"> • Santa Barbara County experiences wildfires on a regular basis – history presented below • Terrain and climate of Santa Barbara • Santa Ana Winds
Earthquake	<ul style="list-style-type: none"> • USGS • CGS • CISON • FEMA-HAZUS 99 • FEMA Hazards website 	<ul style="list-style-type: none"> • Several active fault zones pass through Santa Barbara County • Historical Earthquake Damage
Coastal Storm Surge/Tsunami	<ul style="list-style-type: none"> • Maximum Tsunami Run up Projections (USCA OES) • FEMA FIRM Maps • FEMA Hazards website 	<ul style="list-style-type: none"> • Coastal storms history • Coastline stabilization measures have been implemented at various times in the past (erosion) • Extensive development along the coast
Landslide/Coastal Erosion	<ul style="list-style-type: none"> • USGS • CGS • Tan Map Series • Steep slope data (USGS DEM) • FEMA FIRM V-Zones • FEMA-HAZUS • FEMA Hazards website • Maximum Tsunami Run up Projections (USCA OES) • FEMA Hazards website 	<ul style="list-style-type: none"> • Steep slopes within earthquake zones characterize Santa Barbara County, which creates landslide risk. • Landslide history (primarily during flooding events, severe winter storms, and areas recently hit by wildfire) • Coastal storm/erosion history • Coastline stabilization measures have been implemented at various times in the past (erosion) • Extensive development along the coast

Hazard	Representative Data Collected for Hazard Identification	Justification for Inclusion
Dam Failure	<ul style="list-style-type: none"> • FEMA-HAZUS • Dam Inundation Data (CA OES) • County Public Works GIS Services • FEMA FIRM maps • FEMA Hazards website 	<ul style="list-style-type: none"> • Potential threat to drinking water supply • Several dams exist throughout Santa Barbara County • Many dams over 30 years old • Some downstream development

Data in GIS format was projected into the State Plane, NAD 1983, California Zone VI Coordinate System (US Survey Units Feet), and clipped to the Santa Barbara County and Jurisdictional boundaries. Data that was not available in GIS format was either digitized into GIS or kept in its original format and used as a reference. A matrix of all data collected, including source, original projection, scale, and data limitations is included in Appendix 4-A. Maps were generated depicting the potential hazards throughout the County and distributed to the jurisdictions. Data and methods that were ultimately used to determine risk levels and probability of occurrence for each hazard are described in detail in the hazard profiling sections.

4.2.3 Hazard Identification Sources

Hazard data was collected from the Internet, direct communication with various agencies, discussions with consultant team in-house experts, and historical records. Specific sources included:

- United States Geological Survey (USGS)
- California Geological Survey (CGS)
- Federal Emergency Management Agency (FEMA) HAZUS
- FEMA Flood Insurance Rate Maps (FIRM)
- United States Forest Service (USFS)
- California Office of Emergency Services (CA OES)
- California Department of Forestry – Fire and Resource Assessment Program (CDF-FRAP)
- National Oceanographic and Atmospheric Administration (NOAA)
- National Climatologic Data Center (NCDC)
- Santa Barbara County Flood Control District
- Southern California Earthquake Data Center (SCEDC)
- California Seismic Safety Commission (CSSC)
- California Integrated Seismic Network (CISN)
- California Department of Fish and Game (CDFG)
- Input from local jurisdictions, districts and agencies
- General Plan Safety and Land Use Elements from the 8 cities
- Santa Barbara County Comprehensive Plan
- Santa Barbara County Public Works, GIS Services
- Santa Barbara County Fire, OES

Table 4.2-1 also depicts data sources researched and utilized by hazard, as well as brief justifications for inclusion of each hazard of concern in the Santa Barbara region.

Non-Profiled Hazards

During the initial evaluation the MAC determined that a number of hazards would not be included in the profiling step because they were not prevalent hazards within the County, were found to pose only minor or very minor threats to the County compared to the other hazards or were generally linked to or covered by other selected hazards. The following table gives a brief description of those hazards and the reason for their exclusion.

**Table 4.2-2
Summary of Hazards Excluded from Hazard Profiling**

Hazard	Description	Reason for Exclusion
Avalanche	A mass of snow moving down a slope. There are two basic elements to a slide; a steep, snow-covered slope and a trigger	Snowfall in County mountains not significant; poses very minor threat compared to other hazards
Drought/water supply	Long periods without substantial rainfall.	The most populous area of the County (South County) receives its water from the Cachuma Reservoir. Although droughts are somewhat common, no significant long term threats were identified. Mitigation strategies are limited.
Expansive soils	Expansive soils shrink when dry and swell when wet. This movement can exert enough pressure to crack sidewalks, driveways, basement floors, pipelines and even foundations	Presents a minor threat to limited portions of the County. No historical problems with expansive soils were identified. No soil data was identified for profiling and analysis.
Extreme heat	Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks	Prolonged heat waves are not a historically documented hazard in the region
Hailstorm	Can occur during thunderstorms that bring heavy rains, strong winds, hail, lightning and tornadoes	Occurs during severe thunderstorms; most likely to occur in the central and southern states; no historical record of this hazard in the region.
Land subsidence	Occurs when large amounts of ground water have been withdrawn from certain types of rocks, such as fine-grained sediments. The rock compacts because the water is partly responsible for holding the ground up. When the water is withdrawn, the rocks fall in on themselves.	Soils in the County are mostly hard. Presents a minor threat. No historical record of this hazard in the region.
Severe winter storm	Large amounts of falling or blowing snow and sustained winds of at least 35 miles per hour occurring for several hours	Minor threat in mountains of the County. No historical record of this hazard in the region.
Tornado	A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is spawned by a thunderstorm (or	Less than one tornado event occurs in the entire State of California in any given year; poses very minor threat compared to other hazards. No historical record of this

Hazard	Description	Reason for Exclusion
	sometimes as a result of a hurricane) and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris.	hazard in the region.
Volcano	A volcano is a mountain that is built up by an accumulation of lava, ash flows, and airborne ash and dust. When pressure from gases and the molten rock within the volcano becomes strong enough to cause an explosion, eruptions occur	No active volcanoes in Santa Barbara County. No historical record of this hazard in the region.
Windstorm	A storm with winds that have reached a constant speed of 74 miles per hour or more	Maximum wind speed in the region is less than 60 miles per hour and would not be expected to cause major damage or injury
Liquefaction	Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other.	Will be covered generally in earthquake section. Consistent quality liquefaction mapping not available Countywide. History of liquefaction in Santa Barbara County is not available. Soil types A – C (hard soils) are most prevalent in the County. Although there are some soil type D areas in the County that may present more of a risk.

4.2.4 Hazard Ranking

Once the MAC identified that hazards to be included in the plan the hazards were ranked. Prioritization of the hazards that threaten the County was based on two separate factors:

- Probability that the hazard will affect the community; and,
- Potential impacts on the community when it does

Each hazard’s total impact is made up of three separate factors:

- Likely geographical extent of affected area;
- Primary impacts of the hazard event; and,
- Related secondary impacts

While primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For example, a primary impact of a flood event may be road damage due to submerged

pavement or eroded surface. A possible secondary impact in these circumstances would be restricted access of emergency vehicles to citizens in a portion of the County due to the road closure.

A formula was developed to assign a value for probability and impact for each of the hazards considered. The probability of each hazard was determined by assigning a level, from 1 to 4, based on the likelihood of occurrence (which itself is based on historical data) and interviews with citizens and department heads as well as on the public and agency surveys conducted early in the planning process. The total impact value includes the affected area, primary impact and secondary impact levels of each hazard. These levels are then multiplied by an importance factor to obtain a score for each category. The probability score is multiplied by the sum of the three impact categories to determine the total score for the hazard. Based on this total score, the hazards were separated into four categories based on the relative risk level they pose to the County: *significant*, *moderate* and *limited*. In order to focus on the most critical hazards, those assigned a level of *Significant* or *Moderate* were given the most extensive attention in the remainder of this analysis, while those with a *Limited*, planning consideration were addressed in more general ways.

The hazard ranking was based on the overall probability and impact on the County as a whole. When examining the multiple jurisdictions included in this plan, the same ranking does not always apply. For example, in Guadalupe, where there are no mapped flooding hazards, flooding would not be given the highest priority, as obviously coastal surge and Tsunami wouldn't be a factor for communities far inland. In Section 5, where each participating jurisdiction provides its capabilities assessment, goals, objectives and mitigation actions, the hazards that are most critical to those jurisdictions are presented.

**Table 4.2-3
Hazard Ranking and Planning Consideration**

Hazard Type and Ranking	Planning Consideration Based on Hazard Level
1. Flooding (52)	Significant
2. Wildfire (50)	Significant
3. Earthquake (41)	Significant
3. Coastal Surge/Tsunami (36)	Moderate
4. Landslide/Coastal Erosion (26)	Limited
5. Dam Failure (22)	Limited

A Hazard Identification and Ranking Worksheet is included as Appendix 4-B and contains all the calculations and formulas utilized.

4.3 HAZARD PROFILING, RISK, AND VULNERABILITY ASSESSMENT

A hazard profile is a description of the physical characteristics of a hazard and a determination of various hazard descriptors, including magnitude, duration, frequency, probability, and extent. The hazard data that were collected in the hazard identification process were mapped to determine the geographic extent of the hazards in each jurisdiction in the County and the level of risk associated with each hazard. Most hazards were given a risk level of high, medium or low depending on several factors unique to the hazard. The

hazards identified and profiled for Santa Barbara County, as well as the data used to profile each hazard are presented in this section on a hazard-by-hazard basis in the order they were ranked in subsection 4.4.2. for each jurisdiction.

The analysis presented here is based upon “best available data”. See Appendix 4-A for a complete listing of sources and their unique data limitations (if any). Data used in updates to this plan should be reassessed upon each review period to incorporate new or more accurate data if/when possible. Significantly more data was available for some hazards than for others.

4.3.1 Flood

4.3.1.1 Hazard Profile

Nature of Hazard

A flood occurs when water from rainfall flows into rivers and streams where it exceeds the bank capacity and is forced onto the river’s floodplains. Floodplains are lowlands adjacent to rivers, lakes, and oceans that are subject to recurring floods. Most injury and death from floods occur when people are swept away by flood currents, and property damage typically occurs as a result of inundation by sediment-filled water. Most areas around the globe are subject to some form of flooding.

Several factors determine the severity of floods, including rainfall intensity and duration, surface permeability, and geographic characteristics of the watershed such as shape and slope. A large amount of rainfall in a short time can result in flash flood conditions, as can a dam failure, or other sudden spill. The National Weather Service’s definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

Flooding History

Between 1862 and the 1998, Santa Barbara experienced 14 significant floods. Eight of these floods received Presidential Disaster Declarations. Table 4.3-1 lists these floods, as well as information concerning the nature of the flooding and the extent of the damages.

**Table 4.3-1
Historical Records of Large Floods in Santa Barbara County**

Date	Damages	Source of Estimate	Comments
1862	Not available	1993 Precipitation Report	Largest discharges ever in California
1907	Significant damage to structures, crops	1993 Precipitation Report	4 straight days of rain, entire Lompoc Valley engulfed
1914	Twelve houses and six bridges lost	County of Santa Barbara Sanitation and Flood Control	Destroyed 2 dams, 22 deaths
1952	50+ homes inundated, large-scale evacuations	EIR, 1993 Precipitation Report	Propagated the formation of the Flood Control District
1964	Millions of dollars	Floodplain Information Montecito Streams Vicinity of Montecito, SB County	Relatively light rain fell on recently burned areas. 20' walls of water, mud, boulders, and trees
1969	\$4.5 million	Floodplain Information Montecito Streams Vicinity of Montecito, SB County	Highest flows in 2900 years on Santa Ynez River, 16" of rain in 24 hours at Juncal Dam
1971	Federal Disaster Declaration	Floodplain Information Montecito Streams Vicinity of Montecito, SB County	High flows and flooding along Romero Canyon Creek, Garrapata Creek, and Toro Canyon Creek
1978	Millions of dollars, Presidential Disaster Declaration	1993 Precipitation Report and Hydrology Methods	Inundation of agricultural areas and mudslides.
1980	Presidential Disaster Declaration	n/a	Severe flooding, mudslides, and high tides throughout County
1982-1983	2 Presidential Disaster Declarations	n/a	Parts of southern California received over 200% of normal rainfall
1993	\$1.4 million in disaster recovery funds received from FEMA	1993 Precipitation Report and Hydrology Methods	180%-209% or normal rainfall, with highest-ever intensity for the County recorded at Buellton Fire Station: 1 1/4 inches in 15 minutes.
January 1995	\$50 million, Presidential Disaster Declaration	1995 Floods	Flooding on most major channels in Goleta, Santa Barbara, Montecito, and Carpinteria
March 1995	\$30 million, Presidential Disaster Declaration	1995 Floods	Major flooding in Goleta, Santa Barbara, and Montecito, many of the same structures flooded in January were flooded again
1998	\$15 million, Presidential Disaster Declaration	1998 Flood Report	21.36" of rainfall that month in Santa Barbara, many areas at 600% of normal February rainfall

The following paragraphs summarize the historic flooding events in noted on the prior page. Information in this section has been obtained and compiled from County documents, committee and public input, and federal and state declared disaster information.

1862 Flood Summary - Three storms between December 1861 and January 1862, collectively called the Great Floods, produced some of the largest flood discharges ever experienced in California. These storms changed the landscape of the County. (1993 Precipitation Report)

1907 Flood Summary - After four straight days of rain, flood flows on the Santa Ynez River engulfed the entire Lompoc Valley. The floods caused significant damage to structures and crops and all but one of the bridges along the river were washed out. (1969 Floods) (1993 Precipitation Report)

1914 Flood Summary - Torrential rains beginning January 15, 1914, continued for nearly two weeks and were more severe in the south coast streams. Sixteen inches of rainfall, climaxed by over four inches in two hours on the final day, caused enormous damage in both suburban and rural areas. These storms also resulted in the destruction of twelve homes and six bridges in the Mission Creek area. (Floodplain Information Montecito Streams Vicinity of Montecito, Santa Barbara County, California) (1993 Precipitation Report)

1952 Flood Summary - During January 1952 there were devastating floods on the South Coast that propagated the formation of the Flood Control District. During these floods, more than fifty homes around Mission Creek were inundated and there were many large-scale evacuations. (EIR) (1993 Precipitation Report)

1964 Flood Summary - Relatively light rain, which fell on portions of the watershed, burned by the Coyote Fire, caused severe flooding in the area of Montecito, Hot Springs, Cold Springs, and San Ysidro Creeks. Record high flows were recorded in San Antonio and Montecito Creeks. Damage to public and private property was in the millions of dollars and hundreds were forced to evacuate their homes. Eyewitnesses to the flood reported over 20-foot walls of water, mud, boulders, and trees moving down the channels at approximately 15 miles per hour. Bridges were swept away in seconds and flows inundated large areas damaging structures and depositing debris. (Floodplain Information Montecito Streams Vicinity of Montecito, Santa Barbara County, California) (1993 Precipitation Report)

1969 Flood Summary - Governor Reagan declared Santa Barbara County a disaster area on January 25, 1969. The worst flood in 55 years drove hundreds from their homes, caused \$4,500,000 in property damage and closed most highways leading out of the city. Flooding occurred at the East and West branches of Toro Creek, Oak Creek at Mouth, San Ysidro Creek, Buena Vista Creek, and Romero Canyon Creek. (Floodplain Information Montecito Streams Vicinity of Montecito, Santa Barbara County, California) The Santa Ynez River experienced highest flows in 2,900 years and 16-inches of rain fell at Juncal Dam in a 24-hour period. The 1969 storm was equivalent to a 100-year storm in the upper Santa Ynez watershed and the Lompoc, San Antonio, Santa Maria, and Goleta Valleys experienced 5-10-year storms. (1969 Floods)

1971 Flood Summary - In December of 1971 flooding and high flows were recorded at Romero Canyon Creek, Garrapata Creek, and Toro Canyon Creek. Santa Barbara County, particularly the Montecito-

Summerland area, was declared a federal disaster area. (Floodplain Information Montecito Streams Vicinity of Montecito, Santa Barbara County, California)

1978 Flood Summary - Storms in February and March of 1978 caused inundation of agricultural areas, mudslides, and millions of dollars of damage. (1993 Precipitation Report and Hydrology Methods) (Presidential Disaster Declaration)

1980 Floods Summary Storms in February, 1980 caused severe flooding mudslides and high tides throughout the County. (Presidential Disaster Declaration)

1982 – 1983 Flooding - During 1982 – 1983, several parts of southern California received over 200% of normal rainfall during what was the strongest El Nino event of record. Santa Barbara County had widespread slope destabilization and coastal flooding. (2 Presidential Disaster Declarations)

1992 Flood Summary - The 1992 – 1993 rainy season was one of the wettest recorded in Santa Barbara County, areas of the County received 180% to 209% normal rainfall. One of the County's highest short-duration rainfall intensities was recorded during 1993; 1-1/4-inches fell in fifteen minutes at the Buellton Fire Station. Following a 25-year storm event that occurred in late March, Santa Barbara was declared a federal disaster area with 12 creeks substantially damaged along with several detention basins and residences. Santa Barbara County received approximately \$1.4 million in disaster recovery funds from FEMA. (1993 Precipitation Report and Hydrology Methods) (Presidential Disaster Declaration)

1995 Flood Summary - The floods of 1995 brought widespread flooding to Santa Barbara County. The most severe flooding occurred on the South Coast while the rest of the County was largely spared from serious damages. On the South Coast, the 1995 Flood was more severe and wide spread than either the 1969 or 1967 floods. Flooding occurred on most major streams from Goleta to Montecito. Estimated public and private damages were around \$100 million and the area was declared a federal disaster area. (1995 Floods)

January 1995 - Flooding occurred on most major channels in Goleta, Santa Barbara, Montecito, and Carpinteria. Approximately 510 structures were reported flooded and/or damaged along the South Coast, with a total cost resulting from public and private damages of approximately \$50,000,000. All modes of transportation in and out of the South Coast were cut off for several hours; some modes of transportation were not restored for several days. (1995 Floods) (Presidential Disaster Declaration)

March 1995 - During the March 10th 1995 storm, major flooding occurred again in the areas of Goleta, Santa Barbara, and Montecito. More than 300 structures were reported flooded and/or damaged; many of the same structures flooded or damaged during the January 1995 storm event. Approximately 30 million dollars of public and private property were damaged during the storm. Once again, all modes of transportation in and out of the South Coast were cut off for several hours. (1995 Floods) (Presidential Disaster Declaration)

1998 Flood Summary – February 1998 brought several record-breaking rainfalls with 50-year storm event intensities. The City of Santa Barbara recorded its wettest month in history, 21.36-inches of rainfall. By the end of the month, many areas in the County had received 600% of normal February

rainfall. Flood related damages within Santa Barbara occurred during three major storm periods: February 1-4, February 6-9, and February 22-24. The cost to repair extensive flood damage to public and private property was estimated at \$15 million. Just like in 1995, transportation throughout the County was disrupted through closures of roads, the Santa Barbara Airport, and train service. Flood damage was spread throughout the County and the County was declared a Federal Disaster Area on February 9. (Presidential Disaster Declaration)

Although the February storms had higher annual rainfalls, flooding in 1998 was considered less severe than other historical events due to flood control improvements, such as Cachuma Reservoir, and channel and debris dam maintenance performed by the County. (1998 Flood Report) Damage locations, amounts and public assistance requests from FEMA for past Presidential Disaster Declarations are included as Appendix 4-C.

Location and Extent/Probability of Occurrence and Magnitude

In regions such as Santa Barbara, without extended periods of below-freezing temperatures, floods usually occur during the season of highest precipitations or during heavy rainfalls after long dry spells. Due to the Mediterranean climate of Santa Barbara County and the variability of rainfall, stream flow throughout the County is highly variable and directly impacted from rainfall with little snowmelt or base flow from headwaters. Most streams in the County are dry during the summer months. Many streams in the County have flows that rise and fall in response to precipitation. Watercourses can experience a high amount of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years.

The drainages in the southern part of the County are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. The drainages in the northern part of the County are contained in the upper mountain areas, but broaden out into level valley floors. The drainages in the northern part of the County are generally characterized by longer duration and less intense storms than the southern coastal areas. The majority of streams in Santa Barbara County only flow during winter months.

In addition to building damage due to flooding there are numerous undersized culverts, low water crossings and low capacity bridges throughout the County that cause flooding problems. A few of the “hot spots” are listed below.

Low Water Crossing

McLaughlin Road (Outskirts of Lompoc on Santa Ynez River)

Orcutt-Garey Road (Outskirts of Santa Maria on unnamed intermittent stream)

Refugio Road (Several crossings causing closing road in frequent events –connecting Gaviota Coast to Santa Ynez valley – major emergency access road for fire and other hazards)

Tepusquet Road (Outskirts of Santa Maria – Sisquoc)

Low Capacity Bridges (Bridge Capacity)

Lompoc-Casmalia (connects Lompoc to Santa Maria through Vandenburg AFB – bridge has no capacity – disrupts emergency access)

Bonita School Road – (Elevated Rail Car Structure – Connector across Santa Maria River between SBCO and San Luis Obispo County)

Refugio Road (multiple low capacity bridges cause flooding and access problems)

There are four major reservoirs located in the County; Lake Cachuma, Twitchell, Gibraltar, and Jameson Lake. The Cachuma and Twitchell reservoirs are owned by the federal government, administered by the County Water Resources Division, and operated by local water purveyors, the Gibraltar Reservoir is owned and operated by the City of Santa Barbara, and the Jameson Reservoir is owned and operated by the Montecito Water District.

Lake Cachuma, Gibraltar Reservoir, and Jameson Lake are located along the Santa Ynez River, in the South County. Lake Cachuma is the largest reservoir along the Santa Ynez River, with a drainage area of 421 square miles upstream of the Bradbury Dam. Gibraltar Reservoir has a drainage area of 214 square miles upstream of Gibraltar Dam and Jameson Lake has a drainage area of 14 square miles upstream of Juncal Dam.

In the North County, the Twitchell Reservoir is located along the Cuyama River. The Cuyama River Basin has a drainage area of approximately 1,140 square miles and it is the confluence of the Cuyama and Sisquoc Rivers that form the Santa Maria River. The Twitchell Reservoir has a drainage area of 1,135 square miles above Twitchell Dam.

The County is divided into five major watersheds; Santa Maria, Cuyama, San Antonio, Santa Ynez River and South Coast. The Santa Maria Watershed includes the Cuyama and Sisquoc watersheds. The drainage areas for these watersheds are presented in Table 4.3-2.

**Table 4.3-2
Santa Barbara County Watersheds**

Watershed	Drainage Area
Santa Maria	1,845 square miles
Cuyama	1,140 square miles
San Antonio	165 square miles
Santa Ynez River	900 square miles
South Coast	416 square miles

Flooding has been a major problem throughout Santa Barbara County’s history. Santa Barbara County has several hydrologic basins that have different types of flooding problems, including over bank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in Santa Barbara is due to riverine flooding and flash flood events. Table 4.3-3 on the following page outlines the various types of flooding to which the County is subject.

Table 4.3-3

Santa Barbara County Flooding Hazards

Flooding Type	Characteristics	Hazard to County
Overflow of streams	<ul style="list-style-type: none"> • Flooding occurs in response to heavy rainfall events when streams, rivers, creeks, and drainage channels overtop their banks and low-lying areas with poor drainage become inundated. • Factors such as fires in the watersheds, structures or fill materials in flood-prone areas, debris build-up, and development of impervious surfaces (roads, parking lots, rooftops), increase an area's vulnerability to flooding. • A common measure of an area's susceptibility to flooding is the calculation of the '100-year flood,' which is a flood event that statistically has a chance of one percent of being equaled or exceeded in any given year. 	<ul style="list-style-type: none"> • Portions of the County are subject to flooding due to flash flooding, urban flooding, river channel overflow, and downstream flooding. • The County historically has also been vulnerable to storm surge inundation associated with tropical storms.
Tsunami/Coastal Surge	<ul style="list-style-type: none"> • Large waves generated by earthquakes, landslides, volcanic eruptions, and impacts of cosmic bodies. 	<ul style="list-style-type: none"> • The Cities of Santa Barbara and Carpinteria are located on or near several offshore geological faults, the more prominent faults being the Mesa Fault, the Santa Ynez Fault in the mountains, and the Santa Rosa Fault. There are other unnamed faults in the offshore area of the Channel Islands. These faults have been active in the past and can subject the entire area to seismic action at any time.
Dam/Levee Breach Inundation	<ul style="list-style-type: none"> • Flooding that occurs as a result of structural failure. Sources of dam failure include erosion of face or foundation of the dam, improper siting, rapidly rising floodwater, structural design flaws, landslides flowing into a reservoir, or terrorist actions. • Inundation can also be caused by seismic activity. A seismically induced wave can overtop the dam. • Will cause loss of life, damage to property, and displacement of people residing in the inundation path. • Damage to electric generating facilities and transmission lines could impact life support systems in communities outside the immediate hazard area. 	<ul style="list-style-type: none"> • The cities of Lompoc, Santa Barbara and Carpinteria, and portions of Santa Maria, Buellton, and Solvang are subject to potential dam failure. • There are nine major dams in the County; Alisal Creek, Bradbury, Dos Pueblos, Gibraltar, Glen Anne, Juncal, Ortega, Rancho Del Ciervo, and Twitchell. • Bradbury dam has the largest concern of failure because floodwaters from this dam would affect Cachuma Village, Solvang, Buellton, Lompoc City, Lompoc Valley and south Vandenberg AFB. • Failure of the remaining 8 dams, would affect portions of populated cities and communities, forest and agricultural lands, roads, and highways could be inundated.

As noted previously, the drainages in the southern part of the County are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. Runoff from high intensity, short duration storm events can cause inundation of over bank areas, debris in the water that can plug culverts and bridges, erosion and sloughing of banks, and loss of channel capacity due to sedimentation.

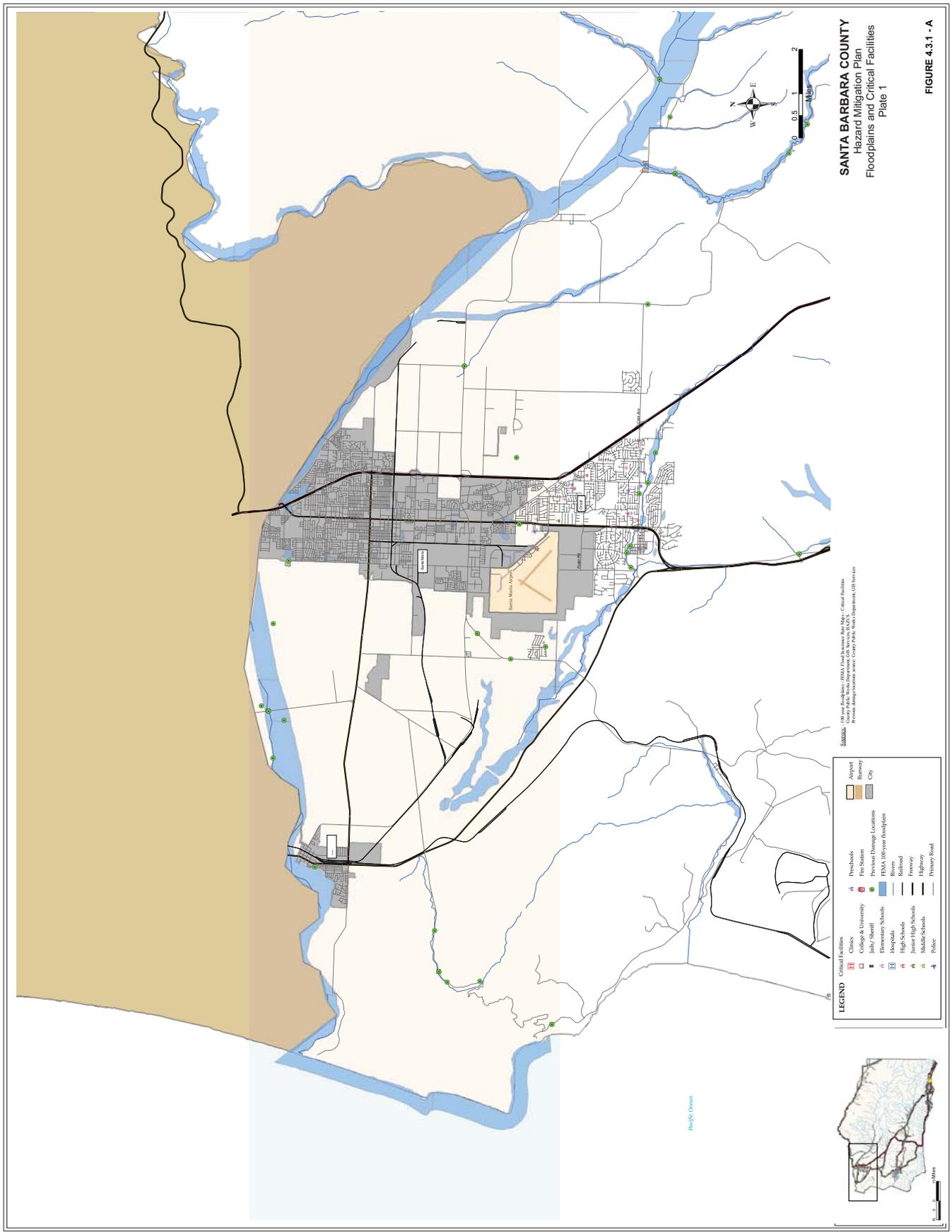
Most watersheds in the northern part of the County are located in the upper mountain areas and broaden into level valley floors. The drainages in the northern part of the County are generally characterized by longer duration and less intense storms than the southern coastal areas. Runoff in this area creates wide meandering streams and broad floodplains. Debris, rocks and cobbles tend to drop out in the upper watershed.

FEMA FIRM data was used to determine hazard risk for floods in the County of Santa Barbara. FEMA defines flood risk primarily by a 100-year flood zone, which is applied to those areas with a 1% chance, on average, of flooding in any given year. Any area that lies within the FEMA-designated 100-year floodplain is designated as high risk. Any area found in the 500-year floodplain is designated at low risk. Base flood elevations (BFE) were also used in the modeling process. A BFE is the elevation of the water surface resulting from a flood that has a 1% chance of occurring in any given year (i.e. the height of the base flood).

Figures 4.3.1-A, 4.3.1-B and 4.3.1-C displays the location and extent of flood hazard areas for the County of Santa Barbara. As shown in these figures, high hazard (100-year flood) zones in Santa Barbara County are generally concentrated within the coastal areas, including bays, coastal inlets and estuaries and in major watershed areas connecting the local mountain range to the coastal region, where flash floods are more common.

SANTA BARBARA COUNTY
Hazard Mitigation Plan
Floodplains and Critical Facilities
Plate 1

FIGURE 4.3.1 - A



4.3.1.2 Flood Vulnerability Assessment

Vulnerability describes how exposed or susceptible to damage an asset is, and depends on an asset's construction, contents and the economic value of its functions. Depth and velocity of flooding are also directly correlated with the amount of building and content damage for a given structure. This vulnerability analysis predicts the extent of damage to residential and commercial properties and critical facilities that may result from a flood event of a given intensity in a given area on the existing and future built environment. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. Indirect effects can be much more widespread and damaging than direct effects. For example, damage to a major utility line or arterial roadway could result in significant inconveniences and business disruption that would far exceed the cost of repairing the utility line.

4.3.1.2.1 Asset Inventory

Flooding that occurs in Santa Barbara County can impact critical facilities located in the unincorporated County and other jurisdictions. A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the County, or fulfills important public safety, emergency response, and/or disaster recovery functions. Figures 4.3.1-A, 4.3.1-B and 4.3.1-C show the location of critical facilities identified for the County, in relation to flood hazard areas. A combination of Census data from HAZUS-MH, parcel data from the County and the County Assessor's database were combined to asset inventories of critical facilities and other structures in the jurisdictions. Table 4.3-4 shows the average replacement values for central California for critical facilities as well as describes the abbreviations for them that are used throughout this analysis. The tables on the following pages provide inventories of population and buildings in high risk areas and describe the methodologies used in their identification.

Table 4.3-4
Abbreviations and Costs Used for Critical Facilities and Infrastructure

Abr.	Name	Building Type (where applicable)	Average Replacement Cost (x\$1,000)
AIR	Airport facilities	s1l	43,105
BRDG	Bridges	n/a	1,869
BUS	Bus facilities	c1l	1,286
COM	Communication facilities and Utilities	c1l	2,000
DAM	State-sized dams		Not Available
ELEC	Electric Power facility	c1l	129,800
EMER	Emergency Centers, Fire Stations and Police Stations	c1l	2,439
GOVT	Gov't Office/Civic Center	c1l	1,180
HOSP	Hospitals/Care facilities	s1m	16,520
INFR	Kilometers of Infrastructure. Includes:		
	Oil/Gas Pipelines (og)	n/a	300
	Railroad Tracks (RTR)	n/a	860
	Highway (HWY)	n/a	3,218
PORT	Port facilities	c1l	2,572
POT	Potable and Waste Water facilities	c1l	39,294.00 (Potable facilities) 78,588.00 (Waste Water facilities)
RAIL	Rail facilities	c1l	2,572
SCH	Schools	rm1l	5,000

4.3.1.2.2 Estimating Potential Flood Exposure and Losses

GIS modeling was used to estimate the potential hazard exposure of population, critical facilities, infrastructure, and residential/commercial properties. The specific methods and results of all analyses are presented below. The results are shown as potential exposure in thousands of dollars, and as the worst-case scenario. For infrastructure, which has been identified as highways, railways and energy pipelines, the length of exposure/impact is given in kilometers.

Exposure characterizes the value of structures within the hazard zone, and is shown as estimated exposure based on the overlay of the hazard on the critical facilities, infrastructure, and other structures, which are given an assumed cost of replacement for each type of structure exposed. These replacement costs are estimated using a building square footage inventory from HAZUS-MH. The square footage information was classified based on Standard Industrial Code (SIC) and provided at a 2002 census-tract resolution from HAZUS. The loss or exposure value is then determined with the assumption that the given structure is totally destroyed (worst case scenario), which is not always the case in hazard events. This assumption was valuable in the planning process, so that the total potential damage value was identified when determining capabilities and mitigation measures for each jurisdiction.

Table 4.3-4, above, provides abbreviations and average replacement costs used for critical facilities and infrastructure listed in all subsequent exposure/loss tables.

Loss Estimation

In addition to exposure, loss was estimated for flood hazards in the County. Loss estimation includes the portion of the exposure that is expected to be lost to a certain hazard scenario, and is estimated by referencing frequency and severity of previous hazards. Information from HAZUS used in the analysis included economic and structural data on infrastructure and critical facilities, including replacement value costs with 2002 square footage and valuation parameters to use in loss estimation assumptions. It provides estimates for the potential impact by using a common, systematic framework for evaluation. Loss estimates used available data, and the methodologies applied resulted in an approximation of risk.

These estimates should be used to understand relative risk from flooding and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (such as incomplete inventories, broad value estimation, demographics, or economic parameters).

Using data from HAZUS, potential impacts on residential and commercial structures in the event of a 100-year flood (considered high risk area for this plan) was estimated using the potential 100-year flood depth from the FEMA flood maps and utilizing the Federal Insurance Administration's (FIA's) previously determined depth damage functions to anticipate damage to buildings and contents. These functions estimate the damages to a structure as a percentage of the building value, and are differentiated by building type. An average estimated damage per structure was calculated and then applied to all the structures in the floodplain of the same use for each jurisdiction.

The building values for the structures analyzed were determined utilizing the building inventory data included in HAZUS. For each jurisdiction, the total number of structures for each general occupancy type (or land use) was obtained along with the total building value throughout the jurisdiction for each type. Utilizing this data the average value for each land use type was determined and assumed for each structure in the floodplain for the specific jurisdiction.

The total number of structures in the floodplain for each jurisdiction was developed by overlaying the County parcel database with the FEMA Q3 data. From this exercise the total number of parcels intersecting the floodplain, as well as parcels that were located totally within the floodplain was developed. After all parcels listed as vacant or as park space were removed, it was assumed that each parcel completely in the floodplain contained one structure. For those parcels partially in the floodplain, the percentage of parcels containing a structure was developed for each jurisdiction based on an analysis of the County Tax Assessor's database. Using this method, a total number of structures in the floodplain was determined. For each of these structures the land use provided from the County tax database was converted to the standard land use types included in the HAZUS database, and the structures for each database were sorted by land use. For the purpose of the commercial building analysis, agricultural and industrial uses were analyzed in aggregate with other commercial uses.

The average flood depth for each jurisdiction was determined by evaluating the FEMA determined flood elevations in comparison to local topography data for the principal flooding sources in each jurisdiction, in close coordination with the Flood Control District and MAC team members. These flood depths were

then used to determine the appropriate level of damage utilizing FEMA’s Federal Insurance Administration depth damage functions for both building and content damage. A type of structure was assumed for all land use types to determine the appropriate percentage. Utilizing these percentages the total damage for both building and contents was determined for each jurisdiction and for each use type. The complete flood loss estimation table, including all formulas and assumptions is included as Appendix 4-D.

Table 4.3-5 and 4.3-6 provide a breakdown of potential losses to residential land commercial property and total exposure for critical facilities and infrastructure, respectively, by jurisdiction. Approximately 34,000 people may be at risk from the 100-year flood hazard and over \$600 million dollars in residential property damage and over \$4 billion in commercial property damage. Total exposure to infrastructure and critical facilities in the 100-year floodplain was estimated at over \$4 billion dollars, as well, based on available data. It is important to note that the methods used for exposure analysis and loss estimation are based on limited data and several assumptions (e.g. population and buildings being evenly distributed across census tracts). For the cities of Solvang and Buellton, no damage to critical facilities and infrastructure was identified. For the City of Guadalupe, no risk is identified for flooding, since the analysis is based on mapped flood hazard areas. It should not be assumed that there are no risks in these areas for these types of facilities and infrastructure. Rather, the analysis shows that relative to the other jurisdictions the risk is much lower.

**Table 4.3-5
Population Exposure and Potential Loss Estimates from 100Year Flood Hazard by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Estimated Building and Contents Loss (x\$1000)	Building Count	Estimated Building and Contents Loss (x\$1000)
Santa Barbara County, unincorporated	11,120	1023	178,000	1320	1,878,600
City of Buellton	15	137	5,224	69	222,600
City of Carpinteria	2,632	1500	134,200	21	13,900
City of Goleta	4,114	584	51,400	313	320,200
City of Guadalupe	0*	0	0	0*	0
City of Lompoc	3,827	178	17,200	73	98,500
City of Santa Barbara	9,689	1717	188,500	725	1,725,000
City of Santa Maria	2,554	441	28,000	84	65,900
City of Solvang	28	22	2,300	13	12,000
Total	33,979	5,602	604,284		4,336,700

* Guadalupe has no mapped 100 year flood hazard areas

Note: Commercial loss estimates include Industrial and Agricultural buildings and contents

SECTION FOUR

Risk Assessment

Table 4.3-6

Potential Exposure to Critical Facilities and Infrastructure from 100 Year Flood Hazard by Jurisdiction

Jurisdiction	Data	AIR	BRDG	BUS	COM	EMER	HOSP	INFR (km)	RAIL (facility)	RAIL (km)	SCH	Total
Santa Barbara County, unincorporated	Number	2	64			1		320		61	3	451
	Exposure (x\$1000)	159,560	89,689			1,652		2,533,079		103,604	1,770	2,889,354
City of Buellton	Number								1			1
	Exposure (x\$1000)								0			0
City of Carpinteria	Number		4					40		8		51
	Exposure (x\$1000)		3,712				1	356,496		15,067		375,275
City of Goleta	Number		10					48		16	2	78
	Exposure (x\$1000)		10,272				8,260	312,694		13,788	1018	346,033
City of Guadalupe	Number											0
	Exposure (x\$1000)											0
City of Lompoc	Number		1					7		10		18
	Exposure (x\$1000)		13,400					39,527		25,755		78,682
City of Santa Barbara	Number		33	1	3			73	1	49	5	165
	Exposure (x\$1000)		22,838	1,286	0			632,828	2,572	4,946	2,950	667,420
City of Santa Maria	Number							18		5	1	24
	Exposure (x\$1000)							126,157		4,342	590	131,090
City of Solvang	Number											0
	Exposure (x\$1000)											0
Total Number		2	112	1	3	1	1	506	2	148	10	762
Total Exposure (x\$1000)		159,560	139,911	1,286	0	1,652	8,260	4,000,781	2,572	167,503	5,900	4,356,925

Note: Dollar amounts in this table are total exposure to 100 year flood (assumes worse case scenario) as opposed to loss estimation that was conducted for Residential and Commercial property above.

4.3.2 Wildfire Fire

4.3.2.1 Hazard Profile

Nature of Hazard

“A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures” (FEMA 386-2, 2001) and may originate from a variety of ignition sources. Three different types of wildfires exist. A “surface fire” is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A “ground fire” is usually started by lightning and burns on or below the forest floor in the organic layer down to the mineral soil. “Crown fires” spread rapidly by wind and move quickly by jumping along the tops of trees.

Wildfires can be classified as either a wildland fire or an urban-wildland interface (UWI) fire. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. An urban-wildland interface fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In UWI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the urban-wildland interface is defined as “...the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.”

The UWI fire can be subdivided into three categories (NWUIFPP, 1998): The *classic wildland-urban interface* exists where well-defined urban and suburban development presses up against open expanses of wildland areas. The *mixed wildland-urban interface* is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings. The *occluded wildland-urban interface* exists where islands of wildland vegetation occur inside a largely urbanized area. Generally, the areas at risk within the Santa Barbara County fall into the classic wildland-urban interface category.

Certain conditions must be present for a wildfire hazard to occur. A large source of fuel must be present; the weather must be conducive (generally hot, dry, and windy); and fire suppression sources must not be able to easily suppress and control the fire. Once a fire starts, topography, fuel, and weather are the principal factors that influence wildfire behavior. People and lightning start most wildfires, but once burning, wildfire behavior is based on three primary factors: fuel, topography, and weather. Fuel will affect the potential size and behavior of a wildfire depending on the amount present, its burning qualities (e.g. level of moisture), and its horizontal and vertical continuity. Topography affects the movement of air, and thus the fire, over the ground surface. The terrain can also change the speed at which the fire travels, and the ability of firefighters to reach and extinguish the fire. Weather as manifested in temperature, humidity and wind (both short and long term) affect the probability, severity, and duration of wildfires.

The vegetation in Santa Barbara County is an excellent fire fuel. Commonly called chaparral, it is dense and scrubby bush that has evolved to persist in a fire-prone habitat. Chaparral plants will eventually age and

die, but won't be replaced by new growth until a fire rejuvenates the area. Chamise, manzanita and ceanothus are all examples of chaparral which are quite common in Santa Barbara County.

Large fires have several indirect effects beyond those of a smaller, local fire. These may include air quality and health issues, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters such as landslide and flooding.

Disaster History

Santa Barbara County was proclaimed a state of emergency due to fires four times between the years 1950 and 1997. Two separate fires in 1964 burned over 100 square miles of land. In 1977 a kite caught on a power line started a fire that burned about 1.25 square miles. In more recent times, the famous Painted Cave Fire of 1990 burned 6²/₃ square miles and the 2004 Gaviota fires, over 7,400 acres. Table 4.3-7 lists nine major wildfires in Santa Barbara County.

**Table 4.3-7
Major Wildfires in Santa Barbara County**

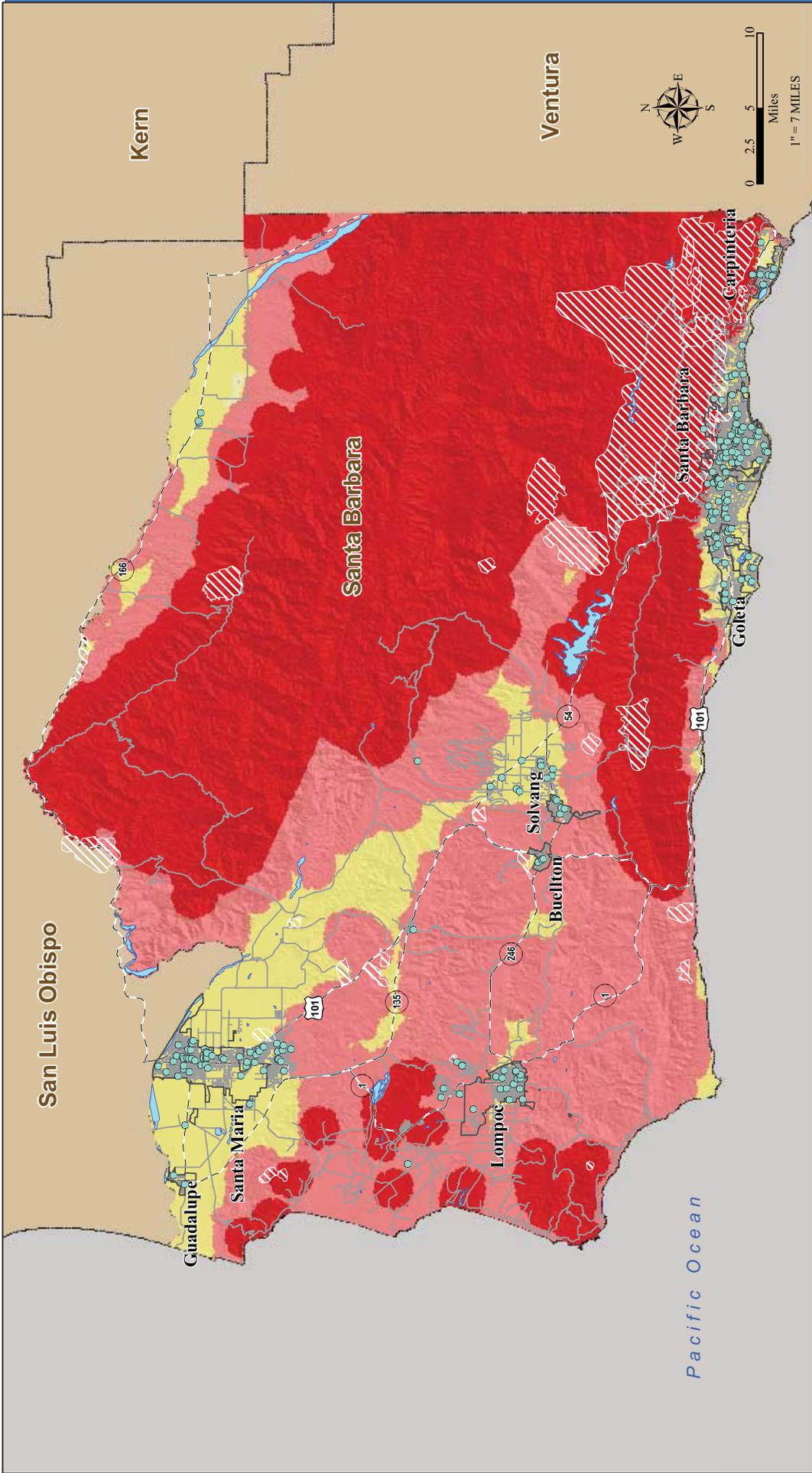
Fire	Date	Cause	Acres Burned	Structures Damaged or Destroyed	Deaths
Gaviota Fire	July 2004	Unknown	7,440	1	0
Painted Cave	June 1990	Wildland Arson	4,270	673	2
Wheeler	1985	Unknown	Not Available	26 (Ventura Co. on border)	0
Eagle Canyon Fire	September 1979	Unknown	4,529	N/A	0
Sycamore Fire	July 1977	Kite on power line	806	234	N/A
Romero Fire	October 1971	Incendiary	14,500	N/A	N/A
Polo Fire	March 1964	Power line	586	N/A	N/A
Coyote Fire	September 1964	Unknown	80,000	94	1
Refugio Fire	September 1955	Burning Building	85,000	20	N/A

Damage Locations, amounts and public assistance requests from FEMA for some past Presidential Disaster Declarations are included as Appendix 4-C.

Location and Extent/Probability of Occurrence and Magnitude

The California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (CDF-FRAP) developed several models to assist in determining fire behavior and frequency. The FRAP Wildland Urban Interface (WUI) Fire Threat model was used to determine potential exposure to moderate, high, very high and extreme wildfire hazard areas. The WUI methodology assigns relative wildfire risk to areas of significant population density by intersecting residential housing unit density with proximate fire threat to give a relative measure of potential loss of structures and threats to public safety from wildfire. Initially developed at a 30-meter scale, a 100-meter representation of the data was used for analysis.

CDF-FRAP modeled wildland fire threat for the state of California in 2002. This model was used in GIS to profile the fire hazard throughout the County, and is described in detail below in the Vulnerability Assessment portion of this document. Figure 4.3.2-A displays the location and extent of the risk levels for wildfire fire throughout the County, used for this analysis. The figure also presents the location of historic wildfires identified in Table 4.3-7, above, and the location of critical facilities in the County. The hazard levels depicted within the boundaries of the 2004 Gaviota fire will likely change after CDF re-evaluates these very recently burned areas. After this re-evaluation is complete, it is expected that CDF-FRAP will remodel the fire risk and provide updated risk maps. These updated maps should be included in future revisions of this plan.



SANTA BARBARA COUNTY, CA
 Hazard Mitigation Plan
Wildfire Threat Categories
 Figure 4.3.2-A

Legend

White	Little or no Threat	Blue circle	Critical Facilities
Light Yellow	Moderate Fire Threat	Blue line	Roads
Yellow	High Fire Threat	Blue dashed line	Highway
Orange	Very High Fire Threat	Blue rectangle	Lakes
Red	Extreme Fire Threat	Blue hatched area	Historic Wildfire Locations
Dark Red	Fire History		

Sources: Fire Threat Categories: Calif. Dept. of Forestry.
 Historic Wildfire Locations: SB County Office of Emergency Services

Source: CA OES, (Wildfire Threat),
 SBC (Fire History)

Overview Map

4.3.2.2 Wildfire Vulnerability Assessment

With all hazards, vulnerability describes how exposed or susceptible to damage an asset is, and depends on an asset's construction, contents and the economic value of its functions. This vulnerability analysis predicts the extent of damage that may result from a hazard event of a given intensity in a given area on the existing and future built environment. Unlike with flooding, where the amount of damage a building and its contents receives is directly related to flood depths, velocity and other factors, it is more difficult to estimate losses from wildfire, a peril that is less predictable and driven by such factors as wind direction and seasonal precipitation variations. With indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. Indirect effects can be much more widespread and damaging than direct effects. For example, with wildfire, the threat of future flooding, landslide and erosion increases dramatically. In addition to potential damage to homes and businesses, agricultural economies can be destroyed and having indirect effects on labor and associated industries (e.g. transportation.)

4.3.2.2.1 Asset Inventory

Wildfire in Santa Barbara County can impact critical facilities as well as residential and commercial property. Figure 4.3.2-A shows the critical facilities identified for the County. Using GIS, the CDF-FRAP threat data, provided by CA OES was analyzed against an inventory of assets to identify vulnerabilities to the four levels of wildfire risks, resulting in three risk/exposure estimates for each level of risk: 1) the aggregated dollar exposure and building count at the census block level for residential and commercial occupancies, 2) the aggregated population at risk at the census block level, and 3) the critical infrastructure at risk (schools, hospitals, airports, bridges, and other facilities of critical nature). Analysis at the census block level involved determining the proportion of total area for a census block to the area of hazard zone that intersects it. This spatial proportion was used to determine percentage of the population and buildings that would be affected within each block. Critical facilities and infrastructure that fell within the boundary of the hazard area were determined to be vulnerable and were totaled by count or number of kilometers affected. These numbers were aggregated and presented for each jurisdiction and for the unincorporated areas of Santa Barbara County.

In general, dense urban areas offer greater resistance to the spread of wildfires, as they are not likely to contain continuous surface fuels despite the presence of mature trees.

4.3.2.2.2 Estimating Potential Exposure and Losses

As noted in the previous section, GIS modeling was used to estimate exposure to population, critical facilities, infrastructure, and residential/commercial properties, from the mapped wildfire threat categories using the pre-established CDF-FRAP Fire Threat Model. CDF-FRAP modeled wildland fire threat for the state of California in 2002. The mapped model results were used in GIS to profile the fire hazard throughout the County, and then used in overlays to determine exposure. In the model, fire threat is a combination of two factors; 1) fire rotation, or the likelihood of a given area burning, and 2) potential fire behavior (fuel rank). These two factors were combined to create five threat classes ranging from little or

no threat to extreme. The fuel ranking methodology assigned ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, temperature, and fuel moistures). The procedure made an initial assessment of rank based on an assigned fuel model and slope, then potentially increases ranks based on the amount of ladder and/or crown fuel present to arrive at a final fuel rank. Fire rotation class intervals were calculated from fifty years of fire history on land areas grouped into "strata" based on fire environment conditions. These strata are defined by climate, vegetation, and land ownership. The Fire rotation interval is the number of years it would take for past fires to burn an area equivalent to the area of a given stratum. Fire rotation interval for a given stratum is calculated by dividing the annual number of acres burned into the total area of the stratum. Finally, fire rotation values were grouped into classes. The larger fire rotation values correspond to less frequent burning. CDF calculated a numerical index of fire threat based on the combination of fuel rank and fire rotation. A 1-3 ranking of fuel rank was summed with the 1-3 ranking from rotation class to develop a threat index ranging from 2 to 6. This threat index was then grouped into four threat classes. The specific methods and results of all analyses are presented below. The results are shown as potential exposure in thousands of dollars, and as the worst-case scenario. For infrastructure, which has been identified as highways, railways and energy pipelines, the length of exposure/impact is given in kilometers. Exposure characterizes the value of structures within the hazard zone, and is shown as estimated exposure based on the overlay of the hazard on the critical facilities, infrastructure, and other structures, which are given an assumed cost of replacement for each type of structure exposed. These replacement costs are estimated using a building square footage inventory from HAZUS-MH. The square footage information was classified based on Standard Industrial Code (SIC) and provided at a 2002 census-tract resolution. The loss or exposure value is then determined with the assumption that the given structure is totally destroyed (worst case scenario), which is not always the case in hazard events. This assumption was valuable in the planning process, so that the total potential damage value was identified when determining capabilities and mitigation measures for each jurisdiction. Table 4.3-4, above, provides abbreviations and average replacement costs used for critical facilities and infrastructure listed in all subsequent exposure/loss tables. Table 4.3-8, 4.3-9, 4.3-10 and 4.3-11 provide the total inventory and exposure estimates for residential and commercial property located in Extremely High Threat, Very High Threat, High Threat and Moderate Threat zones, respectively. Critical facilities and infrastructure total exposure by the same zones, in the same order, by jurisdiction are presented in Tables 4.3-12 through 4.3-15. In addition to estimating potential exposure for structures, total population at risk by threat level was also identified and included in the tables. At-risk population data based upon the 2000 census information.

Wildfire can create a multi-hazard effect, where areas that are burned by wildfire suddenly have greater flooding risks because the vegetation that prevented erosion is now gone. Watershed from streams and rivers will change and floodplain mapping may need to be updated. Also, air quality issues during a large-scale fire would cause further economic losses than only the structural losses described below. Road closures and business closures due to large-scale fires would also increase the economic losses shown below.

As demonstrated in tables below, over 67,000 people are potentially exposed to extremely and very high fire threat categories, with over 25,000 residential structures with an approximate value of \$4 billion and 172 commercial properties with an approximate value of \$5 million in harms way in these two highest threat areas alone.

**Table 4.3-8
Potential Exposure from Extreme Wildfire Hazard by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	15,598	6,375	1,081,087	54	201,066
City of Buellton					
City of Carpinteria	149	51	8,467	0	7,272
City of Goleta					
City of Guadalupe					
City of Lompoc					
City of Santa Barbara	3,738	1,748	307,115	0	15,342
City of Santa Maria					
City of Solvang					
Total	19,485	8,174	1,396,669	54	223,680

**Table 4.3-9
Potential Exposure from Very High Wildfire Threat by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	30,259	11,714	1,770,641	71	158,130
City of Buellton	1,918	798	88,402	19	43,006
City of Carpinteria	2,446	725	124,959	6	20,319
City of Goleta					
City of Guadalupe					
City of Lompoc	9,899	2,328	388,670	7	24,390
City of Santa Barbara	810	335	56,292	0	1,905
City of Santa Maria					
City of Solvang	1,989	819	122,865	15	35,062
Total	47,321	16,717	2,551,829	118	283,762

**Table 4.3-10
Potential Exposure from High Wildfire Hazard by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	77,364	24,535	4,279,456	110	292,374
City of Buellton	1,910	579	81,104	9	28,534
City of Carpinteria	7,159	1,951	286,428	44	102,491
City of Goleta	14,808	3,850	736,034	154	324,703
City of Guadalupe	5,659	1,172	173,880	9	15,134
City of Lompoc	31,204	7,485	1,237,333	72	150,319
City of Santa Barbara	75,743	20,539	4,062,417	270	595,688
City of Santa Maria	77,207	17,196	2,743,548	290	588,202
City of Solvang	3,328	940	194,245	31	64,677
Total	294,382	78,247	13,794,445	989	2,162,122

**Table 4.3-11
Potential Exposure from Moderate Wildfire Hazard by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	4,882	1,676	281,413	9	28,569
City of Buellton					
City of Carpinteria	4,325	1,281	232,766	36	61,969
City of Goleta	15,045	4,210	784,774	119	261,903
City of Guadalupe					
City of Lompoc					
City of Santa Barbara	12,128	2,116	617,565	327	710,947
City of Santa Maria					
City of Solvang					
Total	36,380	9,283	1,916,518	491	1,063,388

**Table 4.3-12
Potential Exposure to Critical Facilities and Infrastructure from Extreme Wildfire Hazard by Jurisdiction**

Jurisdiction	Data	AIR	BRDG	COM	EMER	INFR (km)	POT	RAIL	SCH	Total
Santa Barbara County, unincorporated	Number		39	23	1	124	37	1	2	227
	Exposure (x\$1000)		35,822	46,000	2,439	324,836	1,453,878	2,572	10,000	1,875,547
City of Buellton	Number					0				0
	Exposure (x\$1000)					0				0
City of Carpinteria	Number					1			2	3
	Exposure (x\$1000)					2,085			10,000	12,085
City of Goleta	Number					0				0
	Exposure (x\$1000)					0				0
City of Guadalupe	Number					0				0
	Exposure (x\$1000)					0				0
City of Lompoc	Number					0				0
	Exposure (x\$1000)					0				0
City of Santa Barbara	Number	2			1	7				10
	Exposure (x\$1000)	4,112			2,439	21,647				28,198
City of Santa Maria	Number					0				0
	Exposure (x\$1000)					0				0
City of Solvang	Number					0				0
	Exposure (x\$1000)					0				0
Total Number		2	39	23	2	132	37	1	4	240
Total Exposure (x\$1000)		4,112	35,822	46,000	4,877	348,569	1,453,878	2,572	20,000	1,915,830

SECTION FOUR

Risk Assessment

Table 4.3-13

Potential Exposure to Critical Facilities and Infrastructures from Very High Wildfire Hazard by Jurisdiction

Jurisdiction	Data	AIR	BRDG	COM	EMER	GOVT	INFR (km)	POT	SCH	Total
Santa Barbara County, unincorporated	Number	2	95	8	6	3	330	15	17	476
	Exposure (x\$1000)	86,210	127,098	16,000	14,632	3,540	754,248	589,410	85,000	1,676,138
City of Buellton	Number		3				2			5
	Exposure (x\$1000)		5,408				6,555			11,963
City of Carpinteria	Number						1	2	1	4
	Exposure (x\$1000)						4,421	78,588	5,000	88,009
City of Goleta	Number						0			0
	Exposure (x\$1000)						0			0
City of Guadalupe	Number						0			0
	Exposure (x\$1000)						0			0
City of Lompoc	Number	1	2			2	3		2	10
	Exposure (x\$1000)	43,105	3,990			2,360	7,814		10,000	67,269
City of Santa Barbara	Number						1		4	5
	Exposure (x\$1000)						2,249		20,000	22,249
City of Santa Maria	Number						0			0
	Exposure (x\$1000)						0			0
City of Solvang	Number						0		1	1
	Exposure (x\$1000)						1,158		5,000	6,158
Total Number		3	100	8	6	5	337	17	24	500
Total Exposure (x\$1000)		129,315	136,496	16,000	14,632	5,900	776,446	667,998	125,000	1,871,786

SECTION FOUR

Risk Assessment

Table 4.3-14

Potential Exposure to Critical Facilities and Infrastructures from High Wildfire Hazard by Jurisdiction

Jurisdiction	Data	AIR	BRDG	BUS	COM	ELEC	EMER	GOVT	HOSP	INFR (km)	POT	RAIL	SCH	Total
Santa Barbara County, unincorporated	Number	4	90	0	4	1	14	11	1	179	58		45	407
	Exposure (x\$1000)	172,420	95,645	0	8,000	129,800	34,141	12,980	4,130	417,449	2,475,522		225,000	3,575,087
City of Buellton	Number		2				2	2		3		1	1	11
	Exposure (x\$1000)		3,566				4,877	2,360		9,950		2,572	5,000	28,326
City of Carpinteria	Number		10				1			8		1	1	21
	Exposure (x\$1000)		7,755				2,439			15,016		2,572	5,000	32,782
City of Goleta	Number		9	1			2	2	1	14		1	4	34
	Exposure (x\$1000)		17,293	1,286			4,877	2,360	8,260	30,593		2,572	20,000	87,242
City of Guadalupe	Number						2	5		9		1	1	18
	Exposure (x\$1000)						4,877	5,900		14,586		2,572	5,000	32,935
City of Lompoc	Number		2	1	1		4	3	1	10		1	10	33
	Exposure (x\$1000)		701	1,286	2,000		9,755	3,540	16,520	19,316		2,572	50,000	105,690
City of Santa Barbara	Number	1	48		1	1	5	14	2	27	3		22	124
	Exposure (x\$1000)	43,105	36,894		2,000	129,800	12,193	16,520	20,650	67,454	117,882		110,000	556,498
City of Santa Maria	Number	1	9	2	2		7	23	1	35		1	17	98
	Exposure (x\$1000)	43,105	11,128	2,572	4,000		17,071	27,140	16,520	80,704		2,572	85,000	289,813
City of Solvang	Number		1				2	4	1	2		1	1	12
	Exposure (x\$1000)		903				4,877	4,720	4,130	8,022		2,572	5,000	30,225
Total Number		5	161	2	6	2	30	37	5	251	61	5	84	649
Total Exposure (x\$1000)		215,525	162,758	2,572	12,000	259,600	78,037	48,380	53,690	582,386	2,593,404	15,434	425,000	4,448,787

SECTION FOUR

Risk Assessment

Table 4.3-15

Potential Exposure to Critical Facilities and Infrastructures from Moderate Wildfire Hazard by Jurisdiction

Jurisdiction	Data	AIR	BRDG	BUS	COM	ELEC	EMER	GOVT	INFR (km)	POT	RAIL	SCH	Total
Santa Barbara County, unincorporated	Number		2						4	4		1	11
	Exposure (x\$1000)		1,399						10,134	157,176		5,000	173,708
City of Buellton	Number								0				0
	Exposure (x\$1000)								0				0
City of Carpinteria	Number		7				1	2	4	2		3	19
	Exposure (x\$1000)		4,554				2,439	2,360	12,156	117,882		15,000	154,391
City of Goleta	Number		16				1	1	13	3		9	43
	Exposure (x\$1000)		23,135				2,439	1,180	25,848	117,882		45,000	215,484
City of Guadalupe	Number								0				0
	Exposure (x\$1000)								0				0
City of Lompoc	Number								0				0
	Exposure (x\$1000)								0				0
City of Santa Barbara	Number		29	1	3	1	4	20	11	2	1	3	75
	Exposure (x\$1000)		30,249	1,286	6,000	129,800	9,755	23,600	17,219	157,176	2,572	15,000	392,657
City of Santa Maria	Number								0				0
	Exposure (x\$1000)								0				0
City of Solvang	Number								0				0
	Exposure (x\$1000)								0				0
Total Number		0	54	1	3	1	6	23	31	11	1	16	147
Total Exposure (x\$1000)		0	59,336	1,286	6,000	129,800	14,632	27,140	65,358	550,116	2,572	80,000	936,240

4.3.3 Earthquake

4.3.3.1 Hazard Profile

Nature of Hazard

An earthquake is caused by a release of strain within or along the edge of the Earth's tectonic plates that produces ground motion and shaking, surface fault ruptures, and ground failure. The severity of the motion increases with the amount of energy released, decreases with distance from the causative fault or epicenter, and is amplified by soft soils. After just a few seconds, earthquakes can cause massive damage and extensive casualties.

There are three common ways of expressing an earthquake's intensity. The Modified Mercalli Scale (MMS) is somewhat subjective as it uses amount of damage and perceived shaking to rate the severity of the event. A MMS value of I is not felt, and a MMS value of II is only felt by persons favorably placed. The largest MMS value of XII is described as near total damage, lines of sight distorted, large rock masses displaced, and objects thrown into the air.

Most people are familiar with the Richter scale, a method of rating earthquakes based on strength using an indirect measure of released energy. The Richter scale is logarithmic. Each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released. An earthquake registering 7.0 on the Richter scale releases over 1,000 times more energy than an earthquake registering 5.0.

Peak ground acceleration (PGA) is a measure of the strength of ground movement. Rapid ground acceleration results in greater damage to structures. PGA is used to project the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%, 5%, or 2%) of being exceeded in 50 years return period. Therefore these values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions. PGA is the measurement system used in this plan.

Liquefaction is the phenomenon that occurs when ground shaking causes loose soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength. Lateral spreads develop on gentle slopes and entails the sidelong movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength results when the soil supporting structures liquefies and causes structures collapse.

Earthquake History

Minor earthquakes occur regularly in the County of Santa Barbara. Strong earthquakes that affected residents and damaged structures occurred in 1812 (est. 7.1), 1857, 1902, 1925, 1927, 1978 and 2003. The 1857 earthquake was reportedly larger than the well known San Francisco earthquake of 1906. Santa Barbara sustained relatively little damage, however, due both to its distance from the epicenter and its relatively low population and small structures. The 1925 earthquake, reportedly a magnitude 6.3, caused considerable damage to the downtown area of the City of Santa Barbara. The result is still visible, as the

city was completely rebuilt in the Mission Style, giving it the unique look it maintains today. Damage estimates range from \$6 million to \$20 million.

In 1978 a series of micro-earthquakes culminated in a large shock that caused interior and cosmetic damage to homes and displaced mobile homes from their supports. Should one of these earthquakes recur in the more populated parts of Santa Barbara County today, significantly more damage to health and property would likely occur. Starting in March of 1978 and continuing sporadically through July, 1978, a swarm of small earthquakes, called micro-earthquakes occurred underneath the northeastern end of the Santa Barbara Channel. Toward the end of the micro-earthquake swarm, in July and early August of 1978, Santa Barbara an unusually large amount of oil and tar was reported on local beaches. Another common occurrence for the Santa Barbara area, the oil from these natural seeps was considered only a minor nuisance. On August 13, 1978, an earthquake started just to the southwest of the city of Santa Barbara, about 5 miles beneath the Santa Barbara Channel. The earthquake ruptured to the northwest, focusing its energy toward Goleta, the most intense ground motion occurring between Turnpike Road and Winchester Canyon Road, an area that includes the University of California, Santa Barbara. A strong-motion seismograph on the University of California campus, recorded an acceleration of 0.45 times that of gravity. Another seismograph, located at the top of North Hall, recorded an acceleration of 0.94 times that of gravity. Sixty five people were treated for injuries at local hospitals. No deaths were reported.

A magnitude 6.5 earthquake struck the central California coast on December 22, 2003 at 11:15 am. The event, known as the San Simeon Earthquake, was located 11 km northeast of San Simeon, and 39 km west/northwest of Paso Robles, where the brunt of the damage and casualties occurred. Two deaths due to a building collapse were experienced in Paso Robles. The most severe damage was to un-reinforced masonry structures (URM) that had not yet been retrofitted to better withstand earthquakes. Some un-reinforced masonry structures that had been retrofitted survived the earthquake.

Although this earthquake hit the adjoining County of San Luis Obispo to the north much harder, there was minor damage to more than 30 URM buildings in the City of Guadalupe. According to reports by the U.S. Geological Survey, Menlo Park, California and U.C. Berkeley Seismological Laboratory, Berkeley, California, in addition to the two people killed, over 40 buildings collapsed or were severely damaged in the Paso Robles area and 40 additional people were injured. More than 10,000 homes and businesses were without power in the same area. The event was reportedly felt as a MMS VI in Guadalupe and Santa Maria and as a MMS V in Lompoc, Santa Ynez and Solvang.

Damage Locations, amounts and public assistance requests to FEMA for the 2003 earthquake are included as Appendix 4-C.

Location and Extent/Probability of Occurrence and Magnitude

Figure 4.3.3-A displays the location and extent of the profiled earthquake hazard areas for Santa Barbara County. This is based on a USGS earthquake model that shows probabilistic peak ground acceleration for every location in Santa Barbara County. All buildings that have been built in recent decades must adhere to building codes that require them to be able to withstand earthquake magnitudes that create a PGA of 0.4 or greater. The County is located in the Transverse Range geologic province. Movement of continental plates is manifest primarily along the San Andreas Fault system. Other faults in the region

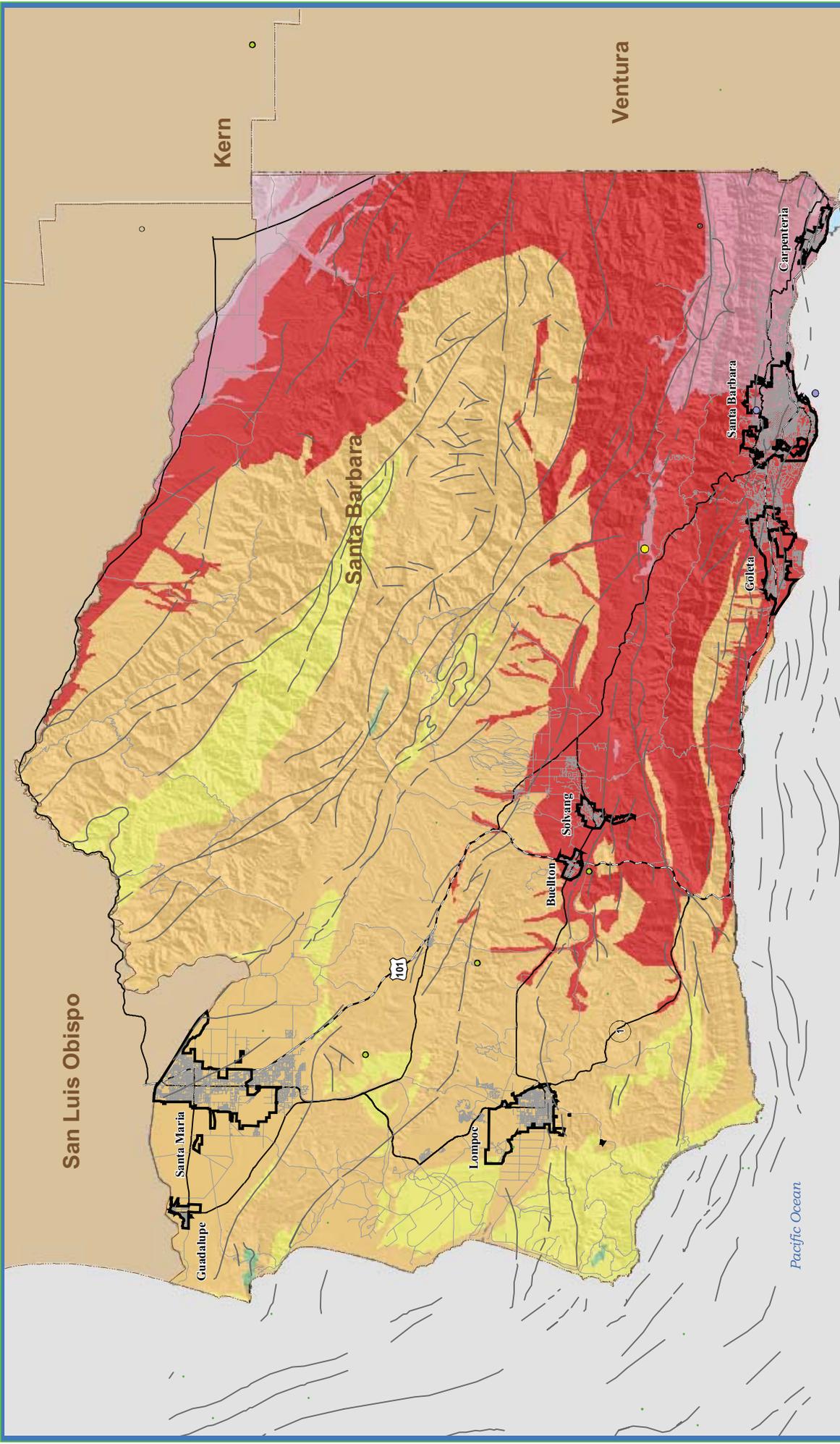
include the Big Pine and Santa Ynez faults. Figure 4.3.3-A also shows the location of known fault lines and epicenters from past events. Historically active faults in or affecting the region include Big Pine and San Andreas faults. There are several other active faults including Santa Ynez and Mesa and yet several others categorized as potentially active. Most historic seismic events in the Santa Barbara region have been centered offshore between Santa Barbara and the Channel Islands. The estimated magnitudes of the maximum credible earthquake along the faults in the region range from 5.0 to 7.2, with the San Andreas Fault being the outlier, with an estimated maximum credible earthquake in the low 8.0 range.

Earthquakes were modeled using HAZUS-MH, which uses base information to derive probabilistic peak ground accelerations much like the PGA map from USGS that was used for the profiling process. A 7.0 event was selected as representative of risk in the County and the model was run for 500 year and 2000 year recurrence events.

Liquefaction – Low lying coastal areas and areas in the floodplains of the larger rivers in the County are likely more susceptible. The potential exists in areas of loose soils and/or shallow groundwater in earthquake fault zones throughout the County. No consistent mapping of the County for liquefaction prone areas was identified for profiling and analysis.

The National Earthquake Hazards Reduction Program (NEHRP) rates soils from hard to soft, and give the soils ratings from Type A through Type E, with the hardest soils being Type A, and the softest soils rated at Type E. Liquefaction risk is considered high if there were soft soils (Types D or E) present within an active fault zone. The majority of the soils in the County are types A-C, with some areas having type D. No type E soils were identified, nor was consistent mapping of soil types.

For these reasons, combined with a lack of liquefaction history, liquefaction was not addressed in a manner separate from earthquake. It should be considered in subsequent updates to the plan as better data becomes available.



SANTA BARBARA COUNTY
Hazard Mitigation Plan
Ground Shaking Potential and Fault Lines

Data Source:
 Earthquake Shaking Potential for California, California Seismic Safety Council, 1972; California Geological Survey, 1972; California Geological Survey, 1972; California Geological Survey, 2003; Digital database of faults from the Fault Activity Map of California and Adjacent Areas, California Geological Survey, 2001, 1994.

- Earthquake Epicenters**
- 0 - 4.9
 - 5.0 - 5.1
 - 5.1 - 5.3
 - 5.3 - 5.5
 - 5.5 - 5.8
 - 5.8 - 6

These regions are near major active faults and will experience shaking more frequently. This intense shaking can damage even strong, modern buildings.

These regions are distant from known active faults and will experience lower levels of shaking less frequently. In most earthquakes, only weaker, masonry buildings would be damaged. However, very frequent earthquakes could still cause strong shaking here.

- Legend**
- County Boundary
 - US Route
 - State Route
 - Road
 - Hydrology
 - Fault Lines
 - August 2004

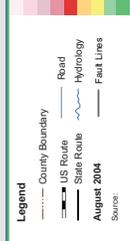


Figure 4.3.3-A

4.3.3.2 Earthquake Vulnerability Assessment

Unlike other hazards discussed in this section, where census, building and critical facilities data were extracted from the HAZUS-MH model for spatial analysis for exposure and/or loss based on other GIS layers, for earthquake, the model was used to evaluate vulnerability for specific events in the County. How the model was used is discussed in more detail in the subsections below.

4.3.3.2.1 Asset Inventory

Critical facilities and the amount of damage they would be expected to receive in the modeled events are addressed in the tables that follow. Residential and commercial buildings were not inventoried in terms of aggregate exposure as the unpredictable nature of this hazard would arguably put all structures in the County at some risk. How vulnerable a particular building is to a particular event includes many variables, including construction type, date of construction, etc.

4.3.3.2.2 Estimating Potential Exposure and Losses

The HAZUS software model, which was developed for FEMA by the National Institute of Building Sciences as a tool to determine earthquake loss estimates, was used to model earthquake for this assessment. This software program integrates with GIS to facilitate the manipulation of data on building stock, population, and the regional economy with hazard models. The scenarios used in the earthquake hazard assessment were a 500- and 2000- year return period USGS probabilistic hazards. The analysis was limited to damage caused by ground-shaking. In addition, a default soil map was used to simplify the modeling process, in absence of better soils data.

Anticipated losses were modeled. Loss is that portion of the exposure that is expected to be lost to a hazard, and is estimated by referencing frequency and severity of previous hazards. Hazard risk assessment methodologies embedded in HAZUS, FEMA's loss estimation software, were applied to earthquake hazards in Santa Barbara County. The software contains economic and structural data on infrastructure and critical facilities, including replacement value costs with 2002 square footage and valuation parameters to use in loss estimation assumptions. This approach provides estimates for the potential impact by using a common, systematic framework for evaluation. The HAZUS risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g. ground shaking and building types) were modeled to determine the impact (damages and losses) on the built environment. The model was used to estimate losses from earthquake hazards to critical facilities, infrastructure, and residential and commercial properties, as well as economic losses on two return period events (500 year and 2000 year). Loss estimates used available data, and the methodologies applied resulted in an approximation of risk. These estimates should be used to understand relative risk from hazards and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (such as incomplete inventories, demographics, or economic parameters).

Loss estimates are presented for 1) the residential and commercial occupancies at the census tract level for each jurisdiction, and 2) the critical infrastructure at risk (schools, hospitals, airports, bridges, and other facilities of critical nature). In addition, potential shelter needs and casualties were estimated.

Table 4.3-16 and 4.3-17 provide breakdowns of potential losses due to a 2000-year earthquake events by jurisdiction for residential and commercial properties. Table 4.4-18 provides data on critical facilities exposure and numbers of households expected to be without power for the 2000 year event. Tables 4.3-19 through 4.3-21 provide the same estimates, only for the 500-year event.

SECTION FOUR

Risk Assessment

Table 4.3-16 Loss Estimates from 2000 year Earthquake Hazard by Jurisdiction

Residential Buildings

Jurisdiction	Structural Damage (x\$1000)	Non-Structural Damage (x\$1000)	Building Damage (x\$1000)	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)	Total Loss (x\$1000)
Buellton	731	2,941	3,673	641	0	15	10	166	24	4,529
Carpinteria	44,851	189,306	234,157	39,484	0	815	790	14,006	1,849	291,101
Goleta	108,967	452,260	561,226	95,719	0	1,988	1,575	28,052	3,693	692,253
Guadalupe	259	1,172	1,430	277	0	6	0	77	0	1,791
Lompoc	40,059	187,733	227,792	43,197	0	912	580	14,916	1,358	288,754
Santa Barbara	275,152	1,237,267	1,512,419	259,454	0	5,254	6,561	108,700	15,381	1,907,768
Santa Maria	61,992	290,137	352,129	68,157	0	1,432	477	21,077	1,117	444,389
Solvang	1,293	5,859	7,152	1,383	0	32	0	385	0	8,953
Unincorporated	389,000	1,651,312	2,040,313	360,098	0	7,077	3,941	103,530	9,231	2,524,191
Total	922,305	4,017,986	4,940,291	868,412	0	17,532	13,934	290,907	32,653	6,163,728

4.3-17 Loss Estimates from 2000 year Earthquake Hazard by Jurisdiction

Commercial Buildings

Jurisdiction	Structural Damage (x\$1000)	Non-Structural Damage (x\$1000)	Building Damage (x\$1000)	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)	Total Loss (x\$1000)
Buellton	224	651	875	300	14	5	139	87	155	1,574
Carpinteria	9,565	30,759	40,324	14,390	591	171	7,024	3,414	7,747	73,662
Goleta	25,111	83,268	108,380	39,157	1,154	605	19,465	9,949	24,782	203,492
Guadalupe	61	149	210	69	5	1	38	18	44	385
Lompoc	8,950	25,774	34,723	11,840	498	213	7,049	3,780	8,582	66,686
Santa Barbara	113,394	400,802	514,196	189,649	4,640	2,831	101,506	46,560	119,908	979,289
Santa Maria	26,626	74,727	101,353	33,983	1,500	597	20,442	10,838	24,236	192,949
Solvang	2,054	6,505	8,559	3,071	123	42	1,609	788	1,765	15,956
Unincorporated	67,715	210,471	278,186	95,952	3,630	1,337	55,679	26,864	53,177	514,825
Total	253,700	833,106	1,086,806	388,411	12,154	5,802	212,950	102,297	240,397	2,048,817

SECTION FOUR

Risk Assessment

Table 4.3-18
Potential Loss to Critical Facilities and Infrastructure from 2000-year Earthquake Event

Jurisdiction	Data	AIR	BRDG	BUS	COM	ELEC	RAIL	SCH	Total
Santa Barbara County, unincorporated	Number	9	237		36	2	2		286
City of Buellton	Loss (x\$1000)	28,149	69,586		1,921	136,844	54	3,234,725	3,471,279
City of Carpinteria	Number							6,822	6,822
City of Goleta	Loss (x\$1000)		15					392,768	396,567
City of Guadalupe	Number		3,799						3,799
City of Lompoc	Loss (x\$1000)		31	1			1		33
City of Santa Barbara	Number		15,251	793			34	982,524	998,602
City of Santa Maria	Loss (x\$1000)								0
City of Solvang	Number		4	1				2,301	2,301
Total Number	Loss (x\$1000)	2,737	409	550	0	1	3	369,270	372,966
Total Exposure (x\$1000)	Number		67	1	4	1	103	3,025,335	3,050,392
	Loss (x\$1000)		23,802	872	280	0		680,190	726,413
	Number	1	6	1	1	1			10
	Loss (x\$1000)	2,899	1,095	570	38	41,621			0
	Number							54,000	54,000
	Loss (x\$1000)	11	360	4	42	4	6		417
	Number	33,785	113,942	2,785	2,239	178,465	191	8,747,936	8,352,930

2000-year Earthquake -- Households without power

County Fips	TotalHouseHolds	HhWoPowerDay1	HhWoPowerDay3	HhWoPowerDay7	HhWoPowerDay14	HhWoPowerDay30	HhWoPowerDay90
6083	136,622	110,926	79,545	41,966	19,633	10,906	137

**Table 4.3-19 Loss Estimates from 500 year Earthquake Hazard by Jurisdiction
Residential Buildings**

Jurisdiction	Structural Damage (x\$1000)	Non-Structural Damage (x\$1000)	Building Damage (x\$1000)	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)	Total Loss (x\$1000)
Buellton	252,645	1098,388	1351,033	265,6175	0	5,768	4,65	60.19	10,8855	1698,144
Carpinteria	17,368	81,215	98,584	18,958	0	373	375	6,042	877	125,209
Goleta	42,585	195,174	237,759	47,342	0	903	785	12,155	1,841	300,785
Guadalupe	109	538	647	145	0	3	0	33	0	828
Lompoc	19,957	98,576	118,533	24,940	0	504	323	7,661	756	152,717
Santa Barbara	107,527	531,238	638,765	124,502	0	2,451	3,121	47,480	7,315	823,635
Santa Maria	29,386	145,693	175,079	38,039	0	747	257	10,248	602	224,972
Solvang	1,908	9,031	10,939	2,150	0	41	204	922	477	14,732
Unincorporated	157,304	150,182	148,274	157,063	159,213	159,171	159,009	158,291	158,735	144,480
Total	376,398	1,790,537	2,166,935	436,152	0	8,342	6,744	129,153	15,802	2,763,128

SECTION FOUR

Risk Assessment

4.3-20 Loss Estimates from 500 year Earthquake Hazard by Jurisdiction
Commercial Buildings

Jurisdiction	Structural Damage (x\$1000)	Non-Structural Damage (x\$1000)	Building Damage (x\$1000)	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)	Total Loss (x\$1000)
Buellton	121	121	121	121	121	121	121	121	121	121
Carpinteria	4,978	4,978	4,978	4,978	4,978	4,978	4,978	4,978	4,978	4,978
Goleta	14,905	14,905	14,905	14,905	14,905	14,905	14,905	14,905	14,905	14,905
Guadalupe	35	35	35	35	35	35	35	35	35	35
Lompoc	5,521	5,521	5,521	5,521	5,521	5,521	5,521	5,521	5,521	5,521
Santa Barbara	60,977	60,977	60,977	60,977	60,977	60,977	60,977	60,977	60,977	60,977
Santa Maria	15,774	15,774	15,774	15,774	15,774	15,774	15,774	15,774	15,774	15,774
Solvang	1,153	1,153	1,153	1,153	1,153	1,153	1,153	1,153	1,153	1,153
Unincorporated	38,166	38,166	38,166	38,166	38,166	38,166	38,166	38,166	38,166	38,166
Total	141,629	426,971	568,599	192,921	6,150	3,742	125,684	63,839	143,109	1,104,044

SECTION FOUR

Risk Assessment

**Table 4.3-21
Potential Exposure to Critical Facilities and Infrastructure from 500-Year Earthquake Hazard by Jurisdiction**

Jurisdiction	Data	AIR	BRDG	BUS	COM	ELEC	RAIL	SCH	Total
Santa Barbara County,	Number	9	237		36	2	2		286
unincorporated	Loss (x\$1000)	0	28,542		1,085	0	0	9,638	39,265
City of Buellton	Number							1	0
	Loss (x\$1000)								1
City of Carpinteria	Number		15						15
	Loss (x\$1000)		1,120					647	1,767
City of Goleta	Number		31	1			1		33
	Loss (x\$1000)		6,362	0			0	10,220	16,582
City of Guadalupe	Number							0	0
	Loss (x\$1000)								0
City of Lompoc	Number	1	4	1	1				7
	Loss (x\$1000)	0	152	0	23			1,890	2,065
City of Santa Barbara	Number		67	1	4	1	3		76
	Loss (x\$1000)		7,426		160	0	0	6,189	13,775
City of Santa Maria	Number	1	6	1	1	1			10
	Loss (x\$1000)	0	502	0	22	0		510	1,034
City of Solvang	Number								0
	Loss (x\$1000)							1	1
Total Number		11	360	4	42	4	6		417
Total Exposure (x\$1000)		0	44,104	0	1,290	0	0	29,096	73,456

500-year Earthquake -- Households without power

County Fips	TotalHouseHolds	HhWoPowerDay1	HhWoPowerDay3	HhWoPowerDay7	HhWoPowerDay14	HhWoPowerDay30	HhWoPowerDay90
6083	136,622	51,559	31,404	12,550	4,368	2,379	72

In addition to loss estimation for residential and commercial structures and exposure for critical facilities, HAZUS also modeled potential shelter needs and predicted casualties on a by jurisdiction basis for both events. This information is presented in Tables 4.3-22 through 4.3-25 below.

Table 4.3-22 Potential Shelter Needs from 2000 year Earthquake Hazard by Jurisdiction

Jurisdiction	Displaced Households	Short Term Shelter Needs
Buellton	207	48
Carpinteria	1,047	262
Goleta	1,874	429
Guadalupe	84	26
Lompoc	916	257
Santa Barbara	8,503	2,183
Santa Maria	1,223	362
Solvang	408	94
Unincorporated	5,532	1,384
Total	19,794	5,045

Table 4.3.23 Potential Shelter Needs from 500 year Earthquake Hazard by Jurisdiction

Jurisdiction	Displaced Households	Short Term Shelter Needs
Buellton	39	9
Carpinteria	320	81
Goleta	551	129
Guadalupe	28	9
Lompoc	387	109
Santa Barbara	2,806	723
Santa Maria	496	147
Solvang	28	26
Unincorporated	1,912	494
Total	6,567	1,727

Table 4.3-24 Casualties from 2000-year Earthquake Hazard by Jurisdiction and General Building Type							
		Wood	Steel	Concrete	Masonry	Mobile Home	Total
Buellton	Injury	2	0	0	0	2	4
	Death	0	0	0	0	0	0
	Total	2	0	0	0	2	4
Carpinteria	Injury	151	8	16	25	27	227
	Death	2	0	1	2	1	7
	Total	153	8	18	27	28	234
Goleta	Injury	304	17	35	48	101	505
	Death	4	1	3	4	2	14
	Total	308	18	38	52	102	519
Guadalupe	Injury	1	0	0	0	0	1
	Death	0	0	0	0	0	0
	Total	1	0	0	0	0	2
Lompoc	Injury	119	13	25	40	43	240
	Death	1	1	2	3	1	7
	Total	120	13	27	43	44	248
Santa Barbara	Injury	885	83	172	246	42	1,428
	Death	13	4	15	20	1	53
	Total	898	88	188	265	43	1,481
Santa Maria	Injury	209	18	36	57	58	378
	Death	2	1	3	4	1	10
	Total	211	19	39	61	59	388
Solvang	Injury	14	0	1	1	1	16
	Death	0	0	0	0	0	0
	Total	14	0	1	1	1	16
Unincorporated	Injury	937	78	148	206	269	1,638
	Death	12	4	13	16	5	50
	Total	949	82	160	222	273	1,688
Total	Injury	2,622	217	433	624	543	4,438
	Death	35	11	37	48	10	141
	Total	2,657	228	471	672	552	4,579

Table 4.3-25 Casualties from 500-year Earthquake Hazard by Jurisdiction and General Building Type							
		Wood	Steel	Concrete	Masonry	Mobile Home	Total
Buellton	Injury	0	0	0	0	1	1
	Death	0	0	0	0	0	0
	Total	0	0	0	0	1	1
Carpinteria	Injury	45	3	6	10	12	75
	Death	0	0	1	1	0	2
	Total	45	3	7	11	12	77
Goleta	Injury	88	8	16	24	50	185
	Death	1	0	1	2	1	5
	Total	89	8	18	25	50	190
Guadalupe	Injury	0	0	0	0	0	1
	Death	0	0	0	0	0	0
	Total	0	0	0	0	0	1
Lompoc	Injury	49	7	12	19	24	111
	Death	0	0	1	1	0	3
	Total	49	7	13	20	24	114
Santa Barbara	Injury	256	30	70	108	19	483
	Death	2	1	6	8	0	17
	Total	258	31	75	115	19	500
Santa Maria	Injury	83	10	18	26	32	168
	Death	1	0	1	2	0	4
	Total	83	10	19	27	32	172
Solvang	Injury	1	0	0	0	0	2
	Death	0	0	0	0	0	0
	Total	1	0	0	0	0	2
Unincorporated	Injury	293	33	63	93	129	611
	Death	2	1	5	6	2	17
	Total	295	34	68	99	131	628
Total	Injury	814	91	186	280	266	1,637
	Death	7	4	14	19	4	47
	Total	821	94	200	298	270	1,684

4.3.4 Coastal Storm Surge and Tsunami

4.3.4.1 Hazard Profile

Nature of Hazard

These hazards were mapped and profiled together because many of the risks involved are similar and limited to the coastal areas. When coastal storms make landfall they produce large ocean waves that sweep across coastlines. Storm surges inundate coastal areas, destroy dunes, and cause flooding. If a storm surge occurs at the same time as high tide, the water height will be even greater.

A tsunami is a series of long waves generated in the ocean by a sudden displacement of a large volume of water. Underwater earthquakes, landslides, volcanic eruptions, meteoric impacts, or onshore slope failures cause this displacement. Tsunami waves travel at speeds averaging 450 to 600 miles per hour. As a tsunami nears the coastline, its speed diminishes, its wavelength decreases, and its height increases. Depending on the type of event that creates the tsunami, as well the remoteness of the event, the tsunami could reach land within a few minutes or after several hours. Low-lying areas could experience severe inland inundation of water and deposition of debris more than 3,000 feet inland.

Disaster History

The relative threat for local tsunamis in California can be considered low due to low recurrence frequencies. Large, locally-generated tsunamis in California are estimated to occur once every 100 years. Thirteen possible tsunamis have been observed or recorded from local earthquakes between 1812 and 1988. These tsunami events were poorly documented and some are very questionable. There is no doubt that earthquakes occurring along submarine faults off Santa Barbara could generate large destructive local tsunamis (<http://www.drgeorgepc.com/Tsunami1812SantaBarbara.html>). It is obvious from accounts found during internet research that one, and possibly two large tsunamis were generated from two major earthquakes in the Santa Barbara region in December of 1812. The size of these tsunamis may never be known with certainty, but there are unconfirmed estimates of 15 feet at Gaviota, 30-35 feet at Santa Barbara, and 15 feet or more at Ventura, found in various literature and based on anecdotal history only.

Major faults of the San Andreas zone, although capable of strong earthquakes, cannot generate any significant tsunamis. Only earthquakes in the Transverse Ranges, specifically the seaward extensions in the Santa Barbara Channel and offshore area from Point Arguello, can generate local tsunamis of any significance. The reason for this may be that earthquakes occurring in these regions result in a significant vertical displacement of the crust along these faults. Such tectonic displacements are necessary for tsunami generation.

Two separate events, occurring in 1877 and 1896, are listed in NOAA's online database, as having heights of 1.8 and 2.5 feet. Determining tsunami heights from historical records is nothing short of guess work, and values should be used with caution. Other recorded tsunamis affecting Santa Barbara during the 20th century are in the 0.1 – 1.0 foot range.

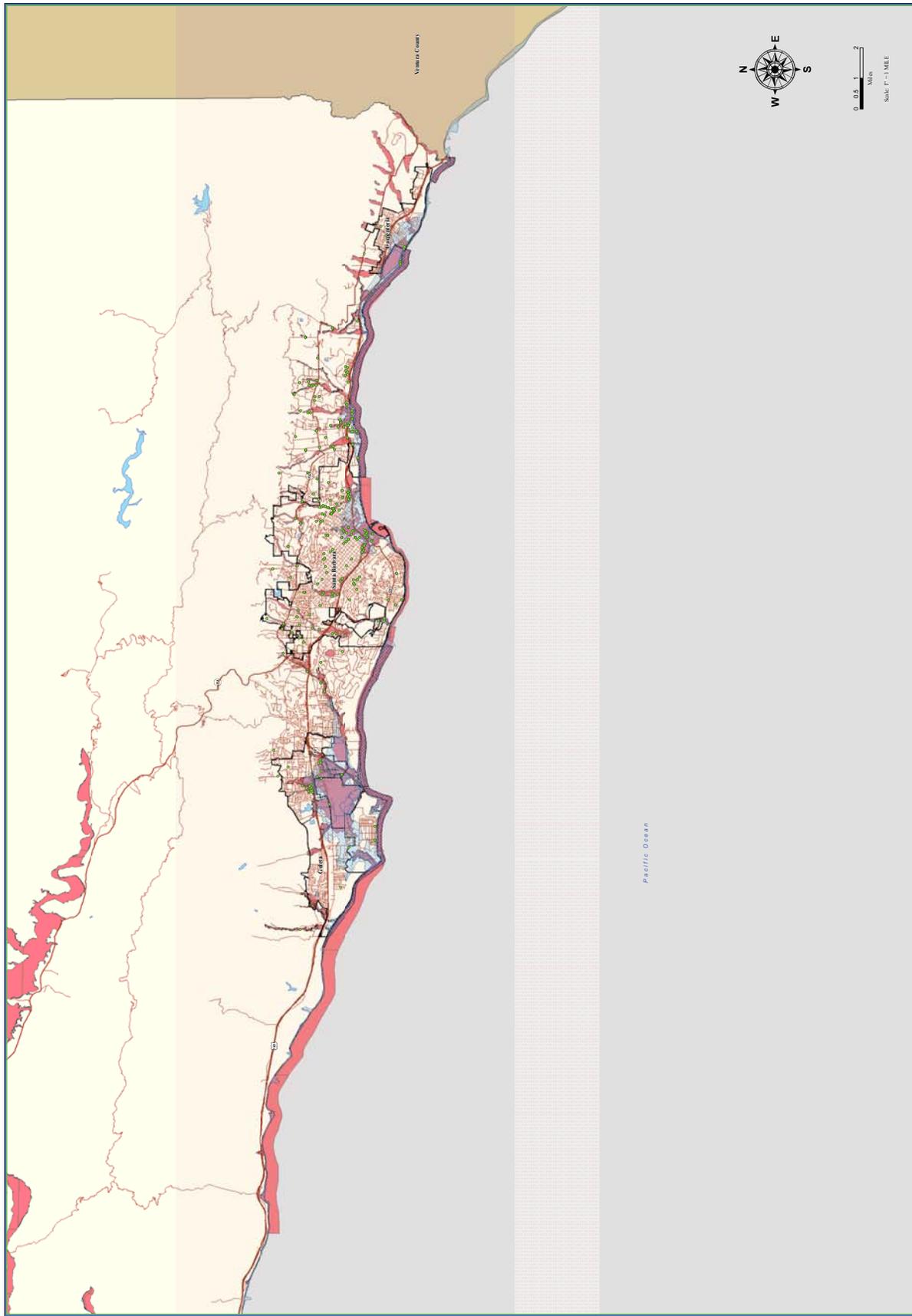
In terms of Coastal Surge, most of the land within this narrow coastal strip is designated Zone C on the FIRMs. There is also V-Zone fronting the entire strip. Between these zones there are small areas designated as A-Zones at the locations where six coastal creeks and the Carpinteria Slough empty into the ocean. There is also a relatively small Zone B area between V-Zone and C-Zone areas. This portion of the coast is periodically subject to high velocity wave action as was experience in January and March of 1983 (Presidential Disaster Declaration). The Base Flood Elevation (BFE) ranges from 6 to 10 feet along the coastal strip. On the portion of the coastal strip in the vicinity of the Carpinteria Slough, the V-Zone BFE is 8 feet. During past flooding events, County personnel have observed flood elevations of approximately 10 to 11 feet (USGS MSL Datum) in the vicinity of the Carpinteria Slough.

Location and Extent/Probability of Occurrence and Magnitude

Areas exposed to coastal storm surge/coastal erosion were identified using FEMA VE-Zones. FEMA defines Zone VE as an area inundated by 100-year flooding with velocity hazard (wave action). The data was obtained from Santa Barbara County and was originally digitized on-screen from scanned FEMA Flood Insurance Rate Maps.

The University Of Southern California Tsunami Research Group has modeled areas in Santa Barbara County that could potentially be inundated in the event of a tsunami. This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources. These data were mapped by CA OES for the purpose of Tsunami Evacuation Planning. Extreme tsunami inundation areas were mapped and used to profile maximum potential exposure.

Figures 4.3.4-A, 4.3.4-B, 4.3.4-C, and 4.3.4-D, illustrate the profiled coastal surge and tsunami inundation zones for Santa Barbara County.



SANTA BARBARA COUNTY
Hazard Mitigation Plan
Coastal Storm Surge/Tsunami
 Figure 4.3.4-C

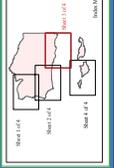


Map Source:
 FEMA VE Zones (High Risk) - FEMA Flood Insurance Rate Maps
 FEMA A Zones - FEMA Flood Insurance Rate Maps
 Incorporated City Boundary - Santa Barbara County
 Insurance/Maintenance Projected Damage (High Risk) - Santa Barbara County
 ALEs - Santa Barbara County
 Private Damage Locations - Santa Barbara County
 Roads - Santa Barbara County
 Interstates - Santa Barbara County
 Santa Barbara County - Santa Barbara County
 Counties - Santa Barbara County



Legend

- FEMA VE Zone (High Risk)
- FEMA A Zones
- Incorporated City Boundary
- Insurance/Maintenance Projected Damage (High Risk)
- ALEs
- Private Damage Locations
- Roads
- Interstates
- Santa Barbara County
- Counties



4.3.4.2 Coastal Storm Surge and Tsunami Vulnerability Assessment

Vulnerability to Coastal Surge and Tsunami inundation zones was addressed by examining total exposure of population, critical facilities, residential and commercial buildings values to the profiled hazard areas. The majority of Coastal Santa Barbara County, with the exception of portions of the south coast flood zone, is on high bluffs and safe from coastal surge. However, V-Zone mapping in these areas are based on wave height analysis that are known to be outdated and to underestimate the potential velocity areas. Readers should be aware that V-Zones were used as a best available source of coastal surge data for profiling this hazard. In areas such as Carpinteria, where there are no structures in the V-Zones but many in the immediate coastal area it should not be assumed that there is no vulnerability.

4.3.4.2.1 Asset Inventory

The specific methods and results of all analyses are presented below in subsection 4.3.4.2.2, below. The results are shown as potential exposure in thousands of dollars, and as the worst-case scenario. For infrastructure, which has been identified as highways, railways and energy pipelines, the length of exposure/impact is given in kilometers. Exposure characterizes the value of structures within the hazard zone, and is shown as estimated exposure based on the overlay of the hazard on the critical facilities, infrastructure, and other structures, which are given an assumed cost of replacement (from HAZUS) for each type of structure exposed. These replacement costs are estimated using a building square footage inventory from HAZUS-MH. The square footage information was classified based on Standard Industrial Code (SIC) and provided at a 2002 census-tract resolution. The exposure value is then determined with the assumption that the given structure is totally destroyed (worst case scenario), which is not always the case in hazard events. This assumption was valuable in the planning process, so that the total potential damage value was identified when determining capabilities and mitigation measures for each jurisdiction.

4.3.4.2.2 Estimating Potential Exposure and Losses

Coastal Surge - Areas exposed to coastal storm surge were identified using FEMA VE-Zones. FEMA defines Zone VE as an area inundated by 100-year flooding with velocity hazard (wave action). The data was obtained from Santa Barbara County and was originally digitized on-screen from scanned FEMA Flood Insurance Rate Maps. Using GIS, this data was analyzed against an inventory of assets to identify vulnerabilities to coastal storm surge/coastal erosion, resulting in three risk/exposure estimates: 1) the aggregated dollar exposure and building count at the census block level for residential and commercial occupancies, 2) the aggregated population at risk at the census block level, and 3) the critical infrastructure at risk (schools, hospitals, airports, bridges, and other facilities of critical nature). Analysis at the census block level involved determining the proportion of total area for a census block to the area of hazard zone that intersects it. This spatial proportion was used to determine percentage of the population and buildings that would be affected within each block. Critical facilities and infrastructure that fell within the boundary of the hazard area were determined to be vulnerable and were totaled by count or number of kilometers affected. These numbers were aggregated and presented for each jurisdiction and for the unincorporated areas of Santa Barbara County.

Tsunami -The University Of Southern California Tsunami Research Group has modeled areas in Santa Barbara County that could potentially be inundated in the event of a tsunami. This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources. Using GIS, this data was analyzed against an inventory of assets to identify vulnerabilities to tsunami inundation, resulting in three risk/exposure estimates: 1) the aggregated dollar exposure and building count at the census block level for residential and commercial occupancies, 2) the aggregated population at risk at the census block level, and 3) the critical infrastructure at risk (schools, hospitals, airports, bridges, and other facilities of critical nature). Analysis at the census block level involved determining the proportion of total area for a census block to the area of inundation that intersects it. This spatial proportion was used to determine percentage of the population and buildings that would be affected within each block. Critical facilities and infrastructure that fell within the boundary of the inundation area were determined to be vulnerable and were totaled by count or number of kilometers affected. These numbers were aggregated and presented for each jurisdiction and for the unincorporated areas of Santa Barbara County.

Table 4.3-26 and 4.3-27 provides the total inventory and exposure estimates for population, residential buildings and commercial buildings for tsunami and coastal surge, respectively, by jurisdiction. Table 4.3-28 identifies critical facilities and infrastructure by jurisdiction based on the profiled tsunami inundation zone. No critical facilities were identified within the narrow strip of profiled coastal surge zone.

**Table 4.3-26
Potential Exposure from Tsunami Hazard by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	7,871	1,654	381,327	3	11,793
City of Buellton					
City of Carpinteria	4,468	1,270	233,880	31	56,742
City of Goleta	7,633	1,364	329,935	168	315,322
City of Guadalupe					
City of Lompoc					
City of Santa Barbara	11,790	1,651	527,921	99	252,388
City of Santa Maria					
City of Solvang					
Total	31,762	5,939	1,473,063	301	636,245

**Table 4.3-27
Potential Exposure from Coastal Surge by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	456	153	24,859	0	1,385
City of Buellton	0	0	0	0	0
City of Carpinteria	0	0	54	0	0
City of Goleta	0	0	0	0	0
City of Guadalupe	0	0	0	0	0
City of Lompoc	0	0	0	0	0
City of Santa Barbara	0	0	50	0	0
City of Santa Maria	0	0	0	0	0
City of Solvang	0	0	0	0	0
Total	456	153	24,963	0	1,385

SECTION FOUR

Risk Assessment

Table 4.3-28

Potential Exposure to Critical Facilities and Infrastructure from Tsunami Hazard by Jurisdiction

Jurisdiction	Data	AIR	BRDG	BUS	COM	ELEC	EMER	GOVT	HOSP	INFR (km)	PORT	POT	RAIL	SCH	Total
Santa Barbara County, unincorporated	Number		22				1			24		3		2	52
	Exposure (x\$1000)		14,739				2,439			36,639		157,176		10,000	220,993
City of Buellton	Number									0					0
	Exposure (x\$1000)									0					0
City of Carpinteria	Number		3				1	2		4		1	1	3	15
	Exposure (x\$1000)		1,602				2,439	2,360		6,035		78,588	2,572	15,000	108,596
City of Goleta	Number		7	1			1	1		7			1	2	20
	Exposure (x\$1000)		9,694	1,286			2,439	1,180		13,882			2,572	10,000	41,053
City of Guadalupe	Number									0					0
	Exposure (x\$1000)									0					0
City of Lompoc	Number									0					0
	Exposure (x\$1000)									0					0
City of Santa Barbara	Number	1	34	1	3	2	2	6		14		2	1	4	70
	Exposure (x\$1000)	43,105	30,727	1,286	6,000	259,600	4,877	7,080		23,219		157,176	2,572	20,000	555,643
City of Santa Maria	Number									0					0
	Exposure (x\$1000)									0					0
City of Solvang	Number									0					0
	Exposure (x\$1000)									0					0
Total Number		1	66	2	3	2	5	9	0	49	0	6	3	11	157
Total Exposure (x\$1000)		43,105	56,762	2,572	6,000	259,600	12,193	10,620	0	79,774	0	392,940	7,717	55,000	926,284

4.3.5 Rain-Induced Landslide and Coastal Erosion

4.3.5.1 Hazard Profile

Nature of Hazard

Landslides and coastal erosion comprise rock, earth, or debris displacing down an incline. This includes rock falls, rock slides, deep slope failures, shallow debris flows, and mud flows. The correct geological conditions (unstable or weak soil or rock) and topographical conditions (steep slopes) are necessary for landslides and mass coastal wasting. Heavy rain often triggers them, as the water adds extra weight that the soil cannot bear. Over irrigating has the same affect. Earthquakes can also affect soil stability, causing enough weakening to favor gravitational forces.

All are influenced by human activity (mining and construction of buildings, railroads, and highways). The most common cause of a landslide is an increase in the down slope gravitational stress applied to slope materials (over-steepening). This may be produced either by natural processes or by man's activities. Undercutting of a valley wall by stream erosion or of a sea cliff by wave erosion are ways in which slopes may be naturally oversteeped.

Another type of soil failure is slope wash, the erosion of slopes by surface-water runoff. The intensity of slope wash is dependent on the discharge and velocity of surface runoff and on the resistance of surface materials to erosion. Surface runoff and velocity is greatly increased in urban and suburban areas due to the presence of roads, parking lots, and buildings, which are impermeable to water and provide relatively smooth surfaces that do not slow down runoff.

Mudflows are another type of soil failure, and are defined as flows or rivers of liquid mud down a hillside. They occur when water accumulates under the ground, usually following long and heavy rainfalls. If there is no brush, tree, or ground cover to hold the soil, mud will form and flow down the slope. Various locations throughout the County are subject to all of these types of events.

Disaster History

In Sycamore Canyon (near the border of Santa Barbara County and the City of Santa Barbara) in the late 1990's a mud flow ripped a home from its foundation and moved it several feet downhill. This is a fairly benign example of the destruction landslides can cause. In the spring of 1995 La Conchita (located at the western border of Ventura County, adjacent to Santa Barbara County) experienced a landslide that completely destroyed several houses nearest to it. A portion of the bank along the Cuyama River collapsed east of Santa Maria in 1998. This occurred on Highway 166; half a dozen cars and a tractor trailer rig were caught in the slide. Two people were killed. These forgoing are examples of "newsworthy" landslide events. There are several areas in the County that are prone to more frequent rain induced landslides that primarily cause disruption to transportation and damage to roadways. The most common areas of recent historic slides are listed below.

South County

- Palomino Road (1995, 1998)
- Gibraltar Road (1995, 1998, 2001, 2003)

- Glen Annie Road (1995, 1998, 2001, 2004)
- All Roads underlain by the Rincon Shale Formation.
- Refugio Road (1995, 1998, 2001)
- Ortega Hill Road (1995, 1998)
- Stagecoach Road (Constant, 2003, 2004)
- Painted Cave (1995, 1998)
- Old San Marcos Road (1995, 1998, currently moving)
- Gobernador Canyon (1995, 1998, currently moving)
- East Mountain Drive (1995, 1998, 2001)

North County (Most experienced sliding in 1995 and 1998, and are considered ongoing threats)

- Miguelito Canyon
- Sweeney Road
- Jalama Road
- Point Sal Road
- Drum Canyon Road
- Mail Road
- Santa Rosa Road
- Figueroa Mountain Road

More detailed descriptions of the landslide prone areas listed above are included as Appendix 4-E. In addition to these 18 areas where landslide is a common occurrence, listed below are several bridges throughout the County that are known to experience scour during flooding erosion events.

Scour Critical Bridges

North County

- Foothill (Cuyama)
- Jalama Road at Ramajal Creek (Bridge No 51C-0016) is listed as Scour Critical, with Unstable Foundation

South County

- East Mountain Drive at San Ysidro Creek (Bridge No 51C-0202) is listed as Scour Critical, with Extensive Foundation Scour
- Ashley Road at Montecito Creek (Bridge No 51C-0043) is listed as Scour Critical, with Extensive Foundation Scour
- Cathedral Oaks Road at San Antonio Creek (Bridge No 51C-0001) is listed as Scour Critical, with Extensive Foundation Scour

Landslides and landslide prone sedimentary formations are present throughout the coastal plain of western Santa Barbara County. Landslides also occur in the granitic mountains of East Santa Barbara County, although they are less prevalent. Many of these landslides are thought to have occurred under much wetter climatic conditions than at present. Recent landslides are those with fresh or sharp geomorphic expressions suggestive of active (ongoing) movement or movement within the past several decades. Reactivations of existing landslides can be triggered by disturbances such as heavy rainfall,

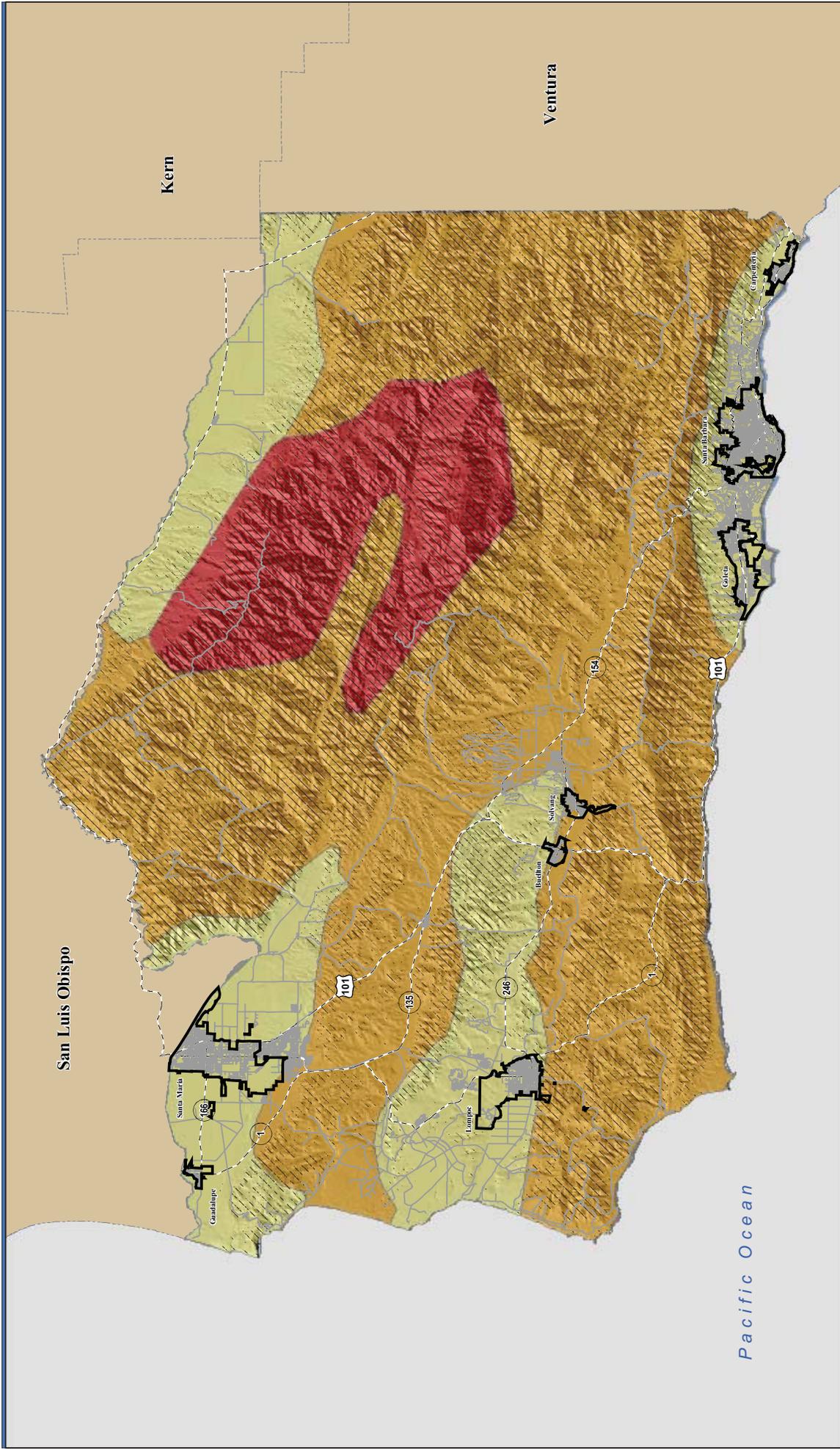
seismic shaking and/or grading. Many recent landslides are thought to be reactivations of ancient landslides.

Location and Extent/Probability of Occurrence and Magnitude

The location and extent of landslides are extremely difficult to predict consistently for a planning area the size of Santa Barbara County. There are locations throughout the County that are prone to landslide and erosion activity, in addition to areas of known concern, some of which are listed above. URS obtained a digital version of the Landslide Overview Map of the Conterminous United States from the USGS. Because this data was created at a nationwide scale and is not suitable for local planning, URS refined this data layer using slope derived from the USGS 30-meter resolution Digital Elevation Model. High and moderate risk areas within Santa Barbara County were refined by identifying the areas where the risk of landslide incidence was considered high or moderate by the national data set and where the slope exceeded 25%.

For coastal erosion, in the absence of better data, areas exposed to coastal erosion were identified using FEMA VE-Zones. FEMA defines Zone VE as an area inundated by 100-year flooding with velocity hazard (wave action). The data was obtained from Santa Barbara County and was originally digitized on-screen from scanned FEMA Flood Insurance Rate Maps. The general assumption was made that property within the V-Zones would be more susceptible to coastal erosion.

Figure 4.3.5-A shows the general locations of high and moderate landslide risk based on the methodology described above along with the areas (V-Zones) that may be susceptible, or more susceptible, to coastal erosion.



Legend

Soil Slip Susceptibility (USGS)

- Incidence High
- Incidence Moderate
- Incidence Low
- FEMA VE Zone (High Risk)

- Slopes Greater Than 25%
- Freeway
- Road

Source: Soil Slip Susceptibility - United States Geological Survey
 Slopes - Derived from USGS Digital Elevation Model



4.3.5.2 Rain-Induced Landslide and Coastal Erosion Vulnerability Assessment

As noted in previous sections, vulnerability describes how exposed or susceptible to damage an asset is, and depends on an asset's construction, contents and the economic value of its functions. Indirect damages, associated with landslide and coastal erosion likely outweigh direct damages in terms of impact on the community. Road closure from landslide, for example, is a consistent problem throughout the County. There are also ancillary impacts on other hazards. Many of the canyon areas with steep slopes and frequent landslides and road closures are areas where wildfire threats are greatest. Many of the roads used for fire suppression vehicles are the same roads that are closed by landslides. Also, many ranch and farming operations have limited ingress and egress for moving raw materials and products. These economic factors are difficult to quantify in terms of dollar losses, but are a very real part of landslide vulnerability.

4.3.5.2.1 Asset Inventory

The specific methods and results of all analyses are presented below in subsection 4.3.5.2.2, below. The results are shown as potential exposure in thousands of dollars, and as the worst-case scenario. For infrastructure, which has been identified as highways, railways and energy pipelines, the length of exposure/impact is given in kilometers. Exposure characterizes the value of structures within the hazard zone, and is shown as estimated exposure based on the overlay of the hazard on the critical facilities, infrastructure, and other structures, which are given an assumed cost of replacement (from HAZUS) for each type of structure exposed. These replacement costs are estimated using a building square footage inventory from HAZUS-MH. The square footage information was classified based on Standard Industrial Code (SIC) and provided at a 2002 census-tract resolution. The exposure value is then determined with the assumption that the given structure is totally destroyed (worst case scenario), which is not always the case in hazard events. This assumption was valuable in the planning process, so that the total potential damage value was identified when determining capabilities and mitigation measures for each jurisdiction.

4.3.5.2.2 Estimating Potential Exposure and Losses

Landslide - Using GIS, high and moderate landslide risk areas were analyzed independently against an inventory of assets to identify vulnerabilities to each level of hazard, resulting in three risk/exposure estimates for each level of risk: 1) the aggregated dollar exposure and building count at the census block level for residential and commercial occupancies, 2) the aggregated population at risk at the census block level, and 3) the critical infrastructure at risk (schools, hospitals, airports, bridges, and other facilities of critical nature). Analysis at the census block level involved determining the proportion of total area for a census block to the area of hazard zone that intersects it. This spatial proportion was used to determine percentage of the population and buildings that would be affected within each block. Critical facilities and infrastructure that fell within the boundary of the hazard area were determined to be vulnerable and were totaled by count or number of kilometers affected. These numbers were aggregated and presented for each jurisdiction and for the unincorporated areas of Santa Barbara County.

Due to the existence of small, localized conditions for landslide within Santa Barbara County, URS suggests that landslide risk areas be defined digitally at a local level to determine the true impact of this hazard to Santa Barbara County.

Areas mapped as high risk areas, combined with slopes of greater than 25% are generally the unpopulated areas of the County. This combined with the percentage of census tract level of detail for population and buildings resulted in a total exposure of only \$738,000 in residential property and no commercial exposure and very limited population exposure. In the moderate risk zone, combined with slopes of greater than 25% the results yielded no exposure. No critical facility and infrastructure data was available in HAZUS for these profiled areas. Obviously there is significant exposure, particularly to infrastructure throughout the County. With the level of detail of the best available data, consistent for the region, a level of analysis necessary to yield meaningful results could not be performed. For that reason, in the remainder of the plan, including Section 5, the landslide hazard is addressed in a general way and based on the many known landslide areas listed above in this section.

Coastal Erosion - Using GIS, V-Zone areas were analyzed against an inventory of assets to identify vulnerabilities to coastal storm surge/coastal erosion, resulting in three risk/exposure estimates: 1) the aggregated dollar exposure and building count at the census block level for residential and commercial occupancies, 2) the aggregated population at risk at the census block level, and 3) the critical infrastructure at risk (schools, hospitals, airports, bridges, and other facilities of critical nature). Analysis at the census block level involved determining the proportion of total area for a census block to the area of hazard zone that intersects it. This spatial proportion was used to determine percentage of the population and buildings that would be affected within each block. Critical facilities and infrastructure that fell within the boundary of the hazard area were determined to be vulnerable and were totaled by count or number of kilometers affected. These numbers were aggregated and presented for each jurisdiction and for the unincorporated areas of Santa Barbara County

Table 4.3-29 provides a breakdown of potential exposure for coastal erosion hazard by jurisdiction for population, residential and commercial properties. Note that this table coincides with the coastal surge exposure table from that section of the risk assessment. There were no identified critical facilities in the coastal erosion zone as profiled.

**Table 4.3-29
Potential Exposure from Coastal Storm/Erosion Hazard by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	456	153	24,859	0	1,385
City of Buellton	0	0	0	0	0
City of Carpinteria	0	0	54	0	0
City of Goleta	0	0	0	0	0
City of Guadalupe	0	0	0	0	0
City of Lompoc	0	0	0	0	0
City of Santa Barbara	0	0	0	0	0
City of Santa Maria	0	0	0	0	0
City of Solvang	0	0	0	0	0
Total	456	153	24,963	0	1,385

Note: limitations are due to percentage of census tract in identified V-Zones. It should not be implied that there is no vulnerability at all to coastal erosion based on the figures in this table.

4.3.6 Dam Failure

4.3.6.1 Hazard Profile

Nature of Hazard

Dams fail due to old age, poor design, or structural damage. Structural damage is often a result of a flood or earthquake. A catastrophic dam failure could inundate the area downstream. The force of the water is large enough to carry boulders, trees, automobiles, and even houses along a destructive path downstream. The potential for casualties, environmental damage, and economic loss is great.

Disaster History

Built in 1917, the Sheffield Dam only survived for eight years, failing catastrophically during an earthquake in 1925. It was built on sandy soil which liquefied during the event. The center 300-feet of the 720-foot long dam broke off and was carried away on the liquefied soil, spilling 30 million gallons of water. Damage estimates are unavailable. This is the only major dam failure identified in the County during research.

The floods of 1995 and the nearby 1994 Northridge earthquake prompted the Santa Barbara County Grand Jury to investigate preparedness for disasters within the County of Santa Barbara. The findings of the investigation noted that the Bradbury Dam could suffer catastrophic structural damage if a major earthquake should occur in its vicinity. When the U. S. Department of the Interior evaluated all dams under its jurisdiction, the review of the Bradbury Dam disclosed deficiencies.

The alluvial earth at the front of the dam was water saturated. In 1995, to alleviate this condition, 17 pumps were installed after holes were drilled down to the bedrock. The removal of this water should prevent liquefaction and instability that can result from an earthquake. This safety project was completed, but further work is needed.

When it was first announced that seismic dam failure was a possibility before repairs were completed, the County OES distributed safety brochures throughout the Santa Ynez Valley, including Lompoc, Solvang and Buellton. The possibility of a major earthquake is rare and thus the risk of a catastrophic dam break is also minimal. The City of Lompoc has plotted those areas of the city that would be impacted by flood waters and has installed warning sirens, designated evacuation routes, and held simulated drills.

Location and Extent/Probability of Occurrence and Magnitude

Dam inundation zones, obtained through the California Governor's Office of Emergency Services, show areas that would be flooded should a dam fail. Figure 4.3.6-A displays the dam failure inundation areas along with the location of major dams in the County and location of critical facilities.

There are four major reservoirs located in the County; Lake Cachuma, Twitchell, Gibraltar, and Jameson Lake. The Cachuma and Twitchell reservoirs are owned by the federal government, administered by the County Water Resources Division, and operated by local water purveyors, the Gibraltar Reservoir is

owned and operated by the City of Santa Barbara, and the Jameson Reservoir is owned and operated by the Montecito Water District.

Lake Cachuma, Gibraltar Reservoir, and Jameson Lake are located along the Santa Ynez River, in the South County. Lake Cachuma is the largest reservoir along the Santa Ynez River, with a drainage area of 421 square miles upstream of the Bradbury Dam. Gibraltar Reservoir has a drainage area of 214 square miles upstream of Gibraltar Dam and Jameson Lake has a drainage area of 14 square miles upstream of Juncal Dam.

In the North County, the Twitchell Reservoir is located along the Cuyama River. The Cuyama River Basin has a drainage area of approximately 1,140 square miles and it is the confluence of the Cuyama and Sisquoc Rivers that form the Santa Maria River. The Twitchell Reservoir has a drainage area of 1,135 square miles above Twitchell Dam.

4.3.6.2 Dam Failure Vulnerability Assessment

There is significant vulnerability to population, buildings, critical facilities and infrastructure in the dam inundation areas mapped in Figure 4.3.6-A. The cities of Lompoc, Santa Barbara and Carpinteria, and portions of Santa Maria, Buellton, and Solvang are subject to potential dam failure. There are nine major dams in the County; Alisal Creek, Bradbury, Dos Pueblos, Gibraltar, Glen Anne, Juncal, Ortega, Rancho Del Ciervo, and Twitchell. Bradbury dam has the largest concern of failure because floodwaters from this dam would affect Cachuma Village, Solvang, Buellton, Lompoc City, Lompoc Valley and south Vandenberg AFB. Failure of the remaining 8 dams, would affect portions of populated cities and communities, forest and agricultural lands, roads, and highways could be inundated. The levee that protects nearly all of downtown Santa Maria is also of significant concern.

The majority of the most populous south County areas are serviced by water from the reservoirs noted above. In addition to catastrophic property damage, significant water supply issues could result from the breach of these dams.

4.3.6.2.1 Asset Inventory

The specific methods and results of all analyses are presented below in subsection 4.3.6.2.2, below. The results are shown as potential exposure in thousands of dollars, and as the worst-case scenario. For infrastructure, which has been identified as highways, railways and energy pipelines, the length of exposure/impact is given in kilometers. Exposure characterizes the value of structures within the inundation zones, and is shown as estimated exposure based on the overlay of the hazard on the critical facilities, infrastructure, and other structures, which are given an assumed cost of replacement (from HAZUS) for each type of structure exposed. These replacement costs are estimated using a building square footage inventory from HAZUS-MH. The square footage information was classified based on Standard Industrial Code (SIC) and provided at a 2002 census-tract resolution. The exposure value is then determined with the assumption that the given structure is totally destroyed (worst case scenario), which is not always the case in hazard events. This assumption was valuable in the planning process, so that the total potential damage value was identified when determining capabilities and mitigation measures for each jurisdiction

4.3.6.2.2 Estimating Potential Exposure and Losses

Dam inundation zones, obtained through the California Governor's Office of Emergency Services, show areas that would be flooded should a dam fail. Using GIS, this data was analyzed against an inventory of assets to identify vulnerabilities to dam inundation, resulting in three risk/exposure estimates: 1) the aggregated dollar exposure and building count at the census block level for residential and commercial occupancies, 2) the aggregated population at risk at the census block level, and 3) the critical infrastructure at risk (schools, hospitals, airports, bridges, and other facilities of critical nature). Analysis at the census block level involved determining the proportion of total area for a census block to the area of inundation that intersects it. This spatial proportion was used to determine percentage of the population and buildings that would be affected within each block. Critical facilities and infrastructure

that fell within the boundary of the inundation area were determined to be vulnerable and were totaled by count or number of kilometers affected. These numbers were aggregated and presented for each jurisdiction and for the unincorporated areas of Santa Barbara County.

Table 4.3-30 provides a breakdown of potential exposure by jurisdiction, and Table 4.3-31 provides a breakdown of potential exposure to infrastructure and critical facility by jurisdiction. Approximately 368,000 people are at risk from the dam failure hazard. In addition, special populations at risk that may be impacted by the dam failure hazard in Santa Barbara County include 13,689 low-income households and 24,316 elderly persons.

**Table 4.3.30
Potential Exposure from Dam Failure Hazard by Jurisdiction**

Jurisdiction	Exposed Population	Residential Buildings at Risk		Commercial Buildings at Risk	
		Building Count	Potential Exposure (x\$1000)	Building Count	Potential Exposure (x\$1000)
Santa Barbara County, unincorporated	2,089	759	110,845	15	43,490
City of Buellton	2,301	957	103,117	18	40,433
City of Carpinteria	126	42	7,058	0	196
City of Goleta	42	14	2,339	2	5,289
City of Guadalupe	5,659	1,172	173,880	9	15,134
City of Lompoc	26,960	6,709	1,063,843	52	117,672
City of Santa Barbara	5,047	1,417	320,328	21	50,644
City of Santa Maria	71,320	15,194	2,482,181	204	404,538
City of Solvang	780	350	43,771	4	9,541
Total	114,324	26,614	4,307,362	325	686,937

SECTION FOUR

Risk Assessment

Table 4.3-31

Potential Exposure to Critical Facilities and Infrastructure from Dam Failure Hazard by Jurisdiction

Jurisdiction	Data	AIR	BRDG	BUS	COM	ELEC	EMER	GOVT	HOSP	INFR (km)	PORT	POT	RAIL	SCH	Total
Santa Barbara County, unincorporated	Number	2	27		3	1				53		1		3	90
	Exposure (x\$1000)	86,210	72,470		6,000	129,800				112,560		39,294		15,000	461,334
City of Buellton	Number		3				2	1		3.738			1		11
	Exposure (x\$1000)		6,094				4,877	1,180		12028.89			2,572		26,753
City of Carpinteria	Number									0					0
	Exposure (x\$1000)									0					0
City of Goleta	Number		2							0.88					3
	Exposure (x\$1000)		1,560							1829.69					3,390
City of Guadalupe	Number						2	5		9.494			1	1	18
	Exposure (x\$1000)						4,877	5,900		14585.68			2,572	5,000	32,935
City of Lompoc	Number	1	3		1		1	2		7.898			1	8	25
	Exposure (x\$1000)	43,105	922		2,000		2,439	2,360		14774.12			2,572	40,000	108,172
City of Santa Barbara	Number		6					1		2.216				1	10
	Exposure (x\$1000)		4,426					1,180		4351				5,000	14,957
City of Santa Maria	Number		9	2	2		5	18	1	26.8			1	16	81
	Exposure (x\$1000)		11,128	2,572	4,000		12,193	21,240	16,520	62796.8			2,572	80,000	213,023
City of Solvang	Number									0.528					1
	Exposure (x\$1000)									1699.1					1,699
Total Number		3	41	0	4	1	5	9	0	77	0	1	3	13	157
Total Exposure (x\$1000)		129,315	85,471	0	8,000	129,800	12,193	10,620	0	161,828	0	39,294	7,717	65,000	649,239

4.4 ANALYSIS OF LAND USE

Santa Barbara County has a mountainous interior, made up of three primary mountain ranges; the Santa Ynez Mountains, the San Rafael Mountains, and the Sierra Madre Mountains. Most of the mountainous region is within the Los Padres National Forest. The forest contains the San Rafael Wilderness and the Dick Smith Wilderness. The valleys, especially those along the coast, contain most of the population. The cities of Santa Barbara, Goleta, and Carpinteria are all along the south coast, in the valley south of the Santa Ynez Mountains. The Cuyama Valley in the north part of the County is less populated and more arid; oil production, ranching, and agriculture are the dominant land uses there. The County also includes four Channel Islands in the Pacific Ocean. These include San Miguel Island, Santa Barbara Island, Santa Cruz Island, and Santa Rosa Island. Santa Cruz Island is the only one of the four that is privately owned. The Nature Conservancy has owned it since 1987. The other islands are part of the Channel Islands National Park. Agriculture is the primary land use in most of the unincorporated County. In the south County coastal area, tourism, education, government and service industries, along with residential uses dominate land use. In the incorporated cities, land use is varied.

Buellton is transitioning from a crossroads commercial center for automobile travelers to a unique community offering full services to its residents and visitors. Located within commuting distance to the more populous coastal areas, Buellton is home to many commuters. It is also expected to grow. With real estate prices at an all time high, more and more people are locating to the Santa Ynez Valley and other previously undeveloped areas to find more affordable housing.

The City of Carpinteria is a thriving business community, with proximity to strategic business centers and an idyllic seaside location. The industries employing the largest number of workers in the City are services, retail, and durable manufacturing. Prominent service industries that support tourist activities include recreation and amusement, hotels and lodging, and local transportation services.

As a recently incorporated city (February 2002), Goleta is in the unique position of defining not who they are, but who they want to be. According to the vision statement from the Goleta Valley Vision, Goleta would like to be part old-fashioned suburb, and part high-tech entrepreneurial business area, with a history of cutting-edge environmentalism. The city is located in the commercial and industrial heart of the County and has in recent years drawn many high technology companies to the area. Goleta has a strong combination of residential, commercial and industrial land uses.

Guadalupe is primarily a residential community surrounded by agricultural land use. Commercial land uses within the City generally are for service of its residents.

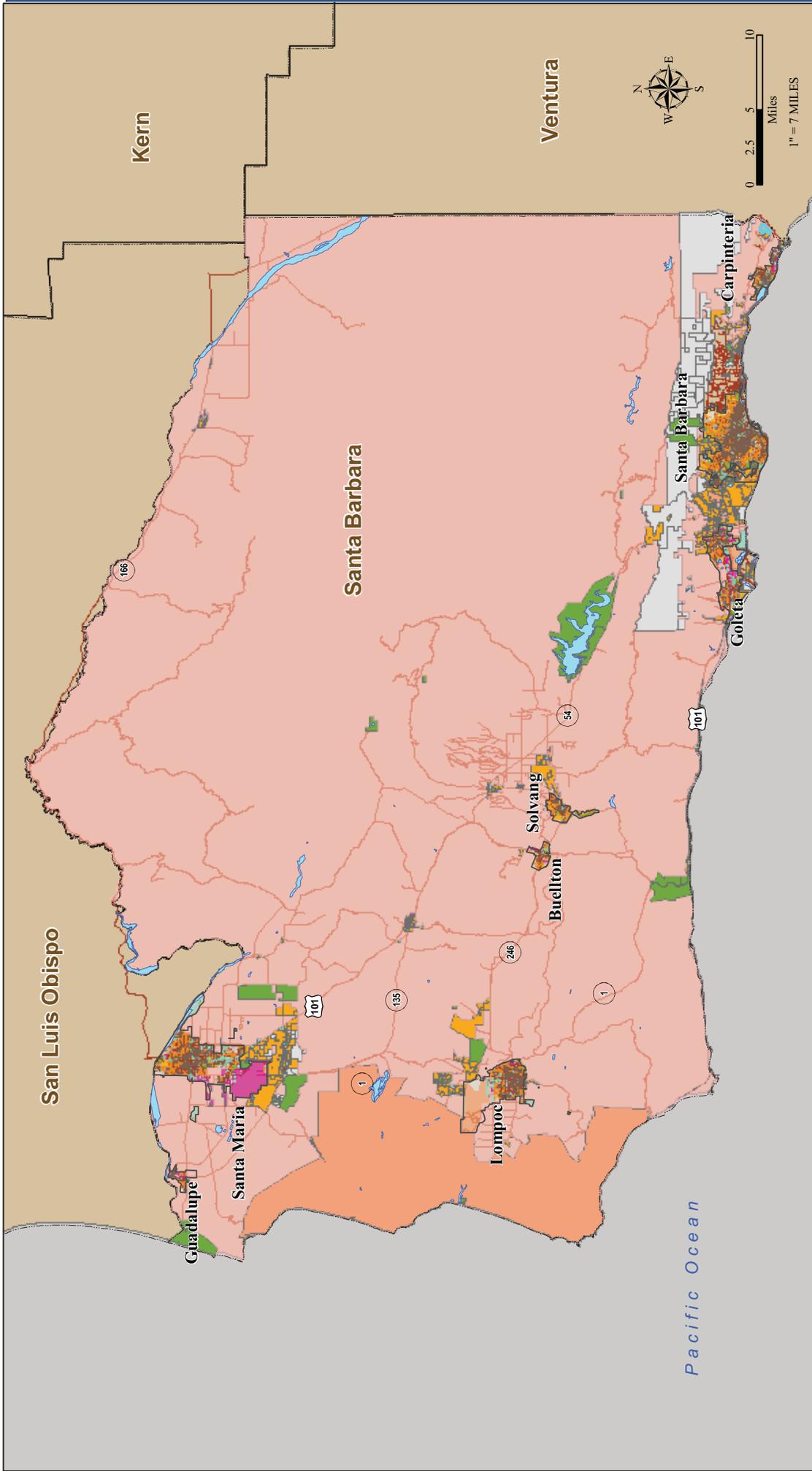
Lompoc was incorporated on August 13, 1888. The growth and diversification of Lompoc was due in part to the establishment and growth of Camp Cooke Army Base, now Vandenberg Air Force Base, which is located just seven miles west of Lompoc.

The City of Santa Barbara is located on the south coast of the County. Santa Barbara is the retail, tourism and government center of the County. It is home to the Santa Barbara Municipal Airport, which services the majority of the County.

Santa Maria is one of the fastest growing cities in the County. For most of the 20th Century, the City's area remained roughly four square miles. Annexations beginning in August 1954 have increased the city's physical size to slightly over 20 square miles. Agriculture has always been the prominent land use and plays an important role in the City's economy. However, other important sectors of the local economy are growing, including the aerospace industry; communications; high-technology research and development; energy production; military operations; and various manufacturing industries. Residential growth is also booming due to relatively less expensive property.

Solvang is now a popular tourist destination. Located in the Santa Ynez Valley, it is home to a variety of Danish festivals, the Hans Christian Andersen Park, Danish pastries and Danish-themed shops. Solvang was incorporated as a city on May 1, 1985. Solvang, like the rest of the Santa Ynez Valley continues to experience growth as people migrate from the coastal areas looking for affordable real estate within commuting distance to the more populous areas of the County. Primary land use in Solvang is residential and commercial retail.

Figure 4.4-A shows general land use categories throughout the County based on Tax Assessor Database land uses.



- Legend**
- Land Use
 - AGRICULTURE
 - COMMERCIAL
 - INDUSTRIAL
 - PARKS AND RECREATION
 - RESIDENTIAL
 - TRANSPORTATION, COMMUNICATION AND UTILITIES
 - GOVERNMENT
 - UNDEVELOPED
 - Incorporated City Boundary
 - Lakes

Sources: County Public Works Department, GIS Services
County Tax Assessor's parcel database

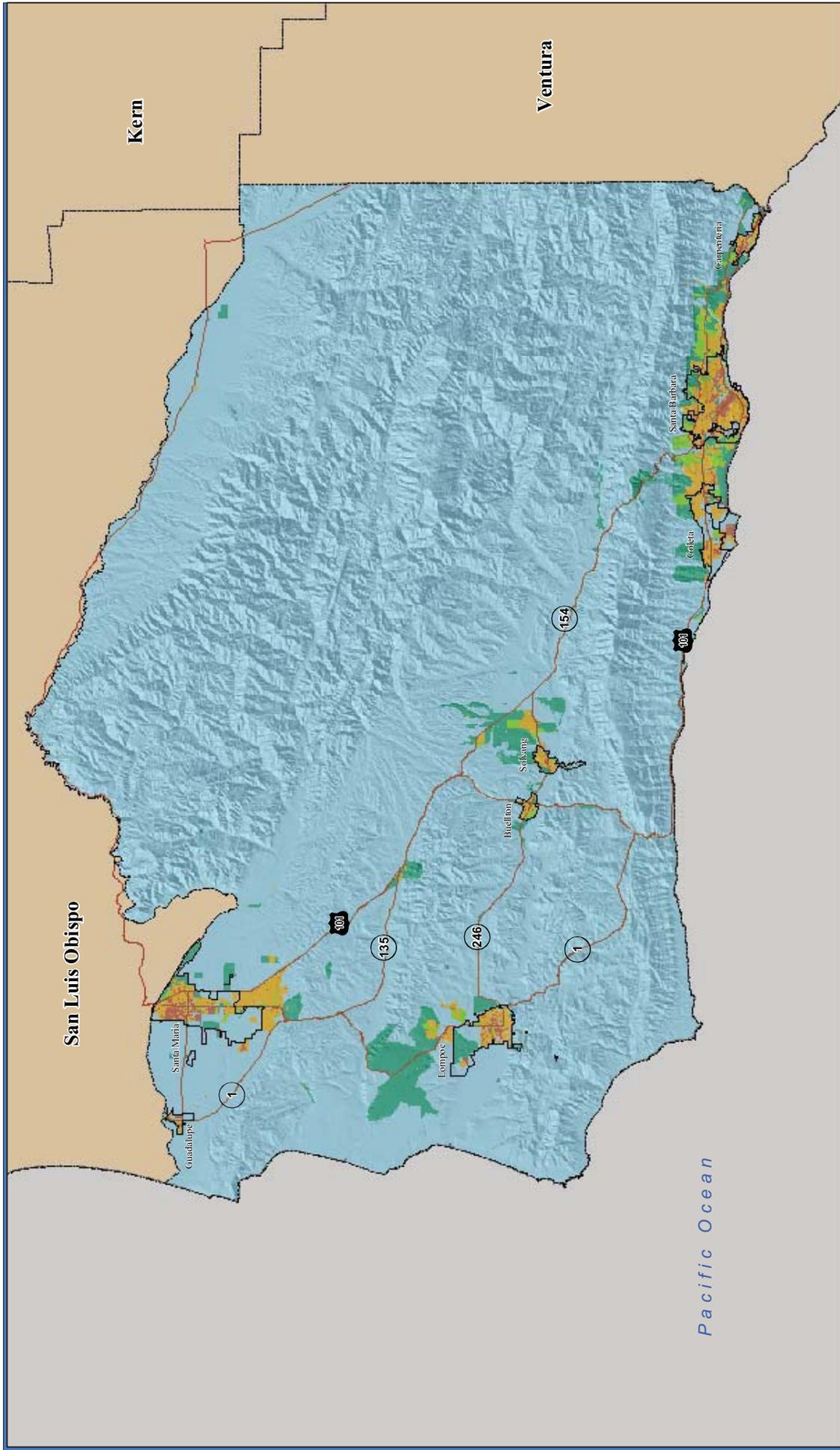


SANTA BARBARA COUNTY
Hazard Mitigation Plan
Land Use
Figure 4.4-A

4.5 ANALYSIS OF DEVELOPMENT TRENDS

Development in the near term will continue to occur in the unincorporated urban core and southwestern portion of Santa Barbara County in and around the cities of Santa Barbara, Goleta and Carpinteria. In the floodprone coastal areas there is a trend toward constructing large additions on existing structures and razing and replacing valuable property with newer larger homes. In the more rural areas of the Santa Ynez Valley and unincorporated mountainous areas there is increased development as people are willing to commute further to work to find more affordable land on which to build. This trend can be expected to continue and to increase exposure in areas most vulnerable to Wildfire and Landslide hazards. Most new commercial and industrial development will be constructed to modern codes and standards and should be safer to earthquake and other hazards than much of the older building stock.

Figure 4.5-A shows the current population density for the County.



Legend
Census Blocks - Population Density per Sq. Mi.

0.00 - 100.00	Lightest Green
100.01 - 500.00	Light Green
500.01 - 1000.00	Medium Green
1000.01 - 10000.00	Dark Green
10000.01 - 742857.2	Red

Blocks
 Counties
 Incorporated City Limits

Source: US Census Bureau, TIGER Block Files, 2002



SANTA BARBARA COUNTY
 Hazard Mitigation Plan
Population Density
 Figure 4.5-A

SECTION 5 GOALS, OBJECTIVES AND ACTIONS**5.1 OVERVIEW**

This section of the Plan incorporates each of the nine participating jurisdictions': 1) mitigation goals and objectives, 2) mitigation actions and priorities, 3) an implementation plan, and 4) documentation of the mitigation planning process. These steps are described as follows.

Develop Mitigation Goals and Objectives

Each jurisdiction reviewed hazard profile and loss estimation information presented in Section 4 and used this as a basis for developing mitigation goals and objectives. Mitigation goals are general explanations of what hazards, and losses due to hazards, each jurisdiction would like to prevent. They are typically long-range visions and are oriented towards jurisdictional policy. The objectives define strategies to attain those goals. Both are based on consistent and complementary goals contained within existing local plans, policy documents, and regulations, as well as on public input.

Identify and Prioritize Mitigation Actions

Mitigation actions are a means of carrying out the objectives. They must be compatible with the plans, policies, and regulations of the jurisdiction. The jurisdiction must also have the legal, administrative, fiscal, and technical capacities to perform each action. The process of analyzing the capacity of the jurisdiction is called the capabilities assessment, and it results in a list of acceptable and realistic mitigation actions. This list can then incorporate the social, technical, administrative, political, legal, economic, and environmental (STAPLE/E) opportunities and constraints of each action, and it can be trimmed accordingly. After completion of the capabilities assessment, each jurisdiction evaluated and prioritized their proposed mitigation actions. This step resulted in a list of acceptable and realistic actions that address the hazards identified in each jurisdiction. Each jurisdiction then identified and prioritized actions with the highest short to medium term priorities. An implementation schedule, funding source and coordinating individual or agency are identified for each prioritized action item. Each community's approach to reducing the impacts of disasters varies and must be tailored to intertwine with the competing needs and objectives of that community. The framework chosen to work towards goals and objectives is captured by six categories of mitigation actions:

- Prevention;
- Property protection;
- Public education and awareness;
- Natural resource protection;
- Emergency services; and,
- Structural projects

PREVENTION MEASURES

- Keep a hazard risk from getting worse.
- Ensure that future development does not increase hazard losses.

- Guide future development away from hazards, while maintaining other community goals such as economic development and quality of life and environment.

Communities can achieve significant progress toward hazard resistance through prevention measures, particularly in areas that have not been developed or where capital investment has not been substantial.

PROPERTY PROTECTION MEASURES

- Modify existing buildings subject to hazard risk, or their surroundings
- Directly protect people and property at risk
- Inexpensive measures because often they are implemented or cost-shared with property owners.

Protecting a building does not have to affect the building's appearance and is therefore a popular measure for historic and cultural sites.

PUBLIC EDUCATION AND AWARENESS MEASURES

- Inform and remind people about hazardous areas and the measures they can take to avoid potential damage and injury.

Education and awareness measures can be tailored to different audiences, including but not limited to: property owners, potential property owners, business owners, children and visitors.

NATURAL RESOURCE PROTECTION MEASURES

- Reduce the intensity of hazard effects and improve the quality of the environment and wildlife habitats.

Parks, recreation, or environmental agencies or organizations usually implement these activities.

EMERGENCY SERVICES MEASURES

- Emergency services protect people before and after a hazard event.

Actions taken to ensure the continuity of emergency services are considered to be mitigation.

STRUCTURAL MEASURES

- Directly protect people and property at risk.

These measures are termed "structural" mitigation because they involve construction of man-made structures to control hazards.

EVALUATING ALTERNATIVES AND PRIORITIZING PROJECTS

The MAC used the STAPLE/E Criteria (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) to select and prioritize the most appropriate mitigation alternatives. This methodology requires that the social, technical, administrative, political, legal, economic, and environmental aspects of a project be considered when reviewing potential actions. This process was used to help ensure that the most equitable and feasible actions would be undertaken based on capabilities. Table 5-1 provides information regarding the review and selection criteria for alternatives.

TABLE 5-1 — STAPLE/ E REVIEW AND SELECTION CRITERIA FOR ALTERNATIVES

SOCIAL
<ul style="list-style-type: none"> • IS THE PROPOSED ACTION SOCIALLY ACCEPTABLE TO THE COMMUNITY? • ARE THERE EQUITY ISSUES INVOLVED THAT WOULD MEAN THAT ONE SEGMENT OF THE COMMUNITY ARE TREATED UNFAIRLY? • WILL THE ACTION CAUSE SOCIAL DISRUPTION?
TECHNICAL
<ul style="list-style-type: none"> • WILL THE PROPOSED ACTION WORK? • WILL IT CREATE MORE PROBLEMS THAN IT SOLVES? • DOES IT SOLVE A PROBLEM OR ONLY A SYMPTOM? • IS IT THE MOST USEFUL ACTION IN LIGHT OF OTHER COMMUNITY GOALS?
ADMINISTRATIVE
<ul style="list-style-type: none"> • CAN THE COMMUNITY IMPLEMENT THE ACTION? • IS THERE SOMEONE TO COORDINATE AND LEAD THE EFFORT? • IS THERE SUFFICIENT FUNDING, STAFF, AND TECHNICAL SUPPORT AVAILABLE? • ARE THERE ONGOING ADMINISTRATIVE REQUIREMENTS THAT NEED TO BE MET?
POLITICAL
<ul style="list-style-type: none"> • IS THE ACTION POLITICALLY ACCEPTABLE? • IS THERE PUBLIC SUPPORT BOTH TO IMPLEMENT AND TO MAINTAIN THE PROJECT?
LEGAL
<ul style="list-style-type: none"> • IS THE COMMUNITY AUTHORIZED TO IMPLEMENT THE PROPOSED ACTION? IS THERE A CLEAR LEGAL BASIS OR PRECEDENT FOR THIS ACTIVITY? • ARE THERE LEGAL SIDE EFFECTS? COULD THE ACTIVITY BE CONSTRUED AS A TAKING? • IS THE PROPOSED ACTION ALLOWED BY THE GENERAL PLAN, OR MUST THE GENERAL PLAN BE AMENDED TO ALLOW THE PROPOSED ACTION? • WILL THE COMMUNITY BE LIABLE FOR ACTION OR LACK OF ACTION? • WILL THE ACTIVITY BE CHALLENGED?
ECONOMIC
<ul style="list-style-type: none"> • WHAT ARE THE COSTS AND BENEFITS OF THIS ACTION? • DO THE BENEFITS EXCEED THE COSTS? • ARE INITIAL, MAINTENANCE, AND ADMINISTRATIVE COSTS TAKEN INTO ACCOUNT? • HAS FUNDING BEEN SECURED FOR THE PROPOSED ACTION? IF NOT, WHAT ARE THE POTENTIAL SOURCES (PUBLIC, NON-PROFIT, AND PRIVATE)? • HOW WILL THIS ACTION AFFECT THE FISCAL CAPABILITY OF THE COMMUNITY? • WHAT BURDEN WILL THIS ACTION PLACE ON THE TAX BASE OR LOCAL ECONOMY? • WHAT ARE THE BUDGET AND REVENUE EFFECTS OF THIS ACTIVITY?

TABLE 5-1 — STAPLE/ E REVIEW AND SELECTION CRITERIA FOR ALTERNATIVES

- DOES THE ACTION CONTRIBUTE TO OTHER COMMUNITY GOALS, SUCH AS CAPITAL IMPROVEMENTS OR ECONOMIC DEVELOPMENT?
- WHAT BENEFITS WILL THE ACTION PROVIDE?

ENVIRONMENTAL

- HOW WILL THE ACTION AFFECT THE ENVIRONMENT?
 - WILL THE ACTION NEED ENVIRONMENTAL REGULATORY APPROVALS?
 - WILL IT MEET LOCAL AND STATE REGULATORY REQUIREMENTS?
- ARE ENDANGERED OR THREATENED SPECIES LIKELY TO BE AFFECTED?

Prepare an Implementation Plan

Each jurisdiction prepared a strategy for implementing the mitigation actions. These strategies identify who is responsible for which action, what kind of funding mechanisms and other resources are available or will be pursued, and when the strategies will be completed. The goals, objectives, actions and implementation strategies form the body of each jurisdiction’s Plan. The following subsections present individual Plans for each jurisdiction.

5.2 REGIONAL CONSIDERATIONS

The Disaster Mitigation Act of 2000 requires that regions develop and maintain a document outlining measures that can be taken before a hazard event occurs that would help minimize the damage to life and property. The Multi-Hazard Mitigation Plan meets this requirement by including specific goals, objectives, and mitigation action items that each of the participating jurisdictions developed. Some of the overall goals and objectives shared some commonalities (including promoting disaster-resistant future development; increasing public understanding, support, and demand for effective hazard mitigation; building and supporting local capacity and commitment to continuously becoming less vulnerable to hazards; and improving coordination and communication with federal, state, local and tribal governments). However, the specific hazards and degree of risk vary greatly between the different jurisdictions; and the mix of other goals and objectives, and most action items are unique to each jurisdiction. Consequently, they will be implemented on a jurisdiction-by-jurisdiction basis, which is how they are presented in this Plan.

5.3 COUNTY OF SANTA BARBARA

The County of Santa Barbara (County) produced exposure/loss estimates for the unincorporated portion of the County. The data came from the HAZUS and other analyses. This information is summarized in Tables 5.3-1 and 5.3-2. See Section 4.0 for additional details.

**Table 5.3-1
Summary of Potential Hazard-Related Exposure/Loss in Santa Barbara County**

Hazard Type	Exposed Population	Residential		Commercial		Critical Facilities	
		Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	11,120	1023	178,000	1,320	1,878,600	451	2,889,354
Wildfire							
Extreme	15,598	6,375	1,081,087	54	201,066	227	1,875,547
Very High	30,259	11,714	1,770,641	71	158,130	476	1,676,138
High	77,364	24,535	4,279,456	110	292,374	407	3,575,087
Moderate	4,882	1,676	281,413	9	28,569	11	173,708
Earthquake*							
2000 Year	N/A	N/A	2,040,313	N/A	278,186	286	3,471,279
500 Year	N/A	N/A	2,040,313	N/A	278,186	286	39,265
Tsunami /Coastal Storm Surge	7,871	1,654	381,327	3	11,793	52	220,993
Landslide							
High	3	7	728	0	0	0	0
Moderate	10,011	4,209	620,879	30	85,352	29	240,397
Coastal Erosion	456	153	24,859	0	1,385	0	0
Dam Failure	2,089	759	110,845	15	43,490	90	461,334

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

**Table 5.3-2
Non-Building Earthquake Loss Estimates in Unincorporated Santa Barbara County**

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	360,098	0	7,077	3,941	103,530	3,923
500 Year Commercial	95,952	3,630	1,337	55,679	26,864	15,802
2000 Year Residential	360,098	0	7,077	3,941	103,530	9,231
2000 Year Commercial	95,952	3,630	1,337	55,679	26,864	32,653

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. The unincorporated portions of the county may anticipate approximately 1912 displaced households, with 494 requiring short term shelter, in the event of a 500-year earthquake, and 5,532 displaced households with 1,384 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that the unincorporated portions of the county should anticipate 611 injuries and 17 deaths during a 500-year and 1,638 injuries and 50 deaths during a 2000-year earthquake.

5.3.1 Capabilities Assessment

The County identified current capabilities available for implementing hazard mitigation activities. The Capability Assessment portion of the jurisdictional mitigation plan identifies administrative, technical, legal and fiscal capabilities. This includes a summary of departments and their responsibilities associated with hazard mitigation planning as well as codes, ordinances, and plans already in place associated with hazard mitigation planning. The second part of the Assessment provides the County’s fiscal capabilities that may be applicable to providing financial resources to implement identified mitigation action items.

5.3.1.1 Existing Institutions, Plans, Policies and Ordinances

The following is a summary of existing departments in the County and their responsibilities related to hazard mitigation planning and implementation, as well as existing planning documents and regulations related to mitigation efforts within the community. The administrative and technical capabilities of the County, as shown in Table 5.3-4, provides an identification of the staff, personnel, and department resources available to implement the actions identified in the mitigation section of the Plan. Specific resources reviewed include those involving technical personnel such as planners/engineers with knowledge of land development and land management practices, engineers trained in construction practices related to building and infrastructure, planners and engineers with an understanding of natural or manmade hazards, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community. Figure 5.3-1 shows the agencies within the County that will have a significant role in implementing the Plan.

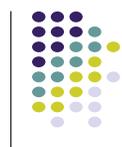
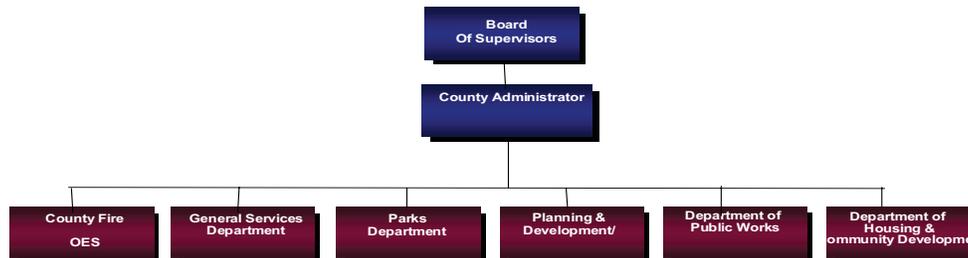


Figure 5.3-1
County of Santa Barbara
Abbreviated Organization Chart



Only Departments with possible role in implementation of the plan are listed

Many of the programs and plans of these departments, with applicability and links to loss reduction efforts, are detailed below.

Santa Barbara County Office of Emergency Services

The Santa Barbara County Office of Emergency Services (SBC OES), a division of the Santa Barbara County Fire Department, is responsible for emergency planning and coordination for the Santa Barbara Operational Area. On a day to day basis, OES is responsible for emergency planning and coordination among the Santa Barbara Operational Area entities which include:

Cities: Buellton, Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria, Solvang

Special Districts: Air Pollution Control District, Fire Districts, Sanitary Districts, School Districts, Vector Control Districts, Water Districts

Volunteer Organizations: American Red Cross, Amateur Radio Emergency Services (ARES), Equine Evacuation, and Monticeto Emergency Response & Recovery Action Group (MERRAG)

Industry Groups: CAER-Community Awareness and Emergency Response, Petroleum industry mutual aid group, SBIA-Santa Barbara Industrial Association.

Tri-County Coordination: Santa Barbara County OES also coordinates with adjoining offices of emergency services in Ventura and San Luis Obispo Counties. The Tri-County Coordinators meet to discuss regional preparedness several times throughout the year.

SBC OES responsibilities include, but are not limited to:

- Maintain the Santa Barbara County Operational Area Multihazard Functional Plan.
- Maintain the County Emergency Operations Center (EOC) in a state of operational readiness.

- Maintain a trained cadre of EOC team members.
- Provide ongoing leadership and coordinate disaster plans and exercises with the eight cities throughout the County.
- Assist County departments in developing department emergency plans which address how they will perform during disasters.
- Assist County departments with development of facility emergency plans for every occupied County facility.
- Provide ongoing training for County department emergency coordinators.
- Participate in an ever-expanding public education campaign for all hazards through the Earthquake Survival Program (ESP), public venues and various media presentations.

SEMS Multi-hazard functional plan

The Santa Barbara County OES developed the SEMS Multi-Hazard Functional Plan (SEMS MHFP) in June 2003 to ensure the most effective and economical allocation of resources for the maximum benefit and protection of the civilian population in time of emergency. The MHFP was developed for the Santa Barbara Operation Area as part of the California Standardized Emergency Management System (SEMS). The MHFP addresses emergency responses associated with natural disasters, technological incidents, and national-security. The objective of the plan is to establish an effective organization capable of responding to potential large-scale emergency situations using all appropriate facilities and personnel in the County. The SEMS MHFP assigns tasks and specifies policies and procedures for coordination of emergency staff and service elements. The SEMS MHFP identifies emergency response actions associated with the large-scale emergencies through standard operating procedures (SOP).

The plan states that hazard mitigation is a year round effort and encourages all communities to prepare hazard mitigation plans. The following activities were identified by the plan as potential mitigation activities: improving structures and facilities at risk, identifying hazard-prone areas and developing standards for prohibited or restricted use, recovery and relief from loss (i.e., insurance), and providing hazard warning and protecting the population.

Santa Barbara County Fire Department

The mission of the Santa Barbara County Fire Department is to serve and safeguard the community from the impacts of fires, medical emergencies, environmental emergencies, and natural disasters. This will be accomplished through education, code enforcement, planning and prevention, emergency response, and disaster recovery. The Fire Department is responsible for managing the following activities related to wildfire hazard reduction:

- Weed Abatement Program (hazard reduction program), enforcing of defensible space

- Enforcing Development Standards
- Writing and Implementing the Wildfire Management Plan for the County (meeting National Fire Plan Standards)
- Assisting Planning and Development (and other Departments) with Development Standards for High Fire Hazard Areas
- Enforcing fuel breaks along highway corridors and public roadways
- Conducting Outreach and Education
- Fire Suppression
- Conducting prescribed burns
- Participating in the Healthy Forest Initiative
- Monitoring “fire weather” and completing annual action plans based on data from fire service agencies

Fire Hazard Severity Zoning – The State of California is required to determine and map fire hazard severity zones. The Fire Department and County hold the maps for the local responsibility area. The County is in the process of reevaluating the zones while meeting both the intent of the State law and also county ordinances. The County High Fire Hazard Area map is thought to be outdated.

Vegetative Management Plan Requirements - Prior to the erection of combustible materials, a vegetation management plan must be submitted and approved by the department. The vegetation management plan shall describe all actions that will be taken to prevent fire from being carried toward or away from structures. The plan must include a copy of a site plan indicating topographic features and a copy of a landscape plan. Each plan must also include methods and timetables for controlling, changing or modifying areas on the property. Elements of the plan must include removal of dead vegetation, litter, vegetation that may grow into overhead electrical lines, certain ground fuels, and ladder fuels, as well as the thinning of live trees. Lastly the plan must include a maintenance schedule.

Stored Water Fire Protection Systems for One and Two Family Dwellings – As the name implies, this development standard prescribes standards for stored water at one and two family dwellings in high fire hazard areas.

Fire Hydrant Spacing and Flow Rates – This development standard addresses the placement and standard for fire hydrants in new developments.

Private Road and Driveway Standards for One and Two Family Dwellings – This development standard addresses easements, vegetative clearing, access (width, turnaround, etc.), paving and surface standards for private roads and driveways serving residential structures.

Fire Hazard Abatement Notices - Every year the County Fire Department sends notices to abate fire hazards to the owners of all properties in county fire jurisdiction that potentially pose a fire hazard, in conjunction with public education efforts through media outlets such as local television stations and newspapers. These notices indicate the start of yearly weed abatement requirements.

Property owners have approximately three weeks to meet the requirements for clearing property outlined in the notice for their property. The various requirements include:

- Clearing entire parcels or lots (Mow or Disc).
- Maintaining a 30 foot perimeter break is required around buildings.
- Maintaining a 10 foot roadside clearance break adjacent to the parcel.
- Maintaining a 10 foot driveway clearance break.
- Removal of all flammable vegetation around and adjacent to any structure for a distance of 30 feet or to the property line.
- Cutting vegetation to 18 inches or less around and adjacent to any structures beginning at 30 feet up to 100 feet.

These requirements do not apply to single specimens of trees, ornamental shrubbery, or cultivated ground cover such as green grass, ivy succulents, or similar plants used as ground covers, provided that they do not form a means of readily transmitting fire from the native growth to any structure. When clearing property to abate fire hazards, consideration should be given to the potential environmental impact.

Santa Barbara County General Services Department

The General Services Department provides customer-oriented, internal support services for all County Departments and other public agencies in the following three areas:

Administrative & Financial Support: Financial Services, Risk Management, Purchasing, Back to Work Program

Support Services: Real Property, Facilities Management, Capital Projects, Vehicle Operations

Information Technology Services: Computer Services, Communications, Imaging and Copying Services and Government Access TV

The following Divisions/Programs will support future mitigation activities:

- The **Division of Real Property** provides professional real estate services to meet County space needs and requirements. It prepares and negotiates real property transactions including leases, sales and purchases.
- The **Division of Facilities Management** promotes a safe, healthy environment for County employees and visitors. It provides a full range of maintenance and custodial services for County owned buildings. Staff takes care of over 900,000 square feet of space in 60 County-owned buildings. Services are provided through scheduled maintenance programs and reimbursable projects.

- **Communications and Telephone Services** provide a wide range of telephone, radio, microwave, audio and video services to County departments and various other governmental agencies.
- **Government Access Television (GATV)** is a cable television station operated by the County. GATV provides live, gavel-to-gavel coverage of local government meetings, public meetings, public information programs, and a scroll with information about various County Government meetings, announcements and public events. GATV was used to advertise public meetings associated with this plan and to broadcast associated hearings.
- **Risk Management** acts as the "insurance company" for the County. Each program within this office is designed to promote the prudent financial management of funds entrusted to the County for the provision of services to the public.
- **Procurement Services** for all Santa Barbara County Departments are centralized in the Purchasing Division under the direction of the Purchasing Manager.

Santa Barbara County Planning and Development

Planning & Development plans for and promotes reasonable, productive and safe long-term uses of the land which foster economic and environmental prosperity in the unincorporated areas of Santa Barbara County. It provides planning, permitting and inspection services through a public process under the policy direction of the Board of Supervisors and the Planning Commission.

It is responsible for the creation, update and implementation of the County Comprehensive Plan, including the Safety Element. The divisions of the Planning and Development Department that have a role in natural disaster mitigation include:

- Development Review
- Zoning and Permits
- Comprehensive Planning
- Building and Safety

Development Review - reviews projects for permit decisions by staff, the Zoning Administrator, or the Planning Commission based on policies in the Comprehensive Plan, state law and local ordinances. It also ensures compliance with environmental impact mitigation measures and conditions of approval.

Zoning and Permits – Enforces the County Zoning Ordinances and provides information and services related to:

- Site specific zoning, meaning of zone districts, site specific land uses (e.g., required setbacks and allowable uses), general land uses
- Historical Permit Information: information in microfiche (or original) address or permit files on issued permits.
- Issuance of Land Use of Coastal Development Permits: plan review, exemptions, re-stamping for minor revisions.

- Discretionary Permits: status of applications in process, copies of materials (staff reports) related to pending case, procedures for filing new applications, assistance with filing, procedures for filing appeals.
- Board of Architectural Review (BAR): applicability, procedure, Hillside/Ridgeline Ordinance.
- Agricultural Preserves: applicability, procedure, allowable uses.
- Comprehensive Plan: site specific designations, meaning of designations, policies.
- Mission Canyon: specific plan procedure
- Growth Management Ordinances: exemptions, points, allocations, effective dates, hardships.
- Maps: assistance with map selection, reading, interpretation.
- Assessor's Parcel System (APS); Assessor Parcel Numbers, copies of pages; landscape bonding procedures; sign ordinance; address assignment; zoning or permit compliance status, fees, etc.

Comprehensive Planning - The Mission of the Comprehensive Planning Division is to develop, promote and implement plans, policies and public improvements which enhance the quality of life for Santa Barbara County residents, protect natural resources and promote sound long term economic development, while recognizing the differing needs and values of each of the County's unique communities and diverse rural areas.

Building and Safety – The primary function of this division is to provide reasonable controls and regulations that protect the citizenry and establish effective safeguards for the life, health and property equally throughout the unincorporated areas of the County. This is achieved through the application of uniform codes and standards that involve design, materials, construction, use, and occupancy of all buildings constructed within the jurisdiction. This division enforces the County building code, including the Geologic Hazards and High Fire Hazards Articles. It also enforces the grading code (landslide mitigation) and other sections of the zoning ordinances, dealing with public safety and hazard loss reduction techniques.

Santa Barbara County Park Department - Maintains more than 900 acres of parks and open spaces, 84 miles of trails and coastal access easements, and the grounds surrounding county buildings. Park rangers or hosts reside in every major park to provide public assistance and supervise the grounds, enjoyed by over 6 million people annually. As pertains to natural hazard mitigation, the Park Department's role includes facility and infrastructure protection and public safety on Park lands.

Santa Barbara County Housing & Community Development Department - The mission of the Housing and Community Development Department (HCD), working in cooperation with county citizens, cities, governmental entities, commercial interest and other valuable county stakeholders, is to:

- Coordinate the development and implementation of regional strategic housing and community development processes that respect local needs, priorities and our natural environment, that lead to the development of healthy and viable neighborhoods and an improved quality of life for all in our region.

- Lead this community building effort by developing partnerships to create a full spectrum of housing; building creative strategies for economic vitality; promoting advocacy & educational activities on healthy growth and well designed development initiatives.

These two mission areas are closely linked to mitigation in that the department would want to ensure that the development it promotes is safely constructed and well sited housing.

Santa Barbara County Department of Public Works

The County of Santa Barbara, Public Works Department is comprised of five divisions:

- Administration
- County Surveyor's Office
- Resource Recovery and Waste Management
- Transportation
- Water Resources (including the Flood Control District)

Each division performs functions that are directly related to natural hazard mitigation.

Administration – Within the administration division is housed the Office of the Disaster Recovery Manager. This position is responsible for coordinating among department and agencies in a post-disaster environment to ensure that federal and state disaster relief programs are handled efficiently and to the maximum benefit of the residents of Santa Barbara County. This office is also at the forefront of Disaster Mitigation and grant procurement of the county in both pre and post-disaster environments. The Disaster Recovery Manager is a project manager for the department and leads project relating to state and federal disaster assistance and loss reduction activities. This office is also responsible for maintaining the County's Disaster Mitigation Web Site: <http://www.countyofsb.org/pwd/DMA2000.html>

County Surveyor's Office – The mission of the office is to provide quality surveying services through the creation, maintenance and protection of land based records for public and private resources. The Surveyor Division is responsible for maintaining accurate land records within the County. The Division has been allocated 23 full-time positions and has five general areas of responsibility. They are: 1) Checking and recording subdivision maps and documents; 2) Providing survey related data to the general public; 3) Conducting field surveys for County projects; 4) Administration of various State and local programs, and; 5) Providing real property services for the Department of Public Works.

The GIS Services Unit of the County Surveyor's office is active in mapping past disaster locations, future mitigation project locations and in developing a disaster history and mitigation tracking system. Additionally, The GIS arm of the Surveyor's office is examining other emergency management and mitigation related uses of GIS applications.

Resource Recovery and Waste Management Division – The Resource Recovery and Waste Management Division is responsible for the cost-effective management of solid waste and utilities in the

County. The Division's comprehensive program for the management of solid waste includes the collection, recycling, and disposal of solid waste, and also the abatement of illegal dumping of waste.

There are four sections within the Division, each responsible for performing a unique series of functions.

The Collection and Materials Management section manages the County's resource recovery and waste diversion programs (community programs), reviews and manages long-range solid waste management plans, and oversees the County's solid waste collection franchises for regularly generated solid waste. The Operations section manages waste processing and disposal operations at the County's transfer stations and active landfills. The Engineering section prepares all engineering and geologic plans and documents for the County's solid waste facilities, and monitors all active and closed landfills currently or previously owned by the County to ensure ongoing compliance with the many State and Federal regulations governing the environmental safety of each facility. Utilities section manages and operates the Laguna Wastewater Treatment Facility serving the unincorporated area of Orcutt in the North County, and provides engineering and administrative support (i.e., billing) to the County's underground utilities program and the County-administered wastewater, water and street lighting districts located throughout the unincorporated areas of the County.

The principal natural disaster mitigation related function of this division is debris management planning in a pre-disaster environment and debris disposal post disaster.

Transportation Division – The Transportation Division mission statement is as follows: *“Provide the traveling public a smooth ride, a clear path and a safe trip within the unincorporated areas of Santa Barbara County.”*

The Transportation Division supports this mission through inspecting, maintaining, repairing, replacing and improving all infrastructure within the County's Road Right-of-Way. This includes roadways, bridges, culverts and drainage structures. The Transportation Division is responsible for the maintenance of approximately 900 center lane miles of roads throughout the County, or approximately 1,800 lane miles, approximately 110 bridge structures, 3500 drainage structures (including culverts and drop inlets), 65 traffic signals (including flashing beacons), thousands of signs, and striping along the majority of the County's 900 lane miles.

The Transportation Division ensures that these facilities are maintained through our preventative maintenance programs, capital improvement projects to replace structurally deficient structures, and constructing vital links in the County's roadway infrastructure. In addition, the Transportation Division continually inspects all infrastructure and identifies hazards likely to impact County-owned facilities. Developing proper mitigation strategies and designs to these hazards is part of the mission of this division. To accomplish our mission statement all four of the Transportation Division's sections work together. The four sections are Engineering, Construction/ Permits, Traffic, and Road Maintenance.

Emergency Response

During a hazardous or disaster event, the Transportation Division staff immediately transforms into an emergency response organization. A local base of operations is established in order to effectively coordinate personnel and resources in order to immediately respond to hot spots as they are identified by Public Works staff, local agencies and the public. This base of operations becomes a collection center for

information, inspection/damage reports, and response strategies as they are developed. In addition, storm monitoring, public information response, dispatch and patrols are organized from this center. Staff are deployed to mitigate hazards and inspect critical structures, as well as oversee any contracted clean-up or construction crews. Transportation staff is well-rehearsed in disaster response training, having experienced declared disasters in 1995, 1998, and 2001. During past declared disasters and other lesser events, staff performed exceptionally in quickly and thoroughly reacting to the changing conditions and requirements of emergency response. The Public Works Department and the Transportation Division in particular have a pre-planned routine for emergency response, with pre-assigned teams responsible for inspecting critical facilities and to perform as flexible response units.

Engineering Section - Provides engineering needs related to new construction and rehabilitation of roads in the unincorporated area of the county, as well as develops design engineering for all major and routine road maintenance projects and capital improvement projects within the road right of way, oversees preparation of construction grant applications for federal and state funding, manages bidding for major road maintenance and construction projects, coordinates permit and environmental review, and plays a major role in administering and overseeing construction work performed by private contractors, including bridge management system and storm repair and restoration.

In response to a natural disaster, the Engineering Section:

- Acts as First Responders during hazard events. During a natural hazard, the Engineering Staff performs inspections of critical facilities in order to determine response strategies. This includes inspections of bridge structures, rockfall protection measures, drainage facilities, and roadways. Working together with the Construction and Maintenance Sections, this allows for properly trained staff to survey the entirety of the County in an expeditious and thorough manner.
- Develops and implements mitigation strategies to avoid further damage to critical facilities, or to reduce/avoid damage during future hazard events.
- Develops permanent designs to mitigate hazards, through construction/rehabilitation/retrofit strategies.
- Develops short and long-term inspection programs to monitor degradation of facilities due to natural hazards, and to develop mitigation strategies to avoid severe slides or other dangerous situations before disasters occur.
- Periodically works with County Fire to keep key roadways and facilities critical for fire suppression and/or resident evacuation open and accessible to emergency vehicles and resident traffic

Traffic Section - Provides transportation planning and traffic engineering for the County's unincorporated areas; prepares and reviews transportation improvement plans (TIPs), community plans, traffic impact studies, general plans and specific plans for proposed development projects; and performs operation and design functions including traffic signal repair and maintenance, striping and signage of roads, design and construction of bikeways and pedestrian facilities, traffic and turning movement counts, design of minor safety and operational improvements, computerized traffic modeling, and evaluation of requests for stop signs, parking restrictions, speed limit changes and traffic signals.

In response to a natural disaster, the Traffic Section:

- Acts as First Responders during hazard events. During a natural hazard, the Traffic Staff performs inspections of critical traffic control facilities in order to determine response strategies. This includes inspections of traffic control signals, and electrical hazards.
- During major natural or man-made disasters, the Traffic Section would determine alternate routes and detours in order to avoid hazardous disaster areas, emergency repair sites, and staging areas.
- Works to quickly restore transportation access/infrastructure to avoid economic disruption and ensure public safety.

Construction Section - Inspects the construction for all projects that are constructed within the road right of way. These projects include: road rehabilitation, preventative road maintenance, and capital improvement projects. In addition, they verify all County road rights-of-way prior to the start of any road encroachment operations or activity by individuals, corporations, utilities, cities and other governmental agencies; issues permits for construction activity within, under or over the County right-of-way; and performs final review and inspections to ensure that construction activity meets federal, state and county standards.

In response to a natural disaster, the Construction Section:

- Acts as First Responders during hazard events. During a natural hazard, the Construction Staff performs inspections of infrastructure and facilities in order to determine response strategies. . This includes inspections of bridge structures, rockfall protection measures, drainage facilities, and roadways. Working together with the Engineering and Maintenance Sections, this allows for properly trained staff to survey the entirety of the County in an expeditious and thorough manner.
- Develops and implements mitigation strategies to avoid further damage to critical facilities, or to reduce/avoid damage during future hazard events.
- Perform inspections of emergency repairs, direct construction crews during emergency construction and clean up operations.

Maintenance Section - Provides major and routine maintenance of the County's road system and management of 13 different County road maintenance programs, including surface treatment, roadway and bike path surface maintenance, street tree maintenance and sidewalk surface grinding, roadway slope repair, weed and brush removal, traffic control maintenance/safety assessment, and culvert maintenance; cooperates with other public agencies and with private parties to promote the safe use of the county's roadways; and oversees private contractors which may be involved in major road maintenance projects.

In response to a natural disaster, the Maintenance Section:

- Acts as First Responders during hazard events. During a natural hazard, the Maintenance Staff performs inspections of infrastructure and facilities in order to determine response strategies. . This includes inspections of bridge structures, rockfall protection measures, drainage facilities, and roadways. Working together with the Engineering and Construction Sections, this allows for properly trained staff to survey the entirety of the County in an expeditious and thorough manner.

- Maintenance crews perform emergency repairs to critical facilities, and clear roadways of debris and water, in order to restore access to the public and County staff.
- Oversee contractors performing emergency repairs and clean-up operations.

On an annual basis, the Maintenance Section:

- Performs annual culvert inspection program
 - This has been instrumental in the creation of the Culvert Inventory Project, which has worked to determine the condition of all culverts within the maintenance system and prioritize which culverts are in need of repairs or replacement.
- Performs annual roadway inspection program to monitor slipping, cracking, etc. to formulate maintenance projects to prevent slides, and washouts of roadway and accompanying infrastructure.
- Periodically works with County Fire to keep key roadways and facilities critical for fire suppression open and accessible to emergency vehicles and resident traffic.
- Implements fire abatement program along roadways, involving vegetation control to avoid fires and to provide a wider break in the event of a wildfire.

With an approved DMA 2000 Multi-Jurisdictional Hazard Mitigation Plan, the Public Works Department will be eligible for Hazard Mitigation funding through FEMA to put in place corrective mitigation measures to minimize the damage to the infrastructure in the event of a natural or man-made disaster. Some examples of where this funding could be utilized is retrofitting bridge structures, placing cable mesh netting on slopes that are prone to rock falls, constructing retaining walls on slopes that are prone to slides, lengthening and raising bridges to reduce the flooding impacts, and installing scour mitigation at bridges that have been identified as scour critical by Caltrans.

Water Resources Division – The Water Resources Division is comprised of office and technical staff as well as three field maintenance shops in Santa Barbara, Lompoc and Santa Maria. It maintains hundreds of miles of creeks, channels and rivers, including 26 miles of levees in Santa Maria Valley. Office staff includes engineering, environmental, hydrology and administrative services.

The Flood Control and Water Conservation District, within the Water Resources Division implements programs and projects designed to provide protection for the public and to private property against flood risks and hazards. Capital improvement and ongoing maintenance projects are designed to reduce flood risks and enhance the environment by providing protection for property and minimizing flood hazards.

Construction of flood control and drainage system facilities has been taking place throughout the county for over fifty years. The District maintains an extensive amount of storm drains, channels, dams and debris basins.

Urban Drainage

Every community in the County is equipped with an urban drainage system that consists of several hundred drainage inlets throughout the District. The inlets discharge into many miles of underground storm drain pipes which carry the water safely into a major channel. If these inlets become blocked,

floodwaters will accumulate in buildings, streets, schools, and homes. Keeping the system in operation and repairing or replacing worn or damaged facilities is a major ongoing obligation.

Major Channels

Over two hundred miles of major channels carry peak flood runoff from the hills and upland areas safely through the developed communities in the valley and coastal plain. They also provide an outlet for the extensive urban drainage system extending throughout urbanized areas. Wherever possible, the District encourages the preservation of natural creek channels as open space green belts. These generally require more maintenance than modified channels. Maintenance and repair of the channels is a major ongoing obligation.

Flood Control

The District's dams and retarding basins are used for flood control, debris control, and water conservation. These dams require continual maintenance to assure the structural stability of the dams and the operational readiness of its mechanical equipment.

Floodplain Management Program

The objective of the Floodplain Management Program is to prevent future flood hazards, created in developing areas subject to flooding, and to reduce the necessity of constructing expensive flood control facilities in the future. Benefits derived from this program include the prevention of losses in flood-prone areas and reduced need for public emergency response during storm activity. Activities associated with the Floodplain Management Program include reviewing new development permit applications for elevation above the 100-year flood level, proper setback from watercourses, and adequate drainage plans. The County's Floodplain Management Ordinance exceeds the minimum requirements for participation in the NFIP.

Elevation Certificates

The District reviews development permit applications for structure elevation above the base flood elevation (BFE). The District must certify that the lowest floor of any building in a special flood hazard area (SFHA) is elevated above the BFE before final approval for floodplain construction can be obtained. FEMA Elevation Certificates are required.

Routine Maintenance Program

As part of the District's Floodplain Management Program, it conducts routine creek maintenance. It has been doing so since 1992. The Routine Maintenance Program occurs annually and each year the District has to prepare an Annual Routine Maintenance Plan, as well as conduct public workshops and California Environmental Quality Act (CEQA) reviews of planned maintenance projects. The Annual Routine Maintenance Plan includes a description of the need for maintenance work, the work to be performed, the presence of sensitive biological resources, impacts of the activities on biological resources, standard maintenance practices to reduce impacts, and restoration measures. The Routine Maintenance Program focuses on urbanized areas or developed agricultural areas. The main objective of the program is to reduce flood hazard and damage to life, public property, and infrastructure by maintaining the capacity of key channels in the County. All routine maintenance activities are conducted in a manner that minimizes environmental impacts. Maintenance activities are completed prior to the winter. The Routine

Maintenance Program includes selective brushing, de-silting, channel shaping, bank stabilization, bank protection, herbicide spraying, and channel clearing activities in most creeks and streams throughout the County. These activities can be applied individually or in combination to address the specific requirements of the affected drainage. The Routine Maintenance Program also addresses the maintenance and repair of concrete lined channels. The individual flood zones fund the Routine Maintenance Program and the extent and frequency of channel maintenance is dependent upon the availability of funds.

Operation and Maintenance Program

The Operation and Maintenance Program is one of the District's highest priority programs, and includes normal operation of the District's dams, channels and other flood protection facilities, and the routine and emergency maintenance and repair of these facilities. The District maintains channels, debris basins, dams, and storm drain facilities to prevent flooding.

Dam Safety

The Dam Safety Program is a State program the District is responsible for enforcing. The District is exposed to a substantial potential liability because of the catastrophic losses that could occur in the event of a dam failure. The objective of the program is to assure the continuing safety of dams in their flood control and water conservation functions.

Dam Plan

The Dam Plan for Santa Barbara County contains general information, maps of potential inundation area, and proposed evacuation routes for dams.

Debris Control Program

The District operates and maintains 39 debris basins, which constitute the primary debris control system within the District. Flood runoff from the hillsides, particularly from those hillsides recently denuded by fires, slides or developments, is heavily laden with rock, sand, silt, mud, and debris. The dams and debris basins restrain the rock, sand, silt, mud and debris that would otherwise clog and damage channels, which could result in flooding of adjacent property and downstream floodplains.

The objectives of the Debris Control Program include the prevention of debris flow; the planning and construction of adequate debris control facilities; the routine, scheduled clearance and disposal of debris from basins and dams; and the overall management of debris flow through channels.

There are 16 debris basins on the South Coast and the operation and maintenance procedures for these are described in the Debris Maintenance Plan, which is considered an element of the overall Maintenance Program.

Basin maintenance is conducted on an as-needed basis to ensure the proper functioning of the basin prior to each winter. Basins are inspected during the winter after significant rain events. Routine maintenance includes keeping the outlet works clear of vegetation, and maintenance of a 15-foot wide pilot channel through the center of the basin. Long-term maintenance of the basins involves the removal of sediment once the design capacity has been reduced by 25 percent (or when there is a significant wildfire).

Emergency Storm Response

During flood events, the District staff immediately transforms into an emergency response organization. District staff work around-the-clock and are deployed to flood-fighting and support activities. Staff from the District office performs a variety of emergency tasks such as answering phone calls, storm monitoring, radio dispatching, field patrolling, and computer modeling for flood flow forecasting. Emergency operations also include pre-planned routines such as the monitoring of all flood facilities and equipment; the operation of dams and channel gates; and the provision of logistics support, field operations headquarters and responses to emergency situations.

Storm Rehabilitation program

The Storm Rehabilitation Program provides for post-storm rehabilitation of flood control facilities damaged in any storm disaster. The objective of the program is to prevent future hazard to life and property by returning the flood control system back to the state of readiness that existed prior to the storms. Activities included in the Storm Rehabilitation Program include removing debris from access roads, reservoirs, debris basins, and reconstruction and repair as necessary.

The objectives of the District through the Storm Rehabilitation Program are to:

1. Assess storm damage quickly and completely;
2. Allocate District resources on a priority basis to rehabilitation and repair facilities;
3. Maximize efforts to receive State and Federal funding, when possible;
4. Complete rehabilitation work quickly to prevent further damage and provide protection from future storms events; and
5. Contact and request assistance from other agencies, when necessary.

Tsunami Plan

Santa Barbara County is currently preparing a countywide Tsunami Plan that covers emergency response actions associated with tsunami events. Santa Barbara County receives advisory messages and warnings through an emergency services microwave/computer communications network from Coast and Geodetic Survey Stations. If a seismic wave or tidal disturbance has been observed, the main system at the Honolulu Observatory will transmit warnings to satellite stations including the time of occurrence of the disturbance, the location, verification of tsunami generation, and expected arrival times at various points along the Pacific coast.

ALERT Flood warning system

The District maintains a comprehensive Flood Warning System (or Automated Local Evaluation in Real Time [ALERT] system) that assesses flood risk and provides advance warning of impending flooding. The Flood Warning System consists of “real time” rainfall and stream flow gages located throughout Santa Barbara County and a base station located at the District office that collects and processes the incoming data. There are 49 gage stations and over 90 sensors that collect hydrologic parameters such as rainfall intensity, stream flow, reservoir levels, wind speed and direction, temperature, barometric pressure, relative humidity, and soil moisture.

Once a predefined significant change in any of the parameters has occurred a transmission is sent from the sensor to the base station. The data is used in conjunction with computer models to determine the location and timing of potential flooding. District staff coordinates with the National Weather Service (NWS) and other emergency services to advise the public and reduce the damages to life and property from flooding. In addition, the ALERT network has been instrumental in guiding reservoir operations to maximize both flood control and water supply benefits.

Current Santa Ynez River Programs

The following subsections describe current activities performed by the District along the Santa Ynez River.

Santa Ynez Maintenance Program

As part of the Lower Santa Ynez River Maintenance Project, the District has periodically cleared portions of the lower Santa Ynez River that is prone to flooding. The District cleared portions of the project reach in 1992, 1993, and 1997/1998. The affected portion of the Santa Ynez River is a 4.5-mile reach extending from the Lompoc Wastewater Treatment Plant to the 13th Street Bridge on Vandenberg Air Force Base.

The objective of the Lower Santa Ynez River Maintenance Project is to maintain a 100-foot wide swath along the project reach with non-obstructive vegetation in order to allow sufficient channel capacity for certain flood flows. Maintenance is performed on the Lower Santa Ynez River as needed. The Santa Ynez Maintenance Program evaluated annually.

Santa Ynez River Flood Warning System

Due to the lack of economic feasibility of flood control works on the Santa Ynez River, the District operates an elaborate flood warning system to give residents along the river time to evacuate equipment and livestock if flooding is imminent. The Santa Ynez River Flood Warning System is part of the ALERT network and compiled data from remote sensors can be input into the District's Santa Ynez Flood Warning computer model FC River. Using the compiled data, the District's model can forecast river flows up to two days in advance.

Comprehensive Plan

The Comprehensive Plan, discussed above under the Planning and Development Department, has several components specific to flood control and mitigation. The Plan is a "comprehensive, long-term general plan" for the development of Santa Barbara County. The Comprehensive Plan focuses on the elements, land use, circulation, and environmental resource management. The Comprehensive Plan identifies procedures for protecting watersheds such as installing debris basins and silt traps at development sites to remove sediment from runoff, planting temporary vegetation to thwart erosion, and providing adequate storm water conveyance. The Comprehensive Plan establishes flood hazard area policies that regulate development with the 100-year floodplain. The plan also establishes location specific measures for flood control facilities, such as for the Lompoc area in which flood control measures include provisions to recharge water basins with water runoff. According to the Environmental Resource Management Element of the Comprehensive Plan, policies on development of lands subject to environmental

constraints are identified by four categories; Categories A, B, C, and D. The categories and their application to floodplain management are described in Table 5.3-3

Table 5.3-3 Flood Policies in Comprehensive Plan	
Category	Floodplain Development Policy
A	Urbanization should be prohibited in these areas; <ul style="list-style-type: none"> • Stream channels with flood hazard or recharging groundwater. • Floodway areas.
B	Urbanization should be prohibited in these areas, except in a relatively few special instances; <ul style="list-style-type: none"> • 100-year floodplains (except west of the City of Lompoc).
C	Urbanization could be permitted in these areas only in appropriate instances, subject to plan review and imposition of specific conditions to protect against hazards and to preserve the integrity of the land and environment: <ul style="list-style-type: none"> • Areas subject to inundation by tsunamis. • Areas of unknown flood hazard.
D	Urbanization should be permitted these areas. There are no concerns regarding floodplains with lands in this category.

The Departments, programs and policies addressed above provide an overview of the County’s activities related to natural disaster mitigation. Table 5.3-4 provides a general analysis of administrative and technical capabilities within the County’s departments.

**Table 5.3-4
County of Santa Barbara: Administrative and Technical Capacity**

Staff/Personnel Resources	Y/N	Department/Agency and Position
A. Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	Multiple
B. Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Y	Multiple
C. Planners or Engineer(s) with an understanding of natural and/or manmade hazards	Y	Multiple
D. Floodplain Manager	Y	Public Works, Flood Control District
E. Surveyors	Y	Public Works, County Surveyor's Office (GIS also)
F. Staff with education or expertise to assess the community's vulnerability to hazards	Y	Public Works, County Fire/OES
G. Personnel skilled in GIS and/or HAZUS	Y	Assessors Office, Public Works - County Surveyor's Office, Planning & Development
H. Scientists familiar with the hazards of the County	Y	OES, DPW, P&D
I. Emergency manager	Y	County Fire – OES, Public Works - Administration
J. Grant writers	Y	Departments determine their own level of service. (Disaster Recovery Manager with Public Works is lead for most disaster related grants.

The legal and regulatory capabilities of the County are shown in Table 5.3-5, which presents the existing ordinances and codes that affect the physical or built environment of the County. Examples of legal and/or regulatory capabilities can include: the County's building codes, zoning ordinances, subdivision ordinances, special purpose ordinances, growth management ordinances, site plan review, general plans, capital improvement plans, economic development plans, emergency response plans, and real estate disclosure plans.

**Table 5.3-5
County of Santa Barbara: Legal and Regulatory Capability**

Regulatory Tools (ordinances, codes, plans)	Local Authority (Y/N)	Does State Prohibit (Y/N)
A. Building code	Y	N
B. Zoning ordinance	Y	N
C. Subdivision ordinance or regulations	Y	N
D. Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	Y	N
E. Growth management ordinances (also called “smart growth” or anti-sprawl programs)	Y	N
F. Site plan review requirements	Y	N
G. General or comprehensive plan	Y	N
H. A capital improvements plan	Y	N
I. An economic development plan	Y	N
J. Emergency response plan (s)	Y	N
K. A post-disaster recovery plan	Y	N
L. Real estate disclosure requirements	Y	N

5.3.1.2 Fiscal Resources

Table 5.3-6 shows specific financial and budgetary tools available to the County such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, gas, or electric services; impact fees for homebuyers or developers for new development; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

**Table 5.3-6
County of Santa Barbara: Fiscal Capability**

Financial Resources	Accessible or Eligible to Use (Yes/No)
A. Community Development Block Grants (CDBG)	Yes
B. Capital improvements project funding	Yes
C. Authority to levy taxes for specific purposes (flood control districts)	Yes
D. Fees for water, sewer, gas, or electric service	Yes
E. Impact fees for homebuyers or developers for new developments/homes	Yes
F. Incur debt through general obligation bonds	Yes
G. Incur debt through special tax and revenue bonds	Yes
H. Incur debt through private activity bonds	No
I. Withhold spending in hazard-prone areas	No

5.3.2 Goals, Objectives and Actions

Listed below are the County’s specific hazard mitigation goals, objectives and related potential actions. For each goal, one or more objectives have been identified. In subsequent subsections, strategies to attain the goals are provided. Where appropriate, the County has identified a range of specific actions to achieve the objective and goal.

The goals and objectives were developed by considering the risk assessment findings, localized hazard identification and loss/exposure estimates (Section 4), and an analysis of the County’s current capabilities assessment. These preliminary goals, objectives and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities. County representatives met with consultant staff to specifically discuss these hazard-related goals, objectives and actions as they related to the overall Plan. Representatives of numerous County departments involved in hazard mitigation planning, including Fire and Public Works, provided input to the County MAC. The County MAC members responsible for developing the Goals, Objectives and Actions for the County were those listed in Section 3.1, minus the LPG representatives from the Cities.

Public meetings were held at multiple locations in the County to present these preliminary goals, objectives and actions to citizens and to receive public input. The following sections present the hazard-related goals, objectives and actions as prepared by County’s MAC in conjunction with the Hazard Mitigation Working Group, locally elected officials, and local citizens.

5.3.2.1 Goals

The County of Santa Barbara has developed the following 5 Goals for their Hazard Mitigation Plan.

- Goal 1. Promote Disaster-resistant future development.
- Goal 2. Increase public understanding and support for effective hazard mitigation.
- Goal 3. Build and support capacity and commitment to become less vulnerable to hazards.
- Goal 4. Enhance hazard mitigation coordination and communication with federal, state, local and tribal governments.
- Goal 5. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and County-owned facilities, due to:
 - A - Floods
 - B - Wildfire
 - C - Earthquakes
 - D - Landslides/Coastal Erosion
 - E - Coastal Storm/Tsunami
 - F - Dam Failure

5.3.2.2 Objectives

The County of Santa Barbara developed the following objectives to assist in the implementation of each of their 5 identified goals. For each of these objectives, specific actions were developed that would assist in their implementation. A discussion of the prioritization and implementation of the action items is provided in Section 5.3.2.3.

Goal 1: Promote disaster-resistant future development.
<i>Objective 1.A: Facilitate the development or updating of the Comprehensive Plan, City General Plans and zoning ordinances to limit (or ensure safe) development in hazard areas.</i>
<i>Objective 1.B: Facilitate the adoption of building codes that protect existing assets and restrict new development in hazard areas.</i>
<i>Objective 1.C: Facilitate consistent enforcement of the comprehensive plan, zoning ordinances, and building codes.</i>

Goal 2: Increase public understanding and support for effective hazard mitigation.
<i>Objective 2.A: Educate the public to increase awareness of hazards and opportunities for mitigation actions.</i>
<i>Objective 2.B: Increase public understanding, support and demand for hazard mitigation for new developments.</i>
<i>Objective 2.C: Promote hazard mitigation in the business community.</i>
<i>Objective 2.D: Monitor and publicize the effectiveness of mitigation actions implemented countywide.</i>

Goal 3: Build and support capacity and commitment to become less vulnerable to hazards.
<i>Objective 3.A: Increase awareness and knowledge of hazard mitigation principles and practice among County Department officials.</i>
<i>Objective 3.B: Provide technical assistance to city jurisdictions to implement their mitigation plans.</i>
<i>Objective 3.C: Address identified data limitations regarding the lack of information about new development and build-out potential in hazard areas.</i>
<i>Objective 3.D: Address data limitations identified in Hazard Profiling and Risk Assessment</i>

Goal 4: Enhance hazard mitigation coordination and communication with federal, state, local and tribal governments.
<i>Objective 4.A: Participate in initiatives that have mutual hazard mitigation benefits for the County, cities, state, tribal, and federal governments.</i>
<i>Objective 4.B: Encourage other organizations to incorporate hazard mitigation activities into their existing programs and plans.</i>
<i>Objective 4.C: Continue partnerships between the state, local, and tribal governments to identify, prioritize, and implement mitigation actions.</i>
<i>Objective 4.D: Continuously improve the County's capability and efficiency at administering pre- and post-disaster mitigation.</i>
<i>Objective 4.E: Support a coordinated permitting activities process.</i>
<i>Objective 4.F: Provide technical support to cities in administering pre- and post-disaster</i>

<i>mitigation programs</i>
<i>Objective 4.G: Coordinate recovery activities while restoring and maintaining public services.</i>

Goal 5: Reduce the possibility of damage and losses to existing assets, including people, critical facilities/infrastructure, and public facilities due to:
A. Flooding
<i>Objective 5A.A: Educate local residents and businesses on the range of flooding that could affect the County and the potential impact.</i>
<i>Objective 5A.B: Participate in initiatives that result in better risk communication and the evaluation of flood threats.</i>
<i>Objective 5A.C: Decrease the vulnerability of public infrastructure including facilities, roadways, and utilities.</i>
<i>Objective 5A.D: Educate the professional community on design and construction techniques that will minimize flood damage</i>
<i>Objective 5A.E: Record, collect, and maintain comprehensive list of hazard related data.</i>
<i>Objective 5A.F: Minimize repetitive losses caused by flooding.</i>
<i>Objective 5A.G: Protect existing assets with the highest relative vulnerability to the effects of floods within the 100-year floodplain.</i>
<i>Objective 5A.H: Coordinate with and support existing efforts to mitigate floods (e.g., US Army Corps of Engineers, US Bureau of Reclamation, California Department of Water Resources).</i>
B. Wildfire
<i>Objective 5B.A: Enhance citizen and Departmental understanding of wildfire threats and private property mitigation techniques through education and outreach.</i>
<i>Objective 5B.B: Address known deficiencies in fire weather forecasting.</i>
<i>Objective 5B.C: Strengthen existing development standards in high threat areas.</i>
<i>Objective 5B.D: Protect existing assets with the highest relative vulnerability to the effects of structural wildfire.</i>
<i>Objective 5B.E: Coordinate with and support existing efforts to mitigate wildfire.</i>
<i>Objective 5B.F: Address identified data limitations regarding the lack of information about the relative vulnerability of assets from wildfire.</i>
C. Earthquakes

<i>Objective 5C.A: Protect existing assets with the highest relative vulnerability to the effects of earthquakes.</i>
<i>Objective 5C.B: Coordinate with and support existing efforts to mitigate earthquake hazards.</i>
<i>Objective 5C.C: Obtain better information on highest risk county owned buildings in the County</i>
<i>Objective 5C.D: Educate building owners on earthquake safety and damage reduction techniques</i>
D. Landslide/Coastal Erosion
<i>Objective 5D.A: Perform mitigation alternative studies at known landslide-prone areas (areas of repeat sliding).</i>
<i>Objective 5D.B: Protect existing assets with the highest relative vulnerability to the effects of landslide and coastal erosion.</i>
<i>Objective 5D.C: Improve and support existing efforts to mitigate landslide/coastal erosion.</i>
<i>Objective 5D.D: Address identified data limitations regarding the lack of information about the relative vulnerability of assets from landslide and coastal erosion.</i>
E. Tsunami/Coastal Storm
<i>Objective 5E.A: Address identified data limitations regarding the lack of information about the relative vulnerability of assets from tsunamis</i>
<i>Objective 5E.B: Evaluate floodplain ordinance to determine the feasibility of encouraging floodplain construction standards in Tsunami inundation areas.</i>
<i>Objective 5.E: Educate property owners in Tsunami inundation areas on preparation</i>
F. Dam Failure
<i>Objective 5F.A: Protect existing assets with the highest relative vulnerability to the effects of a dam failure.</i>
<i>Objective 5F.B: Coordinate with and support existing efforts to mitigate dam failure (e.g., US Army Corps of Engineers, US Bureau of Reclamation, California Department of Water Resources).</i>
<i>Objective 5F.C: Provide dam inundation mapping as information only layer on FEMA DFIRMs and advise developers of lands in inundation areas.</i>
<i>Objective 5F.D: Protect floodplains from inappropriate development.</i>

5.3.2.3 Prioritization and Implementation of Action Items

Once the comprehensive list of jurisdictional goals and objectives listed above was developed, the proposed mitigation actions were prioritized. This step resulted in a list of acceptable and realistic actions that address the hazards identified. This prioritized list of action items was formed by the MAC weighing STAPLE/E criteria.

The Disaster Mitigation Action of 2000 (at 44 CFR Parts 201 and 206) requires the development of an action plan that not only includes prioritized actions but one that includes information on how the prioritized actions will be implemented. For each of the strategies developed, the goal and objective(s) addressed are listed. In addition, the description of each measure also includes a priority level, responsible department, implementation strategy, timeframe for implementation, a potential funding source, and a discussion of the strategies benefits and costs. A description of each of these measures is included below:

Priority: For each mitigation measure a priority level of *Very High*, *High*, *Medium*, or *Low* has been assigned. These priority levels have been developed based on input from Committee members, the overall planning consideration of the hazard as assigned in the hazard identification section of this document, the anticipated benefit-cost ratio and consideration of the STAPLE/E criteria.

Coordinating Individual/Organization: The coordinating individual/organization listed for each alternative is tasked with the lead role in all aspects of the implementation of this measure. However, many of the measures identified will require effort and support from other departments. This department is expected to coordinate the efforts of all local departments as well as with additional regional, state, and federal entities that may be involved.

Implementation Strategy: The implementation strategy developed for each measure includes a general description of potential methods that could be utilized or actions that could be taken. Due to the complex nature of a number of these measures, not all of the listed methods will ultimately prove feasible. Before initiating the implementation of each measure, the responsible department should develop a detailed project plan with particular attention to technical feasibility and cost effectiveness.

Timeframe for Implementation: The timeframe for implementation describes the length of time, beginning from the date of plan adoption, when the mitigation measure has been targeted for completion. Timeframes listed are goals and can be influenced by many additional factors. Through the development of detailed project plans by the lead agencies, the timeframe will be evaluated and revised when necessary.

Potential Funding Source: For each mitigation measure, potential funding sources are listed. Whenever possible, non-local sources of funding have been identified, including state and federal grants. The sources listed are not intended to represent all possible options, as additional opportunities for funding may be identified during implementation.

Benefit vs. Cost: For each measure a general discussion comparing potential benefits and costs is provided. For many of the projects, cost effectiveness is unknown. It should be noted that this discussion is not intended to replace a benefit cost analysis that should be completed prior to implementation.

All of the strategies identified in the remainder of this section are summarized in a table entitled *Mitigation Implementation Strategy Tracking Table*, which can be found in Appendix 5-A.

The prioritized mitigation actions as well as an implementation strategy for each are numbered by heading as follows:

- GEN (General Mitigation – or multiple hazards)
- FLD (Flood)
- WDF (Wildfire)
- EQ (Earthquake)
- LSD (Landslide)
- CE (Coastal Erosion)
- T/CS (Tsunami/Coastal Storm)
- DF (Dam Failure)

Proposed mitigation actions or strategies are listed and prioritized as follows:

Action #: GEN-1- GIS Multi-Hazard Disaster Management Information System In the preparation of this plan, the County began the early phase of developing this system by cataloging existing spatial and tabular data relating to past disaster locations and claims and potential future mitigation project locations. In addition to commencing the development of the Disaster Management System, the data were used in preparation of the Hazard Identification and Risk Assessment outlined in Section 4. The program envisioned here will be a multi-departmental system with a primary focus on maintenance and accessibility of disaster related data through a centralized interface. Intelligent mapping through analysis and data sharing is vital for disaster management. A direct benefit of the project is a systematic framework to feed the continuous update of this plan as it is implemented and maintained.

The analytical capabilities of GIS support all aspects of disaster management: planning, response and recovery, and records management.

Planning

GIS adds a comprehensive set of advanced spatial modeling and analysis tools to the disaster management system. These tools can help you predict the scope of a disaster, where the damage would be the greatest, what lives and property would be at highest risk, and where specific resources would be required, enabling the development of executable mitigation projects based on sound data.

Response and Recovery

During a crisis, effective response and recovery includes incident mapping; establishing priorities; developing action plans; and implementing the plan to protect lives, property, and the environment. GIS

allows disaster managers to quickly access and visually display critical information by location. This information can be easily shared with disaster response personnel for the coordination and implementation of emergency efforts. Mobile GIS allows the command center to stay in touch with personnel at the scene and to gather data critical for making decisions. There are also mitigation benefits inherent in using the tools for response (e.g. with more accurate predictions and warning, there may be more time to remove assets from harm's way).

Records Management

Records such as claims information, status of repairs, required repair work, and personnel can be difficult to maintain after a crisis. GIS facilitates record keeping and the status of ongoing work. As work is completed and identified, GIS can visually display current project status. For example, damaged structures deemed unsafe for occupancy or those requiring minimal work can be appropriately coded and displayed in GIS. As status changes, information can be quickly updated and reports generated and made available to others through a centralized GIS interface.

Priority: Very High

Objectives Addressed: 1.A, 2.D, 4.A, 4.D, 5.A-B, 5.A-E, 5.B-F,

Coordinating Individual /Organization:

Public Works Department – County Surveyor's Office (Lead),
Transportation Division, Flood Control, Disaster Recovery Manager,
County Fire - OES

Implementation Strategy: The following activities will be conducted to develop, implement and maintain the system:

- Procure the appropriate hardware and software needed to design and implement the system
- Identify dedicated staff and associated funding
- Establish inter-departmental committee to design the scope of the system
- Conduct outreach to the incorporated cities (and select Special Districts) that have GIS capabilities to begin examining ways to develop parallel systems that could eventually feed the county system for a centralized disaster data clearinghouse
- Design web-based interface application that would be made available to county and city users.
- Develop a brief data stewardship plan
- Identify potential integration (multi-beneficial uses) between the system, HAZUS, and DFRIM production for map modernization

Implementation Timeline: Develop system within 2 years of adoption of this plan (funding dependent). Maintenance and use are ongoing and require annual funding needs.

Cost Effectiveness: Total start-up costs are estimated at \$81,000 for hardware, \$101,500 for software, \$140,000 staffing and \$35,000 in contract services, for a total of \$375,500.00. Annual maintenance, including these categories and staffing needs is estimated at \$330,500. B/C Unknown.

Potential Funding Sources: University of California, Santa Barbara Campus (UCSB) geography interns, City cost shares, DHS, Homeland Security Grants, DHS-FEMA, Fire Grants and Mitigation programs (e.g. PDM-Planning)

Action #: GEN-2 - **Enhance the dissemination of risk data:** The County’s web server does not currently have the capacity to serve large files such as the countywide DFIRMs and other hazard and risk data being developed for the multi hazard mitigation plan. The county would like to have a web page devoted to hazard risk communication and mitigation planning.

Priority: Very High

Objective Addressed: 2.A, 2.B, 3.A, 4.A and 4.D

Responsible Department: Public Works – Office of the County Surveyor and Disaster Recovery, County OES

Implementation Strategy:

- Increase server size of the County’s webpage to be able to provide the public access to countywide DFIRMs, once DFIRMs are completed and the multi-hazard mitigation plan and associated mapping and data is available.
- Design and implement a Santa Barbara County Disaster Mitigation web page.

Timeframe for Implementation: 2 years, funding dependent.

Benefit vs. Cost: Undetermined

Potential Funding Source: Departmental Operating Budgets, FEMA Pre-Disaster Mitigation Grant, FEMA Map Modernization funding.

Action #: GEN-3 – **Obtain better data on the impacts of hazards on future development** – During the planning process there was a clear lack of information available to access future development. Between now and the next required update of the plan, the County will develop additional data.

Priority: High

Objectives Addressed: 1A, 3C, 4.A, and 4D

Coordinating Individual /Organization: Planning and Development, County Fire, OES and Public Works – Flood Control

Implementation Strategy:

- Form a committee led by Planning and Development to identify areas where growth and development can be expected in the next 5 years based on existing plans, ordinances and codes.
- Overlay anticipated growth areas with hazard profile mapping to generally analyze potential future exposure to each hazard in terms of population, buildings and infrastructure.

Implementation Timeline: 5 Years

Benefit vs. Cost: N/A

Potential Funding Sources: Departmental Budgets

Action #: GEN-4 – **Develop a Debris Management Plan for All Hazards:** All of the hazards identified throughout this plan could pose a serious need for processing of debris in a post-disaster environment. The County is lacking a comprehensive all hazards debris management plan.

Priority: High

Objective Addressed: 4.G

Responsible Department: Public Works – Resource Recovery and Waste Management Division, in consultation with Planning & Development environmental staff.

Implementation Strategy:

- Form small working group to evaluate existing solid waste capacity and post-disaster debris management actions
- Model anticipated debris from different event scenarios
- Write and seek public approval for a comprehensive all-hazard debris management plan

Timeframe for Implementation: 5 years

Benefit vs. Cost: Undetermined

Potential Funding Source: Departmental Operating Budgets, Department of Homeland Security (DHS) funding, CA OES

Action #: GEN-5 - **Enhance Post-Disaster Damage Inspections to Include Mitigation Strategies** – In a post storm environment the Transportation Division inspects roadways, bridges, culverts and other infrastructure for damage. This action proposes building a mitigation component into the inspection program.

Priority: Medium

Objectives Addressed: 3.A, 3.D, 4.B, 4.D, 4-F, 4.G, 5.A-C, 5.A-E, and 5.D-C

Coordinating Individual /Organization: Public Works Department – Transportation Division

Implementation Strategy: The following activities will be conducted to enhance the existing inspection program:

- Create an inspection checklist for each type of infrastructure
- Include a section on the checklist for the inspector to recommend, based on field observations what could have been done to the structure prior to the flood that might have protected it.
- Provide an annual training session (or at minimum an immediate post disaster training session) for inspectors to explain desired outcome of inspection.
- Where feasible, request State OES and FEMA trained mitigation staff to accompany County inspectors and to provide in the field training and mitigation materials.

Implementation Timeline: Complete checklist and first training within 4 years of adoption of the plan, then implement with each storm event.

Benefit vs. Cost: N/A

Potential Funding Sources: Inexpensive strategy, general operating budget

Action #: GEN- 6 - **Critical Facility Audits:** The County will conduct voluntary audits of critical facilities, identified in Section 4 as being located in the most vulnerable profiled areas for Earthquake and Flooding, to assess specific vulnerability to the hazards and develop recommendations for possible mitigation measures. The audits will be conducted first at critical facilities with a history of damage, and may be expanded to include all critical facilities.

Priority: Medium

Objective Addressed: 2.C, 4.B, 5A.A thru C, 5A.G, and 5C(all)

Responsible Department: Public Works and County OES

Implementation Strategy:

- Develop materials explaining the purpose of the voluntary program and solicit appointments
- Visit facilities with flood control experts and engineers
- Develop a site specific list of potential mitigation measures
- Develop a pre-flood and pre-earthquake preparation check list for each facility
- Provide information on grant programs for addressing mitigation projects

Timeframe for Implementation: 3 years

Benefit vs. Cost: Undetermined

Potential Funding Source: Public Works and OES budgets for Audits, potential assistance from USGS, US Army Corp of Engineers and State OES for audits. DHS/FEMA Pre-Disaster Mitigation, Hazard Mitigation Grant Program and Flood Mitigation Assistance program for implementing mitigation measures.

Action #: FLD-1 - Increase Participation in Floodplain Re-mapping Initiative: The basis for a sound floodplain management program is the quality of the risk information upon which development decisions are made. The FEMA FIRMS are the best available depiction of overall flooding risk in the County. The current FIRMS are outdated and were developed using manual cartographic techniques, and, as such, are of little utility to the broad base of users. They are difficult to use in any practical risk assessment activity where combination with current state of the art digital data is beneficial. FEMA's flood map modernization initiative is focused on producing seamless digital flood maps on a countywide basis nationwide. The digital maps will provide a platform from which updated flood data (hydrologic, topographic and hydraulic analysis and coastal storm surge modeling) can be added at a fraction of the cost and time previously required. FEMA Region IX has begun a process of scoping mapping needs in Santa Barbara County. The county will seek an increased role in the remapping process via a Cooperating Technical Partnership (CTP) agreement with FEMA to ensure the accuracy and quality of new countywide mapping.

Priority: Very High

Objective Addressed: 1.C, 2.A, 4.A, 4.C, 4.E, and 5A.H

Responsible Department: Public Works – Water Resources Division, Flood Control

Implementation Strategy: Apply for funding under the CTP program to undertake the following activities.

- Coordinate with the incorporated cities to identify mapping needs to promote flood mitigation on a watershed basis, not on jurisdictional basis (after DFIRM production).
- Use DWR Stream Prioritization Methodology to identify high priority streams for detailed analysis studies (after DFIRM production).
- Provide a detailed needs assessment to FEMA Region IX
- Identify local cost share

Timeframe for Implementation: CTP Agreement within 1 year, project completion within 2 years

Benefit vs. Cost: Cost Beneficial – FEMA research defends that the benefits of better flood mapping data at a national level exceed the costs. From the perspective of increased NFIP participation and awareness of flood hazard in SBC, benefits would increase.

Potential Funding Source: DHS/FEMA Map Modernization Program funds via CTP Agreement, Cost share in the form of available mapping data (e.g. base mapping, topographic data, etc.)

Action #: FLD-2 - Floodplain Management and Flood Mitigation Education and Outreach: The largest losses to the NFIP in Santa Barbara County are the 26 RL structures in the South County Coastal Basin. Options for dealing with those properties structurally are very limited. Hard protection such as groins, revetments, sea walls, etc. is economically unfeasible and generally not able to gain environmental permit approval. Acquisition and demolition is also not feasible, as these are among the most expensive and most desirable properties in California. Elevation and less extensive retrofits may be an alternative. However, with view-shed restrictions and the political implications of providing grant assistance to this type of property is unlikely. For these reasons, the County has developed multiple outreach and education strategies to encourage self-responsible actions in these areas and other flood prone areas in general. The County will target education and outreach programs to a variety of audiences to not only encourage retrofit and flood loss reduction activities but to encourage flood resistant future development.

Priority: Very High

Objective Addressed: 2.A, 2.C, 3.A, 5A.A, 5A.B, 5A.D, and 5A.F

Responsible Department: Public Works, Flood Control and Water Conservation District and Disaster Recovery, and County OES.

Implementation Strategy:

- Provide flood education programs for design professionals, (engineers, architects, surveyors) on the FEMA Coastal Construction Manual and workshops on breakaway walls and floodway encroachment.
- Target flood education programs for repetitive loss property owners where owners can learn about mitigation grant programs and mitigation techniques. Invite with direct mailings. These flood education programs will also be made available to other floodplain residents also interested in flood mitigation. A local sponsor will be sought and the seminars provided at a location near the RL area.
- Provide training for real estate and insurance professionals, including the basics of the NFIP development and insurance sides
- The County will develop Flood Education Program targeted for Elementary School students, coinciding with Flood Awareness Week.
- The County will add a public outreach element and involve the community in Creek Walk activities.
- The County will conduct public outreach activities to educate the public on illegal dumping in channels (i.e., placing grass clippings in channels). This will include the use of government access television and press releases as well as web site postings

Timeframe for Implementation: Start within 1 year. Provide annually.

Benefit vs. Cost: Cost Beneficial – Although it can not be proven that this strategy will reduce the levels of damages due to a flooding events, it will likely reduce the significant economic impact to the community immediately following a flood.

Potential Funding Source: DHS/FEMA for Coastal Construction Manual Training; RL and floodprone resident training on mitigation and grants from departmental budgets with technical support from State OES and FEMA Region IX; Insurance and Real Estate professionals training, from departmental capital budgets with support of FEMA’s Bureau and Statistical Agent (CSC) for insurance training; all others from departmental operating budgets.

Action #: FLD-3 - Enhance Floodplain Management Ordinance: SBC has an aggressive floodplain management ordinance that exceeds the minimum standards of the NFIP (See Capabilities Assessment, Section 6.3). The County will, however, make additional changes to the ordinance to incorporate additional mitigation policies and clarification.

Priority: Very High

Objective Addressed: 1.A and 1.B

Responsible Department: Flood Control and Water Conservation District

Implementation Strategy:

- Modify Floodplain Management Ordinance to include a cumulative substantial improvement provision and clarification of the use of replacement cost minus depreciation in making substantial improvement determinations.

Timeframe for Implementation: 1 year

Benefit vs. Cost: Undetermined

Potential Funding Source: Flood Control Budget

Action #: FLD-4 - **Adding Community Volunteers to Creek Walk Committees:** As part of the District's Floodplain Management Program, it conducts routine creek maintenance annually. The District has a very successful annual Creek Walk, done by an in-house Creek Walk Committee. The Committee identifies and prioritizes maintenance needs. An Annual Routine Maintenance Plan is then developed, followed by conduct public workshops and California Environmental Quality Act (CEQA) reviews of planned maintenance projects. The main objective of the Routine Maintenance Program is to reduce flood hazard and damage to life, public property, and infrastructure by maintaining the capacity of key channels in the County. The individual flood zones fund the Routine Maintenance Program and the extent and frequency of channel maintenance is dependent upon the availability of funds. The County will add representative from the community to the committee. Community volunteers will help bridge the gap between the County and property owners, so owners take an active role in maintenance activities on their property, ultimately saving money for the County.

Priority: Very High

Objective Addressed: 2.A, 2B, 2.C, 5A.A, 5A.B, 5A.E and 5A.G

Responsible Department: Public Works, Flood Control and Water Conservation District

Implementation Strategy:

- Publish annual notice for volunteers in the local paper, Public Works website and Channel 20 Government Access television station
- Recruit individuals from high risk areas if necessary
- Hold kick-off/educational meetings to organize Walk

Timeframe for Implementation: annually

Benefit vs. Cost: Undetermined

Potential Funding Source: Flood Control Budget, Benefit Assessment Fees

Action #: **FLD-5 – Carneros and San Pedro Creek Debris Barriers (Goleta)** – Debris frequently clogs culvert under Cathedral Oaks Road the crossing of these creeks, causing backwater flooding on the north side of the highway causing flooding of streets and agricultural land. In events where the water overtops the highway homes are flooded. The County has used upstream debris barriers successfully in other situations to prevent culvert clogging.

Priority: Very High

Objective Addressed: 4.C, 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the City of Goleta

Implementation Strategy:

- Identify funding
- Obtain permits
- Install Debris Basins at both locations

Timeframe for Implementation: Within 2 years, funding dependent

Benefit vs. Cost: Estimated cost, based on similar past applications is \$80,000.00 per structure for a total of \$160,000. If damages are avoided to homes and streets from one flood, the project will have paid for itself.

Potential Funding Source: Flood Control Budget, FEMA (PDM-C, HMPG, FMA grants)

Action #: **FLD-6 – Atascadero Creek Channel Liner Improvements (Goleta)** – Footing of slope liner is becoming exposed from erosion from repeat flooding, causing creek blockage and flooding, putting hundreds of homes at risk.

Priority: Very High

Objective Addressed: 4.C, 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the City of Goleta

Implementation Strategy:

- Identify funding
- Obtain permits
- Stabilize bottom grade by installing grade stabilizers and check structures

Timeframe for Implementation: Within 5 years, funding dependent

Benefit vs. Cost: Estimated cost is \$745,000.00 which includes wetland creation required for the project. Based on the number of homes that are expected to receive damage if this project is not constructed, it can be expected to be highly cost beneficial.

Potential Funding Source: Flood Control Budget, FEMA (PDM-C and HMPG grants)

Action #: **FLD-7 – Las Vegas and San Pedro Creeks Culvert Additions** – Undersized culverts beneath Highway 101, Union Pacific Railroad and Calle Real cause frequent and very significant backwater flooding of neighborhoods and retail areas north of the crossings. When the freeway and rail tracks are overtopped, downtown Santa Barbara becomes completely blocked, causing major disruption to commerce. Although flooding is flashy, the highway can be (and has been) closed for more than a day, even without highway damage. These undersized culverts also contribute to flooding of the Santa Barbara Airport, interfering with three forms of transportation into and through the Goleta/Santa Barbara area. The airport has been closed several times due to flooding in the last decade. In Goleta, closure of Calle Real and flooding of numerous developed residential properties are the biggest issue. Both project locations have been studied in detail and determined to be highly cost beneficial. The solution is to expand the capacity (by deepening or widening) of existing culverts, or, in the case of Las Vegas creek, adding additional barrel culverts.

Priority: Very High

Objective Addressed: 4.C, 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the Cities of Goleta and Santa Barbara

Implementation Strategy:

- Identify funding
- Obtain permits
- Increase capacity of existing culverts by constructing new ones and/or widening/deepening of existing culverts
- Although presented as one project, the County would likely obtain funding and proceed with each individually.

Timeframe for Implementation: Within 5 years, funding dependent

Benefit vs. Cost: Estimated cost is \$2.5 million per creek for a total project cost of \$5 million. With the amount of property damage and economic disruption caused by flooding, studies have determined that the project is highly cost beneficial.

Potential Funding Source: CalTrans- State Highway Operational Protection Program Funds, Flood Control Budget, South County Benefit Assessment District Funding, FEMA (PDM-C and HMPG grants and PA 401 funds), Cities of Goleta and Santa Barbara Capital Improvements Funds

Action #: FLD-8 – **Thornwood Drive Storm Drainage Improvements (Goleta)** – There is only one inlet for all run off in this urbanized industrial area. The piping from the inlet is in bad condition and unable to handle flows from even minor flooding events. This causes street flooding near the intersection of Thornwood Drive and Pine and significantly restricts emergency access to the area. Flooding also disrupts commerce of the industries frequently. In more significant events, there is flooding of properties, including a demolition yard, which presents potential environmental harm to the area when flooded.

Priority: Very High

Objective Addressed: 4.C, 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the City of Goleta

Implementation Strategy:

- Identify funding
- Obtain permits
- Construct gravity flow drainage system to protect the area

Timeframe for Implementation: Within 4 years, funding dependent

Benefit vs. Cost: Estimated cost is \$200,000.00. Damages avoided in large floods can be expected to significantly exceed that amount.

Potential Funding Source: Flood Control Budget, South County Benefit Assessment District Funding, FEMA (PDM-C and HMPG grants and PA 401 funds), Cities of Goleta Capital Improvements Funds

Action #: FLD-9 – **Mission Creek Channel Improvements (Santa Barbara)** – The Mission Creek Channel, from just below Cannon Perdido Street to the Pacific Ocean provides protection to a 10-year storm event. A significant number of homes are flooded in every major event. The County has studied and designed improvements to the Channel that would provide protection to the 25-year event. Previous funding attempts have been denied because protection is not to the 100-year flood.

Priority: Very High

Objective Addressed: 4.C, 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the City of Santa Barbara

Implementation Strategy:

- Identify funding
- Procure land
- Obtain permits
- Construct channel improvements

Timeframe for Implementation: Within 5 years, funding dependent

Benefit vs. Cost: Estimated cost is \$26 million. B/C unknown.

Potential Funding Source: Flood Control Budget, South County Benefit Assessment District Funding, U.S. Army Corp of Engineers funding, City of Santa Barbara Capital Improvements Funds

Action #: FLD-10 – **West Side Storm Drainage Construction (Santa Barbara)** – A large portion of the west side of the City of Santa Barbara is without adequate storm drainage. Urban street flooding renders an entire portion of the city inaccessible during flooding events trapping people in the west side, preventing emergency vehicle access and trapping school children at school. The county would like to construct and upgrade the size of inadequate drainage facilities.

Priority: Very High

Objective Addressed: 4.C, 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the City of Santa Barbara

Implementation Strategy:

- Identify funding

- Obtain permits and engineered design
- Construct project

Timeframe for Implementation: Within 5 years, funding dependent

Benefit vs. Cost: Estimated cost is \$1.9 million. B/C unknown.

Potential Funding Source: Flood Control Budget, South County Benefit Assessment District Funding, City of Santa Barbara Capital Improvements Funds

Action #: FLD-11 – **Sycamore Creek Culvert Additions (Santa Barbara)** – Undersized culverts beneath Highway 101 and the Union Pacific Railroad cause frequent and very significant backwater flooding of neighborhoods north of the crossings. There is also a sound barrier wall that exacerbates backwater flooding north of the freeway by acting as a dam. When the freeway and rail tracks are overtopped, serious impediments to transportation and emergency services exist, resulting in disruption to commerce. Although flooding is flashy, the highway can be (and has been) closed for more than a day, even without highway damage. The project has been studied in detail and determined to be cost beneficial. The solution is to expand the capacity is to tunnel an additional culvert under the freeway and railroad and provide breakaway panels in the sound barrier wall.

Priority: Very High

Objective Addressed: 4.C, 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the City of Santa Barbara

Implementation Strategy:

- Identify funding
- Obtain permits
- Increase capacity of existing culverts by tunneling new ones under the freeway and rail tracks.

Timeframe for Implementation: Within 5 years, funding dependent

Benefit vs. Cost: Estimated cost is \$3.2 million. With the amount of property damage and economic disruption caused by flooding, studies have determined that the project is highly cost beneficial.

Potential Funding Source: CalTrans- State Highway Operational Protection Program Funds, Flood Control Budget, South County Benefit Assessment District Funding, FEMA (PDM-C and HMPG grants and PA 401 funds), City Santa Barbara Capital Improvements Funds

Action #: FLD-12 – San Ysidro Creek Realignment – North of Highway 101, in the Montecito area of the County, the San Ysidro Creek makes two 90 degree bends prior to reaching the culvert, causing backwater flooding to agricultural lands and some residential areas. The water also overtops the freeway disrupting transportation, emergency services and commerce. The County will realign the creek to speed water under the highway and prevent backwater flooding.

Priority: Very High

Objective Addressed: 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District

Implementation Strategy:

- Identify funding
- Obtain permits
- Construct realigned channel

Timeframe for Implementation: Within 3 years, funding dependent

Benefit vs. Cost: Estimated cost is \$260, 000.00, which includes wetlands restoration. The project is expected to be highly cost beneficial.

Potential Funding Source: CalTrans- State Highway Operational Protection Program Funds, Flood Control Budget, South County Benefit Assessment District Funding, FEMA (PDM-C and HMPG grants)

Action #: FLD-13 – Padaro Lane Ditch Improvements – An existing drainage ditch along Padaro Lane in the Summerland area of the County is overgrown and unable to pass significant storm events. The result is flooding of residences. The County has studied and identified three mitigation alternatives and has chosen the one that it believes is most feasible and cost effective.

Priority: Very High

Objective Addressed: 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District

Implementation Strategy:

- Identify funding
- Obtain permits

- Widen ditch and improve inlet and outlet structures

Timeframe for Implementation: Within 3 years, funding dependent

Benefit vs. Cost: Estimated cost is \$350,000.00, which includes wetlands restoration. The project is expected to be cost beneficial.

Potential Funding Source: Flood Control Budget, South County Benefit Assessment District Funding, FEMA (PDM-C and HMPG grants)

Action #: **FLD-14 – Foster Road Storm Drainage Improvements** – Foster Road in Orcutt, near the Santa Maria Airport, has no drainage facilities and becomes impassable in minor flooding events. The road provides access to County facilities, including critical facilities included in Section 4.

Priority: Very High

Objective Addressed: 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District

Implementation Strategy:

- Identify funding
- Obtain permits
- Construct storm drainage facilities

Timeframe for Implementation: Within 3 years, funding dependent

Benefit vs. Cost: Estimated cost is approximately \$ 1,000,000.00. B/C ratio is currently unknown.

Potential Funding Source: Flood Control Budget, FEMA (PDM-C and HMPG grants)

Action #: **FLD-15 – Santa Maria Levee Protection Project**– Nearly the entire City of Santa Maria is protected by a levee. It was constructed in the 1960’s by the U.S. Army Corp of Engineers and is maintained under contract agreement with the County Flood Control District. Within one portion of the levee the river is changing direction and threatening to erode the banks. The County will undertake a project to decrease velocity flows.

Priority: Very High

Objective Addressed: 4.A, 4.C, 5A.D and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District in cooperation with the City of Santa Maria

Implementation Strategy:

- Identify funding
- Obtain permits
- Plant willow trees along banks of levee to reduce velocity flows.

Timeframe for Implementation: Within 3 years, funding dependent

Benefit vs. Cost: Estimated cost is approximately \$490,000.00. B/C ratio is currently unknown.

Potential Funding Source: Flood Control Budget, U.S. Army Corp of Engineers, FEMA (PDM-C and HMPG grants)

Action #: FLD-16 – **Los Alamos Storm Drainage Project** – A canyon in the unincorporated Town of Los Alamos drains to Centennial Street. There are no storm drainage facilities in the area. A study and benefit cost analysis has been conducted. It was determined that 26 homes could avoid flood damage if the stormwater was put into an underground drainage system down the length of Centennial Street to San Antonio Creek.

Priority: Very High

Objective Addressed: 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District

Implementation Strategy:

- Identify funding
- Obtain permits
- Construct Storm Drainage Facilities

Timeframe for Implementation: Within 3 years, funding dependent

Benefit vs. Cost: Damages avoided for more than 25 residential buildings. Project was determined to be cost beneficial. Estimated cost is \$2 million

Potential Funding Source: Flood Control Budget, FEMA (PDM-C and HMGP grants)

Action #: FLD-17 – **Construct Orcutt Regional Detention Basins** – Orcutt is one of the flattest locations in the unincorporated county. Its storm drainage system is overwhelmed in most minor flooding events, creating significant traffic disruption and emergency access issues. During major storm events, building damage will likely occur. The County would like to add a total of 8 stormwater retention facilities, strategically sited throughout the area, to retard flows and alleviate the problem.

Priority: High

Objective Addressed: 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District

Implementation Strategy:

- Identify funding
- Acquire land
- Obtain permits
- Construct storm drainage retention basins

Timeframe for Implementation: Within 3 years, funding dependent

Benefit vs. Cost: Estimated cost is approximately \$4.5 million. B/C ratio is currently unknown.

Potential Funding Source: Flood Control Budget, FEMA (PDM-C and HMPG grants)

Action #: FLD-18 – **Expand Kovar Regional Basin** – The Kovar Basin is the existing regional retention basin for stormwater for Santa Maria. Due to significant development and increases in impervious surfaces in and around Santa Maria, it is now undersized and overtops causing flooding of fields and agricultural land.

Priority: High

Objective Addressed: 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District

Implementation Strategy:

- Identify funding
- Obtain permits
- Construct expanded basin

Timeframe for Implementation: Within 3 years, funding dependent

Benefit vs. Cost: Estimated cost is approximately \$500,000.00. B/C ratio is currently unknown.

Potential Funding Source: Flood Control Budget, FEMA (PDM-C and HMPG grants)

Action #: **FLD-19 – San Antonio Creek Improvements** – The San Antonio Creek in the unincorporated town of Los Alamos is undersized and overgrown with vegetation. The County would like to clear and widen the channel to reduce flooding in Los Alamos.

Priority: High

Objective Addressed: 5A.C and 5A.G

Responsible Department: Public Works, Water Resources Division - Flood Control and Water Conservation District

Implementation Strategy:

- Identify funding
- Obtain permits
- Construct channel improvements

Timeframe for Implementation: Within 5 years, funding dependent

Benefit vs. Cost: Estimated cost is \$1.2 million. B/C ratio is unknown.

Potential Funding Source: Flood Control Budget, U.S. Army Corp of Engineers funding, FEMA (PDM-C and HMGP grants)

Action #: **FLD-20 - Monitor RL properties for Substantial Improvement:** SBC will monitor RL properties for substantial improvements and will complete RL verification forms to keep FEMA lists current. SBC will further monitor the performance of Substantially Improved buildings meeting current NFIP standards after floods.

Priority: High

Objective Addressed: 1.C, 5A.E, 5A.F, and 5A.G

Responsible Department: Flood Control and Water Conservation District

Implementation Strategy:

- Create spreadsheet for RL structures to track all improvements and performance during storms
- Update RL Verification sheets when RL properties are substantially improved.
- Include copy of improvement and performance spreadsheet in District file for each property

Timeframe for Implementation: Ongoing

Benefit vs. Cost: Undetermined

Potential Funding Source: Flood Control Budget

Action #: FLD-21 - **Repetitive Loss Structure Voluntary Audits:** The County will conduct voluntary audits of repetitive loss structures to assess specific vulnerability to flood hazards and develop recommendations for potential mitigation measures. These programs will be geared to educating homeowners on potential mitigation strategies. As part of this program, the County will pursue removing repetitive loss structures that no longer qualify as repetitive losses.

Priority: High

Objective Addressed: 2.A, 3.B, 5A.A, 5A.B, 5A.D, 5A.F and 5A.G

Responsible Department: Flood Control and Water Conservation District

Implementation Strategy:

- Develop materials explaining the purpose of the voluntary program and solicit appointment
- Visit facilities with flood control experts and engineers
- Develop a site specific list of potential mitigation measures
- Develop a pre-flood preparation check list for each facility
- Provide information on grant programs for addressing mitigation projects

Timeframe for Implementation: 2 years

Benefit vs. Cost: Undetermined

Potential Funding Source: Flood Control Budget and OES budgets for Audits, potential assistance from USGS, US Army Corp of Engineers and State OES for audits. DHS/FEMA Pre-Disaster Mitigation, Hazard

Mitigation Grant Program and Flood Mitigation Assistance program for implementing mitigation measures.

Action #: FLD-22 - Provide Incentives for RL and other floodprone property owners to retrofit homes to be safer from flooding or to construct new homes to higher standards: Residents often react more positively to incentives than to regulation or participation in government programs. Santa Barbara County will investigate development of an incentive program for retrofits and other safety/protective enhancements.

Priority: High

Objective Addressed: 2.A, 2.D, and 5A.B

Responsible Department: Public Works, Flood Control and Water Conservation District and Disaster Recovery, County Legal Department.

Implementation Strategy:

- The County will also evaluate implementing a “Flood Safe” certification program for homes, similar to the star system used to rate vehicle safety in California. Real Estate professionals can use certification as a selling point for homes.

Timeframe for Implementation: Complete evaluation and program design within 2 years

Benefit vs. Cost: Cost Beneficial – The relatively low cost of developing such an incentive program should easily be off set by damages avoided even if only a few participate.

Potential Funding Source: Departmental Operating Budgets

Action #: FLD 23 - Construct Storm Drainage Improvements at Toro Canyon Park - Large canyon drains to an undersized culvert under Toro Canyon Park Road resulting in silt and debris over road and erosion of the road embankment on the outlet side of the pipe. Public Assistance money has been paid in previous disasters to make the road passable. The County will replace the culvert with one of adequate size to pass the 100-year event.

Priority: High

Objectives Addressed: 5A.C

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Identify funding

Hire Engineering firm to perform watershed analysis, design and permit the project
Replace Culvert

Implementation Timeline: Within 1 year of adoption of the plan, contingent on funding.

Benefit vs. Cost: Cost is estimated to be approximately \$100,000 and is expected to reach that amount for debris and roadway clearing in only a few events.

Potential Funding Sources: FEMA (401, 404, PDM), General Fund

Action #: **FLD-24 - Tucker's Grove Park Interior Access Road Creek Crossing Improvements**
Existing "Arizona Crossing" and associated low flow culverts silt in storm events and cause erosion of the road embankment on the upstream and down stream sides of the crossing and dangerous flooding conditions on the roadway. The County will remove the crossing and replace it with a bridge for pedestrian and vehicle access. This will avoid repeat damage, facilitate fish passage and improve safety conditions.

Priority: High

Objectives Addressed: 5A-C and 5A-G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Identify Funding
Hire Engineering firm to design and permit protection
Construct bridge

Implementation Timeline: 5 years from adoption of plan

Benefit vs. Cost: Cost is estimated to be approximately \$300,000. It is anticipated that more than this will be avoided in future repairs.

Potential Funding Sources: California State Department of Fish and Game, FEMA (401, 404, PDM), General Fund

Action #: **FLD-25 - Cachuma Lake Recreational Area Rip-rap installation around water intake**
Lake is used for flood retention during flooding events. Surchage levels increase water surface by 3 feet which creates flood and wave action around the water intake for the water treatment facility. The County will install rip-rap protection around the inlet to prevent future damage.

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Preliminary design and cost estimation completed.
Hire Engineering firm to design and permit protection
Construct protection

Implementation Timeline: 2 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be \$225,000, B/C Unknown. Not implementing could result in loss of intake due to excessive erosion and loss of water service to facility.

Potential Funding Sources: DOI, Bureau of Reclamation, FEMA (401, 404, PDM), General Fund

Action #: FLD-26 - Cachuma Lake Mohawk Trail Bridge and Dock Abutment Rehabilitation and Access Improvements – During a 2001 flooding event this pedestrian bridge over Tequepis Creek was undermined, eliminating access for public fishing area and floating dock. The County will design and repair the bridge to endure wave action and move the trail to a safer area and re-establish land connection to floating dock.

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Design is in place, identify funding and construct project

Implementation Timeline: 1 year from adoption of plan.

Benefit vs. Cost: Cost is estimated at approximately \$100,000, B/C Unknown.

Potential Funding Sources: DOI, Bureau of Reclamation, FEMA (401, 404, PDM), General Fund

Action #: FLD-27 - Cachuma Lake Mohawk Camping Area Bridge Abutment Protection – Traffic bridge over Tequepis Creek to Mohawk Camping Area experiences scour at its abutments during high creek flows, threatening the integrity of the bridge abutments. The County will reinforce the bridge and protect the abutments with rip-rap or similar material.

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Hire Engineering firm to design and permit protection
Construct improvements

Implementation Timeline: 4 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be approximately \$200,000. B/C Unknown. Not implementing will result in erosion of the abutment, which could lead to bridge failure. Bridge replacement estimated at \$500,000.

Potential Funding Sources: DOI, Bureau of Reclamation, FEMA (401, 404), General Fund

Action #: FLD-28 - **Cachuma Lake Water Treatment Plant Relocation** – In addition to water supply, Lake Cachuma is used for flood retention. Lake surcharges will be increased by 3 feet to allow spring release for steelhead salmon spawning season. The County will relocate the existing water treatment plant and two sewer lift stations to address increased flooding levels, which when combined with storm waves on the lake will threaten existing facilities with erosion, inundation, loss of water services, and potential sewerage spills into the lake. Relocation will be to an area outside of the inundation zone.

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy:

- Lift Station relocation has been designed and preliminary designs for the water treatment facility are in place
- Complete final designs
- Receive permits
- Construct

Implementation Timeline: 2 years from adoption of plan.

Benefit vs. Cost: Cost to relocate lift stations is estimated to be \$1,000,000 for both lift stations and approximately \$3,000,000 for the treatment plant. \$200,000 funding for the lift station relocation is currently budgeted. B/C

Unknown. Not implementing could result in loss of facilities due to flooding. The utilities serve residences as well as public facilities.

Potential Funding Sources: DOI, Bureau of Reclamation, State Water Resources Control Board, Proposition 50 Grant Funds, FEMA (401, 404), General Fund

Action #: FLD-29 - **Cachuma Lake Recreational Area Public Access Ramp Protection** - With increased water surface elevations (3') associated with flood retention, combined with storm waves, access to boat mooring area is inundated, precluding public access during the period of inundation. Period of inundation could be up to five months. The County will install a construction retaining wall to relocate access way to higher area.

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Hire Engineering firm to design and permit protection
Identify funding
Construct project

Implementation Timeline: 4 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be approximately \$300,000. B/C Unknown

Potential Funding Sources: DOI, Bureau of Reclamation, General Fund

Action #: FLD-30 - **Richardson Park Pedestrian Bridge Replacements** – Two pedestrian bridges over Salisbury Creek (tributary to Cuyama River) and their abutments are damaged from years of channelized flood flows and are in imminent danger of collapse. The County would like to replace the bridges with new ones capable of passing 100 year flows, if feasible.

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Obtain structural and hydraulic design
Identify funding

Construct project

Implementation Timeline: 3 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be approximately \$300,000. B/C Unknown. Loss of bridges forces school children to use the highway shoulder to access the school site.

Potential Funding Sources: Recreational Development Impact Fees (QUIMBY) for design
FEMA (401, 404), General Fund

Action #: **FLD-31 - Enhancements to Annual Culvert Inspection Program to Include Mitigation Strategies** – SBCO Public Works, Transportation Division currently implements an annual culvert inspection program to monitor structural condition, debris clogging, and general conveyance. Culverts within the unincorporated county are inventoried with GPS coordinates and mapped as a GIS layer. Attributes currently include type of culvert, size, diameter, length, inspection date, condition, and replacement recommendations when applicable. The Transportation Division will work with Flood Control to continuously update the inventory and add flood carrying capacity of the culverts to the attributes inventoried. This will allow the development of a systematic replacement program that will include consideration of flood loss reduction.

Priority: High

Objectives Addressed: 3.B, 4.C, 4.D, and 5A.E

Coordinating Individual /Organization: Public Works Department – Transportation, Flood Control

Implementation Strategy: As part of the ongoing annual inspection program, the size (length, volume, condition, etc.) have been collected and inventoried in a GIS environment. This survey and data collection program allows for the budgeting of repairs and replacements. To enhance the existing program, the two divisions will work together to implement the following steps:

- From the existing size inventory, work with Flood Control to determine the ability of key culverts to pass the 100-year design event.
- Capture findings as a GIS attribute associated with the mapped points
- Produce a brief implementation plan to ensure that attribute database will remain updated as part of the overall GIS system in the County.

Implementation Timeline: Complete update of inventory within 3 years of plan adoption, perform ongoing updates.

Benefit vs. Cost: Unknown

Potential Funding Sources: Government Accountability Standards Board (GASB-34),
County Measure D Revenues, FEMA FMA-Planning

Action #: FLD-32 - Replace, Repair and Upgrade of Existing Undersized Culverts That Create Adverse Flooding Conditions

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Public Works Department – Transportation and Flood Control

Implementation Strategy: Based on known undersized problematic culverts and other identified by Action FLD-31, above, implement a program to systematically evaluate the benefits (and downstream potential impacts) of replacements. Prioritize replacements, identify funding sources, complete designs and construct replacements.

Implementation Timeline: Initial Studies will be undertaken within 3 years of adoption of this plan depending on successful procurement of funding through Grant Application(s).

Benefit vs. Cost: Must be determined on a culvert-by-culvert basis during prioritization.

Potential Funding Sources: County Measure D Revenues to implement program of evaluation and prioritization. Possible FEMA grant funding (PDM, FMA, HMGP (404) and 401) for actual replacements.

Action #: FLD-33 - Santa Barbara Bowl Storm Drainage Improvements

The Bowl was built in 1936 as a one-time-a-year performance venue for the Santa Barbara Fiesta. Today the Bowl is primarily a late spring, summer and early fall concert venue and is a communal center, providing a place where people can participate in community performances. Seasonal runoff descends from the upper level (Rivera) down both sides of the canyons and around the stage area to a seasonal creek in the Glen and ultimately to the City of Santa Barbara’s storm drains. Excessive run-off has caused damage to the Bowl on many occasions, with repeat damages to the stage area, parking lots, and floods Milpas Street on the East Side of Santa Barbara. Specific damage descriptions are as follows:

Damage Description No. 1.

Flooding off the west drive portion of the Bowl from an existing 16” CMP will cause approximately 2 acres of hillside decay, approximately 0.5 acres asphalt roadway washout, the front offices could be

flooded with interior damage closing the Bowl for repairs and suspending all services. Additionally, this flooding has caused road closure at Milpas Street and flooded the adjacent apartments.

Damage Description No. 2.

Approximately 125 feet of 65% grade hillside is collapsing a walkway located at the back seating area of the Bowl. Currently, there are a line of K-rails that keeps the gravel, dirt and boulders from coming onto the walkway area.

Damage Description No. 3.

A 24" concrete drainage connector at the top of the stairs of the Bowl, near the lighting – hillside area, is improperly designed. Water runoff is supposed to go into the drainage but the design and concrete asphalt are worn.

Damage Description No. 4.

Approximately 200 feet from the top of the stairway is a 12 inch CMP which is supposed to collect run off. Because of the asphalt wear, the water by-passes the drainage causing hillside erosion and asphalt damage.

Priority: High

Objectives Addressed: 2.C, 3.B, 4.C, 5A.C and 5A.G

**Coordinating Individual
/Organization:**

Santa Barbara County Parks, with Santa Barbara Bowl Foundation
and in cooperation with the City of Santa Barbara

Implementation Strategy:

- Install and fit 135 ft of 24" CMP to an existing 16" CMP located on the west side of the Bowl. The 24" CMP will be buried beneath the existing roadway and walkway which will connect to the 36" CMP located at the center of the Bowl parking lot.
- Build a 125 foot X 6 feet high MBG (Metal Beam Guard), or CIP (Cast in Place) Rock retaining wall.
- Reshape and design a 25 foot X 40 foot section of asphalt to recapture the runoff from adjacent hillside without causing tripping hazards to the public.
- Remove and replace a 50' X 10' feet section of asphalt to properly drain into the existing 12" CMP against roadway.

Implementation Timeline: 5 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be approximately \$750,000 and is expected to avoid future losses that exceed that amount.

Potential Funding Sources: Santa Barbara Bowl Foundation Funds, FEMA (401, 404 PDM)

Action #: FLD-34 – **Laguna County Sanitation District Flood Analysis and Protection** - The Laguna County Sanitation District is a county sanitation district formed in 1958 pursuant to the county sanitation district act (Section 4700 et seq of the California Health & Safety Code). The District is a dependent special district with the County Board of Supervisors acting as its ex-officio board of directors. The District’s reclamation plant treats wastewater collected from the unincorporated community of Orcutt and unincorporated portions of Santa Maria, which is primarily domestic with small commercial contributions. The plant is located in the proximity of known earthquake faults. The proximity to Orcutt (a.k.a. Solomon) Creek also contributes to high ground water conditions. The plant is located adjacent to the Orcutt Creek flood plain. FEMA maps show the plant to be located in Zone-A, areas subject to 100-year flood. However, further reports indicate the plant site to be just out of most 100-year flood reaches. Actual flood waters have breached the adjacent creek and washed around the plant site causing damage to the access road to the plant. Therefore, flood damage is possible. The plant, as with most wastewater plants, was constructed downstream of its collection systems as a way to economically transport wastewater to the plant by gravity. This generally results in placement of trunk collector lines and wastewater plants near major water courses since water courses follow lower lying areas. At the time the plant was constructed, regulations for development within potential floodways did not exist, as FEMA maps and flood impacts from development were not available until 1979. However, to date a comprehensive flood study has not been conducted. Potential damage includes sediment deposition, flooding, and wash-outs of all below grade facilities.

Priority: High

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual

/Organization: Public Works - Resource Recovery & Waste Management Division

Implementation Strategy:

- Commission flood study and implement recommended corrective measures such as levee construction and drainage improvements.
- Implement recommendations of the study

Implementation Timeline: Within 3 years, depending on funding.

Benefit vs. Cost: Cost is estimated at \$50,000 for study and \$500,000 for mitigation measures. Potential impacts includes damage to the influent pumping station, grit chamber, primary clarifiers, secondary clarifier, six ponds, the basements in the lab and power distribution buildings as well as damage to the access road to the plant. Costs to repair damage and resume plant operations would include labor and equipment costs expected to exceed the costs of this project in a single event. Loss of plant operations could be as much as one month after initial damage. In addition, back-up systems would need to be implemented in order to

maintain minimal treatment levels. Replacement and or reconstruction of several processes or structures would also be required.

Labor and equipment costs:	\$ 500,000
Back-up systems:	\$ 500,000
<u>Replacement costs:</u>	<u>\$2,000,000</u>
Total estimated loss:	\$3,000,000

Potential Funding Sources: FEMA PDM-C, and HMGP Grants, General Fund

Action #: FLD-35 - University Circle Open Spaces Berkely Bike/Pedestrian Bridge Removal and Replacement – Pedestrian/bike bridge is not capable of passing significant storm events, resulting in upstream backwater flooding. This could cause the bridge to fail, and causes access problems across the creek in that area, which is heavily traveled by County residents. The County will replace the bridge with one capable of passing 100 year flows.

Priority: High

Objectives Addressed: 5A-C and 5A-G

Coordinating Individual /Organization:

Santa Barbara County Parks

Implementation Strategy:

Identify funding
Hire Engineering firm to design and permit protection
Construct bridge

Implementation Timeline: 5 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be approximately \$120,000 and is expected to save more than that amount in avoided future damages.

Potential Funding Sources: Transportation Enhancement Act (TEA), Federal DOT, FEMA (401, 404, PDM), General Fund

Action #: FLD-36 - Jalama Beach Park Waterline Protection – Well and primary water supply line to park crosses private properties. Erosion of ranch roads during storms, (e.g. 1998) have undermined and exposed the water line, threatening service and potentially costly repairs. The County will mitigate repeat damage by installing drainage improvements on the roadways in the areas of the line crossing.

Priority: Medium

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization:	Santa Barbara County Parks
Implementation Strategy:	Complete in house design Construct improvements
Implementation Timeline:	5 years from adoption of plan.
Benefit vs. Cost:	Cost is estimated to be \$50,000 and is expected to save more than that amount via avoided damages.
Potential Funding Sources:	FEMA (401, 404), General Fund

Action #: FLD-37 - Live Oak Camp Access Road Protection – Access road to camp is adjacent to the bank of the Santa Ynez River. Relocation is not a feasible alternative due to topography. During high stream flows, erosion is occurring in the road embankment. The County will install gabion retaining walls and erosion control systems along a 200 foot reach to protect from erosion.

Priority:	Medium
Objectives Addressed:	5A.C and 5A.G
Coordinating Individual /Organization:	Santa Barbara County Parks
Implementation Strategy:	Complete in house design and obtain permits Identify funding Construct project
Implementation Timeline:	5 years from adoption of plan.
Benefit vs. Cost:	Cost is estimated to be approximately \$300,000. B/C Unknown
Potential Funding Sources:	DOI, Bureau of Reclamation, FEMA (401, 404), General Fund

Action #: FLD-38 - Miguelito Park Embankment and Bridge Protection – Miguelito Creek is eroding the road embankment and causing scour damage around bridge footings. The County will evaluate installing revetment, extending bridge abutments and other structural measures to mitigate scour.

Priority:	Medium
Objectives Addressed:	5A.C and 5A.G

Coordinating Individual

/Organization: Santa Barbara County Parks

Implementation Strategy: Retain engineer to design protection
Identify funding
Obtain permits
Construct improvements

Implementation Timeline: 5 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be \$200,000 and is expected to save more than that amount via avoided damages.

Potential Funding Sources: FEMA (401, 404), General Fund

Action #: **FLD-39 - Toro Canyon Park Gazebo Access Road Drainage** – Dirt road lacks adequate drainage and is severely eroded in flooding events. The County will construct drainage facilities including water bars and drainage culverts to prevent future erosion and continuous repair.

Priority: Medium

Objectives Addressed: 5A.C

Coordinating Individual

/Organization: Santa Barbara County Parks

Implementation Strategy: Identify funding, conduct in house design and construct drainage project.

Implementation Timeline: 5 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be \$300,000 for an area of approximately $\frac{3}{4}$ of a mile. Previous damage and repairs have been in the \$50-60 thousand range per event.

Potential Funding Sources: FEMA (401, 404, PDM), General Fund

Action #: **FLD-40 - Evaluate Expansion of Flood Warning System:** The County will evaluate expanding the flood warning system. The ALERT system is located throughout the County, but most areas of the County experience flash flooding events that are difficult to predict. The County will evaluate ways to disseminate warning information to the public (i.e., reverse 911). Way to link the flood warning system to critical facility and Repetitive Loss audit information to instruct homeowners what proper actions to take to protect their property will be examined.

Priority: Medium

Objective Addressed: 5A.B

Responsible Department: Public Works - Flood Control and Water Conservation District

Implementation Strategy:

- Create a short report detailing alternatives, feasibility and costs for achieving this strategy

Timeframe for Implementation: 5 years

Benefit vs. Cost: Undetermined

Potential Funding Source: Public Works Budget

Action #: FLD-41 - **Santa Rosa Park Culvert Replacement** – Santa Rosa Road runoff floods park entrance road causing erosion and road damage. The County will install a culvert under the park road to divert runoff underground and avoid road damage.

Priority: Medium

Objectives Addressed: 5A.C and 5A.G

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Complete in house design
Identify funding
Construct culvert

Implementation Timeline: 5 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be \$50,000 and is expected to save more than that amount via avoided damages to the park road.

Potential Funding Sources: FEMA (401, 404), General Fund

Action #: FLD-42 - **Obtain National Weather Service “Storm Ready” Designation**

Priority: Medium

Objective Addressed: 2.A, 2.B, 2.D, 3.A, 5A.B

Responsible Department: Public Works and County OES

Implementation Strategy:

- Arrange meeting of FMPC and National Weather Service to review criteria for designation against the programs and actions outlined in this plan

Timeframe for Implementation: 2 years**Benefit vs. Cost:** Undetermined**Potential Funding Source:** Flood Control and OES Budgets

Action #: FLD-43 - **Loon Point Beach Access Trail Erosion Protection** – Drainage from canyon, railroad and Highway 101 severely erodes a portion of the trail frequently (recently 1995, 1998, 2000 and 2001). The trail is also eroded by high tide run up. A design exists to place hard surfaces, water bars, berming, appropriate drainage structures, and hardening on the seaward side of the trail. The design has been successfully implemented in similar locations. The County will seek funding to permit and construct the project.

Priority: Medium**Objectives Addressed:** 5A.C and 5A.G**Coordinating Individual
/Organization:**

Santa Barbara County Parks (in coordination with private property owners for construction easements)

Implementation Strategy: Design is in place. Identify funding, obtain appropriate permits and construct project.**Implementation Timeline:** Seek funding within 1 year of plan adoption. Construct within 2 years from receipt of funding.**Benefit vs. Cost:** The project is estimated to cost \$80,000. Each time the trail is damaged by a storm approximately \$15,000 worth of repair is needed. These costs are expected to be avoided in future events.**Potential Funding Sources:** FEMA (401, 404, PDM), General Fund

Action #: FLD-44 - **Bridge Scour Abatement Program** - Explore strategies to determine cost-effective solutions to recognized geologic erosion hazards (especially scour) affecting County-maintained bridge structures. The County has a unique topographic and climatic setting that leads to relatively large amounts of water flow and materials to be transported over a relatively short distance to the ocean. Due to constricting of creek channels, decreased infiltration rates, and increased run-off from cultivated areas

as well as urban development, creek channels are incised and continue to degrade. This increases the local and long term scour at several bridges throughout the County (see subsection 4.3.5.1).

Priority: Medium

Objectives Addressed: 5A.C, 5A.G

Coordinating Individual /Organization: Public Works Department - Transportation

Implementation Strategy: The County will conduct initial investigations to determine appropriate long term solutions to prevent substantial scour damage and eventual structural failure. Phase II of the project would be to seek funding to design and construct scour mitigation projects.

Implementation Timeline: Initial Studies will be undertaken within 3 year of adoption of this Plan, depending on successful securing of funding through Grant Application(s). Phase II implementation timeline is anticipated to be approximately 6 years and will be more closely evaluated during the next annual review of this plan by the MAC.

Benefit vs. Cost: To be determined upon completion of Phase I studies. Study and design are an unavoidable necessity to any infrastructure project. The cost of repairing damaged bridges or replacing failed bridges can be expected to easily justify the benefits of proactively mitigating the hazard before it occurs.

Potential Funding Sources: Federal Highway Bridge Replacement and Rehabilitation Program (FHWA), County Measure D Revenues, FEMA (401, 404, PDM).

Action #: **FLD-45 - Investigation of Low Capacity Bridges to Determine Appropriate Long-Term Solutions** – A few bridges throughout the County (see 4.3.1.1. for representative sample) do not have the capacity to pass storms of very low recurrence intervals (less than 25-year) causing backwater flooding and potential damage to the structures, commerce, transportation and agricultural lands.

Priority: Medium

Objectives Addressed: 5A.C

Coordinating Individual /Organization: Public Works Department - Transportation

Implementation Strategy: Explore strategies to determine cost-effective solutions to mitigate flooding from low capacity bridges. Initial strategy will be for feasibility

studies to determine the most beneficial course of action to remedy the observed lack of capacity to handle very low recurrence events and increase the capacity of these bridges to pass a 100-year storm event. Phase II will be to seek funding through grant application to design and construct permanent solutions.

Implementation Timeline: Initial Studies will be undertaken within 3 years of adoption of this Plan, depending on successful procurement of funding through Grant Application(s). Timeline for design and construction will be established in either annual memo updates or the 5 year update to this plan.

Benefit vs. Cost: Initial grant applications will be to secure funding to begin analysis and initial design alternatives. Initial Studies will help determine the benefit vs. cost of pursuing construction projects.

Potential Funding Sources: FHWA, FEMA, CA OES, County Measure D Revenues

Action #: **WDF-1 – Update Fire Hazard Zone Mapping** – Building construction standards and other development standards discussed in previous sections of the plan for high fire hazard are based on fire hazard zone mapping. The State of California is required to determine fire hazard severity zones and produce mapping. The Fire Department and County hold the maps for the local responsibility area. The County is in the process of reevaluating the zones while meeting both the intent of the State law and also county ordinances. The County High Fire Hazard Area map is thought to be outdated currently. The mapping, including that used for profiling in this plan is known to be outdated. Since it was last updated, additional threat information data has become available. Fire threat is not a static hazard and changes with numerous variables. The County will work with the State of California to ensure that it has appropriate input in the development of new mapping.

Priority: Very High

Objectives Addressed: 1.C, 2.B, 3.D, 4.A, 5B.C, 5B.F

Coordinating Individual /Organization: County Fire - OES

Implementation Strategy:

- Arrange a meeting of stakeholders with states to provide input
- Involve cities in meeting with state
- When new mapping is obtained, re-evaluate exposure analysis to determine what changes are necessary

Implementation Timeline: Within 5 years

Benefit vs. Cost: With more accurate hazard maps, existing and any new development standards will be enforced in areas where the need is highest, ultimately resulting in avoided losses. The State's program has determined that hazard mapping is cost effective.

Potential Funding Sources: General Fund, California Department of Forestry and Fire Services

Action #: WDF-2 – **Enhance Fire Weather Forecasting Program** – The current fire weather program is based on the U.S. Forest Service system, which includes only 4 remote automated weather stations throughout the county. The stations are in areas that are not representative of the micro-climates that exist within the county. A larger and better network would allow the county to focus fire prevention efforts from year to year in the most accurate and threatened locations.

Priority: Very High

Objectives Addressed: 5B.B, 5B.C, 5B.C

Coordinating Individual /Organization: County Fire - OES

Implementation Strategy:

- Acquire 7 permanent and 4 portable automated fire weather stations
- Site the stations at optimum locations throughout the County, with the flexibility of moving the portables on an annual basis.

Implementation Timeline: Within 2 years, funding dependent

Benefit vs. Cost: Cost is anticipated to be approximately \$190,000 for 11 new stations and a budget of approximately \$12,000 per year for maintenance will be needed. With more accurate forecasting, limited resources could be applied to more targeted locations for prevention and operational activities resulting in significant cost savings and likely losses avoided due to prevention activities.

Potential Funding Sources: General Fund, California Department of Forestry and Fire Services, U.S. Forest Service, Department of Homeland Security's Assistance to Firefighters Act fire grant funds.

Action #: WDF-3 – **Evaluate Enhancements to Hazard Reduction Program** – The Hazard Reduction Program give the county legal authority to cite and recover expenses associated with required vegetative maintenance and other fire mitigation activities that private property owners are required to perform annually, if they do not comply and the county has to expend funds to enforce the standards. The county will evaluate the current enforceable standards to determine if updates are feasible, and then make those updates. For example, there is currently vegetative clearing setback distance of 30 to 100 feet that can be enforced – depending on slope and fuel and other factors those distances are not enough always enough. It would be helpful if the program was designed in a way that the variables that affect threat were included as regulatory parameters.

Priority: High

Objectives Addressed: 1.A, 1.B, 1.C, 5B.C, 5B.D, and 5B.E

Coordinating Individual /Organization: County Fire Department

Implementation Strategy:

- Evaluate all current standards and produce a brief report with recommended revisions
- Go through the process of adopting changes to the program, including public participation

Implementation Timeline: Identify recommendations within 1 year, Codify changes within two years.

Benefit vs. Cost: More appropriately designed standards based on the many variables that are unique to sites can be expected to result in losses avoided in the future.

Potential Funding Sources: General Fund

Action #: WDF-4 – **Continue Update to County Wildfire Management Plan** – The County is currently in the process of updating its Wildfire Management Plan which provides policy guidance for many of the Fire Department’s programs. The process involved in writing and updating the plan is similar to the process used for this plan, involving all stakeholders including the at risk public. The plan addresses items such as fuel breaks, community defense zones identified by stakeholders, target areas and potential prescription burns of areas at greatest risk and many other elements. The plan will be legally adopted by the County Board of Supervisors upon completion. The County will ensure that the plan considers the vulnerability assessment and mitigation actions identified in this plan as it completes the Management Plan.

Priority: High

Objectives Addressed: 1.A, 5B.A, and 5B.E

Coordinating Individual /Organization: County Fire Department

Implementation Strategy:

- Evaluate multi-jurisdictional multi hazard mitigation plan while completing the Wildfire Management Plan
- Incorporate the recommendations and actions contained in the Wildfire Management Plan into this document during the next routine update.

Implementation Timeline: Complete Wildfire Management Plan within 2 years, and incorporate its recommendations and actions into this plan at the first five year update, or sooner.

Benefit vs. Cost: N/A

Potential Funding Sources: General Fund, DHS-Firefighter Assistance Grants

Action #: **WDF-5 – Increase GIS Capabilities within Fire Department** – Almost everything the County Fire Department does in terms of prevention is parcel based, including planning that goes into determining what hazard reduction projects are picked and how they are prioritized. The manipulation and analysis of spatial data would significantly improve planning and result in operational cost savings in the long term.

Priority: Medium

Objectives Addressed: 4.D, 4.F, 4.G, 5B.E

Coordinating Individual /Organization: County Fire Department

Implementation Strategy:

- Identify funding for Computer Hardware and GIS Software
- Purchase and install system
- Train key Staff in the use to of the software

- Migrate current planning applications to the GIS System

Implementation Timeline: 5 Years, funding dependent

Benefit vs. Cost: Unknown

Potential Funding Sources: DHS-Firefighter Assistance Grants, General Fund, DHS-FEMA PDM-C Grants

Action #: WDF-6 – **Staffing of Operations Division of Fire Department** – County fire is lacking in its ability to actually complete projects that result in mitigation benefits. For example, if a fuel breaks are needed, the projects to cut them are typically grant funded. It is very difficult to fund positions with variable grant funds. The County needs fire hand crews in the Operations Division.

Priority: Medium

Objectives Addressed: 5B.D

Coordinating Individual /Organization: County Fire Department

Implementation Strategy:

- Identify potential staff funding sources for additional fire hand crew staff

Implementation Timeline: Make recommendations to hiring managers and Board of Supervisors within 1 year of plan adoption.

Benefit vs. Cost: N/A

Potential Funding Sources: Additional staff resources to seek funding sources

Action #: WDF-7 – **Firewise Community Planning and Prevention Techniques Training** – Outside of the County Fire Department, there is more of an emphasis on fire suppression than on activities individual property owners can undertake to prevent fires from destroying their buildings. The National Fire Protection Association’s (NFPA) Firewise Communities program provides training to local government officials (including planners outside of fire agencies) on fire mitigation at the site specific level. While most of the training includes action on the behalf of property owners that are already required or recommended, those actions may not be familiar to many owners and local government officials.

Priority: Medium

Objectives Addressed: 2.A, 2.B, 3.A, 4.B, 4.C and 5B.A

Coordinating Individual

/Organization: County Fire Department

Implementation Strategy:

- Contact the National Fire Protection Association about opportunities to participate in its Firewise Communities training program.
- Identify funding to train not only Fire Department staff and Forrest Managers, but planning and environmental staff as well, including the 8 Cities
- Distribute invitations to citizens living in Extremely High threat areas
- Rotate training around county

Implementation Timeline: Develop program within 1 year, deliver two trainings in second year, then annually depending on funding and success

Benefit vs. Cost: Unknown

Potential Funding Source: General Funds, CA Dept. of Forestry and Fire Services, NFPA

Action #: EQ-1 - **Seismic Retrofit of 14 County Courthouse Facilities** – There are fourteen court facilities within the County inventory, some with non-court related functions. One facility, the Santa Barbara Courthouse is designated as a State Historic Landmark (no. 1037) and under consideration as a National Historic Landmark. The majority of the structures are two story, plaster with clay tile roofs. The scope of seismic deficiency range from lack of positive roof to wall attachment; missing or undersized wall or roof diaphragms; height to wide ratio of shear walls; weak vertical steel column to horizontal beam connections; moment frame connections; attachment of decorative details; heavy interior ceiling attachment and cross bracing; mechanical equipment anchoring; wall to foundation attachments; shear wall to foundation attachments and cross framing member lateral transfers. The primary reason for these deficiencies results from lack of local, state or federal mandate to retrofit buildings whose occupancy use has not changed.

Priority: Very High

Objectives Addressed: 4.A, 4.G, 5C.A, 5C.B and 5C.D

Coordinating Individual

/Organization: General Services

Implementation Strategy: Identify funding and implement existing retrofit plans. Plan, in the form of a previous grant application, with details on each structure is included as Appendix 5-B. While the project is presented in aggregate

for all 14 buildings, the County will consider a ranking of priority structures and phasing of the retrofit projects.

Implementation Timeline: Within 5 years, depending on funding.

Benefit vs. Cost: The overall project cost is estimated to be \$10,000,000.00. B/C to be determined at project application.

Potential Funding Sources: FEMA PDM-C, and HMGP Grants, General Fund

Action #: EQ-2 - **Seismic Rehabilitation of Existing Bridge Structures.** – Several Bridges within the unincorporated area of Santa Barbara County do not meet current seismic design standards and are in danger of collapse. Over the past decade, the County has initiated an aggressive campaign to retrofit 11 bridges to current seismic code, or replace them, when more cost effective than retrofitting. Due to Santa Barbara’s history of significant seismic events, and a large collection of active faults capable of large magnitude events, it is in the best interest of the public’s safety that these projects are completed in an expedited manner. Many of these roads are important routes for emergency service vehicles, public travel and commerce.

Priority: High

Objectives Addressed: 5C.A and 5C.B

Coordinating Individual /Organization: Public Works Department - Transportation

Implementation Strategy: In order to minimize damage during a large magnitude seismic event, the County of Santa Barbara has undertaken steps to inventory the bridges in the County, and implement seismic rehabilitation or replacement strategies. Designs for all structures that have been designated as Seismic Deficient have been initiated or are completed. One of the 11 bridges has already been retrofitted and another replaced. The county will implement the remaining designs.

Implementation Timeline: Design activities have taken place since 1997 and will continue until the seismic deficiencies of all 11 bridges have been addressed. It is anticipated that the final construction activities for all projects will be completed within the next 5 years

Benefit vs. Cost: The benefit of protecting public safety against bridge collapse is expected to significantly exceed the cost of retrofits and/or replacements.

Potential Funding Sources: Federal Highway Bridge Replacement and Rehabilitation Program, County Measure D Revenues, FEMA (401, 404)

Action #: EQ-3 – **Obtain Liquefaction Hazard Data for Vulnerability Analysis** – Consistent and accurate Liquefaction mapping is not available at the County level. While most soil types are hard in the county, there are areas such as downtown Santa Barbara and other coastal and inland areas where liquefaction is a threat. The California Geologic Survey and others have been producing liquefaction mapping in southern and northern California, with the intention of eventually mapping the entire State. The County will monitor progress on mapping initiatives and will seek other data to better analyze the potential threat of Liquefaction.

Priority: Medium

Objectives Addressed: 3.D and 4.A

Coordinating Individual

/Organization: County Fire – OES, Planning and Development, Public Works – Administration (Disaster Recovery Manager), all in cooperation with the 8 cities.

Implementation Strategy:

- Gather data and mapping of liquefaction hazards from Comprehensive Plan, Cities General Plans (Carpinteria, for example) and other sources.
- Meet with State Geologic Survey and others involved in mapping initiative to discuss the status of liquefaction mapping efforts
- Provide progress update by first update of this plan

Implementation Timeline: 5 years

Benefit vs. Cost: Unknown

Potential Funding Sources: General Fund

Action #: EQ-4 – **Laguna County Sanitation District Earthquake Retrofit Project 1** - The Laguna County Sanitation District is a county sanitation district formed in 1958 pursuant to the county sanitation district act (Section 4700 et seq of the California Health & Safety Code). The District is a dependent special district with the County Board of Supervisors acting as its ex-officio board of directors. The District's reclamation plant treats wastewater collected from the unincorporated community of Orcutt and unincorporated portions of Santa Maria, which is primarily domestic with small commercial contributions. The plant is located in the proximity to known earthquake faults. The proximity to Orcutt (a.k.a. Solomon) Creek also contributes to high ground water conditions. Recent data indicates that the closest active fault is the Casmalia-Orcutt fault 2 miles away with a maximum credible event of 7.5. For reference, the San Simeon Earthquake on December 22, 2003 caused minor damage to the plant, was approximately 65 miles away and was a magnitude 6.5. Earthquake impacts could include damage to

structures, piping and equipment. Center baffles are fiberglass and not compatible with lateral movement of water during earthquakes.

Priority: Medium

Objectives Addressed: 5C.A

Coordinating Individual

/Organization:

Public Works - Resource Recovery & Waste Management Division

Implementation Strategy: Replace existing baffles with stainless steel or other products made to sustain greater lateral forces due to ground and water movement. Upgrade connections to match new baffle material. Upgrade existing secondary clarifier center baffles.

Implementation Timeline: Within 5 years, depending on funding.

Benefit vs. Cost: Cost of the project is estimated at \$150,000.00. Closure of clarifier would result in bypass of material to the holding pond that feeds the Zee Weed ultra filtration system worsening the feed water quality and reducing filtration capacity. For a single event, down time to repair could be up to one week.

Labor and equipment costs:	\$ 30,000
Bypass systems:	\$ 8,000
<u>Replacement costs:</u>	<u>\$ 150,000</u>
Total estimated loss:	\$ 188,000

Potential Funding Sources: FEMA PDM-C, and HMGP Grants, General Fund

Action #: EQ-5 – Laguna County Sanitation District Earthquake Retrofit/Analysis Project 2 - The secondary digester (original primary digester) was constructed in 1959 and the primary digester was constructed in 1974. Today, revised seismic standards exist, and the impact and proximity of earthquake faults have provided new information on seismic threats. It is unknown how stable these facilities are under lateral loadings associated with an earthquake.

Priority: Medium

Objectives Addressed: 5C.A

Coordinating Individual

/Organization:

Public Works - Resource Recovery & Waste Management Division

Implementation Strategy: Commission a structural analysis of the digesters. Implement mitigation measures.

Implementation Timeline: Within 5 years, depending on funding.

Benefit vs. Cost: Estimated cost: \$50,000 for analysis, \$350,000 for mitigation measures and replacement of demolished digesters in the event of an earthquake. It may take three months to demo and construct new digesters. A significant impact would be the need to provide temporary digester facilities.

Labor and equipment:	\$ 500,000
Bypass systems:	\$ 250,000
<u>Replacement costs:</u>	<u>\$1,000,000</u>
Total estimated loss:	\$1,750,000

Potential Funding Sources: FEMA PDM-C, and HMGP Grants, General Fund

Action #: EQ-6 – **Inventory of Un-reinforced Masonry Structures** – There is no solid inventory of all un-reinforced masonry structures in the unincorporated areas of Santa Barbara County. Such information would be helpful in targeting outreach and training and in identifying future mitigation projects.

Priority: Medium

Objectives Addressed: 1A, 5C.B and 5C.C

Coordinating Individual /Organization: General Services, County Assessors’ Office, County Fire-OES, Public Works – GIS Services

Implementation Strategy: Using best available data, inventory un-reinforced masonry buildings in the County and map locations of concentrations of them.

Implementation Timeline: Within 5 years, depending on funding.

Benefit vs. Cost: Unknown

Potential Funding Sources: General Fund

Action #: EQ-7 - **Seismic Safety and Mitigation Outreach and Education**

Priority: Medium

Objectives Addressed: 2.A, 2.C, 3.A, 3.B, 4.B, 4.C, 4.D, 5C.B and 5C.D

Coordinating Individual

/Organization:	General Services
Implementation Strategy:	<p>Develop comprehensive earthquake awareness and outreach programs concentrating on the following areas:</p> <ul style="list-style-type: none">• Understanding of Risk• Understanding of Retrofit Actions, Mitigation and Construction Techniques• Overview of grant funding programs available to assist <p>Target training to the following audiences:</p> <ul style="list-style-type: none">• Owners of un-reinforced masonry buildings• Contractors• The Business Community• County and City employees with mitigation, construction and development related job duties
Implementation Timeline:	Develop Program within 2 years of plan adoption, repeat sessions annually
Benefit vs. Cost:	Relatively inexpensive, benefit not quantifiable
Potential Funding Sources:	General Fund

Action #: LSD-1 - **Geotechnical Engineered Solution of Slope Failure on Glen Annie Road (South County)** - Over the last few years, increased erosion of the creek slope has eroded away the shoulder and support as well as a portion of the roadway for Glen Annie Road. Currently, road width has been diminished, as to only allow one travel lane, with alternating traffic. This road is the only access point for the Goleta Water District water treatment plant at the north end of Glen Annie Road. This sole access way is used to transport water treatment chemicals necessary to the continuous operations of the treatment plant, which serves over 80,000 people in the Goleta and Santa Barbara City and County Area.

Priority:	Very High
Objectives Addressed:	5D.B
Coordinating Individual /Organization:	Public Works Department - Transportation

Implementation Strategy: Based on developed Engineering Design Plans and Specifications, the County will seek to construct a permanent solution to this ever-increasing problem (most likely a mid slope retaining wall as identified as a feasible alternative in the design plans).

Implementation Timeline: Initial construction activities will be undertaken within 1 year of adoption of this Plan, depending upon the successful securing of funding through Grant Application(s).

Benefit vs. Cost: The engineer's Estimate for this project is approximately \$100,000.00, and provides an extremely good Benefit vs. Cost estimate. Should the road be further damaged, the water treatment plant would be inaccessible and would drastically affect water quality and availability to the Goleta and Santa Barbara area. Initial grant applications will be to secure funding for construction in accordance with the design and specs. Benefit vs. cost analysis will be further analyzed in the grant application.

Potential Funding Sources: FEMA (401, 404, PDM), CA OES, Capital Budget

Action #: LSD/WDF-2 - **Old San Marcos Road Geotechnical Survey of Slope Stability** - Old San Marcos Road is a well-used local access road that serves residential and commercial needs, as well as is used as an alternative and important transportation route between State Highway 154 and Cathedral Oaks Road and State Route 192. This road is an important route for emergency service vehicles and State Department of Transportation vehicles to maintain and clear (slide) debris from State Highway 154. During the declared Storm Disaster of 1998, this road was the primary access route for maintenance and construction vehicles accessing a large landslide problem. San Marcos Road is also a key fire suppression and maintenance access way and is located in a very high fire threat area. This is an area of reoccurring slope instability, with long stretches of road actively subject to movement.

Priority: High

Objectives Addressed: 5B.D, 5D.A and 5D.B

Coordinating Individual /Organization: Public Works Department - Transportation

Implementation Strategy: In order to better evaluate the problem, the County will undertake Geotechnical Survey of Slope Stability of Old San Marcos Road in order to determine extent of instability, and appropriate long-term solutions. Phase II of this project would implement analysis and findings into a design plan for a permanent fix, and enable the construction phase.

Implementation Timeline: Initial survey activities will be undertaken within 3 years of adoption of this Plan, depending upon the successful securing of funding through Grant Application(s).

Benefit vs. Cost: The benefits of roadway reconstruction, relating to reducing threats to life and safety and protecting against less easily quantifiable secondary impacts, such as disruption of commerce are expected to significantly

exceed the cost of proactively studying and designing mitigation strategies. Having designs in place will put the County in a position to immediately construct mitigation projects when funding becomes available. A more detailed Benefit/Cost analysis will be performed at project development phase.

Potential Funding Sources: FEMA (401, 404, PDM), CA OES, Capital Budget

Action #: LSD-3 - **South County Geotechnical Survey of Slope Stability** - As indicated in subsection 4.3.5.1, there are numerous locations throughout the County where slope stability problems are reoccurring, causing disaster damage to roadways, public safety access issues and potential economic losses from disruption of commerce. In order to better evaluate the problem, the County will undertake Geotechnical Survey of Slope Stability of Existing Roadways in order to determine appropriate long-term solutions.

Priority: High

Objectives Addressed: 5D.A

Coordinating Individual /Organization: Public Works Department - Transportation

Implementation Strategy: Explore strategies to determine cost-effective solutions to recognized geologic erosion hazards affecting County-maintained roadway and structures in the southern half of the County. Particular emphasis will be placed on areas of reoccurring landslides such as those listed in subsection 4.3.5.1. Due to the unique topography and climate in the County, numerous portions of the County-maintained roadway system are within areas that are prone to landslide damage.

Implementation Timeline: Initial Studies will be undertaken within 1 year of adoption of this Plan, dependent upon successful securing of funding through Grant Application(s).

Benefit vs. Cost: The quantifiable cost of roadway reconstruction, potential threats to life and safety and less easily quantifiable secondary impacts on commerce are expected to significantly exceed the cost of proactively studying and designing mitigation strategies for known hazards. Having designs in place will put the County in a position to immediately construct mitigation projects when funding becomes available. A more detailed Benefit/Cost analysis will be performed at project development phase.

Potential Funding Sources: FEMA (401, 404, PDM), CA OES, County Measure D Revenues

Action #: LSD-4 - North County Geotechnical Survey of Slope Stability - As indicated in subsection 4.3.5.1, there are numerous locations throughout the County where slope stability problems are reoccurring, causing disaster damage to roadways, public safety access issues and potential economic losses from disruption of commerce. In order to better evaluate the problem, the County will undertake Geotechnical Survey of Slope Stability of Existing Roadways in order to determine appropriate long-term solutions.

Priority: High

Objectives Addressed: 5D.A

Coordinating Individual /Organization: Public Works Department - Transportation

Implementation Strategy: Explore strategies to determine cost-effective solutions to recognized geologic erosion hazards affecting County-maintained roadway and structures in the southern half of the County. Particular emphasis will be placed on areas of reoccurring landslides such as those listed in subsection 4.3.5.1. Due to the unique topography and climate here in the County, numerous portions of the County-maintained roadway system are within areas that are prone to landslide damage.

Implementation Timeline: Initial Studies will be undertaken within 1 year of adoption of this Plan, depending on the successful procurement of funding through Grant Application(s).

Benefit vs. Cost: The quantifiable cost of roadway reconstruction, potential threats to life and safety and less easily quantifiable secondary impacts on commerce are expected to significantly exceed the cost of proactively studying and designing mitigation strategies for known hazards. Having designs in place will put the County in a position to immediately construct mitigation projects when funding becomes available. A more detailed Benefit/Cost analysis will be performed at project development phase.

Potential Funding Sources: FEMA (401, 404, PDM), CA OES, County Measure D Revenues

Action #: LSD/CE -5 - Goleta Beach Park Embankment Protection for Park Maintenance Facilities High flows are eroding creek banks and threatening facilities. Current top of bank is within three feet of facilities. Facilities are used for ranger residences and park maintenance storage facilities. Evaluate alternative means to protect the facilities either through hard structures or other means and proceed to construction.

Priority: High

Objectives Addressed: 5D.B

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy:

- Identify funding
- Hire Engineering firm to design and permit protection
- Construct protection along approximately 300 linear feet.

Implementation Timeline: 3 years from adoption of plan.

Benefit vs. Cost: Cost is at \$300,000 based on similar past projects. Damage to facilities is expected to significantly exceed that amount if left unmitigated.

Potential Funding Sources: FEMA (401, 404, PDM), General Fund

Action #: LSD/CE-6 - **Goleta Beach Park Pier Abutment Protection** – Where pier connects to land, high storm waves erode the sandy beach area exposing abutments and threatening failure. The County will place revetment around threatened piers. Design will be completed in-house.

Priority: High

Objectives Addressed: 5D.B

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Design project in house, identify funding, seek permits and construct project

Implementation Timeline: 2 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be \$75,000. Should the abutments become entirely eroded and the pier fail the cost would significantly exceed this amount and threaten public safety.

Potential Funding Sources: FEMA (401, 404, PDM), General Fund

Action #: LSD/CE-7 - **Wallace Avenue Bluff Re-Vegetation and Stabilization** – Bluff is eroding during coastal storms and heavy rain events, threatening the public beach access parking lot on the top of the bluff. Portions of the parking lot have already been lost to previous storm events. The County would

like to stabilize the bluff by re-vegetation and relocation inland of the parking lot away from the bluff. Preliminary design has been completed.

Priority: High

Objectives Addressed: 5D.B

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Identify funding, construct retaining wall, relocate parking lot and re-vegetate the bluff.

Implementation Timeline: 2 years from adoption of plan.

Benefit vs. Cost: Cost is estimated to be \$650,000, of which \$150,000 is currently budgeted from residual income from a dissolved community services district. Bluff failure would likely cause losses to the parking lot that would exceed the cost of the project and would present a serious public safety hazard.

Potential Funding Sources: Community Service District Residual Funds, FEMA (401, 404, PDM), General Fund

Action #: LSD/WDF-8 - **Mountainous Road Rockfall Hazard Geotechnical Surveys** - Several mountainous roads within the unincorporated area are frequently used local access roads that serve residential and commercial needs, as well as providing important routes for emergency service vehicles for fire access and other hazard mitigation/response uses. Due to the highly fractured nature of the geologic materials, and the near vertical slope face, these are areas of reoccurring slope instability, with long stretches of road actively subject to movement. In particular, Gibraltar Road, Stagecoach Road, and Painted Cave Road have been identified as highly hazardous areas. There is a history of occasional damage to public property, and endangerment of the traveling public.

Priority: Medium

Objectives Addressed: 5B.D, 5D.A and 5D.B

Coordinating Individual /Organization: Public Works Department - Transportation

Implementation Strategy: In order to better evaluate the problem, the County will undertake Geotechnical Survey of Slope Stability of pre-defined roadway segments in order to determine extent of instability, and appropriate long-term

solutions. Phase II of this project would implement analysis and findings into a design plan for a permanent fix, and enable the construction phase.

Implementation Timeline: Initial study activities will be undertaken within 5 years of adoption of this Plan, depending upon the successful securing of funding through Grant Application(s).

Benefit vs. Cost: After completion of Phase I, preliminary designs will be in place, putting the County in a position to immediately construct mitigation projects when funding becomes available. A more detailed Benefit/Cost analysis will be performed at project development phase.

Potential Funding Sources: FEMA (401, 404, PDM), CA OES, Capital Budget

Action #: LSD/WDF -9 - **Jalama Road Geotechnical Survey of Slope Stability** - Several sections of roadway along this road are showing evidence of continuing failure. This road is the only access point for the Jalama Beach County Park, for several residences, and for nearby farming and ranching operations. This area was severely damaged in the 1995 and 1998 declared disaster storm events. During the summer of 2004 this area experienced significant wildfire activity, demonstrating its need for continued access for fire suppression vehicles. Several areas are in need of stabilization in order to prevent a larger failure during an intense storm event. Such an event could cause a lengthy road closure, adversely impact the public health and safety, and have negative impacts on the local commerce and economy.

Priority: Medium

Objectives Addressed: 5B.D, 5D.A and 5D.B

Coordinating Individual

/Organization: Public Works Department - Transportation

Implementation Strategy: In order to better evaluate the problem, the County will undertake Geotechnical Survey of Slope Stability of pre-defined roadway segments in order to determine extent of instability, and appropriate long-term solutions. Phase II of this project would implement analysis and findings into a design plan for a permanent fix, and enable the construction phase.

Implementation Timeline: Initial survey activities will be undertaken within 4 years of adoption of this Plan, depending upon the successful securing of funding through Grant Application(s).

Benefit vs. Cost: A detailed Benefit/Cost analysis will be performed at project development phase.

Potential Funding Sources: FEMA (401, 404, PDM), CA OES, Capital Budget

Action #: LSD/CE-10 - **Goleta Beach Parking Areas Reinforcement** – During coastal storms high waves and tide action erode beaches, causing sand to be lost to these events. Beach nourishment programs that replace the sand require heavy equipment, which causes strain and damage to parking areas where equipment is stored. Reinforcing the parking areas will allow the pavement to withstand the damage normally caused by construction vehicles during beach nourishment.

Priority: Medium

Objectives Addressed: 5D.B

Coordinating Individual /Organization: Santa Barbara County Parks

Implementation Strategy: Design is in place. Identify funding, obtain permits, construct project.

Implementation Timeline: 2 years from receipt of funding

Benefit vs. Cost: FEMA funded the protection of sand berm in front of park during the 1998 disaster. The cost of the proposed project is approximately \$300,000 and is expected to protect future damage in excess of that amount.

Potential Funding Sources: FEMA (401, 404, PDM), General Fund, Coastal Resources Grant Program (Assembly Bill 1431 – expires next year), California Coastal Conservancy Fund

Action #: CE-11 - **Geotechnical Investigation and Rehabilitation of Beach Access Stairways in Isla Vista** - Several Stairways along the coastal community of Isla Vista that allow public access to the beach have been damaged due to coastal erosion forces, and the salt corrosive environment. Additionally, existing culverts have reached the end of their service lives and are spilling water directly onto the stairways and coastal bluff. Existing culverts will be slip lined to increase their service life which will protect the stairways access points and reduce direct impact on the coastal bluff.

Priority: Medium

Objectives Addressed: 5D.B

Coordinating Individual /Organization: Public Works Department – Transportation

Implementation Strategy: This project will be implemented at the following public coastal beach access points: Escondido Pass, Camino Pescadero, and Camino Del Sur

The following activities will be undertaken to implement this strategy:

- Replace corroded hardware or damaged wood sections of stairways
- Slip line existing culverts to increase their service life and extend their length and/or redirect flow away from stairways and coastal bluffs

Implementation Timeline: Within 3 years of plan adoption.

Benefit vs. Cost: Cost is estimated at approximately \$300,000 which includes slip lining culverts and replacing damaged elements. B/C Unknown.

Potential Funding Sources: Coastal Resource Enhancement Fund Grant, County Measure D Revenues

Action #: TSN/CS-1 - **Re-evaluate Tsunami Hazard Identification and Risk Assessment In Subsequent Updates to this Plan** – The areas of potential maximum Tsunami inundation profiled and mapped as part of Section 4 of this plan were based on a study conducted by NOAA and the USC – Tsunami Research Center. The findings of the study were mapped on 30 meter resolution digital elevation models by CA OES and was intended for evacuation planning purposes only. While the scale of the analysis conducted for this study was intended to provide a relative analysis of exposure, the County would like to spend additional effort to ensure that the geographical extent of the hazard is consistent with a more localized topographic delineation and is consistent with Tsunami inundation research and mapping from City General Plans and other research.

Priority: Medium

Objectives Addressed: 1A, 3D, 4A, and 5E.A

Coordinating Individual /Organization: Planning and Development Department, Public Works Administrative Division (Disaster Recovery Manager) and County Fire – OES

Implementation Strategy: To better analyze actual vulnerability to Tsunami inundation, the County will implement the following activities:

- Identify additional Tsunami studies from existing sources
- Identify additional Tsunami mapping and/or elevation data from other sources
- Conduct a comparison of all data available
- Based on more accurate topography and findings, re-delineate the Tsunami inundation elevation and conduct a GIS spatial analysis to determine the exposure of building and infrastructure in the area

Implementation Timeline: Within 4 years of Adoption

Benefit vs. Cost: Unknown

Potential Funding Sources: Capital Budget

Action #: TSN/CS-2 – **Tsunami Plan Consistency and Outreach** – Santa Barbara County is currently preparing a countywide Tsunami Plan that covers emergency response actions associated with tsunami events. Santa Barbara County receives advisory messages and warnings through an emergency services microwave/computer communications network from Coast and Geodetic Survey Stations. If a seismic wave or tidal disturbance has been observed, the main system at the Honolulu Observatory will transmit warnings to satellite stations including the time of occurrence of the disturbance, the location, verification of tsunami generation, and expected arrival times at various points along the Pacific coast. The County will ensure that the plan is consistent with the relevant goals, objectives and actions outlined in this plan and institute Tsunami/Coastal Storm awareness education activities.

Priority: Medium

Objectives Addressed: 1A, 4A, and 5E.C

Coordinating Individual /Organization: Planning and Development Department, Public Works Administrative Division (Disaster Recovery Manager) and County Fire – OES

Implementation Strategy:

- Incorporate Tsunami Plan findings and recommendations into the next update of this plan
- Develop Tsunami and Coastal Storm Awareness training for citizens and businesses in inundation areas
- Deliver training to targeted audiences of citizens and business owners in inundation areas

Implementation Timeline: Incorporate Tsunami Plan findings within 2 years. Develop outreach plan and materials within two years. Deliver training in year three and annually thereafter.

Benefit vs. Cost: Unknown

Potential Funding Sources: General Fund or Departmental Operating Budgets, CA OES, USC-Tsunami Research Center

Action #: DF-1 – Incorporate Dam inundation Area “Information Only” Layer in FEMA DFIRM Map Modernization Initiative – As noted in Action FLD-2, the County will increase participation in FEMA’s floodplain re-mapping initiative. The basis for a sound floodplain management program is the quality of the risk information upon which development decisions are made. The FEMA FIRMs are the best available depiction of overall flooding risk in the County and the primary tool that citizens and businesses use to make development decisions in floodprone areas. FEMA’s flood map modernization initiative is focused on producing seamless digital flood maps on a countywide basis nationwide. The digital maps will provide a platform from which updated flood data (hydrologic, topographic and hydraulic analysis and coastal storm surge modeling) can be added at a fraction of the cost and time previously required. FEMA Region IX has begun a process of scoping mapping needs in Santa Barbara County. The County will seek an increased role in the remapping process via a Cooperating Technical Partnership (CTP) agreement with FEMA to ensure the accuracy and quality of new countywide mapping. As part of that role, the County will encourage the inclusion of Dam Failure inundation mapping as an “information only” layer on the new DFIRMs.

Priority: High

Objectives Addressed: 2.A, 2.A, 3.B, 4.A, 4.C, 5F.C and 5F.D

Coordinating Individual /Organization: Public Works – Flood Control and Water Conservation District

Implementation Strategy:

- Establish meeting with FEMA Region IX and CA OES
- Obtain conceptual support from FEMA and CA OES for including informational Dam Inundation Layer
- Work with FEMA contractor to incorporate inundation layer through CTP agreement with FEMA

Implementation Timeline: 2 Years

Benefit vs. Cost: Unknown

Potential Funding Sources: FEMA Map Modernization Initiative, Cooperating Technical Partners (CTP) funding.

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5.4 CITY OF BUELLTON

The City of Buellton (Buellton) reviewed a set of hazard maps including detailed critical facility information and localized potential hazard exposure/loss estimates to help identify the top hazards threatening their jurisdiction. In addition, The LPG was supplied with exposure/loss estimates for Buellton summarized in Table 5.4-1. See Section 4.0 for additional details.

**Table 5.4-1
Summary of Potential Hazard-Related Exposure/Loss in Buellton**

		Residential		Commercial		Critical Facilities	
Hazard Type	Exposed Population	Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	15	137	5,224	69	222,600	1	0
Wildfire							
Extreme	0	0	0	0	0	0	0
Very High	1,918	798	88,402	19	43,006	5	11,963
High	1,910	579	81,104	9	28,534	11	28,326
Moderate	0	0	0	0	0	0	0
Earthquake*							
2000 Year	N/A	N/A	3,673	N/A	875	N/A	6,822
500 Year	N/A	N/A	1,351	N/A	437	N/A	0
Landslide							
High	0	0	0	0	0	0	0
Moderate	443	149	22,494	5	11,708	0	0
Dam Failure	2,301	957	103,117	18	40,433	11	26,753

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

**Table 5.4-2
Non-Building Earthquake Loss Estimates in Buellton**

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	266	0	6	5	60	11
500 Year Commercial	137	6	3	79	53	877
2000 Year Residential	641	0	15	10	166	24
2000 Year Commercial	300	14	5	139	87	1,849

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Buellton may anticipate approximately 39 displaced households, with nine requiring short term shelter, in the event of a 500-year earthquake, and 207 displaced households with 48 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Buellton should anticipate 1 injury during a 500-year earthquake and 4 injuries during a 2000-year earthquake.

After reviewing the localized hazard maps and exposure/loss table above, the following hazards were identified by the Buellton LPG as their top five. A brief rationale for each hazard is included.

- Dam Failure – Proximity to local Bradbury Dam. Buellton sits just north of the Santa Ynez River, which is the catch basin for the Bradbury Dam.
- Earthquake – Proximity to local faults. Buellton is located in Seismic Zone 4, highest potential status in the State of California.
- Santa Ynez River/Flash Flooding – Frequent and historical. Buellton sustained flood damage in February 1993 and February 1998. A Local Emergency was declared on February 5, 1998 following substantial storm flooding.
- Landslide – Resulting from flash flooding, earthquake, and/or wildfire.
- Wildfire – Periodic Santa Ana conditions and fuel loads.

5.4.1 Capabilities Assessment

The LPG identified current capabilities available for implementing hazard mitigation activities. The Capability Assessment (Assessment) portion of the jurisdictional mitigation plan identifies administrative, technical, legal and fiscal capabilities. This includes a summary of departments and their responsibilities

to hazard mitigation planning as well as codes, ordinances, and plans already in place associated to hazard mitigation planning. The second part of the Assessment provides Buellton's fiscal capabilities that may be applicable to providing financial resources to implement identified mitigation action items.

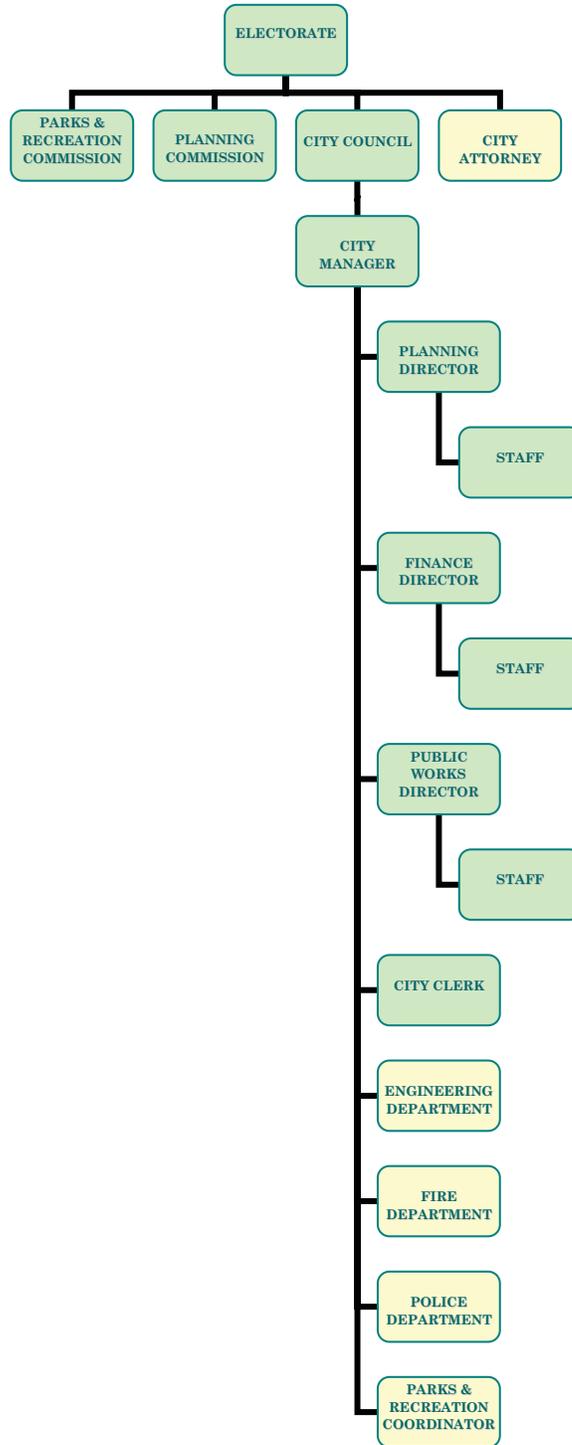
5.4.1.1 Existing Institutions, Plans, Policies and Ordinances

Form of Governance

Buellton utilizes the Council-Manager form of local governance, which includes both elected officials and an appointed City Manager. Buellton has five council members, which includes a mayor and a mayor pro-tem, whom are appointed each calendar year to represent Buellton.

The City Council is Buellton's legislative body, setting policy, approving budgets, and setting tax rates. Members also hire the City Manager, who is responsible for the day-to-day administration of Buellton, and serves as the Council's chief advisor. The City Manager prepares a recommended budget, recruits and hires most of the City's staff, and carries out the council's policies. While the City Manager may recommend policy decisions, he is ultimately bound by the actions of the Council. The Council appoints two additional staff members, the City Attorney and the City Clerk. Buellton's organizational chart is listed below. The **yellow** boxes indicate departments that are contracted labor.

CITY OF BUELLTON ORGANIZATIONAL CHART



Departments involved in activities related to Hazard Mitigation include:

- Fire Protection Services (Buellton contracts with Santa Barbara County for Fire Protection Services)
 - Administration: Develop, implement and monitor policies, procedures, budgets, fees, automatic aid agreements, mutual aid agreements, and liaison with other City departments and outside agencies.
 - Fire Prevention Bureau: Coordinate adoption of codes and ordinances, review site and building plans for fire code compliance, develop and present public education programs and manage Buellton’s weed abatement program.
 - Emergency Medical Services: Manage the department’s paramedic and EMT programs, respond to medical emergencies and other calls for service, provide training and oversight for Buellton’s Public Access Defibrillation (PAD) program and participate with other community and regional health care providers to reduce public illness and injury.
 - Suppression Division: Maintain the department’s personnel, apparatus, equipment and fire stations in a state of readiness to respond to the community’s needs, develop and implement standard operating procedures for various types of emergency responses, respond to all types of emergencies, and train and interact with neighboring jurisdictions and regional agencies.
 - Emergency Management: Coordinate Buellton’s Disaster Preparedness Program, liaison with all City departments and divisions, as well as other public and private organizations, develop, coordinate and implement hazard-specific response plans, and maintain the operational readiness of Buellton’s Emergency Management Team, the E.O.C. and other key elements.
- Building & Safety Department (Buellton contracts with Santa Barbara County for Building & Safety)
 - Coordinate adoption of building, plumbing, electrical, and mechanical codes. Develop building ordinances.
 - Review site and building plans for compliance with building codes and ordinances.
 - Damage assessment of structures from multiple causes to facilitate repair and future occupancy.
- Buellton Planning Department
 - Develop and maintain Buellton’s general plan, zoning ordinances and development standards.
 - Oversee Buellton’s development process assuring compliance with zoning and general plan, and including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions and floodplain development standards.
- Buellton Public Works Department
 - Maintains Buellton’s infrastructure (assets) ranging from streets to parks to buildings and vehicle fleet.

- Responds to Buellton’s emergencies, includes EOC response in disasters and assisting police and fire departments with hazardous materials clean up, traffic and perimeter control efforts, traffic accident clean up and evacuation routing.
- Operates, maintains and enhances both the water distribution and sewer collection systems within Buellton. Also has oversight of solid waste management.
- Responsible for planning and implementation associated with the following plans:
 - 1.1.1 Bradbury Dam Emergency Action Plan
 - 1.1.2 Water Quality Emergency Notification Plan
 - 1.1.3 Water Division Emergency Response Plan
 - 1.1.4 Sewer Overflow Response & Prevention Plan
 - 1.1.5 WTP Operations Plan
- Engineering Department (Buellton contracts with MNS Engineers for Engineering Services).
 - Reviews engineering on private and public grading, floodways, retention basins, transportation infrastructure and structures to assure compliance with Federal, State and local ordinances on seismic and structural stability.
 - Develops engineering ordinances and policies that help protect and preserve Buellton’s infrastructure.
 - Evaluates all circulation elements for projected traffic impacts.
 - Determines needed infrastructure improvements, water system and water/sewer treatment capabilities.
 - Provides response personnel for evaluation of damaged infrastructure and rescue situations.
 - Responds as part of Buellton’s EOC Team.
 - Coordinates other response agencies assisting with damage assessment.
- Police Department (Buellton contracts with Santa Barbara County Sheriff’s Department for Police Services).
 - Responds to safety concerns involving threats and/or damage to life or property. Acts as the enforcement entity for violations of State and local laws and ordinances.
 - Primary emergency responders to acts of civil disobedience and public disorders and terrorism. Support personnel for emergency rescue and management.
 - Investigative services for criminal acts that result in personal injury/death and the destruction of property.
 - Develops and implements emergency response plans and policies, focusing on evacuation procedures and traffic control.
 - Primary responders to acts of terrorism, focusing on suspect intervention and facility and staff protection.

Guiding Community Documents

Buellton has a range of guidance documents and plans for each of its departments. These include a General Plan, with the newly revised 2004 Housing Element, Public Works and Public Utilities Plans, Public Facilities Master Plan, Capital Improvement Plans, Storm Water Management Program, Parks & Recreation Master Plan, Redevelopment Project Guidelines, and Standardized Emergency Management Plan. Buellton uses building codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways Buellton guides its future is through policies laid out in the General Plan.

The General Plan

With the exception of the recently adopted revised Housing Element, the General Plan of Buellton was adopted in 1993. The General Plan consists of seven elements required by the state (Land Use, Circulation, Housing, Safety, Noise, Conservation, and Open Space) and several optional elements that Buellton has elected to adopt (Economic Development, Public Facilities and Services, and Parks & Recreation). There have been minor amendments to the General Plan map in limited areas of Buellton and minor policy amendments over time.

Buellton's General Plan is being comprehensively revised and the Housing Element became the first document to be updated based on the state's priority on resolving affordable housing issues. Buellton's City Council adopted this document on June 10, 2004. The new Housing Element is available in printed form at Buellton's Planning Department and is available for public inspection on Buellton's website. The current General Plan is also viewable on the website. As the General Plan update progresses, printed draft documents will be available at the Planning Department and Buellton's Library and these draft documents will also be viewable on the website.

The current General Plan documents and the General Plan update documents address hazard mitigation concerns. Beyond the adoption of Buellton's new Housing Element, a baseline update report is being prepared along with a master environmental review document, and these documents together will be reviewed by the public, the Planning Commission, the Parks and Recreation Commission, and the City Council, who collectively will go through community visioning exercises, a review of the updates, and finalization of the subject documents. Hazard mitigation and prevention will be a vital part of this effort. The General Plan update will identify weaknesses in the hazard mitigation goals, policies, standards, programs, and implementation measures of the currently adopted General Plan. Additionally, it will incorporate changes that are required as a result of new state and federal laws related to hazard mitigation, as well as integrate best mitigation practices available. As the update effort unfolds, citizen participation will be focused on the subject of hazard mitigation and a greater effort to incorporate mitigation techniques into existing development will be made.

Hazard mitigation planning and implementation will be accomplished in the context of the natural and rural environment surrounding Buellton and within the City limits. Natural habitats on Buellton's edges along the foothills and the Santa Ynez River front, along with Zaca Creek, Thumbelina Creek, and the associated storm drainage system will be considered and enhanced in addition to other natural resources. Preserving open spaces, particularly around floodplains, will reduce and prevent adverse impacts from flooding.

Hazard mitigation planning and implementation will be integrated in the update of the Land Use, Circulation, and Economic Development elements of the General Plan, so that hazard mitigation can help Buellton achieve a more disaster resistant and resilient community.

The General Plan Update will also create a center for hazard mitigation planning and implementation in the Safety Element of the General Plan. Additional hazard mitigation components will be integrated and coordinated throughout the other elements of the Plan as well. Buellton's election to create the optional Public Facilities and Services element and the Parks and Recreation element and their successors will assure a comprehensive implementation of hazard mitigation planning throughout the community.

Zoning and Subdivision Ordinances

The State of California has empowered all cities and counties to adopt zoning ordinances. Buellton's original Zoning Ordinance was adopted on July 22, 1993. This ordinance brought together the Zoning Ordinances of Santa Barbara County (adopted Oct 9, 1934). Buellton is currently operating under the 2000 revision of the original Zoning Ordinance (date of adoption November 2000), reference Buellton Municipal Code Title 19. Buellton adopted a Subdivision Ordinance on November 10, 1994, reference Buellton Municipal Code Title 18.

Since the adoption of the Zoning Ordinance in July 1993, the City Council has amended the Zoning Ordinance in 1995, 1998, 2000, 2002, and 2003. Buellton anticipates some significant changes to the Zoning Ordinance coinciding and/or following the General Plan update.

Buellton has a five member Planning Commission, which is an advisory body to the City Council. The Commission was established under State law to provide relief in special cases where the exact application of the terms of the ordinance would be unduly restrictive and cause a hardship, in addition to generally reviewing zoning and subdivision proposals. The Planning Commission hears and decides upon the interpretation and the application of the provisions of the Zoning and Subdivision Ordinances. Although the Commission has certain discretionary powers in making its decisions, the Commission must always abide by and comply with the powers granted to it by the local Zoning and Subdivision Ordinances and the State's enabling acts. Additionally, the Planning Commission may recommend actions to the City Council and the Planning Commission's actions may be appealed to the City Council.

The Storm Water Management Program

The Storm Water Management Program (SWMP) has been prepared by Buellton's staff members in response to State Water Resources Control Board Water Quality Draft Order No. 2003 – 0005 – DWQ1 (General Permit No. CAS000004) for National Pollutant Discharge Elimination System (NPDES) Phase II. This program covers the incorporated area of Buellton. Although none of the streams in Buellton have been identified as "impaired," Zaca Creek and Thumbelina Creek flow into the Santa Ynez River, which is listed as "impaired" by the State of California for nutrients, salinity (TDS, chlorides) and sedimentation/siltation. Buellton's storm water quality program has been derived from ongoing activities in Buellton and the County of Santa Barbara's non-point source control program (Project Clean Water, "PCW") active in the surrounding area.

The goal of the SWMP is to protect the health of the recreational public and the environment, meet Clean Water Act mandates through compliance with Phase II NPDES Permit requirements and applicable regulations, and to foster heightened public involvement and awareness. Storm drains typically flow into creeks that have already passed through a variety of land uses, including natural, agricultural, urban and

industrial, and often through more than one permit jurisdiction. Buellton is faced with the challenge of requiring and implementing controls to reduce the discharge of pollutants in storm water runoff to the technology-based standard of “Maximum Extent Practicable” (MEP) as required by § 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii).

The County has responsibility for implementing Phase II regulations in the unincorporated areas surrounding Buellton. In addition, the County started PCW in 1998 to address both community concerns regarding water quality in local creeks and the ocean and to address the NPDES regulations. To take advantage of the County’s experience, Buellton has contracted with the County to continue to provide certain storm water quality services. During the initial period of implementation (through FY 2003-04), the program will be managed and staffed by members of Buellton and their contractors, the Santa Barbara County Water Agency (Public Works Department), as well as staff from the Environmental Health Services Division (EHS) of the County Public Health Department. The County’s role is subject to a contract with Buellton and may continue at Buellton’s discretion in subsequent years. Other local agencies may be involved to ensure appropriate implementation of BMPs.

In October 1990, the National Pollutant Discharge Elimination System (NPDES) became the Federal law for regulating storm water runoff to reduce pollution. On October 24, 2003, Buellton implemented its Storm Water Management Program, which outlines design criteria and policies, Buellton standards, and technical specifications for infrastructure development. Per NPDES requirement, Buellton’s SWMP plan has been submitted to the Regional Water Quality Control Board for review and approval. The SWMP plan will receive annual updates and continuing education regarding the Plan will be conducted. Buellton’s Storm Water Management Plan is available on Buellton’s website.

Buellton’s Public Works Department continually maintains its storm water system that is mapped and updated annually. The system has approximately 1.40 miles of open ditch, nearly 6.60 miles of underground pipe and drainage structure as follows: 155 drop inlets/catch basins, 77 manholes, 5 box culverts, and 2 outlet structures (energy dissipaters) throughout Buellton's drainage system.

Building Codes

The State of California has adopted the 2001 California Building Codes, which is enforced in Buellton, through its contracting agency, Santa Barbara County Building & Safety. The California Uniform Statewide Building Code is based on the 1997 Uniform Building Code with State amendments.

Buellton contracts with the County of Santa Barbara (County) and the County’s Inspections Department is principally responsible for enforcing State, City, and County Codes for building residential and commercial structures, enforcing environmental codes and guidelines for maintaining existing structures. In 1999, the County Inspections Department received a rating of "four" for its building code effectiveness in residential and commercial construction from the Insurance Services Office (ISO).

The ISO is an insurer-supported organization that provides advisory insurance underwriting and rating information to insurers. The ISO uses a rating scale of 1 to 10 with 1 to 3 being the highest rating given. The County’s evaluation can be used as a basis for providing rating credits to individual property insurance policies.

Floodplain Management Ordinance

Buellton has a Floodplain Ordinance requiring all habitable floors be built a minimum of two feet above the 100-year floodplain and the special flood hazard areas. However, many parts of Buellton flood due to storm water infrastructure and not because of their proximity to 100-year floodplain.

Buellton sustained flood damage in February 1993 and February 1998 following heavy rain storms. A Local Emergency was declared on February 5, 1998 following substantial storm flooding. Following the 1998 storm, Buellton had significant flooding on La Pita Place, Irelan Drive and Second Street due to an overflowing flood control basin in the area. Thumbelina Creek overflowed its banks onto Kendale Road and there was significant foothill flooding on Via Corona Drive and Calor Drive with two feet of mud in this residential area. Buellton would benefit from a Drainage Study and a Drainage Master Plan to help minimize the effects of flooding following heavy rain storms.

Buellton's Flood Insurance Rate Map (FIRM) numbers are 060331-554C, 555C, 556C, 558C. The FIRM was revised July 7, 1999. They are used by both the public and private sector to determine flood insurance requirements and rates and to administer Buellton's Floodplain Management Ordinance (Title 17, Chapter 17.04 of the Buellton Municipal Code).

Floodplain districts identified in the FIRMs include the following flood hazard zones and definitions:

- **Zone A** is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analysis is not performed for such areas, no Base Flood Elevations or flood hazard factors are determined.
- **Zone AO** is the flood insurance rate zone that corresponds to areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- **Zone A1-A30** is the flood insurance rate zone that corresponds to areas of 100-year flood; base flood elevations and flood hazard factors are determined.
- **Zone B** is the flood insurance rate zone that corresponds to areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
- **Zone C** is the flood insurance rate zone that corresponds to areas of minimal flooding.

SEMS Multi-Hazard Functional Plan

In early September 2004, Buellton submitted its Standardized Emergency Management System (SEMS) Multi-Hazard Functional Plan to the State of California for approval. The Plan discusses mitigation in the form of training and exercises, which are essential at all levels of government to make emergency operations personnel operationally ready. All emergency plans should include provision for training. The objective is to train and educate public officials, emergency response personnel and the public. The best method for training staff to manage emergency operations is through exercises. Exercises are conducted on a regular basis to maintain the readiness of operational procedures. Exercises provide personnel with an opportunity to become thoroughly familiar with the procedures, facilities and systems which will actually be used in emergency situations. There are several forms of exercises:

- Tabletop exercises provide a convenient and low-cost method designed to evaluate policy, plans and procedures and resolve coordination and responsibilities. Such exercises are a good way to see if policies and procedures exist to handle certain issues.
- Functional exercises are designed to test and evaluate the capability of an individual function such as evacuation, medical, communications or public information.
- Full-scale exercises simulate an actual emergency. They typically involve complete emergency management staff and are designed to evaluate the operational capability of the emergency management system.

Mitigation Activities

The Buellton LPG has identified their top five hazards as dam failure, earthquake, Santa Ynez River/Flooding, landslide, and wildfire. In view of those hazards, Buellton has implemented a variety of mitigation measures pertaining to each hazard.

Buellton lies approximately 15 miles west of the Bradbury Dam and sits along the Santa Ynez River. If the dam were to fail, Buellton could sustain substantial flooding via the Santa Ynez River. It has been established that the Bradbury Dam has been mapped for inundation.

Santa Barbara County Officials have indicated that Buellton is located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California. Buellton is aware that its fault lines and liquefaction zones are mapped. Buellton's Public Works Department has examined all structures within the City limits and determined that Buellton has no un-reinforced masonry buildings located within Buellton. All of Buellton's water reservoirs are located underground and following the 6.5 San Simeon Earthquake in December 2003, Buellton's Public Works Department determined that all water reservoirs were unaffected and continued to operate normally.

On July 22, 1993, Buellton adopted a Floodplain Ordinance, (Ordinance No. 17.04). Currently, all flooding areas are mapped and Santa Barbara County is in the process of enhancing the floodplain map. Buellton's Floodplain Ordinance requires all new construction be built at least 200 feet from the top of bank of the Santa Ynez River and all new buildings are constructed 2 feet above the flood zone. When new projects go through Buellton's approval process, the Planning Commission, City Council, and City Engineer ensure the wastewater treatment plant is protected from flooding inundation.

Buellton has never had a hazard involving landslides and has no mitigation activities related to landslides.

Buellton contracts with Santa Barbara County for Fire Protection Services. All high fire zones within Buellton are mapped. The Fire Department, as well as Santa Barbara County Building & Safety requires that all commercial development over 5,000 square feet install indoor sprinklers and use fire resistant building materials. The Fire Department also has a vegetative management program that annually inspects all lots in early spring and advises property owners that all brush must be removed by July 1.

The Santa Barbara County Fire Department works with Buellton's mobile home parks to provide Community Emergency Response Team (CERT) training for the elderly. Early in 2004, Ranch Club

Mobile Estates received grant funding to establish an extensive emergency supplies kit that included, a generator, radios, batteries, flashlights, food, water, and medical supplies.

Buellton's officials continually ensure that future development is sited, designed and constructed in a manner that will reduce future damages associated with natural hazards

GIS, Computer and Communication Technology

Buellton's Engineering Office is in the process of developing a comprehensive GIS system. Currently, parcels, zoning and flood hazards have been mapped, including water, sewer, storm drain, and citywide striping. Hazard layers created for this plan will be incorporated into that system for future planning and updates. The GIS system is somewhat new, and because Buellton has not suffered a major disaster since GIS was installed, Buellton has not had an opportunity to implement the system. In the event it is needed, the GIS system is fully functional and can be used to provide the State of California Office of Emergency Services with preliminary damage assessments.

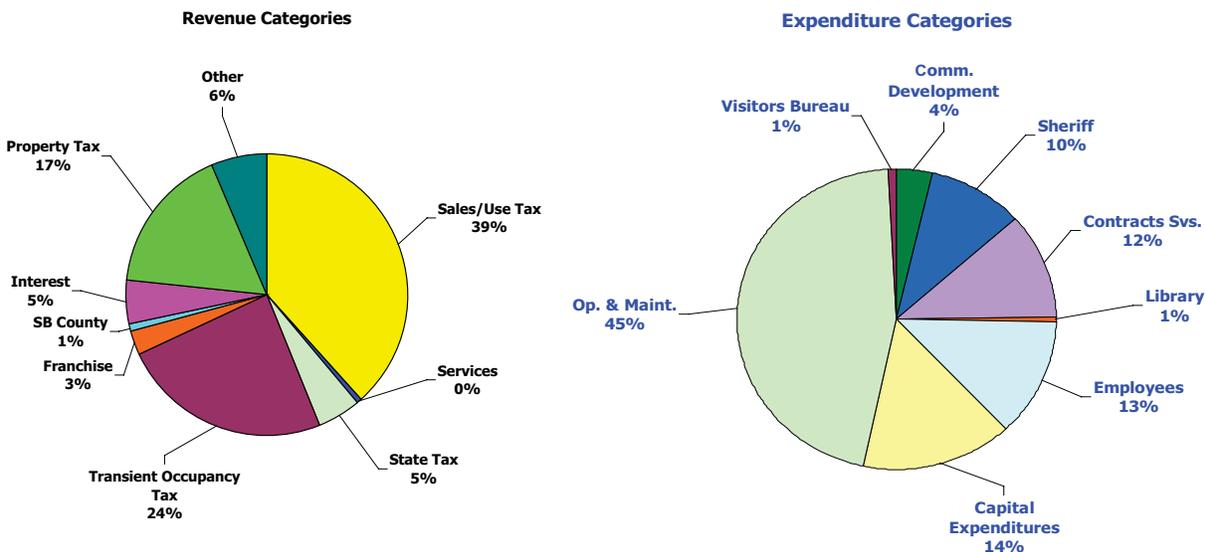
Through the Santa Barbara County Sheriff's Department, Buellton has a fully functional 911 emergency telephone system, dispatch capabilities, and a reverse 911 system to issue warnings in advance of disasters.

Buellton is fully functional on the internet and has its own web site, which will be used to assist with communication necessary for implementation and future updates of this plan.

Financial Resources

Buellton's financial worth has steadily grown over the years. Between 1999 and 2004, general fund revenue was up 14% and revenue from taxes was up 23%. The full value of assessed property has grown 48% since 1999. The Finance Department confirms that Buellton has over 1,760 properties with a total taxable value of approximately \$437,691,439.

The General Fund balance is an important element that can show Buellton's financial strengths or weaknesses. For Fiscal Year 2003-2004 (FY 03-04), Buellton's operating budget has been set at \$11,326,269. The revenue budget for Buellton contains more than 50 line items representing different sources, each governed by a distinct set of conditions particular to that revenue source. The largest revenue factor and the core of the resource base that enables Buellton's provision of community services is the local revenue portion of Buellton's General Fund. Buellton's revenue base is determined by different community conditions such as the current population, employment and income, economic activity within Buellton, and the growth of invested value from residential and commercial construction, business investment in plant and equipment, and demand for local real property. National, State, and regional economic conditions can also affect Buellton's revenue base by creating demand for community goods and services produced within Buellton. The charts below are from Buellton's approved operating budget, which began on July 1, 2004. The chart on the left shows the major revenue categories and percentages of the total budget that Buellton anticipates it will receive from different funding sources. The largest revenue categories are from sales and use tax and transient occupancy tax. The chart on the right shows the major expenditure categories and percentages of the total budget that Buellton anticipates it will spend during FY 04-05. The largest expenditure categories are for operations and maintenance and capital expenditures.



Over the last few years, California’s budget has diminished rapidly due to decreased tax revenues from an economic recession. The overall health of California’s economy has a significant influence on local cities and counties, as local government appropriations are usually the first to have their appropriations diminished due to downturns in the economy.

Buellton’s major economic drivers for its revenue base are from sales tax, transient occupancy tax, population growth, employment, construction, property values, and commercial activities. Buellton will begin to see a deceleration of population growth and construction over the next seven years based on the fact that Buellton is nearly built out. During FY 03-04, Buellton paid off a water department long-term note. Buellton has no outstanding debt.

Buellton’s long-term financial and programmatic policies to be achieved over the next few years demonstrate its dedication to protecting the life and property of Buellton residents and businesses include:

- Continued development of the storm water management system and continued qualitative drainage measures.
- Provide support in public safety to maintain current response time and professionalism, to limit injury, loss of life, and property.

Overall, Buellton has indirectly referenced mitigation and hazard reduction principles throughout many of the aforementioned documents, plans, and policies. Integrating more direct language referencing mitigation and hazard reduction will help to reinforce Buellton’s commitment to these principles. The indirect references can also indicate that the responsibility for hazard reduction is shared among numerous departments within Buellton, making it a challenge to identify a particular department to take the lead in these efforts. To address this potential issue and increase community capabilities globally, the establishment of a formalized Mitigation Advisory Committee is recommended. The Committee should receive official recognition as a working group as soon as it is feasible to begin sharing the responsibilities required to implement Buellton’s mitigation program.

The following is a summary of existing departments in Buellton and their responsibilities related to hazard mitigation planning and implementation, as well as existing planning documents and regulations related to mitigation efforts within the community. The administrative and technical capabilities of Buellton, as shown in Table 5.4-3, provides an identification of the staff, personnel, and department resources available to implement the actions identified in the mitigation section of the Plan. Specific resources reviewed include those involving technical personnel such as planners/engineers with knowledge of land development and land management practices, engineers trained in construction practices related to building and infrastructure, planners and engineers with an understanding of natural or manmade hazards, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community.

**Table 5.4-3
Buellton’s Administrative and Technical Capacity**

Staff/Personnel Resources	Y/N	Department/Agency and Position
A. Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	Planning – Planning Director
B. Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Y	Engineering – City Engineer
C. Planners or Engineer(s) with an understanding of natural and/or manmade hazards	Y	Planning & Engineering – Planning Director/City Engineer
D. Floodplain manager	Y	Engineering – City Engineer
E. Surveyors	Y	Engineering – City Engineer
F. Staff with education or expertise to assess the community's vulnerability to hazards	Y	Fire Department – Director of Public Safety
G. Personnel skilled in GIS and/or HAZUS	Y	Engineering – City Engineer
H. Scientists familiar with the hazards of the community	Y	Consultants
I. Emergency Manager	Y	Fire Department – Director of Public Safety
J. Grant writers	N	

The legal and regulatory capabilities of Buellton are shown in Table 5.4-4, which presents the existing ordinances and codes that affect the physical or built environment of Buellton. Examples of legal and/or regulatory capabilities include building codes, zoning ordinances, subdivision ordinances, special purpose ordinances, growth management ordinances, site plan review, general plans, capital improvement plans, economic development plans, emergency response plans, and real estate disclosure plans.

**Table 5.4-4
Buellton’s Legal and Regulatory Capability**

Regulatory Tools (ordinances, codes, plans)	Local Authority (Y/N)	Does State Prohibit (Y/N)
A. Building code	Y ¹	N
B. Zoning ordinance	Y	N
C. Subdivision ordinance or regulations	Y	N
D. Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	Y ²	N
E. Growth management ordinances (also called “smart growth” or anti-sprawl programs)	Y	N
F. Site plan review requirements	Y	N
G. General or comprehensive plan	Y	N
H. A capital improvements plan	Y ³	N
I. An economic development plan	Y ⁴	N
J. An emergency response plan	Y	N
K. Real estate disclosure requirements	Y	N

- (e.g. county, parish, or regional political entity), ¹Building Code, ²25% slopes, flood plain, smart-growth, ³Storm Drains, ⁴General Plan.

5.4.1.1 Fiscal Resources

Table 5.4-5 shows specific financial and budgetary tools available to Buellton such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water and sewer services; impact fees for developers for new development; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

**Table 5.4-5
Buellton’s Fiscal Capability**

Financial Resources	Accessible or Eligible to Use (Yes/No)
A. Community Development Block Grants (CDBG)	Y
B. Capital improvements project funding	Y
C. Authority to levy taxes for specific purposes	Y – Vote required
D. Fees for water and sewer service	Y
E. Impact fees for developers for new developments/homes	Y
F. Incur debt through general obligation bonds	Y
G. Incur debt through special tax and revenue bonds	Y – Vote required
H. Incur debt through private activity bonds	N
I. Withhold spending in hazard-prone areas	N
J. Other – SANDAG Grant	N
K. Other – Other Grants	N

5.4.2 Goals, Objectives and Actions

After review of the hazard identification and risk assessment and capabilities assessment, the LPG conducted a meeting on September 14, 2004, to discuss the results of the hazard identification and risk assessments, review mitigation goals and alternatives based on the priority areas and hazard types, discuss community strengths and weaknesses, and begin developing the mitigation strategy. The following strengths, weaknesses and priorities were identified.

General Observations — Strengths

- Several policies exist that have hazard mitigation elements or effects such as development and building code regulations, the Floodplain Ordinance, the Zoning Ordinance, the General Plan, and other codes and plans discussed in more detail in this section.
- The General Plan is being updated and will help steer future growth.
- A revised Housing Element was adopted June 10, 2004.
- Existing codes will ensure that new development (including tear down and rebuild projects) will be built to modern standards, including the Floodplain Ordinance, which exceeds minimum standards. With the current trend of replacing existing substandard buildings with new ones, through attrition a safer community will be constructed.
- Housing improvement funds and programs exist, furthering the strength of the preceding statement.
- GIS, communication technology and trained staff are all increasing and will strengthen a mitigation program.

- Better mapping of floodplains and other hazard areas are now available.
- The Bradbury Dam has been mapped for inundation.
- Area fault lines and liquefaction zones have been mapped.
- All flooding areas have been mapped.
- All high fire areas have been mapped.
- Buellton has no unreinforced masonry buildings within the City limits.
- The County Fire Department has a vegetative program whereby all lots are inspected in the spring and property owners are forced to cut vegetation by July 1.
- The County Fire Department has conducted Community Emergency Response Team (CERT) training for senior citizens at the mobile home park.
- Ranch Club Mobile Home Park received grant funding to establish an emergency supplies kit for the mobile home park.

General Observations — Weaknesses

- Because Buellton is located next to the Santa Ynez River, just down stream of the Bradbury Dam, Buellton could sustain substantial flooding in the event of a dam failure.
- Buellton is surrounded by mountains with steep terrain that is covered with brush and trees. During fire season, Buellton is susceptible to wild fire damage.
- Buellton is located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California.
- Evacuation remains an issue, particularly as Buellton and surrounding localities grow. Tourist swell in the summer combined with possible disruption caused by flooding or landslides of major egress and access points is a principal concern.

General Observations — Priorities

During the presentation of findings for the hazard identification and risk assessment and capabilities assessment, the LPG provided preliminary input and ideas for mitigation strategies. In addition, Buellton solidified its goals, which are discussed in more detail in sub-section 5.4.2.1, below. In formulating goals, the following priorities were identified.

- Top priorities for Buellton are public safety, public education, and reducing potential economic impacts of disasters.
- Experiences from past disasters should be built upon.
- Outreach and training should be a major component, to include Community Emergency Response Team Training (CERT) and early warning & evacuation plans.

- Create defensible space around high fire areas by strategically managing vegetation to decrease the fuel available for fires adjacent to the structures. This is relatively inexpensive, accomplished quickly and is effective as long as the vegetation is managed.
- Recent disasters have resulted from flooding. Buellton would benefit from a Drainage Master Plan that would list existing facilities and proposed upgrades. Buellton would also benefit from a drainage study.
- Buellton should develop and maintain a disaster warehouse for storage of emergency supplies.

The goals and objectives were developed by considering the risk assessment findings, localized hazard identification and loss/exposure estimates, and an analysis of the jurisdiction's current capabilities assessment. These preliminary goals, objectives and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities. To help in further development of these goals and objectives, the LPG conducted a meeting on September 14, 2004 and compiled and reviewed current jurisdictional sources including Buellton's planning documents, codes, and ordinances and specifically discussed hazard-related goals, objectives and actions as they related to the overall Plan. Buellton's LPG involved the following members:

Brad Lane, Fire Investigator

Santa Barbara County Fire Protection Services
195 West Hwy. 246 #102
Buellton, CA 93427
(805) 686-8182

Eddie Pond, Deputy/Community Resources Officer

Santa Barbara County Sheriff's Department
P.O. Box 156
Buellton, CA 93427
(805) 686-8150

Ray Severn, Planning Director

City of Buellton
140 West Highway 246
Buellton, CA 93427
(805) 688-7474

Tom Evans, City Engineer

MNS Engineering
201 Industrial Way
Buellton, CA 93427
(805) 688-5200

Bill Callaghan, Assistant City Engineer

MNS Engineering
201 Industrial Way

Buellton, CA 93427
(805) 688-5200

Jeff Thomas, Building Supervisor

Santa Barbara County Building & Safety
195 West Hwy. 246 #104
Buellton, CA 93427
(805) 686-5020

Richard Daulton, Environmental Consultant

Rincon Consultants, Inc.
1530 Monterey Street, Suite D
San Luis Obispo, CA 93401
(805) 547-0900

Bill Albrecht, Public Works Director

City of Buellton
107 West Highway 246
Buellton, CA 93427
(805) 688-5177

Linda Reid, OES Coordinator

City of Buellton
140 West Highway 246
Buellton, CA 93427
(805) 688-7474

A public meeting was held on October 14, 2004, to present preliminary goals, objectives and actions to citizens and to receive public input. Notice of the Hazard Mitigation Plan Public Meeting was issued in the City's newsletter and mailed to all City residents on September 14, 2004. A Notice of Public Meeting was advertised in the Legal Section of the Santa Ynez Valley News on October 7, 2004 and posted in three public locations in Buellton from October 1 through October 14, 2004. Meeting participants included Richard Abrams and Jay McAmis from Santa Barbara County OES. Despite successful advertising efforts, no members of the public attended the meeting. Meeting participants discussed the Hazard Mitigation Plan in general and Buellton's action items as listed below. The following sections present the hazard-related goals, objectives and actions as prepared by Buellton's LPG in conjunction with the Hazard Mitigation Working Group, locally elected officials and City staff.

5.4.1.2 Goals

Buellton has developed the following five (5) Goals for their Hazard Mitigation Plan. Objectives for achieving each goal are discussed in the subsequent section.

Goal 1. Promote public understanding, support and demand for hazard mitigation.

- Goal 2. Improve hazard mitigation coordination and communication with federal, state, county and local governments.
- Goal 3. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to **geological hazards**.
- Goal 4. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to **floods**.
- Goal 5. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to **wildfires**.

5.4.1.3 Objectives

Buellton developed the following broad list of objectives to assist in the achievement of each of its 6 identified goals. For each of these objectives, specific actions were developed that would assist in their implementation. A discussion of the prioritization and implementation of the action items is provided in Section 5.4.2.3.

MITIGATION GOALS AND OBJECTIVES.
Goal 1: Promote public understanding, support and demand for hazard mitigation
<i>Objective 1.A: Educate the public to increase awareness of hazards and opportunities for mitigation actions.</i>
<i>Objective 1.B: Promote hazard mitigation training of all residents to include Community Emergency Response Training (CERT).</i>
<i>Objective 1.C: Monitor and publicize the effectiveness of mitigation actions implemented locally.</i>
<i>Objective 1.D: Discourage activities that exacerbate hazardous conditions.</i>
Goal 2: Improve hazard mitigation coordination and communication with federal, state, county and local governments.
<i>Objective 2.A: Conduct periodic meetings involving the Local Plan Group to update and Revise Buellton’s Hazard Mitigation Plan.</i>
<i>Objective 2.B: Establish and maintain closer working relationships with state agencies, county and local governments.</i>
<i>Objective 2.C: Encourage other organizations to incorporate hazard mitigation activities.</i>
<i>Objective 2.D: Improve Buellton’s capability and efficiency to deal with pre- and post-disaster events.</i>
Goal 3: Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to <u>geological hazards</u>.

MITIGATION GOALS AND OBJECTIVES.
<i>Objective 3.A: Educate the public to increase awareness of hazards and opportunities for mitigation actions.</i>
<i>Objective 3.B: Develop a comprehensive approach to reducing the possibility of damage and losses due to geological hazards.</i>
<i>Objective 3.C: Improve Buellton's capability and efficiency at administering pre- and post-disaster mitigation.</i>
Goal 4: Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to <u>floods</u>.
<i>Objective 4.A: Develop a comprehensive approach to reducing the possibility of damage and losses due to floods (e.g., Prepare Drainage Study and Drainage Master Plan).</i>
<i>Objective 4.B: Coordinate with and support existing efforts to mitigate floods (e.g., US Army Corps of Engineers, US Bureau of Reclamation, and Santa Barbara County Department of Water Resources).</i>
<i>Objective 4.C: Minimize repetitive losses caused by flooding.</i>
<i>Objective 4.D: Address identified data limitations regarding the lack of information about relative vulnerability of assets from floods.</i>
Goal 5: Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to <u>wildfires</u>.
<i>Objective 5.A: Develop a comprehensive approach to reducing the possibility of damage and losses due to wildfires.</i>
<i>Objective 5.B: Coordinate with and support existing efforts to mitigate wildfire hazards.</i>
<i>Objective 5.C: Consult with Santa Barbara County Vegetation Management Department to implement defensible space requirements.</i>

5.4.1.4 Prioritization and Implementation of Action Items

Once the comprehensive list of jurisdictional goals and objectives listed above was developed, proposed mitigation actions were developed and prioritized. This step resulted in a list of acceptable and realistic actions that address the hazards identified in Buellton. This prioritized list of action items was formulated by the Local Plan Group at a meeting on September 14, 2004.

The Disaster Mitigation Action of 2000 (at 44 CFR Parts 201 and 206) requires the development of an action plan that not only includes prioritized actions but one that includes information on how the prioritized actions will be implemented. For each of the strategies developed, the goal and objective(s) addressed are listed. In addition, the description of each measure also includes a priority level, responsible department, implementation strategy, timeframe for implementation, a potential funding source, and a discussion of the strategies benefits and costs. A description of each of these measures is included below:

Priority: For each mitigation measure a priority level of *Very High*, *High*, *Medium*, or *Low* has been assigned. These priority levels have been developed based on input from Committee members, the overall planning consideration of the hazard as assigned in the hazard identification section of this document, the anticipated benefit-cost ratio and consideration of the STAPLE/E criteria.

Coordinating Individual/Organization: The coordinating individual/organization listed for each alternative is tasked with the lead role in all aspects of the implementation of this measure. However, many of the measures identified will require effort and support from other departments. This department is expected to coordinate the efforts of all local departments as well as with additional regional, state, and federal entities that may be involved.

Implementation Strategy: The implementation strategy developed for each measure includes a general description of potential methods that could be utilized or actions that could be taken. Due to the complex nature of a number of these measures, not all of the listed methods will ultimately prove feasible. Before initiating the implementation of each measure, the responsible department should develop a detailed project plan with particular attention to technical feasibility and cost effectiveness.

Timeframe for Implementation: The timeframe for implementation describes the length of time, beginning from the date of plan adoption, when the mitigation measure has been targeted for completion. It should be noted that timeframes listed are goals and can be influenced by many additional factors. Through the development of detailed project plans by the lead agencies, the timeframe will be evaluated and revised when necessary.

Potential Funding Source: For each mitigation measure, potential funding sources are listed. Whenever possible, non-local sources of funding have been identified, including state and federal grants. The sources listed are not intended to represent all possible options, as additional opportunities for funding may be identified during implementation.

Benefit vs. Cost: For each measure a general discussion comparing potential benefits and costs is provided and an anticipated level of cost effectiveness assigned. The levels assigned include *Highly Cost Beneficial*, *Cost Beneficial*, and *Potentially Cost Beneficial*. This discussion is not intended to replace a full benefit cost analysis that should be completed prior to implementation.

All of the strategies identified in the remainder of this section are summarized in a table entitled *Mitigation Implementation Strategy Tracking Table for Buellton*, which can be found in Appendix 5-A.

The prioritized mitigation actions as well as an implementation strategy for each are numbered by heading for GEN (General Mitigation), GEO (Geological), FLD (Flood), and WDF (Wildfire). Proposed actions are listed as follows:

Action #GEN 1: Community Emergency Response Team (CERT) Training

Priority: High

Objectives Addressed: Potentially all.

Coordinating Individual/Organization: Santa Barbara County Fire Department, Emergency Management, and OES Coordinator.

Implementation Strategy: Work with County OES and Santa Barbara County Fire to schedule CERT training courses for Buellton residents. Advertise the training courses in Buellton's newsletter and in the Santa Ynez Valley News. Coordinate with mobile home park managers to ensure all seniors are notified of training courses. Conduct training courses twice a year at different times and locations. CERT is a positive and realistic approach to emergency and disaster situations where citizens may initially be on their own and their actions can make a difference. While people will respond to others in need without the training, one goal of the CERT program is to help them do so effectively and efficiently without placing themselves in unnecessary danger. In the CERT training, citizens learn to manage utilities and put out small fires, treat the three medical killers by opening airways, controlling bleeding, and treating for shock, provide basic medical aid, search for and rescue victims safely, organize themselves and spontaneous volunteers to be effective, and collect disaster intelligence to support first responder efforts.

Implementation Timeline: 2 years

Potential Funding Source: General Fund, State Grants, Santa Barbara County funding.

Benefit v. Cost: Cost Beneficial - The relatively low cost of instituting CERT training and other education programs should easily be offset by damages avoided if only a portion of the community participates in training.

Action #GEN 2: Develop and maintain disaster warehouse for storage of emergency supplies

Priority: High

Objectives Addressed: potentially all.

Coordinating Individual/Organization: Office of Emergency Management, Red Cross, Public Works Department, and OES Coordinator.

Implementation Strategy: Work with the Red Cross to develop and maintain a disaster warehouse for storage of emergency supplies. There are six basic supplies needed for a disaster supply kit, including, water, food, first aid supplies, clothing and bedding, tools and emergency supplies. Special items would include 2-way radios, generators and flares. Additional items could be added as needed.

Implementation Timeline: 1 year

Potential Funding Source: General Fund, State Grants, Santa Barbara County funding.

Benefit v. Cost: Highly Cost Beneficial. The costs of having a warehouse of disaster supplies would prove invaluable in the event of a major disaster and the benefits would outweigh all costs associated with this action.

Action # EQ/DAM 1: Disaster Early Warning and Evacuation Plan in the event of a major earthquake and/or dam failure

Priority: High

Objectives Addressed: 3.A, 3.B, 3.C

Coordinating Individual/Organization: Planning Department, Public Works Department, Fire Department, City Manager, and OES Coordinator.

Implementation Strategy: Explore strategies to develop an early warning/public emergency notification system. Finish development of a comprehensive evacuation plan. Because Buellton is located next to the Santa Ynez River, just down stream of the Bradbury Dam, Buellton could sustain substantial flooding in the event of a dam failure.

Implementation Timeline: 2 years

Potential Funding Source: General Fund, FEMA Grant.

Benefit v. Cost: Highly Cost Beneficial – The relatively low cost of developing an early warning and evacuation plan would easily be off set by injuries and potential loss of life if residents were not immediately informed of a disaster and if no evacuation plans were in place. A disaster early warning plan could include working in conjunction with the Santa Barbara County Sheriff's Department to prepare a database of all phone numbers in Buellton, both residential and commercial so that a reverse 911 system could be used in the event of an emergency. An evacuation plan could be drafted using various scenarios and published in Buellton's newsletter and in the local Santa Ynez Valley News.

Action #WDF 1: Implement Defensible Space Requirement for New Development

Priority: High

Objectives Addressed: 5.A, 5.B and 5.C.

Coordinating Individual/Organization: Fire Department, Planning Department, City Engineer, Santa Barbara County Building & Safety Department

Implementation Strategy: Implement a requirement for appropriate defensible space for new construction. Work with Fire Department to determine appropriate level of defensible space for all new structures depending on the slope and fuel type present.

Implementation Timeline: 2 years.

Potential Funding Source: General Fund.

Benefit vs. Cost: Highly Cost Beneficial – Due to the low cost to implement this measure along with the proven high benefits due to adequate defensible space, this measure can be expected to be cost beneficial.

Action #FLD 1: – Prepare Drainage Study

Priority: Medium

Objective Addressed: 4.A, 4.B and 4.C

Coordinating Individual/Organization: City Engineer, Public Works, County Flood Control, and Flood Consultant.

Implementation Strategy: Prepare a Drainage Study for Buellton that would identify drainage strengths and weaknesses in Buellton and the surrounding areas. The study would show potential vulnerabilities and potential mitigation measures.

Implementation Timeline: 2 years.

Potential Funding Source: General Fund, FEMA Grant

Benefit vs. Cost: Cost Beneficial – This strategy can be cost beneficial. Extreme flooding can cause huge losses and create safety hazards for residents and transient visitors. Preparation of a Drainage Study would identify potential vulnerabilities and subsequently implementing mitigation measures can be expected to produce benefits significantly higher than the cost of a Drainage Study.

Action #FLD 2: – Prepare Drainage Master Plan

Priority: Medium

Objective Addressed: 4.A, 4.B and 4.C

Coordinating Individual/Organization: City Engineer, Public Works, County Flood Control, and Flood Consultant.

Implementation Strategy: Preparation of a Drainage Master Plan would identify existing facilities and potential upgrades and provide the Planning Commission and the City Council with usable guidelines pertaining to drainage prior to granting new project approval. A Drainage Master Plan would also identify potential drainage vulnerabilities and suggest mitigation measures.

Implementation Timeline: 2 years.

Potential Funding Source: General Fund, FEMA Grant

Benefit vs. Cost: Cost beneficial - This strategy can be cost beneficial. Extreme flooding can cause huge losses and create safety hazards for residents and transient visitors. A Drainage Master Plan could identify potential drainage vulnerabilities and suggest mitigation measures that could produce benefits significantly higher than the cost of a Drainage Master Plan

5.5 CITY OF CARPINTERIA

The City of Carpinteria (Carpinteria) reviewed a set of jurisdictional-level hazard maps including detailed critical facility information and localized potential hazard exposure/loss estimates to help identify the top hazards threatening their jurisdiction. In addition, LPG was supplied with exposure/loss estimates for Carpinteria summarized in Table 5.5-1. See Section 4.0 for additional details.

**Table 5.5-1
Summary of Potential Hazard-Related Exposure/Loss in Carpinteria**

Hazard Type	Exposed Population	Residential		Commercial		Critical Facilities	
		Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	2,632	1500	134,200	21	13,900	51	375,275
Wildfire							
Extreme	149	51	8,467			3	12,085
Very High	2,446	725	124,959	6	20,319	4	88,009
High	7,159	1,951	286,428	44	102,491	21	32,782
Moderate	4,325	1,281	232,766	36	61,969	19	154,391
Earthquake*							
2000 Year	N/A	N/A	234,157	N/A	40,324	15	396,567
500 Year	N/A	N/A	98,584	N/A	19,540	15	1,767
Tsunami /Coastal Storm Surge	4,468	1,270	233,880	31	56,742	15	108,596
Landslide							
High	0	0	0	0	0	0	0
Moderate	0	0	0	0	0	0	0
Coastal Erosion	0	0	0	0	0	0	0
Dam Failure	126	42	7,058	0	196	0	0

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

Table 5.5-2

Non-Building Earthquake Loss Estimates in Carpinteria

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	18,958	0	373	375	6,042	877
500 Year Commercial	6,682	279	107	3,892	2,041	1,841
2000 Year Residential	39,484	0	815	790	14,006	1,849
2000 Year Commercial	14,390	591	171	7,024	3,414	3,693

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Carpinteria may anticipate approximately 320 displaced households, with 81 requiring short term shelter, in the event of a 500-year earthquake, and 1047 displaced households with 262 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Carpinteria should anticipate 75 injuries and two deaths during a 500-year earthquake and 227 injuries and seven deaths during a 2000-year earthquake.

After reviewing the localized hazard maps and exposure/loss table above, the following hazards were identified by the Carpinteria LPG as their top five hazards. A brief rationale for including each of these is included.

5.5.1 Capabilities Assessment

FORTHCOMING

5.5.1.1 Existing Institutions, Plans, Policies and Ordinances

FORTHCOMING

5.5.1.2 Fiscal Resources

FORTHCOMING

5.5.2 Goals, Objectives and Actions

FORTHCOMING

5.5.2.1 Goals

FORTHCOMING

5.5.2.2 Objectives

FORTHCOMING

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5.6 CITY OF GOLETA

The City of Goleta (Goleta) reviewed a set of county wide hazard maps including detailed critical facility information and localized potential hazard exposure/loss estimates to help identify the top hazards threatening the City. In addition, the Local Planning Group (LPG) was supplied with exposure/loss estimates for Goleta summarized in Table 5.6-1. See Section 4.0 for additional details.

**Table 5.6-1
Summary of Potential Hazard-Related Exposure/Loss in Goleta**

Hazard Type	Exposed Population	Residential		Commercial		Critical Facilities	
		Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	4,114	576**	51,400	313	320,200	76	345,605
Wildfire							
Extreme							
Very High							
High	14,808	3,850	736,034	154	324,703	34	87,242
Moderate	15,045	4,210	784,774	119	261,903	43	215,484
Earthquake*							
2000 Year	N/A	N/A	561,226	N/A	108,380	33	998,602
500 Year	N/A	N/A	237,759	N/A	60,458	33	16,582
Tsunami /Coastal Storm Surge	7,633	1,364	329,935	168	315,322	20	41,053
Landslide							
High	0	0	0	0	0	0	0
Moderate	0	0	0	0	0	0	0
Coastal Erosion	0	0	0	0	0	0	0
Dam Failure	42	14	2,339	2	5,289	3	3,390

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

** Data modified based on City records (still need distribution between residential and commercial if this is a total number)

**Table 5.6-2
Non-Building Earthquake Loss Estimates in Goleta**

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	47,342	0	903	785	12,155	1,841
500 Year Commercial	20,720	618	407	12,106	6,514	0
2000 Year Residential	95,719	0	1,988	1,575	28,052	3,693
2000 Year Commercial	39,157	1,154	605	19,465	9,949	0

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Goleta may anticipate approximately 551 displaced households, with 129 requiring short term shelter, in the event of a 500-year earthquake, and 1,874 displaced households with 429 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Goleta should anticipate 185 injuries and five deaths during a 500-year earthquake and 505 injuries and 14 deaths during a 2000-year earthquake.

After reviewing the localized hazard maps and exposure/loss table above, the following hazards were identified by the Goleta LPG as their top four.

- **Flooding**
- **Earthquake**
- **Wildfire**
- **Coastal Surge/Tsunami**

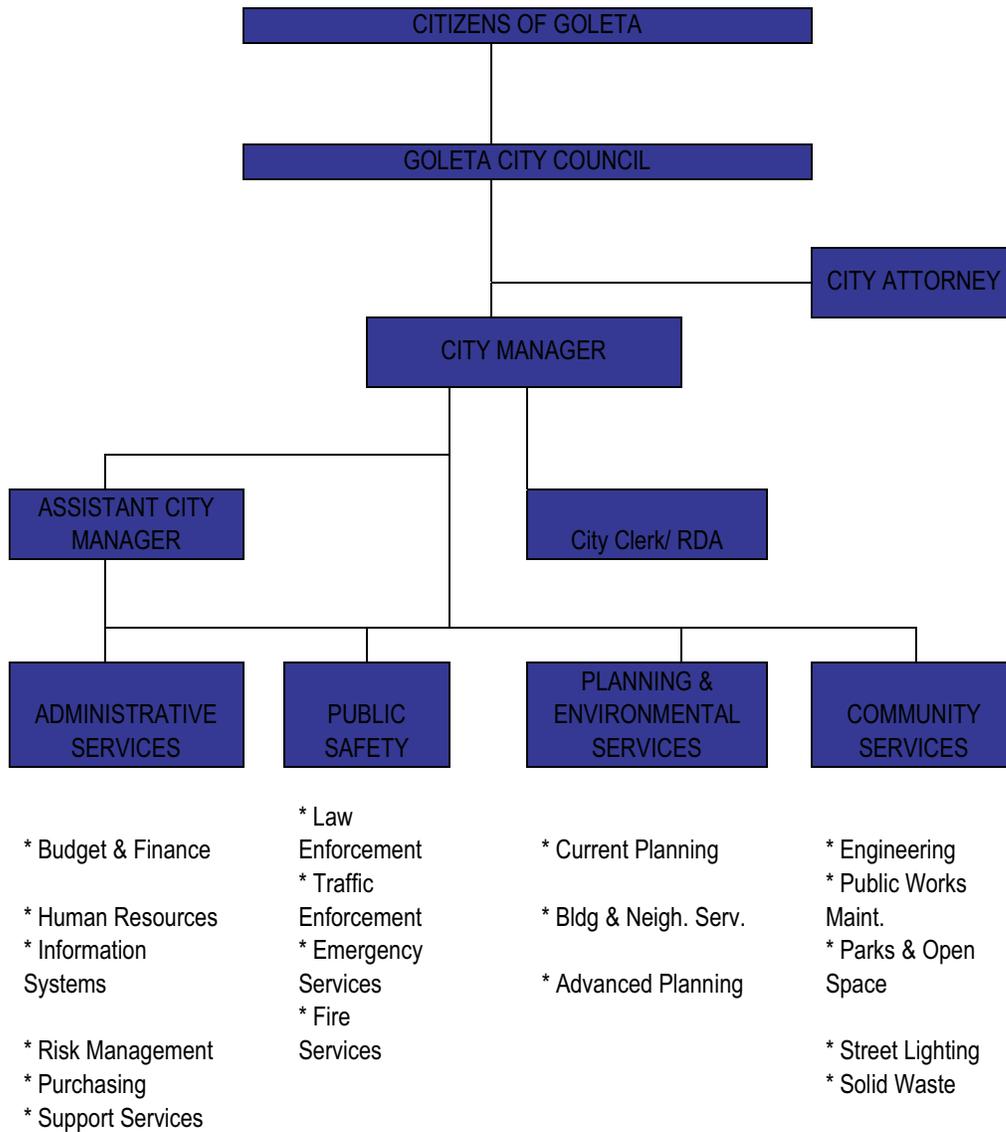
5.6.1 Capabilities Assessment

The LPG identified current capabilities available for implementing hazard mitigation activities. The Capability Assessment (Assessment) portion of the jurisdictional mitigation plan identifies administrative, technical, legal and fiscal capabilities. This includes a summary of departments and their responsibilities associated to hazard mitigation planning as well as codes, ordinances, and plans already in place associated with hazard mitigation planning. The second part of the Assessment provides Goleta’s fiscal capabilities that may be applicable to providing financial resources to implement identified mitigation action items. Goleta was incorporated as a City in February of 2002. For that reason, it is still in the development phase for several key plans, documents and administrative functions. This provides a unique

opportunity to incorporate hazard loss reduction policies into planning documents and developing programs.

5.6.1.1 Existing Institutions, Plans, Policies and Ordinances

The following is a summary of existing departments in Goleta and their responsibilities related to hazard mitigation planning and implementation, as well as existing planning documents and regulations related to mitigation efforts within the community. The administrative and technical capabilities of Goleta, as shown in Table 5.6-3, provides an identification of the staff, personnel, and department resources available to implement the actions identified in the mitigation section of the Plan. Specific resources reviewed include those involving technical personnel such as planners/engineers with knowledge of land development and land management practices, engineers trained in construction practices related to building and infrastructure, planners and engineers with an understanding of natural, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community. The organizational chart below presents the structure of the City's government



Goleta City Council/Redevelopment Agency Board

- Provides vision, adopts policies and regulations, and approves funding requests/budgets over all aspects of City government
- Redevelopment Agency provides vision, adopts policies and facilitates programs focused on the Old Town area, which is one of the more flood prone areas in Goleta and is subject to other hazards.

Goleta City Manager’s Office (Office of Emergency Services)

- Provides the leadership and supervision that, in turn, implements the policies and decisions of the Goleta City Council, thereby ensuring the delivery of services to the community.

- City Manager serves as OEM Director. As noted above, Goleta is a new city in the process of developing plans and programs including emergency response/management plans. The City Manager’s office will be responsible for the implementation of emergency management (including mitigation) programs for the City. Currently Police and Fire Services are contracted through the County. The Manager oversees those contracts.
- The City Grant’s writer is housed in the Manager’s office.

Goleta Administrative Services Department

The finance division will have a role in the implementation of the actions identified in this plan:

Provides services associated with cost tracking and financial management of Grant Funded and other capital improvement projects.

Assures all aspects of City financing, funding, and expenditures are within legal, prescribed guidelines and regulations. The Department tracks and audits expenditures.

City of Goleta Planning and Environmental Services Department (includes Building Inspection and GIS)

- The Department is in the process of developing the City’s general plan.
- Guides the physical development of the City through the implementation of the General Plan (under development) and Building Codes and is committed to enhancing the quality of life in the community by planning for sound infrastructure and public services, protecting the environment, and promoting high quality social and economic growth.
- Enforces County Code that Goleta adopted. Zoning, Municipal Code (brush removal, building regulations, fire prevention, flood management, development along watercourses, oil and petroleum wells,)
- Regulates land uses and land development in accordance with plans, policies, and regulations adopted by the City Council. Enforces local, State, and federal requirements for land development, building construction, and specific uses. Recommends additions and revisions to existing ordinances, plans, and policies when necessary.

City of Goleta Community Services Department (Public Works/Engineering/Parks and Open Space Maintenance)

- Enforces Floodplain Management Ordinance
- Oversee flood control and infrastructure development and improvement projects
- Provides a variety of engineering services including the review and inspection of privately constructed public facilities, infrastructure, and subdivisions; design and inspection of publicly funded infrastructure improvements; management and monitoring of existing and projected traffic conditions throughout the City; preparation of the City’s long-term Capital Improvement Program. Engineering also provides fiscal management for the City’s Parks and Open Space Maintenance, Community Facility Districts, and Development Impact Fees (currently only transportation impact).

- Implements and enforces programs, plans, policies, and regulations over land development and redevelopment in order to assure adequate and maintainable infrastructure.
- Community Services Department, Public Works Operations is a first responder in disaster emergencies.

City of Goleta Public Safety - Police Services (Currently contract with County Sheriff)

- Protects the community through the enforcement of laws and the analysis/reduction/elimination of risks and, in times of emergency, provides for the orderly and rapid implementation of emergency plans.
- Implements and/or enforces programs, plans, ordinances, and policies of the City over a wide range of activities related to law enforcement. The Police Department is a first responder in natural and manmade emergencies.

City of Goleta Public Safety - Fire Services (Currently contract with County Fire Department)

- Serves and safeguards the community through a professional, efficient and effective system of services, which protect life, environment, and property.
- Implements programs, policies, and regulations over a wide range to reduce the loss of life, environment, and property. The Fire Department is a first responder in natural and manmade emergencies.

**Table 5.6-3
City of Goleta: Administrative and Technical Capacity**

Staff/Personnel Resources	Y/N	Department/Agency and Position
A. Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	Planning & Environmental Services./ All Staff Community Services Dept./ City Engineer and Principal Civil
B. Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Y	Community Services Dept./ City Engineer and Principal Civil Planning & Environmental Services/ Chief of Building and Zoning and Building Staff
C. Planners or Engineer(s) with an understanding of natural hazards	Y	Community Services Dept./ City Engineer and Principal Civil Planning & Environmental Services/ Chief of Building and Zoning and Building Staff
D. Floodplain manager	Y	Community Services Dept./ City Engineer
E. Surveyors	Y	Contract Services w/ County Surveyor's Office

Staff/Personnel Resources	Y/N	Department/Agency and Position
F. Staff with education or expertise to assess the community's vulnerability to hazards	Y	Community Services Dept./ City Engineer and Principal Civil Engineer Planning & Environmental Services/ Chief of Building and Zoning and Building Staff
G. Personnel skilled in GIS	Y	Planning & Environmental Services/General Plan Manager
H. Scientists familiar with the hazards of the community	N	
I. Emergency manager	Y	City Manager
J. Grant writers	Y	City Manager's Office/Admin. Asst.

The legal and regulatory capabilities of Goleta are shown in Table 5.6-4, which presents the existing ordinances and codes that affect the physical or built environment of Goleta. Examples of legal and/or regulatory capabilities can include: the City's building codes, zoning ordinances, subdivision ordinances, special purpose ordinances, growth management ordinances, site plan review, general plans, capital improvement plans, economic development plans, emergency response plans, and real estate disclosure requirements.

**Table 5.6-4
City of Goleta: Legal and Regulatory Capability**

Regulatory Tools (ordinances, codes, plans)	Local Authority (Y/N)	Does State Prohibit? (Y/N)
A. Building code	Y	N
B. Zoning ordinance	Y	N
C. Subdivision ordinance or regulations	Y	N
D. Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	Y	N
E. Growth management ordinances (also called "smart growth" or anti-sprawl programs)	Y	N
F. Site plan review requirements	Y	N
G. General or comprehensive plan	N*	N
H. A capital improvements plan	N*	N
I. An economic development plan	N	N
J. An emergency response plan (Fire, O/G Facilities)	Y**	N
K. A post-disaster recovery plan	N	N
L. A post-disaster recovery ordinance	N	N
M. Real estate disclosure requirements (floodplain, airport/noise, contaminated sites)	Y	N

*currently under development **for specific incidents/facilities not overall plan

5.6.1.2 Fiscal Resources

Table 5.6-5 shows specific financial and budgetary tools available to Goleta such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; impact fees for homebuyers or developers for new development; ability to incur debt through general obligations bonds and others.

Goleta’s FY 2003-2004 General Fund budget increased over last fiscal year’s budget. The Fiscal Year 2003-2004 General Fund budget included over \$12 million for General Government, Administrative Services, Public Safety Planning and Environmental Services and Community Services. The General Fund balance is an important element that can show Goleta’s financial strength.

**Table 5.6-5
City of Goleta: Fiscal Capability**

Financial Resources	Accessible or Eligible to Use
A. Community Development Block Grants (CDBG)	Yes
B. Capital improvements project funding	Yes - With Council approval
C. Authority to levy taxes for specific purposes	Yes - With 2/3 voter approval
D. Fees for water, sewer, gas, or electric service	No – Provided by Special Districts
E. Impact fees for homebuyers or developers for new developments/homes	Yes
F. Incur debt through general obligation bonds	Yes - With 2/3 voter approval
G. Incur debt through special tax and revenue bonds	Yes - With 2/3 voter approval
H. Other – Other Grants	Yes

5.6.2 Goals, Objectives and Actions

Listed below (and in subsection 5.6.2.1, 5.6.2.2 and 5.6.2.3) are Goleta’s specific hazard mitigation goals, objectives and related mitigation strategies. In subsection 5.6.2.2, for each goal, one or more objectives have been identified. Subsection 5.6.2.3 includes mitigation strategies, projects and actions to meet the goals and objectives. Where appropriate, the City has identified a range of specific actions to achieve the objective and goal.

The goals and objectives were developed by considering the risk assessment findings, localized hazard identification and loss/exposure estimates, and an analysis of the jurisdiction’s current capabilities assessment. These preliminary goals, objectives and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities. To help in further development of these goals and objectives, the LPG compiled and reviewed current jurisdictional sources including the City’s planning documents, codes, and ordinances. In addition, City representatives met with consultant staff to specifically discuss these hazard-related goals, objectives and actions as they related to the overall multi-jurisdictional plan. Some mitigation strategies, particularly flood control projects coincide with projects of the County Public Works Department’s Flood Control District and will be completed in cooperation.

Representatives of numerous City departments involved in hazard mitigation planning and serving on the LPG include the following:

- Steve Wagner, Director of Community Services
- Kimberly Nilsson, Contract Engineer
- Marti Schultz, Principal Civil Engineer
- Patrick Dugan, General Plan Manager
- Patricia Miller, Planning Manager
- Outside consultation from County PW – Flood Control and County Surveyor’s Office
- Outside consultation from County OES

City staff presented the need for a LPG and consultant to participate in the multi-jurisdictional plan to the City Council. Public meetings, in conjunction with the Santa Barbara County MAC were held throughout the County to present preliminary goals, objectives and actions to citizens and to receive public input. At these meetings, specific consideration was given to hazard identification/profiles and the vulnerability assessment results (See Section 3 for additional information). Separate Council public hearings were held (place holder for future hearing(s)) prior to adoption on (Placeholder).

The following sections present the hazard-related goals, objectives and actions as prepared by Goleta’s LPG in conjunction with the MAC and in support of the Goals and Objective found in the draft Safety Element of the Goleta General Plan.

5.6.2.1 Goals and Objectives

Goleta’s goals and objectives are similar in many ways to those of the unincorporated County. However, they consider the hazards selected for priority action and the uniqueness of Goleta as a new city. They also place a strong emphasis on the development of plans and policies. The City of Goleta has developed the following 5 Goals for their Hazard Mitigation Plan.

- Goal 1. Promote disaster-resistant future development by incorporating hazard loss reduction policies into developing plans and programs.
- Goal 2. Increase awareness of vulnerability to hazards and mitigation options through education and participation in initiatives that promote responsible property owner actions.
- Goal 3. Build and support local capacity and commitment to continuously become less vulnerable to hazards.
- Goal 4. Improve coordination and communication with federal, state and county governments, leading to successful collaboration on mutually beneficial projects.

- Goal 5. Reduce future damage and losses to existing assets, including residences, business, critical facilities and infrastructure and people due to, flood, earthquake, wildfire and coastal surge/Tsunami

The City of Goleta developed the following broad list of objectives to assist in the implementation of each of their 5 identified goals. To assist in meeting each of these objectives, specific actions, or mitigation strategies were developed. A discussion of the prioritization and implementation of the actions is provided in Section 5.6.2.2.

Goal 1: Promote disaster-resistant future development by incorporating hazard loss reduction policies into developing plans and programs.
<i>Objective 1.A: Develop and update the general plans and zoning ordinances, other plans and codes to include consideration of natural hazards</i>
<i>Objective 1.B: Develop emergency response capabilities for all hazards</i>
<i>Objective 1.C: Revise current ordinances when appropriate to require more restrictive standards in high hazard areas</i>

Goal 2: Increase awareness of vulnerability to hazards and mitigation options through education and participation in initiatives that promote responsible property owner actions.
<i>Objective 2.A: Educate the public to increase awareness of hazards and opportunities for mitigation actions.</i>
<i>Objective 2.B: Promote hazard mitigation in the business community.</i>
<i>Objective 2.C: Monitor and publicize the effectiveness of mitigation actions implemented.</i>
<i>Objective 2.D: Promote partnerships between the state, county and local governments to identify, prioritize, and implement mitigation actions.</i>
<i>Objective 2.E: Explore incentives for safe development.</i>

Goal 3: Build and support local capacity and commitment to continuously become less vulnerable to hazards
<i>Objective 3.A: Increase awareness and knowledge of hazard mitigation principles and practice among local officials.</i>
<i>Objective 3.B: Address data limitations identified in Hazard Profiling and Risk Assessment</i>
<i>Objective 3.C: Continuously improve the City’s capability and efficiency at administering pre- and post-disaster mitigation.</i>
<i>Objective 3.D: Record, collect, and maintain comprehensive list of hazard related data.</i>

<p>Goal 4: Improve coordination and communication with federal, state and County governments, leading to successful collaboration on mutually beneficial projects.</p>
<p><i>Objective 4.A: Establish and maintain close working relationships with state, county and federal governments.</i></p>
<p><i>Objective 4.B: Participate in initiatives and projects that have mutual hazard mitigation benefits for the county and city.</i></p>
<p><i>Objective 4.C: Coordinate recovery activities while restoring and maintaining public services.</i></p>

<p>Goal 5: Reduce future damage and losses to existing assets, including residences, business, critical facilities and infrastructure and people due to, flood, earthquake, wildfire and coastal surge/Tsunami</p>
<p><i>Objective 5.A: Develop a comprehensive approach to reducing the possibility of damage and losses due to natural hazards.</i></p>
<p><i>Objective 5.B: Decrease the vulnerability of public infrastructure including facilities, roadways, and utilities to damage from the selected hazards</i></p>
<p><i>Objective 5.C: Protect existing assets with the highest relative vulnerability to the effects of the selected hazards</i></p>
<p><i>Objective 5.D: Protect the Citizens of Goleta from threats that will result from natural hazards</i></p>
<p><i>Objective 5.E: Obtain better information on highest risk critical facilities</i></p>
<p><i>Objective 5.F: Address identified data limitations regarding the lack of information about the relative vulnerability of assets from tsunamis</i></p>
<p><i>Objective 5.G: Consider dam failure inundation areas in policies and actions related to reducing flood damage</i></p>

5.6.2.2 Prioritization and Implementation of Mitigation Actions

Once the comprehensive list of jurisdictional goals and objectives listed above was developed, mitigation actions were developed by the LPG and prioritized. This step resulted in a list of acceptable and realistic actions that address the hazards identified in Goleta. This prioritized list of action items was formed by the LPG and consultants weighing STAPLE/E criteria.

The Disaster Mitigation Action of 2000 (at 44 CFR Parts 201 and 206) requires the development of an action plan that not only includes prioritized actions but one that includes information on how the prioritized actions will be implemented. For each of the strategies developed, the goal and objective(s)

addressed are listed. In addition, the description of each measure also includes a priority level, responsible department, implementation strategy, timeframe for implementation, a potential funding source, and a discussion of the strategies benefits and costs. A description of each of these measures is included below:

Priority: For each mitigation measure a priority level of *Very High, High, Medium, or Low* has been assigned. These priority levels have been developed based on input from LPG members, the overall planning consideration of the hazard as assigned in the hazard identification section of this document, the anticipated benefit-cost ratio and consideration of the STAPLE/E criteria.

Coordinating Individual/Organization: The coordinating individual/organization listed for each alternative is tasked with the lead role in all aspects of the implementation of this measure. However, many of the measures identified will require effort and support from other departments. This department is expected to coordinate the efforts of all local departments as well as with additional regional, state, and federal entities that may be involved.

Implementation Strategy: The implementation strategy developed for each measure includes a general description of potential methods that could be utilized or actions that could be taken. Due to the complex nature of a number of these measures, not all of the listed methods will ultimately prove feasible. Before initiating the implementation of each measure, the responsible department should develop a detailed project plan with particular attention to technical feasibility and cost effectiveness.

Timeframe for Implementation: The timeframe for implementation describes the length of time, beginning from the date of plan adoption, when the mitigation measure has been targeted for completion. It should be noted that timeframes listed are goals and can be influenced by many additional factors. Through the development of detailed project plans by the lead agencies, the timeframe will be evaluated and revised when necessary.

Potential Funding Source: For each mitigation measure, potential funding sources are listed. Whenever possible, non-local sources of funding have been identified, including state and federal grants. The sources listed are not intended to represent all possible options, as additional opportunities for funding may be identified during implementation.

Benefit vs. Cost: For each measure a general discussion comparing potential benefits and costs is provided. For many of the projects, cost effectiveness is unknown. This discussion is not intended to replace a benefit cost analysis that should be completed prior to implementation.

All of the strategies identified in the remainder of this section are summarized in a table entitled *Mitigation Implementation Strategy Tracking Table*, which can be found in Appendix 5-A.

The prioritized mitigation actions as well as an implementation strategy for each are numbered by heading as follows:

- GEN (General Mitigation – or multiple hazards)
- FLD (Flooding, Dam Failure Inundation and Other Water Hazards)
- EQ (Earthquake)
- WDF (Wildfire)
- TSN/CS (Tsunami/Coastal Storm)

Proposed mitigation actions or strategies are listed and prioritized as follows:

Action #: GEN-1- Increase GIS Capabilities and Hazard Related Applications and Support Santa Barbara County’s Multi-Hazard Disaster Management Information System - As noted in Section 5.3, the County is developing a GIS system for managing information related to hazards. Goleta would like to expand its GIS capability and capacity to feed data related to vulnerability analysis and mapping, future disaster damage and mitigation projects into the County’s system. By enhancing GIS capabilities, Goleta will also be better positioned to use applications such as FEMA’s HAZUS software during updates to this plan. The system envisioned would be the basis of monitoring progress, updating and continuously improving the quality of this document.

Priority: Very High

Objectives Addressed: 2.C, 2.D, 3.C, 3.A, 3.B, 3.C, 3.D and 4.A

Coordinating Individual /Organization: Planning and Environmental Services Department and Community Services Department, in coordination with SBC Public Works

Implementation Strategy: The following activities will be conducted to develop, implement and maintain the system:

- Procure the appropriate hardware and software needed to design and implement the system
- Identify dedicated staff and associated funding
- Establish inter-departmental committee to design the scope of the system
- Coordinate with the county to identify ways to develop parallel systems in a way that Goleta’s system could eventually feed the county system for a centralized disaster data clearinghouse
- Design web-based interface application that would be made available to county and city users.
- Develop a brief data stewardship plan
- Identify potential integration (multi-beneficial uses) between the system and HAZUS and DFRIM production for map modernization

Implementation Timeline: Develop system within 2 years of adoption of this plan (funding dependent). Maintenance and use are ongoing and require annual funding needs.

Benefits vs. Cost: Total start-up costs are estimated at \$20,000 for hardware, software and training of existing staff. Annual maintenance costs of approximately \$5000 are expected. B/C ratio is currently unknown.

Potential Funding Sources: University of California, Santa Barbara Campus (UCSB) geography interns, General Fund, Government Accountability Statement Board, Document 34 (GASB-34), DHS, Homeland Security Grants, DHS-FEMA, Fire Grants and Mitigation programs (e.g. PDM-Planning)

Action #: GEN-2 – **Comprehensive Emergency Response Plan** – Goleta currently has response plans for specific events or hazards. Many of the plans were developed by the county or others before Goleta incorporated. Goleta would like to establish a Comprehensive Emergency Response Plan that Considers all natural and man made hazards within the City’s limits.

Priority: Very High

Objectives Addressed: 1B

Coordinating Individual /Organization: City Manager’s Office (OES) Planning and Environmental Services Department, Community Services Department

Implementation Strategy:

- Identify funding
- Review scope of all existing plans
- Review comprehensive response plans from other communities
- Bring stakeholders onto committee
- Develop plan using public process and adopt

Implementation Timeline: 5 Years

Benefit vs. Cost: Estimated Cost is \$100,000. Although response is different than mitigation, the ability to respond in a timely and effective manner can save lives and prevent additional property damage during events.

Potential Funding Sources: Department of Homeland Security grants, FEMA, PDM-Planning, General Funds

Action #: GEN-3 – **Obtain better data on the impacts of hazards on future development** – Goleta is in the process of developing plans and policies that will shape its future growth. Between now and the next required update of the plan, the City will analyze, based on the General Plan and other documents, where growth is expected to occur in relation to profiled hazard threats.

Priority: High

Objectives Addressed: 1.A, 3.B, and 3.C

Coordinating Individual /Organization: Planning and Environmental Services Department

Implementation Strategy:

- Form a committee led by Planning and Environmental Services to identify areas where growth and development can be expected in the next 5 years based on existing plans, ordinances and codes.
- Overlay anticipated growth areas with hazard profile mapping to generally analyze potential future exposure to each hazard in terms of population, buildings and infrastructure.

Implementation Timeline: 5 Years

Benefit vs. Cost: N/A

Potential Funding Sources: Departmental Budgets

Action #: GEN- 4 – **Voluntary Critical Facility Audits:** The City will conduct voluntary audits of critical facilities identified in Section 4, within the City limits of Goleta, that are in the most vulnerable profiled areas for Earthquake and Flooding (including dam failure inundation areas) to assess specific vulnerability to the hazards and develop recommendations for possible mitigation measures. The audits will be conducted first at critical facilities with a history of damage, and may be expanded to include all critical facilities.

Priority: Medium

Objective Addressed: 2.A, 2.B, 3.D, 5.B, 5.C, 5.E, 5.G

Responsible Department: Community Services Department

Implementation Strategy:

- Develop materials explaining the purpose of the voluntary program and solicit appointments

- Visit facilities with flood control experts and engineers and building science expert
- Develop a site specific list of potential mitigation measures
- Develop a pre-flood and pre-earthquake preparation check list for each facility
- Provide information on grant programs for addressing mitigation projects

Timeframe for Implementation: 3 years

Benefit vs. Cost: Undetermined

Potential Funding Source: Community Services Department budget for Audits, potential assistance from USGS, US Army Corp of Engineers and State OES for audits. DHS/FEMA Pre-Disaster Mitigation, Hazard Mitigation Grant Program and Flood Mitigation Assistance program for implementing recommended mitigation measures.

Action #: GEN- 5 – **Development Impact Fee Incorporation of Mitigation Projects** - The City collects development impact fees for certain types of development that have specific impacts on community services or that specifically benefit from City expenditures on projects. Development Impact Fees are calculated based on budgeted expenditures as they relate to specific developments and enable City departments to establish Capital Plans for annual budgets. Goleta will incorporate, to the extent feasible and appropriate, projects and actions outlined in this plan to the fee calculations. This will enable the City to recover some of its investment in the implementation of the plan from property owners who benefit measurably. It will also reduce disproportionate costs to citizens who do not contribute to the need for the project expenditure or benefit from it.

Priority: Medium

Objective Addressed: 2.A, 2.B, 3.D, 5.B, 5.C, 5.E, 5.G

Responsible Department: City Manager’s Office, Administrative Services Department, and Community Services Department

Implementation Strategy:

- Incorporate mitigation strategies into calculated development fee structures

Timeframe for Implementation: Ongoing

Benefit vs. Cost: Cost beneficial for implementation of the plan

Potential Funding Source: Departmental Operating Budgets

Action #: FLD-1 - Enhance Floodplain Management Ordinance: Goleta is currently administering the County Floodplain Management Ordinance, which it adopted as part of its participation in the Nation Flood Insurance Program (NFIP). The ordinance is aggressive in that exceeds the minimum standards of the NFIP. The City will, however, make additional changes to the ordinance to incorporate additional mitigation policies and clarification.

Priority: Very High

Objective Addressed: 1.A and 1.C

Responsible Department: Community Services Department – Engineering
Planning and Environmental Services Department – Building and Safety

Implementation Strategy:

- Modify Floodplain Management Ordinance to include a cumulative substantial improvement provision and clarification of the use of replacement cost minus depreciation in making substantial improvement determinations.
- Have California DWR review ordinance and make recommendations
- Modify to incorporate additional standards tailored for flood threat specific to Goleta

Timeframe for Implementation: 1 year

Benefit vs. Cost: Relatively inexpensive measure that can be expected to result in long term mitigation benefits

Potential Funding Source: Departmental Budgets

Action #: FLD-2 - San Jose Creek/Hollister Avenue Bridge Replacement Project– The current opening at the Hollister Bridge at San Jose Creek is not capable of passing more than a 25-year storm event, resulting in backwater flooding to the Hollister Avenue and the Old Town area corridor. Several businesses and residences along Hollister Avenue are flooded. The city, in cooperation with County Public Works would like to replace the current bridge structure with a new bridge able to accommodate 100-year flows. (Policy FS 1.5 of the Draft General Plan lists this project as an “integral component of this general plan”). Since a significant portion of Old Town is isolated during floods, Goleta will also evaluate alternative ingress and egress for Old Town.

Priority: Very High

Objectives Addressed: 4.A, 4.B, 4.C, 5.B and 5.C

Coordinating Individual

/Organization: Department of Community Services, with peer review by SBCO Public Works – Flood Control District (County is responsible for maintenance).

Implementation Strategy: City is currently in the environmental review process. Preliminary hydraulic analysis was conducted at project scoping. The following activities need to be conducted to complete the project:

- Contract to complete final design and obtain completed environmental documents
- Obtain funding for construction
- Conduct alternative access study

Implementation Timeline: Complete environmental documentation within 1 year
Construction within 3 years

Benefit vs. Cost: The quantifiable cost of infrastructure and building asset damage, potential threats to life and safety and less easily quantifiable secondary impacts on commerce are expected to significantly exceed the cost of constructing this project.

Potential Funding Sources: FEMA (401, 404, PDM), CA OES, General Fund

Action #: FLD-3 – Thornwood Drive Storm Drainage Improvements – This is a County flood control project proposed in Section 5.3 of this document. There is only one inlet for all run off in this urbanized industrial area. The piping from the inlet is in bad condition and unable to handle flows from minor storm events. This causes street flooding near the intersection of Thornwood Drive and Pine Avenue, and significantly restricts emergency access to the area. Flooding also frequently disrupts commerce of the industries. In more significant events, there is flooding of properties, including a demolition yard, which presents potential environmental harm to the area when flooded.

Priority: Very High

Objective Addressed: 2.B, 4.A, 4.B, 4.C, 5.B and 5.C

Responsible Department: County Public Works, Water Resources Division - Flood Control and Water Conservation District, in coordination with the City of Goleta – Community Services Department

Implementation Strategy:

- Identify funding
- Obtain permits
- Construct gravity flow drainage system to protect the area

Timeframe for Implementation: Within 4 years, funding dependent

Benefit vs. Cost: Estimated cost is \$200,000.00. Damages avoided in large storm events can be expected to significantly exceed that amount.

Potential Funding Source: Flood Control Budget, South County Benefit Assessment District Funding, FEMA (PDM-C and HMPG grants and PA 401 funds), Cities of Goleta Capital Improvements Funds

Action #: FLD/EQ -4 - **Lake Los Carneros Outlet Structure and Dam Face Rehabilitation** – Previous storm events have damaged the outlet works and downstream face of the dam, potentially threatening the integrity of the structure. The City would like to perform a geotechnical/structural analysis of the existing dam face and outlet works to determine what measures are necessary to protect the integrity of the structure in future storm or seismic events. Failure of the dam would impact adjacent developed residential and commercial properties and would close Calle Real and Highway 101.

Priority: Very High

Objectives Addressed: 5.B, 5.C, 5.D, and 5.G

Coordinating Individual /Organization: Community Services Department – Engineering, Public Works Maintenance, Parks & Open Space

Implementation Strategy:

- Identify funding
- Obtain Engineering Consultant to perform geotechnical/structural analysis and recommend mitigation alternatives
- Obtain permits
- Construct mitigation project

Implementation Timeline: Analysis within 1 year of identifying funds. Construct within 3 years.

Benefit vs. Cost: Failure of the dam would impact adjacent developed residential and commercial properties and would close Calle Real and Highway 101. The threat to public safety, infrastructure, commerce and residential and commercial properties in terms of dollars, in the event of a failure is expected to significantly exceed the cost of this project.

Potential Funding Sources: CA OES, General Funds, FEMA (HMGP, PDM-C or PA 401)

Action #: FLD-5 – **Las Vegas and San Pedro Creeks Culvert Additions** – This is a County flood control project proposed in Section 5.3 of this document. Undersized culverts beneath Highway 101,

Union Pacific Railroad and Calle Real cause frequent and very significant backwater flooding of neighborhoods and retail areas north of the crossings. When the freeway and rail tracks are overtopped, downtown Santa Barbara becomes completely blocked, causing disruption of commerce. Although flooding is flashy, the highway can be (and has been) closed for more than a day, even without highway damage. These undersized culverts also contribute to flooding of the Santa Barbara Airport, interfering with three forms of transportation into and through the Goleta/Santa Barbara area. The airport has been closed several times due to flooding in the last decade. In Goleta, closure of Calle Real and flooding of numerous developed residential properties are the biggest issue. Both project locations have been studied in detail and determined to be highly cost beneficial. The solution is to expand the capacity of existing culverts (by deepening or widening them), or, in the case of Las Vegas creek, adding additional barrel culverts.

Priority:	Very High
Objective Addressed:	4.A, 4.B, 4.C, 5.B and 5.C
Responsible Department:	County Public Works, Water Resources Division - Flood Control and Water Conservation District, in cooperation with the Cities of Goleta and Santa Barbara
Implementation Strategy:	<ul style="list-style-type: none"> • Identify funding • Obtain permits • Increase capacity of existing culverts by constructing new ones and/or widening/deepening of existing culverts • Although presented as one project, the County would likely obtain funding and proceed with each individually.
Timeframe for Implementation:	Within 5 years, funding dependent
Benefit vs. Cost:	Estimated cost is \$2.5 million per creek for a total project cost of \$5 million. With the amount of property damage and economic disruption caused by flooding, studies have determined that the project is highly cost beneficial.
Potential Funding Source:	CalTrans- State Highway Operational Protection Program Funds, Public Works - Flood Control Budget, South County Benefit Assessment District Funding, FEMA (PDM-C and HMPG grants and PA 401 funds), Cities of Goleta and Santa Barbara Capital Improvements Funds

Action #: FLD-6 – **Atascadero Creek Channel Liner Improvements** – This is a County flood control project proposed in Section 5.3 of this document. Erosion from repeat flooding has exposed the footing of the channel slope liner, causing creek blockage and flooding, and putting hundreds of homes at risk.

Priority:	High
Objective Addressed:	4.A, 4.B, 4.C, 5.B and 5.C
Responsible Department:	County Public Works, Water Resources Division - Flood Control and Water Conservation District, will be the responsible department of this project. Goleta, through its Community Services Department will cooperate in whatever way possible.
Implementation Strategy:	<ul style="list-style-type: none"> • Identify funding • Obtain permits • Stabilize bottom grade by installing grade stabilizers and check structures
Timeframe for Implementation:	Within 5 years, funding dependent
Benefit vs. Cost:	Estimated cost is \$745,000.00 which includes wetland creation required for the project. Based on the number of homes that are expected to receive damage if this project is not constructed, it is expected to be highly cost beneficial.
Potential Funding Source:	County Flood Control Budget, FEMA (PDM-C and HMPG grants)

Action #: *FLD-7 – Join the NFIP Community Rating System (CRS):* The NFIP/CRS program is a points based program. Fixed numbers of points are assigned for eligible floodplain management and mitigation activities which exceed the minimum standards of NFIP participation (e.g. development of this plan, more restrictive floodplain ordinance, outreach, etc.). A community accumulates points based on activities it undertakes and as the points accumulate, the community’s rating moves down by classes. Each class level the City obtains results in an additional 5% reduction on all flood insurance premiums for policies held by citizens and businesses in Goleta. Goleta will join the CRS program.

Priority:	High
Objective Addressed:	2.A, 2.B, 2.E and 3.C
Responsible Department:	Community Services Department – Engineering Planning and Environmental Services Department – Building and Safety
Implementation Strategy:	<ul style="list-style-type: none"> • Arrange a meeting with FEMA Region IX and its CRS servicing contractor, ISO Commercial Services to review Goleta’s programs and establish how many points it is eligible for and at what class it could enter the program.

- Make application to FEMA to join.

Timeframe for Implementation: 1 year

Benefit vs. Cost: Relatively inexpensive measure that can be expected to result in long term mitigation benefits

Potential Funding Source: Departmental Budgets

Action #: EQ-1 – **Partnership to Evaluate Earthquake Risk Related to the Venoco Oil and Gas Processing Facility** – The Venoco plant, located in Western Goleta, processes oil and gas, with very dangerous gas as its by-product. The plant is operating on an antiquated permit. A significant earthquake event could result in releases from the facility. The City of Goleta would like to form a partnership with the plant’s management, adjacent property owners, County OES officials and other stakeholders to evaluate seismic risk at the facility.

Priority: Very High

Objectives Addressed: 1.B, 2.B, 3.D, 4.B, 5.D and 5.E

Coordinating Individual /Organization: City Manager’s Office and Community Services Department

Implementation Strategy:

- Contact Venoco Plant Managers to request a meeting
- Work with Venoco and stakeholders to review seismic risk and vulnerability data from all participants
- Identify programs that could fund safety improvements or mitigation actions at the plan if necessary
- Address issues related to the facilities seismic safety in the next update of this plan

Implementation Timeline: Within 5 years, depending on funding.

Benefit vs. Cost: Unknown

Potential Funding Sources: General Fund

Action #: EQ-2 – **Southern California Edison Natural Gas Pipeline Safety Analysis** – Southern California Edison operates a large underground natural gas facility in unincorporated Santa Barbara County, southwest of Goleta. Natural gas lines run underneath Goleta to move the gas to and from

different wells. Goleta will work with the utility to learn more about the location of the pipelines, how they are/are not tested for seismic safety and what the impacts of an earthquake related release would be on the Citizens of Goleta, for emergency response and mitigation related planning purposes.

Priority: Very High

Objectives Addressed: 1.B, 3.B, 3.C, 3.D, 4.B, 4.C, 5.B, 5.C and 5.D

Coordinating Individual /Organization: Community Services and Planning and Environmental Services Departments

Implementation Strategy: The first phase is to meet with the company to explain the need for locating the lines under Goleta. With security issues at the fore, the company is understandably reluctant to release the information

- Contact So. California Edison for a meeting and invite CA OES representatives to attend. Purpose of the meeting is to explain that location data is for planning purposes only.
- Ascertain where the pipes are located and what the utility does to test them for safety, specifically related to seismic hazards.

Phase II will include working with the company, or independently to perform an impact analysis for potential failure scenarios.

Implementation Timeline: Phase I, within 3 years. Phase II, within 5 years.

Benefit vs. Cost: Unknown

Potential Funding Sources: General Fund for Phase I, FEMA (PDM, planning), DHS (preparedness grants)

Action #: EQ-3 – **Inventory of Un-reinforced Masonry Structures in Goleta** – There is no inventory of all un-reinforced masonry structures in the City. Such information would be helpful in targeting outreach and training and in identifying future mitigation projects.

Priority: Medium

Objectives Addressed: 3.C, 3.D, and 5.E

Coordinating Individual

/Organization:	Planning and Environmental Services, with assistance from the County Assessor’s office.
Implementation Strategy:	Using best available data, inventory un-reinforced masonry buildings in the county and map locations of concentrations of them.
Implementation Timeline:	Within 5 years, depending on funding.
Benefit vs. Cost:	Unknown
Potential Funding Sources:	General Fund

Action #: EQ-4 - Seismic Safety and Mitigation Outreach and Education

Priority: Medium

Objectives Addressed:

Coordinating Individual

/Organization: Community Services, Planning and Environmental Services, City Manager’s Office (OES)

Implementation Strategy: Develop comprehensive earthquake awareness and outreach programs concentrating on the following areas:

- Understanding of Risk
- Understanding of Retrofit Actions, Mitigation and Construction Techniques
- Overview of grant funding programs available to assist

Target training to the following audiences:

- Owners of un-reinforced masonry buildings
- Contractors
- The Business Community
- City employees with mitigation, construction and development related job duties

Implementation Timeline: Develop Program within 2 years of plan adoption, repeat sessions annually

Benefit vs. Cost: Relatively inexpensive, benefit not quantifiable

Potential Funding Sources: General Fund

Action #: **WDF-1 – Site Selection for New Fire House** – Goleta currently contracts with the Santa Barbara County Fire Department for fire services. Both Goleta and the County have recognized a need for one additional Fire Station within the City of Goleta to serve the west side of the City. With the hazards that Goleta faces, particularly flooding, emergency access to all parts of the city is of critical concern. Goleta would like to participate in the development of a site selection study, focusing on locating the station in a manner that optimizes its effectiveness and ensures that it includes consideration of all hazards.

Priority: High

Objectives Addressed: 2.D, 3.C, 4.A, 5.C and 5.D

Coordinating Individual /Organization:

Community Services Department, the County Fire Department, and the City Manager’s Department

Implementation Strategy:

- Work with County Fire to identify funding for study and to develop a work plan
- Complete site selection study

Implementation Timeline: Within 1 year, depending on funding.

Benefit vs. Cost: The anticipated cost of the study is approximately \$50,000. The fire station will serve a critical public safety and property protection function, not only related to wildfire hazard. The relatively small amount of money needed for the study to help ensure that the facility is functional and accessible in disasters is believed to be a cost effective use of government funds.

Potential Funding Source: General Funds, County Fire, DHS – Firefighter Assistance Grant Funds, FEMA – PDM Planning grants.

Action #: **WDF-2 – Perform a Comprehensive Evaluation of all Wildfire Hazard Reduction Programs** – As noted elsewhere in the plan, Goleta has adopted the County’s wildfire related development standards and ordinances, including defensible space and vegetative fuel maintenance programs. As Goleta finishes its General Plan it will evaluate current standards and enhance and tailor them to fire threat more specific to Goleta. The 11 goals for wildland and urban fires, outlined in the Safety Element of the Working Draft General Plan should guide this evaluation process.

Priority: High

Objectives Addressed: 1.A, 1.C, and 5.B - D

Coordinating Individual /Organization: Public Safety Department, and Planning and Environmental Services Department, with input of County Fire.

Implementation Strategy:

- Evaluate all current standards and produce a brief report with recommended revisions
- Go through the process of adopting changes to the program, including public participation

Implementation Timeline: Identify recommendations within 1 year, Codify changes within 2 years.

Benefit vs. Cost: More appropriately designed standards based on the unique geographical areas can be expected to result in losses avoided in the future.

Potential Funding Sources: DHS-Firefighter Assistance Grants, General Fund

Action #: **WDF-3 –Firewise Community Planning and Prevention Techniques** – Outside of the fire service profession, there is more of an emphasis on fire suppression than on activities individual property owners can undertake to prevent fires from destroying their buildings. The National Fire Protection Association’s (NFPA) Firewise Communities program provides informational material and training to local government officials (including planners outside of fire agencies) on fire mitigation at the site specific level. While most of the training includes action on behalf of property owners that are already required or recommended, those actions may not be familiar to many owners and local government officials. Goleta will disseminate Firewise materials to residents and businesses identified as being in the “high” wildfire threat areas.

Priority: Medium

Objectives Addressed: 2.A and 4.B

Coordinating Individual /Organization: Public Safety Department, and Planning and Environmental Services Department

Implementation Strategy:

- Develop a mailing list by overlaying parcel data with fire threat layers and query the Assessor’s database to establish target audience
- Work with the Goleta Water District to include written material in billings once per year near the beginning of the fire season.

Implementation Timeline: Annually

Benefit vs. Cost: Unknown

Potential Funding Source: General Funds, CA Dept. of Forestry and Fire Services, NFPA – Firewise Communities Program, Goleta Water District

Action #: TSN/CS-1 - **Re-evaluate Tsunami Hazard Identification and Risk Assessment In Subsequent Updates to this Plan** – The areas of potential maximum Tsunami inundation profiled and mapped as part of Section 4 of this plan were based on a study conducted by NOAA and the USC – Tsunami Research Center. The findings of the study were mapped on 30 meter resolution digital elevation models by CA OES and was intended for evacuation planning purposes only. While the scale of the analysis conducted for this study was intended to provide a relative analysis of exposure, Goleta would like to spend additional effort to ensure that the geographical extent of the hazard is consistent with the General Plan findings for Tsunami and based on a more localized topographic delineation.

Priority: Medium

Objectives Addressed: 5F

Coordinating Individual /Organization: Department of Planning and Environmental Services, Department of Community Services

Implementation Strategy: To better analyze actual vulnerability to Tsunami inundation, Goleta will implement the following activities:

- Identify additional Tsunami studies from existing sources
- Identify additional Tsunami mapping and/or elevation data from other sources
- Conduct a comparison of all data available
- Based on more accurate topography and findings, re-delineate the Tsunami inundation elevation and conduct a GIS spatial analysis to determine the exposure of building and infrastructure in the area

Implementation Timeline: Within 4 years of Adoption

Benefit vs. Cost: Unknown

Potential Funding Sources: Capital Budget

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5.7 CITY OF GUADALUPE

The City of Guadalupe formed a Local Planning Group (LPG) to work with the Santa Barbara County Mitigation Advisory Committee. The LPG consists of representatives from the City, including: the City Engineer, Planning Director, Public Works Supervisor, Fire Chief, Building Official, and the City Administrator; who acts as the city’s OES coordinator. The LPG conducted meetings on August 31st, September 7th, September 14th, and October 5th, and October 8th. A local task force consisting of merchants and citizens was also formed and attended some LPG meetings. A meeting agenda, minutes and list of participants of the LPG meeting are on file with the City of Guadalupe. The LPG reviewed a set of jurisdictional-level hazard maps and localized potential hazard exposure/loss estimates to help identify the top hazards threatening its jurisdiction. In addition, the LPG was supplied with exposure/loss estimates for Guadalupe (as summarized in Table 5.7-1).

**Table 5.7-1
Summary of Potential Hazard-Related Exposure/Loss in Guadalupe**

		Residential		Commercial		Critical Facilities	
Hazard Type	Exposed Population	Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	0	0	0	0	0	0	0
Wildfire							
Extreme	0	0	0	0	0	0	0
Very High	0	0	0	0	0	0	0
High	5,659	1,172	173,880	9	15,134	18	32,935
Moderate	0	0	0	0	0	0	0
Earthquake*							
2000 Year	N/A	N/A	1,430	N/A	210	0	2,301
500 Year	N/A	N/A	647	N/A	115	0	0
Landslide							
High	0	0	0	0	0	0	0
Moderate	0	0	0	0	0	0	0
Dam Failure	5,659	1,172	173,880	9	15,134	18	32,935

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

Table 5.7-2

Non-Building Earthquake Loss Estimates in Guadalupe

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	145	0	3	0	33	0
500 Year Commercial	36	2	1	23	12	756
2000 Year Residential	277	0	6	0	77	0
2000 Year Commercial	69	5	1	38	18	1,358

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Guadalupe may anticipate approximately 28 displaced households, with nine requiring short term shelter, in the event of a 500-year earthquake, and 84 displaced households with 26 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Guadalupe should anticipate one injury during a 500-year and during a 2000-year earthquake.

After reviewing the localized hazard maps and exposure/loss table above, the following hazards were identified by the Guadalupe LPG as its top five. A brief rationale for each hazard is included below.

- **Earthquake** – Proximity to local faults and city located in Seismic Zone 4. Most of the downtown consists of URM buildings. Critical public facilities for school and city hall which houses police and fire, residential units are all of old construction, subject to damage. Thus, loss of buildings and life is significant. A local state of emergency was declared in December 2003 after damage sustained from the December 22, 2003 San Simeon Earthquake.
- **Flooding Levee failure** – Levee location at city limits and near residential area as well as rodeo grounds and public facilities. Flood plain is within proximity to the city. Pioneer Street residents are at risk. Erosion to property and natural habitats. City Proclamation dated March, 5, 2001 documented a levee breach and relocation of residents.
- **Flooding – heavy rains** – Frequent and historical. In February and March 1998, the state and county declared disasters and the City of Guadalupe sustained major flood damage to city owned gymnasium and Wastewater Treatment Plant irrigation lagoons. Flood waters impacted Leroy Park which required city to divert with makeshift drains. Wetlands Lake with undersized culvert overflowed in July 2004 without inclement weather factor. The overflow conditions affected the

nearby Gularte Tract and critical facilities, school, city hall and other residential/commercial areas.

- **Industrial Hazardous Material Incident** - Several ammonia refrigeration processing plants for cold storage are located within the city boundaries. There has been a history of small leaks from these cold storage units in which emergency response was required. The cold storage units have the potential for catastrophic failure. Further critical conditions could magnify problems with wind factor. Current dust issues exist at neighboring residential structures. Unocal is outside city limits but could pose hazardous material issue with winds.
- **Train Derailment – Hazardous materials Incident** – Historical occurrence. The Union Pacific railroad runs through the center of town. There is a potential of a railroad accident in which a hazardous material release could cause a major impact on the city population and its businesses. Further critical conditions could magnify problems with city’s low water pressure during fire.

5.7.1 Capabilities Assessment

The LPG identified current capabilities available for implementing hazard mitigation activities. The Capability Assessment (Assessment) portion of the jurisdictional mitigation plan identifies administrative, technical, legal and fiscal capabilities. This includes a summary of departments and their responsibilities assigned to hazard mitigation planning as well as codes, ordinances, and plans already in place associated with hazard mitigation planning. The second part of the Assessment provides Guadalupe’s fiscal capabilities that may be applicable to providing financial resources to implement identified mitigation action items.

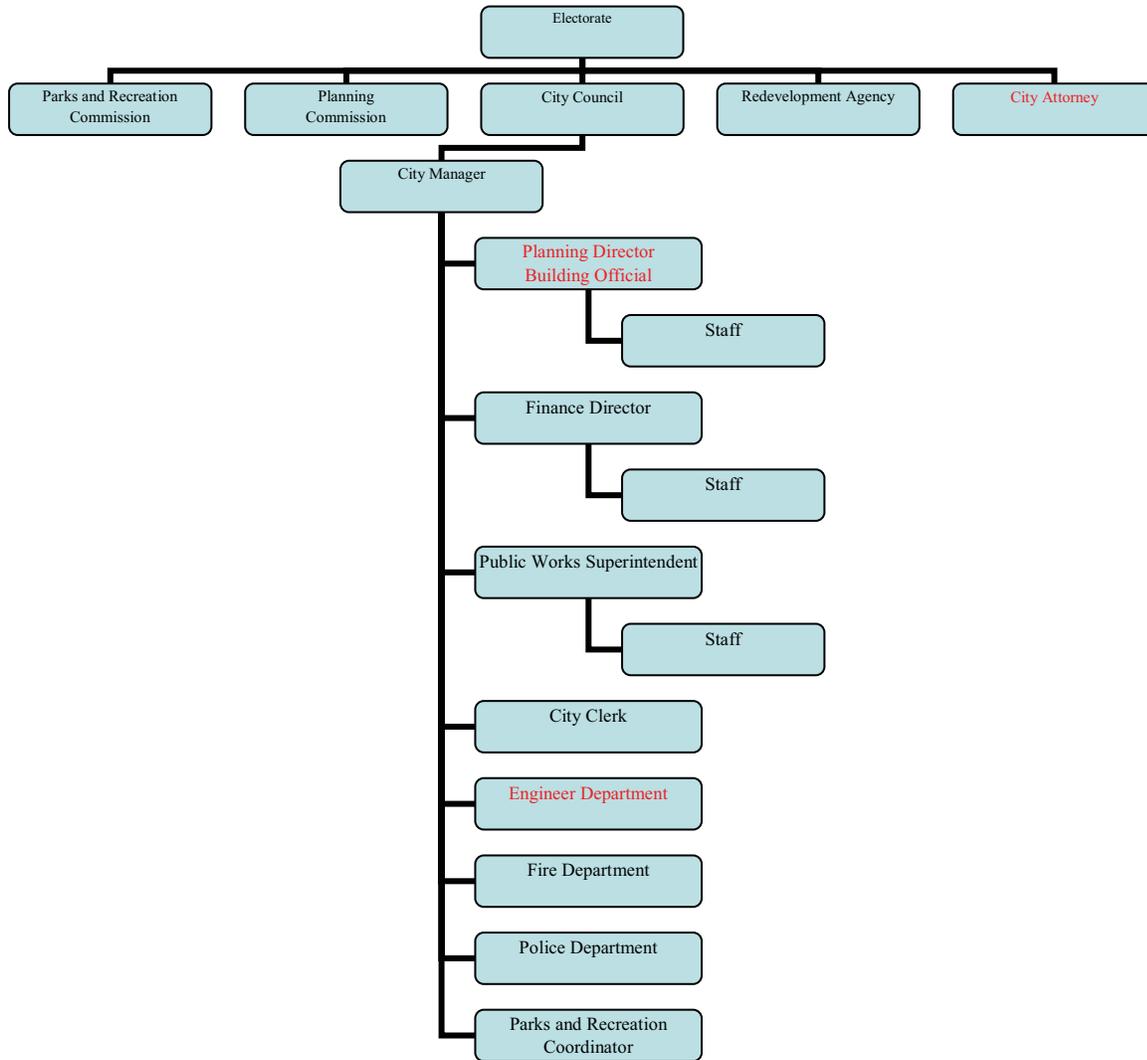
5.7.1.1 Existing Institutions, Plans, Policies and Ordinances

Form of Governance

The mayor and city council are elected by the voters of the City of Guadalupe. The city council exercises the legislative powers of the city and other city officials oversee the city’s daily operations. The council appoints the city administrator. City administration includes the officials appointed by the city council and officials elected by the citywide vote, including the city clerk and city treasurer. Guadalupe has a mayor and four council members, including a mayor pro-tem, who is appointed by the council. The council adopted a Redevelopment Project Area in 1985/1986 which is targeted for the purpose of eliminating blight and revitalizing the community. The Mayor and City Council appoint a chairman and vice chairman from the council members.

The City of Guadalupe’s organizational chart is listed below. Department heads under contract are noted in “Red”.

Figure 5.7-1
City of Guadalupe Organizational Chart



Other City Departments involved in activities related to Hazard Mitigation include:

- **Fire Department:**

- Administration: Develops, implements and monitors policies, procedures, budgets, fees, automatic aid agreements, mutual aid agreements, and liaison with other City departments and outside agencies.
- Fire Prevention: Coordinates adoption of codes and ordinances, reviews site and building plans for fire code compliance, develops and present public education programs and manages the City’s weed abatement program.
- Emergency Medical Services: Manages the department’s EMT programs, responds to medical emergencies and other calls for service, provides training and oversight for the City’s Public Access Defibrillation (PAD) program and participates with other community and regional health care providers to reduce public illness and injury.
- Suppression Fire-Rescue-Hazmat: Maintains the department’s personnel, apparatus, equipment and fire stations in a state of readiness to respond to the community’s needs, develops and implements standard operating procedures for various types of emergency responses, responds to all types of emergencies, and trains and interacts with neighboring jurisdictions and regional agencies.
- Emergency Management: Coordinates the City’s Disaster Preparedness Program, liaisons with all City departments and divisions, as well as other public and private organizations, develops, coordinates and implements hazard-specific response plans, and maintains the operational readiness of the City’s Emergency Management Team, the E.O.C. and other key elements.
- **Building and Community Development Department:**
 - Develops and maintains city general plan, zoning ordinances and development standards. Coordinates adoption of building, plumbing, electrical, and mechanical codes. Develops building ordinances.
 - Reviews site and building plans for compliance with building codes and ordinances.
 - Conducts damage assessment of structures from multiple causes to facilitate repair and future occupancy.
 - Carries out oversight of City development process assuring compliance with zoning and general plan, and including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions and floodplain development standards.
- **City of Guadalupe Public Works Department**
 - Maintains city infrastructure (assets) ranging from streets, parks, buildings and public work’s vehicles and equipment.
 - Responds to City emergencies, including EOC responses during disasters and assisting police and fire departments with hazardous materials clean up, traffic control efforts, traffic accident clean up and evacuation routing.
 - Operates, maintains and enhances both the water distribution and sewer collection systems within the City of Guadalupe. Also, provides input on solid waste management.

- Responsible for planning and implementation associated with the following City plans:
 - 1.1.6 Water Quality Emergency Notification Plan
 - 1.1.7 Water Department Emergency Response Plan
 - 1.1.8 Water Treatment Plant/ Blending Operations Plan
 - 1.1.9 Sewer Overflow Response & Prevention Plan
 - 1.1.10 Streets Maintenance Plan
 - 1.1.11 Water Master Plan
- **Engineering Department:**
 - Reviews engineering plans for private and public grading, floodways, retention basins, transportation infrastructure and structures to assure compliance with Federal, State and local ordinances on seismic and structural stability.
 - Develops engineering ordinances and policies that help protect and preserve City infrastructure.
 - Evaluates all circulation elements for projected traffic impacts.
 - Determines needed infrastructure improvements, water system and water/sewer treatment capabilities.
 - Provides response personnel for evaluation of damaged infrastructure and rescue situations.
 - Responds as part of the City’s EOC Team.
 - Coordinates with other response agencies assisting with damage assessment.
- **Police Department:**
 - Responds to safety concerns involving threats and/or damage to life or property. Acts as the enforcement entity for violations of State and local laws and ordinances.
 - Serves as primary emergency responders to acts of civil disobedience and public disorders and terrorism. Supports personnel for emergency rescue and management.
 - Provides investigative services for criminal acts that result in personal injury/death and the destruction of property.
 - Develops and implements emergency response plans and policies, focusing on evacuation procedures and traffic control.
 - Serves as primary responders to acts of terrorism, focusing on suspect intervention and facility and staff protection.

Guiding Community Documents:

The City of Guadalupe has a range of guidance documents and plans for each of its departments. These include a General Plan, with the newly revised 2004 Housing Element. The City uses building codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways the City guides its future is through policies laid out in the General Plan.

The General Plan

With the exception of the recently adopted revised Housing Element, the General Plan of the City of Guadalupe was adopted in 1986. The General Plan consists of seven elements required by the state (Land Use, Circulation, Housing, Safety, Noise, Conservation, and Open Space). There have been minor amendments to the General Plan map in limited areas of the City and minor policy amendments over time.

The current General Plan is being updated. Beyond the adoption of the City's new Housing Element, a baseline update report is being prepared along with a master environmental review document, and these documents together will be reviewed by the public, the Planning Commission, the Parks and Recreation Commission, and the City Council, who collectively will go through community visioning exercises, a review of the updates, and finalization of the subject documents. Hazard mitigation and prevention will be a vital part of this effort.

The General Plan update will identify weaknesses in the hazard mitigation goals, policies, standards, programs, and implementation measures of the currently adopted General Plan. Additionally, it will incorporate changes that are required as a result of new state and federal laws related to hazard mitigation, as well as, integrate best mitigation practices available. As the update effort unfolds, citizen participation will be focused on the subject of hazard mitigation and a greater effort to incorporate mitigation techniques into existing development will be made.

Hazard mitigation planning and implementation will be accomplished in the context of the natural and rural environment surrounding the City and within the City limits. Natural habitats on the City's edges and interior wetlands, and the associated storm drainage system will be considered and enhanced in addition to other natural resources. Preserving open spaces, particularly around floodplains, will reduce and prevent adverse impacts from flooding.

Hazard mitigation planning and implementation will be integrated in the update of the Land Use, Circulation, and Economic Development elements of the General Plan, so that hazard mitigation can help the City achieve a more disaster resistant and resilient community.

The General Plan Update will also create a center for hazard mitigation planning and implementation in the Safety Element of the General Plan. Additional hazard mitigation components will be integrated and coordinated throughout the other elements of the Plan as well. The City's election to create the optional Public Facilities and Services element and the Parks and Recreation element and their successors will assure a comprehensive implementation of hazard mitigation planning throughout the community.

Zoning and Subdivision Ordinances

The State of California has empowered all cities and counties to adopt zoning ordinances. The City of Guadalupe is currently updating the zoning ordinance.

The City of Guadalupe has a five member Planning Commission, which is an advisory body to the City Council. The Commission was established under State law to provide relief in special cases where the

exact application of the terms of the ordinance would be unduly restrictive and cause a hardship, in addition to generally reviewing zoning and subdivision proposals. The Planning Commission hears and decides upon the interpretation and the application of the provisions of the Zoning and Subdivision Ordinances. Although the Commission has certain discretionary powers in making its decisions, the Commission must always abide by and comply with the powers granted to it by the local Zoning and Subdivision Ordinances and the State's enabling acts. Additionally, the Planning Commission may recommend actions to the City Council and the Planning Commission's actions may be appealed to the City Council.

The Storm Water Management Program

The City of Guadalupe currently has not adopted an overall plan. However, this is currently being developed by the City's Engineering Department. This plan will include all related assets such as the existing storm water infrastructure, required upgrades, relative permits to accomplish these upgrades, and design criteria for compliance.

The development of a Storm Water Management Program (SWMP) is currently in progress by the City of Guadalupe (City) in response to State Water Resources Control Board Water Quality Draft Order No. 2003 – 0005 – DWQ1 (General Permit No. CAS000004) for National Pollutant Discharge Elimination System (NPDES) Phase II. This program covers the incorporated area of the City of Guadalupe. The City of Guadalupe's Public Works Department continually maintains the City's storm water system. The system has approximately 2.1 miles of underground storm water system piping; approximately 1.1 miles of open ditch which affronts agricultural properties and receives field runoff as well as storm runoff; approximately 0.5 miles of open ditch that carries excess water which accumulates in an area known as Guadalupe Wetlands/ Lake and also receives agricultural runoff; 83 drop inlets; 3 box culverts with runs of approximately 125 ft.; and 22 manholes equipped with drop inlets and four outlet sites. This is what functions as the City of Guadalupe's current storm water system.

The goal of the SWMP is to protect the health and safety of the public and the environment, meeting Clean Water Act mandates through compliance with Phase II NPDES Permit requirements and applicable regulations. It further fosters heightened public involvement and awareness. Storm drains typically flow into creeks that have already passed through a variety of land uses, including natural, agricultural, urban and industrial, and often through more than one permit jurisdiction. The City is faced with the challenge of requiring and implementing controls to reduce the discharge of pollutants in storm water runoff to the technology-based standard of "Maximum Extent Practicable" (MEP) as required by § 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii).

In October 1990, the National Pollutant Discharge Elimination System (NPDES) became the Federal law for regulating storm water runoff to reduce pollution. In the near future, the City of Guadalupe will implement its Storm Water Management Program, which outlines design criteria and policies, City standards, and technical specifications for infrastructure development. Per NPDES requirement, the City's SWMP plan has been submitted to the Regional Water Quality Control Board for review and approval. The SWMP plan will receive annual updates and continuing education regarding the Plan will be conducted.

Building Codes

The State of California has adopted the 2001 California Building Codes, which is enforced in the City of Guadalupe. The California Uniform Statewide Building Code is based on the 1997 Uniform Building Code with State amendments.

The City provides for and enforces State, City, and County Codes for building residential and commercial structures, enforcing environmental codes and guidelines for maintaining existing structures.

The City of Guadalupe has an ISO rating of 7.

The ISO is an insurer-supported organization that provides advisory insurance underwriting and rating information to insurers. The ISO uses a rating scale of 1 to 10 with 1 being the highest rating given.

Floodplain Management Ordinance

The City of Guadalupe does not have an enforced Floodplain Ordinance. Thus, the city does not participate in the National Flood Insurance Program. However, parts of the City are periodically threatened due to storm water infrastructure – not because of their proximity to the floodplain.

SEMS Multi-Hazard Functional Plan

In early October 2004, the City of Guadalupe submitted its Standardized Emergency Management System (SEMS) Multi-Hazard Functional Plan to the State of California for approval. The Plan discusses mitigation in the form of training and exercises, which are essential at all levels of government to make emergency operations personnel operationally ready. All emergency plans should include provisions for training. The objective is to train and educate public officials, emergency response personnel and the public. The best method for training staff to manage emergency operations is through exercises. Exercises are conducted on a regular basis to maintain the readiness of operational procedures. Exercises provide personnel with an opportunity to become thoroughly familiar with the procedures, facilities and systems which will actually be used in emergency situations. There are several forms of exercises:

- Tabletop exercises provide a convenient and low-cost method designed to evaluate policy, plans and procedures and resolve coordination and responsibilities. Such exercises are a good way to see if policies and procedures exist to handle certain issues.
- Functional exercises are designed to test and evaluate the capability of an individual function such as evacuation, medical, communications or public information.
- Full-scale exercises simulate an actual emergency. They typically involve complete emergency management staff and are designed to evaluate the operational capability of the emergency management system.

Mitigation Activities

The City of Guadalupe's LPG has identified its top five hazards as earthquake, levee failure flooding, heavy rains/storm flooding, hazardous material leak, and train derailment. In view of those hazards, the City has implemented a variety of mitigation measures pertaining to each hazard.

The City of Guadalupe lies approximately three miles from the Pacific Ocean along State Highway 1 which runs through the center of the downtown central business district. It is located 10 miles west of Santa Maria, at the northern border of Santa Barbara County. Surrounding the city on the East are several square miles of flat, open agricultural land.

EARTHQUAKE:

Santa Barbara County Officials have indicated that the City of Guadalupe is located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California. The City is aware that its fault lines and liquefaction zones are mapped. The City's Fire, Community Development and Public Works Department have examined all of the city-owned public structures, most of the commercial structures, some of the residential and none of the church-type historical structures within the City limits. It has been determined that Guadalupe has both unreinforced masonry buildings (URM) as well as old wood-type/plaster structures. Most of the aforementioned structures suffered some degree of damage during the recent 6.5 San Simeon Earthquake on December 22, 2003. Ordinance No. 2004-367, regulating URMs, is agendized for consideration on the October 12, 2004 city council agenda for second reading and adoption. (Note to file: Passed on October 12, 2004). Revenue sources are being organized and risk assessment underway to assist in the retrofit effort.

The city's public facilities sustained damage, including the American Legion, the Lantern Hotel, the Royal Theatre, City Hall and the Railroad Pedestrian overcross. Damaged infrastructure included the elevated water tank, sewer and water distribution lines and fire hydrants. The city plans to erect a steel frame building to house public safety equipment and purchase a mobile emergency response center (EOC). Removal and replacement of the elevated water storage tank is necessary with loss of life significantly high if the existing foundation fails. Removal and replacement and/or reinforcement of the Pedestrian overcross is imperative with significant loss of life and loss of a main thoroughfare for school children if destroyed during an earthquake and/or disruption of railroad traffic. Renovation of city hall may be appropriate (built in the 1930's), as it is considered an historic building. Retrofitting of the American Legion and construction and retrofitting of the Lantern Hotel is currently planned and underway. The Royal Hotel is under renovation and considered the least at-risk of the three structures. Replacement of damaged and/or dilapidated water and sewer lines, beginning in the easterly half of the city, is also planned and underway.

HEAVY RAINS – FLOODING:

A wetlands lake lies in the heart of the city adjacent to city hall and an elementary school with residential tracts upstream. Private properties, roads and infrastructure have sustained damage from rising water in the past. Downstream is more residential and the central business district. Culverts drain under State Highway 1 and run under the city from the Wetlands into the Pacific Ocean. Undersized culverts have caused backups at the Wetlands during dry seasons. During heavy rains, the problem is compounded. The city is mitigating the issue with a plan to upgrade the culvert but long-range solutions call for an overall plan to deal with the silt filtration issues. The city is meeting with State Regional Water Control Board in October 2004 to address this concern. Floodplains within the city are under review by engineering staff and will be addressed with guidelines for future development. Mitigating established current development at risk will be addressed through more studies.

LEVEE FAILURE – FLOODING:

Property adjacent to and in the water flow area must be evacuated during a levee failure. The Pioneer Street residents, Rodeo Grounds, Leroy Park, Wastewater Treatment Plant, and other residential areas at the easterly side of Highway One could be adversely affected. The facilities that may qualify for temporary housing are not appropriate for long-term housing. The Boys and Girls Club is in the

floodplain at Leroy Park. The city does not have a suitable relocation facility. The city's engineer will review flood protection considerations when new projects go through the City's approval process, the Planning Commission, and City Council and will further ensure that the wastewater treatment plant is protected from flooding and inundation.

HAZARDOUS MATERIAL LEAK:

The City of Guadalupe Fire Department works closely with local industry and monitors and audits risk management and prevention programs. The City of Guadalupe Fire Department requires alarm systems at the facilities and communicates regularly. The City of Guadalupe Fire Department is also involved with Hazardous Material guidelines per CUPA (County Fire Hazardous Material Unit) established Business Plan(s) are complied with. Regular site visits are also performed with CUPA. Other possible leaks coming from rigs traveling through town via Highway One or Highway 166 may be difficult to mitigate with lack of awareness to the chemical activities and involved trucking companies.

TRAIN DERAILMENT:

The City of Guadalupe Police and Fire Department are in close contact with Union Pacific, AMTRAK and Santa Maria Valley Railroad, the three lines traveling directly through the city on a daily basis. The city's easterly and westerly sides could be rendered immobile and impassable if such a catastrophe occurred. The event would be compounded if a hazardous material released in the air was found to be toxic. The city's Railroad Pedestrian Overcross is the main thoroughfare walkway and may well be the only right of passage during a disaster of this nature. Railroad and city officials continually ensure that the safety of citizens and travelers is an important matter and make every attempt to reduce debris along the railway and around the associated areas.

GIS, Computer and Communication Technology

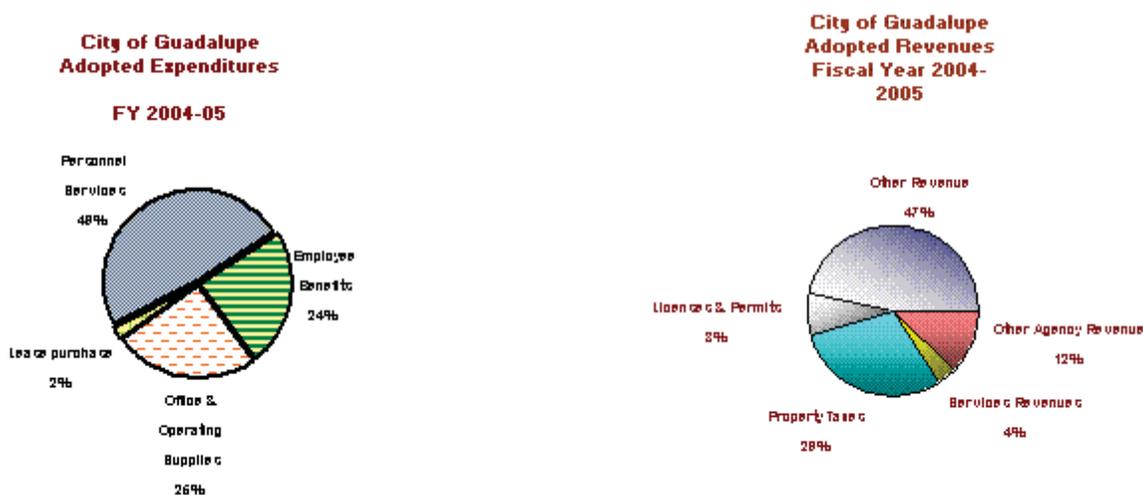
Guadalupe's City Administrative staff is working with the city Engineer, Planner and Building Official to develop a comprehensive GIS system for the City. Currently, parcels, zoning and flood hazards have been mapped, including water, sewer, storm drain, and citywide striping. Hazard layers created for this plan will be incorporated into that system for future planning and updates. The GIS system is not installed and may be cost prohibitive. The city is pricing a Geo Viewer online link through the internet.

The City Fire Department is trained in fire, rescue, EMS and hazardous material. Guadalupe is fully functional on the internet and is in the process of website development. The city's website is in the early stages of construction.

Financial Resources

The General Fund balance is an important element that can show the City's financial strengths or weaknesses. For Fiscal Year 2004-2005 (FY 04-05), the City of Guadalupe's General Fund operating budget has been set at \$11,302,821. The revenue budget for the City contains more than 30 line items representing different sources, each governed by a distinct set of conditions particular to that revenue source. The largest revenue factor and the core of the resource base that enables the City's provision of community services is the local revenue portion of Guadalupe's General Fund. The City's revenue base is determined by different community conditions such as the current population, employment and income, economic activity within the City, and the growth of invested value from residential and commercial construction, business investment in plant and equipment, and demand for local property. National, State,

and regional economic conditions can also affect the City's revenue base by creating demand for community goods and services produced within Guadalupe. The charts below are from the City's approved operating budget, which begins on July 1, 2004. The chart on the left shows the major revenue categories and percentages of the total budget the City anticipates it will receive from different funding sources. The largest revenue categories are from sales tax and property tax. The chart on the right shows the major expenditure categories and percentages of the total budget that the City anticipates it will spend during FY 04-05. The largest expenditure categories are for Personnel Services and Employee Benefits.



Over the last few years, California's budget has diminished rapidly due to decreased tax revenues from an economic recession. The overall health of California's economy has a significant influence on local cities and counties, as local government appropriations are usually the first to have their appropriations diminished due to downturns in the economy.

The Guadalupe Redevelopment Agency budgeted over \$6,500,000 in 2004/2005. A portion of this is allocated to the General Fund and towards Affordable Housing, façade programs, Royal Theatre and the Five Year Plan of Projects which is in progress and due to be completed by December 31, 2004.

The City's long-term financial and programmatic policies to be achieved over the next few years demonstrate the City's dedication to protecting the life and property of City residents and businesses include:

- Continued development of the storm water management system and continued qualitative drainage measures.
- Provide support in public safety to maintain current response time and professionalism, to limit injury, loss of life, and property.
- Continued analysis of private and public URM and conditions of old structures. Supportive incentive options to assist in retrofit program.

Overall, the City of Guadalupe has indirectly referenced mitigation and hazard reduction principles throughout many of the City’s aforementioned documents, plans, and policies. Integrating more direct language referencing mitigation and hazard reduction will help to reinforce the City’s commitment to these principles. The indirect references can also indicate that the responsibility for hazard reduction is shared among numerous departments within the City, making it a challenge to identify a particular department to take the lead in these efforts. To address this potential issue and increase community capabilities globally, the establishment of a formalized Mitigation Advisory Committee is recommended. The Committee should receive official recognition as a working group as soon as it is feasible to begin sharing the responsibilities required to implement the City’s mitigation program.

The following is a summary of existing departments in Guadalupe and their responsibilities related to hazard mitigation planning and implementation, as well as existing planning documents and regulations related to mitigation efforts within the community. The administrative and technical capabilities of Guadalupe, as shown in Table 5.7-3, provides an identification of the staff, personnel, and department resources available to implement the actions identified in the mitigation section of the Plan. Specific resources reviewed include those involving technical personnel such as planners/engineers with knowledge of land development and land management practices, engineers trained in construction practices related to building and infrastructure, planners and engineers with an understanding of natural or manmade hazards and floodplain managers. Guadalupe’s department heads multitask in many areas because of budgetary constraints.

**Table 5.7-3
City of Guadalupe: Administrative and Technical Capacity**

Staff/Personnel Resources	Y/N	Department/Agency and Position
A. Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	Planning – Planning Director
B. Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Y	Engineering – City Engineer
C. Planners or Engineer(s) with an understanding of natural and/or manmade hazards	Y	Planning & Engineering – Planning Director/City Engineer
D. Floodplain manager	Y	Engineering – City Engineer
E. Surveyors	N	
F. Staff with education or expertise to assess the community’s vulnerability to hazards	Y	Fire Department – Director of Public Safety
G. Personnel skilled in GIS and/or HAZUS	N	
H. Scientists familiar with the hazards of the community	N	
I. Emergency Manager	Y	Fire Department – Director of Public Safety
J. Grant writers	N	

The legal and regulatory capabilities of Guadalupe are shown in Table 5.7-4, which presents the existing ordinances and codes that affect the physical or built environment of Guadalupe. Examples of legal and/or

regulatory capabilities can include: the City’s building codes, zoning ordinances, subdivision ordinances, special purpose ordinances, growth management ordinances, site plan review, general plans, capital improvement plans, economic development plans, emergency response plans, and real estate disclosure plans.

**Table 5.7-4
City of Guadalupe: Legal and Regulatory Capability**

Regulatory Tools (ordinances, codes, plans)	Local Authority (Y/N)	Does State Prohibit (Y/N)
L. Building code	Y ¹	N
M. Zoning ordinance	Y	N
N. Subdivision ordinance or regulations	Y	N
O. Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	N	N
P. Growth management ordinances (also called “smart growth” or anti-sprawl programs)	Y	N
Q. Site plan review requirements	Y	N
R. General or comprehensive plan	Y	N
S. A capital improvements plan	Y ³	N
T. An economic development plan	Y ⁴	N
U. An emergency response plan	Y	N
V. A post-disaster recovery plan	N	N
W. A post-disaster recovery ordinance	N	N
X. Real estate disclosure requirements	Y	N

(e.g. county, parish, or regional political entity), ¹Building Code, ²25% slopes, flood plain, smart-growth, ³Storm Drains, ⁴General Plan.

5.7.1.2 Fiscal Resources

Table 5.7-5 shows specific financial and budgetary tools available to Guadalupe such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water and sewer services; impact fees for developers for new development; ability to incur debt through general obligations bonds; Guadalupe Redevelopment Agency and withholding spending in hazard-prone areas.

**Table 5.7-5
City of Guadalupe: Fiscal Capability**

Financial Resources		Accessible or Eligible to Use (Yes/No)
L.	Community Development Block Grants (CDBG)	Y
M.	Capital improvements project funding	Y
N.	Authority to levy taxes for specific purposes	Y – Vote required
O.	Fees for water and sewer service	Y
P.	Impact fees for developers for new developments/homes	Y
Q.	Incur debt through general obligation bonds	Y
R.	Incur debt through special tax and revenue bonds	Y – Vote required
S.	Incur debt through private activity bonds	N
T.	Withhold spending in hazard-prone areas	N
U.	Other – SANDAG Grant	N
V.	Other – Other Grants	N
W.	Guadalupe Redevelopment Agency (Deferred, no interest loans; matching loans; matching grants)	Y
X.	Zoning incentives, fee waivers, design rebates	Y
Y.	Recreation, Trails to Beach, Historic preservation, Duneship, Brownfield grants, CREF	Y

5.7.2 Goals, Objectives and Actions

After review of the hazard identification and risk assessment and capabilities assessment, the LPG conducted a meeting on October 8, 2004, to discuss the results of the hazard identification and risk assessments, review mitigation goals and alternatives based on the priority areas and hazard types, discuss community strengths and weaknesses, and begin developing the mitigation strategy. The following strengths, weaknesses and priorities were identified.

General Observations — Strengths

- Several policies exist that have hazard mitigation elements or effects such as development and building code regulations, the Retrofit Ordinance, the Zoning Ordinance, the General Plan, and other codes and plans discussed in more detail in this section.
- The General Plan is being updated and will help steer future growth.
- A revised Housing Element was adopted June 10, 2004.

- Existing codes will ensure that new development (including tear down and rebuild projects) will be built to modern standards. With the current trend of replacing existing substandard buildings with new ones, and through attrition, a safer community will be constructed.
- Housing improvement funds and programs exist, furthering the strength of the preceding statement.
- Possibility of GIS, communication technology availability via online viewer and will strengthen a mitigation program.
- Better mapping of floodplains and other hazard areas are now available.
- The Wetlands Lake is under review to find resources to mitigate future flooding. Culvert upgrade is part of the plan to prevent backflow condition.
- Area fault lines and liquefaction zones have been mapped.
- All flooding areas have been mapped.
- All high hazardous substance factories have been documented.
- The City of Guadalupe has approximately 33 private-owned unreinforced masonry buildings within the City limits. Conditions have been documented and some retrofitting has taken place.
- The City of Guadalupe has documented public structures with URM. Retrofitting has begun at Lantern Hotel. Dangerous conditions have been documented and mitigation is under review.
- The City Fire Department has a vegetative program whereby all lots are inspected in the spring and property owners are forced to cut vegetation by July 1.
- The City Fire Department conducts Community First Aid and CPR classes for citizens of Guadalupe.
- Emergency Mobil (EOC) Unit to act as base operations in lieu of city hall offices. Awarded and in process of procurement.
- Steel butler building planned to house Fire engine and public works vehicles. Fire truck locations are URM building and city hall. Both considered unsound.

General Observations — Weaknesses

- Because the City of Guadalupe is located next to the levee on the North and along the Western rim is the Wastewater Treatment Plant, the City could sustain substantial flooding in the event of a levee failure.
- Guadalupe's downtown commercial zone is mostly URM. Many people frequent the restaurants and could potentially be in harms way.
- The City of Guadalupe is located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California.

- Evacuation remains an issue, particularly as the City land-locked with two State Highways leading in and out of the city.
- City Hall structure in disorder and disrepair. Electrical and communications systems likely to malfunction during disaster.

General Observations — Priorities

During the presentation of findings for the hazard identification and risk assessment and capabilities assessment, the LPG provided preliminary input and ideas for mitigation strategies. In addition, the City solidified its goals, which are discussed in more detail in sub-section 5.7.2.1, below. In formulating goals, the following priorities were identified.

- Top priorities for Guadalupe are public safety, public education, and reducing potential economic impacts of disasters.
- Experiences from past disasters should be built upon.
- Outreach and training should be a major component, to include Community Emergency Response Team Training (CERT) and early warning & evacuation plans.
- Retrofit incentive program for private URM buildings to find solutions to the URM problem.
- Recent disasters have resulted from flooding. The City would benefit from a Drainage Master Plan that would list existing facilities and proposed upgrades. The City would also benefit from a drainage study.
- The City should develop and maintain a disaster warehouse/steel building for storage of emergency equipment and supplies.
- Public infrastructure, buildings and private non-URM are old and fragile. Begin renovation of public and incentives to private renovations.
- The goals and objectives were developed by considering the risk assessment findings, localized hazard identification and loss/exposure estimates, and an analysis of the jurisdiction's current capabilities assessment. These preliminary goals, objectives and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities. To help in further development of these goals and objectives, the LPG conducted a meeting on October 8, 2004 and compiled and reviewed current jurisdictional sources including the City's planning documents, codes, and ordinances. In addition, City representatives met with consultant staff and/or OES to specifically discuss these hazard-related goals, objectives and actions as they related to the overall Plan. Representatives of numerous City departments involved in hazard mitigation planning, including Fire, Police, Planning, Engineering, Building & Safety, Public Works, City's OES Coordinator and City administration staff. These members include:
 - Carmen Johnson, Fire Chief
 - Jerry Tucker, Police Chief
 - Marc Scalzo, Planning Director
 - Ruben Moreno, City Engineer

- Bruce Taylor, Building Inspector
- Carolyn Galloway-Cooper, City Administrator
- Mike Pena, Public Works Superintendent

A public meeting is scheduled for November 9, 2004, to present these preliminary goals, objectives and actions to citizens and to receive public input. At this meeting, specific consideration was given to hazard identification/profiles and the vulnerability assessment results. The following sections present the hazard-related goals, objectives and actions as prepared by Guadalupe’s LPG in conjunction with the County MAC, locally elected officials, and local citizens.

5.7.2.1 Goals

The City of Guadalupe has developed the following six (6) Goals for their Hazard Mitigation Plan. Objectives for achieving each goal are discussed in the subsequent section.

- Goal 1. Promote public understanding, support and demand for hazard mitigation.
- Goal 2. Improve hazard mitigation coordination and communication with federal, state, county and local governments.
- Goal 3. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to *geological hazards*.
- Goal 4. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to *floods*.
- Goal 5. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to *toxic chemical leak or train derailment*.
- Goal 6. Reduce the possibility of loss of life, damage, and losses to privately-owned, unreinforced Masonry buildings, due to earthquake.

5.7.2.2 Objectives

The City of Guadalupe developed the following broad list of objectives to assist in the achievement of each of its six identified goals. For each of these objectives, specific actions were developed that would assist in their implementation. A discussion of the prioritization and implementation of the action items is provided in Section 5.7.2.3.

MITIGATION GOALS AND OBJECTIVES.
Goal 1: Promote public understanding, support and demand for hazard mitigation
<i>Objective 1.A: Educate the public to increase awareness of hazards and opportunities for</i>

MITIGATION GOALS AND OBJECTIVES.
<i>mitigation actions. City’s government channel, electronic and print media.</i>
<i>Objective 1.B: Promote hazard mitigation training of all residents to include Community Emergency Response Training (CERT).</i>
<i>Objective 1.C: Monitor and publicize the effectiveness of mitigation actions implemented locally. Increase awareness of individual property owners, the business community and other in the importance of taking proactive steps to mitigate risk hazards.</i>
<i>Objective 1.D: Discourage activities that exacerbate hazardous conditions.</i>
Goal 2: Improve hazard mitigation coordination and communication with federal, state, county and local governments.
<i>Objective 2.A: Conduct periodic meetings involving the Local Plan Group to update and revise the City’s Hazard Mitigation Plan.</i>
<i>Objective 2.B: Establish and maintain closer working relationships with state agencies, county and local governments.</i>
<i>Objective 2.C: Encourage other organizations to incorporate hazard mitigation activities.</i>
<i>Objective 2.D: Improve the City’s capability and efficiency to deal with pre- and post-disaster events.</i>
Goal 3: Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to <u>geological hazards</u>.
<i>Objective 3.A: Educate the public to increase awareness of hazards and opportunities for mitigation actions.</i>
<i>Objective 3.B: Develop a comprehensive approach to reducing the possibility of damage and losses due to geological hazards.</i>
<i>Objective 3.C: Improve the City’s capability and efficiency at administering pre- and post-disaster mitigation. Work closely with the downtown business district and URM building owners.</i>
Goal 4: Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to <u>floods</u>.
<i>Objective 4.A: Develop a comprehensive approach to reducing the possibility of damage and losses due to levee breach and storm floods (e.g., Prepare Drainage Study and Drainage Master Plan).</i>
<i>Objective 4.B: Coordinate with and support existing efforts to mitigate floods (e.g., US Army Corps of Engineers, US Bureau of Reclamation, Santa Barbara County Department of Water Resources, Regional Water Quality Control Board, and Coastal Commission).</i>
<i>Objective 4.C: Minimize repetitive losses caused by flooding.</i>
<i>Objective 4.D: Address identified data limitations regarding the lack of information about relative vulnerability of assets from floods.</i>

<p>Goal 5: Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to <u>hazardous materials and train derailment</u>.</p>
<p><i>Objective 5.A: Develop a comprehensive approach to reducing the possibility of damage and losses due to hazardous materials release and/or train derailment.</i></p>
<p><i>Objective 5.B: Coordinate with other public emergency response agencies and support existing efforts to mitigate hazardous chemical release.</i></p>
<p><i>Objective 5.C: Consult with local companies, Union Pacific, Santa Barbara County to draw from current emergency information and communications.</i></p>
<p>Goal 6: Reduce the possibility of loss of life, damage, and losses to privately-owned unreinforced Masonry buildings, <u>due to earthquake</u>.</p>
<p><i>Objective 6.A: Develop a comprehensive task force approach to reducing the possibility of damage and losses due to hazardous materials release and/or train derailment.</i></p>
<p><i>Objective 6.B: Coordinate with business owners, city of Guadalupe, Guadalupe Redevelopment Agency, City staff, seismic experts, other public emergency response agencies to retrofit unreinforced masonry buildings.</i></p>
<p><i>Objective 6.C: Consult with structural engineers to update task force and coordinate risk assessment of properties and establish timeline for retrofitting buildings prone to greater risk of loss of life</i></p>

5.7.2.3 Prioritization and Implementation of Mitigation Action Items

Once the comprehensive list of jurisdictional goals and objectives listed above was developed, proposed mitigation actions were developed and prioritized. This step resulted in a list of acceptable and realistic actions that address the hazards identified in the City. This prioritized list of action items was formulated by the Local Plan Group at a meeting on October 8, 2004.

The Disaster Mitigation Action of 2000 (at 44 CFR Parts 201 and 206) requires the development of an action plan that not only includes prioritized actions but one that includes information on how the prioritized actions will be implemented. For each of the strategies developed, the goal and objective(s) addressed are listed. In addition, the description of each measure also includes a priority level, responsible department, implementation strategy, timeframe for implementation, a potential funding source, and a discussion of the strategies benefits and costs. A description of each of these measures is included below.

Priority: For each mitigation measure a priority level of *Very High, High, Medium, or Low* has been assigned. These priority levels have been developed based on input from Committee members, the overall planning consideration of the hazard as assigned in the hazard identification section of this document, the anticipated benefit-cost ratio and consideration of the STAPLE/E criteria.

Coordinating Individual/Organization: The coordinating individual/organization listed for each alternative is tasked with the lead role in all aspects of the implementation of this measure. However, many of the measures identified will require effort and support from other departments. This department is expected to coordinate the efforts of all local departments as well as with additional regional, state, and federal entities that may be involved.

Implementation Strategy: The implementation strategy developed for each measure includes a general description of potential methods that could be utilized or actions that could be taken. Due to the complex nature of a number of these measures, not all of the listed methods will ultimately prove feasible. Before initiating the implementation of each measure, the responsible department should develop a detailed project plan with particular attention to technical feasibility and cost effectiveness.

Timeframe for Implementation: The timeframe for implementation describes the length of time, beginning from the date of plan adoption, when the mitigation measure has been targeted for completion. The listed timeframes are goals and can be influenced by many additional factors. Through the development of detailed project plans by the lead agencies, the timeframe will be evaluated and revised when necessary.

Potential Funding Source: For each mitigation measure, potential funding sources are listed. Whenever possible, non-local sources of funding have been identified, including state and federal grants. The sources listed are not intended to represent all possible options, as additional opportunities for funding may be identified during implementation.

Benefit vs. Cost: For each measure a general discussion comparing potential benefits and costs is provided and an anticipated level of cost effectiveness assigned. The levels assigned include *Highly Cost Beneficial*, *Cost Beneficial*, and *Potentially Cost Beneficial*. It should be noted that this discussion is not intended to replace a full benefit cost analysis that should be completed prior to implementation.

All of the strategies identified in the remainder of this section are summarized in a table entitled *Mitigation Implementation Strategy Tracking Table for Guadalupe*, which can be found in Appendix 5-A.

The prioritized mitigation actions as well as an implementation strategy for each are numbered by heading for GEN (General Mitigation), GEO (Geological), FLD (Flood), and HML (Hazardous Material Leak) and TDR (Train Derailment). Proposed actions are listed as follows:

Action #GEN 1: Community Emergency Response Team (CERT) Training

Priority: High

Objectives Addressed: Potentially all.

Coordinating Individual/Organization: City of Guadalupe Fire Department, Santa Barbara County Fire Department, Emergency Management, OES Coordinator, Red Cross, and CAER.

Implementation Strategy: Work with County OES and Santa Barbara County Fire to schedule CERT training courses for Guadalupe residents. Advertise the training courses on the City's government access channel and in the Santa Maria Times. Coordinate with Senior Citizens groups, downtown merchants, and property owners to ensure they are notified of training courses. Conduct training courses twice a year at different times and locations. CERT is a positive and realistic approach to emergency and disaster situations where citizens

may initially be on their own and their actions can make a difference. While people will respond to others in need without the training, one goal of the CERT program is to help them do so effectively and efficiently without placing themselves in unnecessary danger. In the CERT training, citizens learn to manage utilities and put out small fires, treat the three medical killers by opening airways, controlling bleeding, and treating for shock, provide basic medical aid, search for and rescue victims safely, organize themselves and spontaneous volunteers to be effective, and collect disaster intelligence to support first responder efforts.

Implementation Timeline: 2 years

Potential Funding Source: General Fund, State Grants, Santa Barbara County funding.

Benefit v. Cost: Cost Beneficial - The relatively low cost of instituting CERT training and other education programs should easily be offset by damages avoided if only a portion of the community participates in training.

Action #GEO 1: Develop and maintain disaster warehouse (Butler building) and/or Mobil Trailer for storage of emergency equipment and supplies

Priority: High

Objectives Addressed: potentially all.

Coordinating Individual/Organization: Office of Emergency Management, Red Cross, Public Works Department, OES Coordinator, City Fire Department, FEMA premitigation grants.

Implementation Strategy: Critical facilities with the city's fire engines, emergency and public works vehicles will be housed in the steel building. Work with the Red Cross to develop and maintain a disaster warehouse for storage of emergency supplies. There are six basic supplies needed for a disaster supply kit, including, water, food, first aid supplies, clothing and bedding, tools and emergency supplies. Special items would include 2-way radios, generators and flares. Additional items could be added as needed.

Implementation Timeline: 1 year

Potential Funding Source: General Fund, special revenue funds, State Grants, Santa Barbara County funding.

Benefit v. Cost: Highly Cost Beneficial. The costs of having a warehouse of disaster supplies would prove invaluable in the event of a major disaster and the benefits would outweigh all costs associated with this action.

Action # GEO 2/HML 1/TDR 1: Disaster Early Warning and Evacuation Plan in the event of a major earthquake and/or levee failure, train derailment, hazardous material leak

Priority: High

Objectives Addressed: 3.A, 3.B, 3.C

Coordinating Individual/Organization: Planning Department, Police Department, Public Works Department, Fire Department, City Administrator, and OES Coordinator.

Implementation Strategy: Explore strategies to develop an early warning/public emergency notification system. Finish development of a comprehensive evacuation plan. Because the City of Guadalupe is located near industrial companies, the levee, railroad lines and is located in seismic zone 4, the City could sustain substantial damage to critical buildings and infrastructure from earthquake and from toxic fumes, flooding and train derailment in the event of a catastrophe.

Implementation Timeline: 2 years

Potential Funding Source: General Fund, FEMA Grant, Brownfield, Unocal grants.

Benefit v. Cost: Highly Cost Beneficial – The relatively low cost of developing an early warning and evacuation plan would easily be off set by injuries and potential loss of life if residents were not immediately informed of a disaster and if no evacuation plans were in place. A disaster early warning plan could include working in conjunction with the city’s fire department to prepare a database of all phone numbers in Guadalupe, both residential and commercial so that a reverse 911 system could be used in the event of an emergency. An evacuation plan could be drafted using various scenarios and published on the City’s government channel and in the local Santa Maria Times.

Action #FLD 1: – Prepare Drainage Study

Priority: Medium

Objective Addressed: 4.A, 4.B and 4.C

Coordinating Individual/Organization: City Engineer, Public Works, County Flood Control, and Flood Consultant.

Implementation Strategy: Prepare a Drainage Study for the City that would identify drainage strengths and weaknesses in the City and surrounding areas. The study would show potential vulnerabilities and potential mitigation measures.

Implementation Timeline: 2 years.

Potential Funding Source: General Fund, FEMA Grant, CREF, Recreational, Duneship trails to beach, County Levee and bikepath funding.

Benefit vs. Cost: Cost Beneficial – This strategy can be cost beneficial. Extreme flooding and erosion can cause huge losses and create safety hazards for residents and transient visitors. Preparation of a Drainage Study would identify potential vulnerabilities and subsequently implementing mitigation measures can be expected to produce benefits significantly higher than the cost of a Drainage Study. Erosion of levee which serves as future bike path. Erosion of floodplain leading to dunes which serves as future trail to beach. Wetlands preservation and development of recreational walkways, riding trails and educational nature continuum to dunes, beach and levee.

Action #FLD 2: – Prepare Drainage Master Plan

Priority: Medium

Objective Addressed: 4.A, 4.B and 4.C

Coordinating Individual/Organization: City Engineer, Public Works, County Flood Control, and Flood Consultant.

Implementation Strategy: Preparation of a Drainage Master Plan would identify existing facilities and potential upgrades and provide the Planning Commission and the City Council with usable guidelines pertaining to drainage prior to granting new project approval. A Drainage Master Plan would also identify potential drainage vulnerabilities and suggest mitigation measures.

Implementation Timeline: 2 years.

Potential Funding Source: General Fund, FEMA Grant

Benefit vs. Cost: Cost beneficial - This strategy can be cost beneficial. Extreme flooding can cause huge losses and create safety hazards for residents and transient visitors. A Drainage Master Plan could identify potential drainage vulnerabilities and suggest mitigation measures that could produce benefits significantly higher than the cost of a Drainage Master Plan.

Action # GEO 3: Earthquake retrofit program for privately-owned Unreinforced Masonry Buildings.

Priority: High

Objectives Addressed: 6.A, 6.B, 6.C

Coordinating Individual/Organization: Planning Department, Engineering Department, Police Department, Public Works Department, Fire Department, City Administrator, OES Coordinator, structural engineers, seismic experts, unreinforced masonry building owners, and local business merchants.

Implementation Strategy: Develop task force to explore strategies to develop a comprehensive retrofit program. Assist building owners with funding through Guadalupe Redevelopment Agency, Community Development Block Grants and enterprise loans, affordable housing, and creative financing.

Retrofit timeline based upon criteria yet to be determined with goal being to retrofit all buildings and prevent loss of life during established time period.

City staff to work with task force in a progressive fashion until the retrofit of all buildings is complete. Although Ordinance No. 2004-367 allows ten years to require all buildings to be retrofitted, the city of Guadalupe is located seismic zone 4 and is faced with a high probability of a devastating earthquake and could sustain substantial damage to life, buildings and infrastructure.

Implementation Timeline: 10 years

Potential Funding Source: Affordable Housing Fund, Redevelopment Operating, Commercial Rehabilitation, and Bond funds, FEMA pre-mitigation and post-mitigation Grant, CDBG, Hazard Mitigation grant and capital projects funding, Historic preservation funding.

Benefit v. Cost: Highly Cost Beneficial – The cost of retrofitting is extremely high depending on the extent of protection to critical facilities and people. The city is committed to provide the utmost protection as is clear in Ordinance No. 2004-367. The city council approved a retrofit ordinance in order to bring safety and well being to the citizens and any visitors. The city is preparing its five year program of projects which will include recommending an assistance program to unreinforced buildings owners. Staff is seeking all funding opportunities and various sources to assist in other funding strategies for this project.

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5.8 CITY OF LOMPOC

The City of Lompoc (Lompoc) reviewed a set of jurisdictional-level hazard maps including detailed critical facility information and localized potential hazard exposure/loss estimates to help identify the top hazards threatening their jurisdiction. In addition, LPGs were supplied with exposure/loss estimates for Lompoc summarized in Table 5.8-1. See Section 4.0 for additional details.

**Table 5.8-1
Summary of Potential Hazard-Related Exposure/Loss in Lompoc**

Hazard Type	Exposed Population	Residential		Commercial		Critical Facilities	
		Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	3,827	178	17,200	73	98,500	18	78,682
Wildfire							
Extreme	0	0	0	0	0	0	0
Very High	9,899	2,328	388,670	7	24,390	10	67,269
High	31,204	7,485	1,237,333	72	150,319	33	105,690
Moderate	0	0	0	0	0	0	0
Earthquake*							
2000 Year	N/A	N/A	227,792	N/A	34,723	7	372,966
500 Year	N/A	N/A	118,533	N/A	20,588	7	2,065
Landslide							
High	0	0	0	0	0	0	0
Moderate	451	163	22,667	0	179	0	0
Dam Failure	26,960	6,709	1,063,843	52	117,672	25	108,172

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

**Table 5.8-2
Non-Building Earthquake Loss Estimates in Lompoc**

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	24,940	0	504	323	7,661	756
500 Year Commercial	6,762	283	149	4,608	2,538	7,315
2000 Year Residential	43,197	0	912	580	14,916	1,358
2000 Year Commercial	11,840	498	213	7,049	3,780	15,381

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Lompoc may anticipate approximately 387 displaced households, with 109 requiring short term shelter, in the event of a 500-year earthquake, and 916 displaced households with 257 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Lompoc should anticipate 111 injuries and 3 deaths during a 500-year and 240 injuries and seven deaths during a 2000-year earthquake.

5.8.1 Capabilities Assessment

FORTHCOMING

5.8.1.1 Existing Institutions, Plans, Policies and Ordinances

FORTHCOMING

5.8.1.2 Fiscal Resources

FORTHCOMING

5.8.2 Goals, Objectives and Actions

FORTHCOMING

5.8.2.1 Goals

FORTHCOMING

5.8.2.2 Objectives

FORTHCOMING

5.8.2.3 Prioritization and Implementation of Action Items

FORTHCOMING

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5.9 CITY OF SANTA BARBARA

The City of Santa Barbara (Santa Barbara) reviewed a set of jurisdictional-level hazard maps including detailed critical facility information and localized potential hazard exposure/loss estimates to help identify the top hazards threatening their jurisdiction. In addition, LPGs were supplied with exposure/loss estimates for Santa Barbara summarized in Table 5.9-1. See Section 4.0 for additional details.

**Table 5.9-1
Summary of Potential Hazard-Related Exposure/Loss in Santa Barbara**

Hazard Type	Exposed Population	Residential		Commercial		Critical Facilities	
		Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	9,689	1717	188,500	725	1,725,000	165	667,420
Wildfire							
Extreme	3,738	1,748	307,115			10	28,198
Very High	810	335	56,292			5	22,249
High	75,743	20,539	4,062,417	270	595,688	124	556,498
Moderate	12,128	2,116	617,565	327	710,947	75	392,657
Earthquake*							
2000 Year	N/A	N/A	1,512,419	N/A	514,196	76	3,050,392
500 Year	N/A	N/A	638,765	N/A	258,133	76	13,775
Tsunami /Coastal Storm Surge	11,790	1,651	527,921	99	252,388	70	555,643
Landslide							
High							
Moderate							
Coastal Erosion							
Dam Failure	5,047	1,417	320,328	21	50,644	10	14,957

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

**Table 5.9-2
Non-Building Earthquake Loss Estimates in Santa Barbara**

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	124,502	0	2,451	3,121	47,480	7,315
500 Year Commercial	90,449	2,248	1,770	57,847	28,296	602
2000 Year Residential	259,454	0	5,254	6,561	108,700	15,381
2000 Year Commercial	189,649	4,640	2,831	101,506	46,560	1,117

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Santa Barbara may anticipate approximately 2,806 displaced households, with 723 requiring short term shelter, in the event of a 500-year earthquake, and 8,503 displaced households with 2,183 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Santa Barbara should anticipate 483 injuries and 17 deaths during a 500-year and 1,428 injuries and 53 deaths during a 2000-year earthquake.

5.9.1 Capabilities Assessment

FORTHCOMING

5.9.1.1 Existing Institutions, Plans, Policies and Ordinances

FORTHCOMING

5.9.1.2 Fiscal Resources

FORTHCOMING

5.9.2 Goals, Objectives and Actions

FORTHCOMING

5.9.2.1 Goals

FORTHCOMING

5.9.2.2 Objectives

FORTHCOMING

5.9.2.3 Prioritization and Implementation of Action Items

FORTHCOMING

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5.10 CITY OF SANTA MARIA

The City of Santa Maria (Santa Maria) reviewed a set of jurisdictional-level hazard maps including detailed critical facility information and localized potential hazard exposure/loss estimates to help identify the top hazards threatening their jurisdiction. In addition, LPGs were supplied with exposure/loss estimates for Santa Maria summarized in Table 5.10-1. See Section 4.0 for additional details.

**Table 5.10-1
Summary of Potential Hazard-Related Exposure/Loss in Santa Maria**

Hazard Type	Exposed Population	Residential		Commercial		Critical Facilities	
		Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	2,554	441	28,000	84	65,900	24	131,090
Wildfire							
Extreme	0	0	0	0	0	0	0
Very High	0	0	0	0	0	0	0
High	77,207	17,196	2,743,548	290	588,202	98	289,813
Moderate	0	0	0	0	0	0	0
Earthquake*							
2000 Year	N/A	N/A	352,129	N/A	101,353	10	726,413
500 Year	N/A	N/A	175,079	N/A	57,616	10	1,034
Landslide							
High	0	0	0	0	0	0	0
Moderate	0	0	0	0	0	0	0
Dam Failure	71,320	15,194	2,482,181	204	404,538	81	213,023

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

**Table 5.10-2
Non-Building Earthquake Loss Estimates in Santa Maria**

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	38,039	0	747	257	10,248	602
500 Year Commercial	18,511	814	403	12,880	7,017	477
2000 Year Residential	68,157	0	1,432	477	21,077	1,117
2000 Year Commercial	33,983	1,500	597	20,442	10,838	24,236

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Santa Maria may anticipate approximately 496 displaced households, with 147 requiring short term shelter, in the event of a 500-year earthquake, and 1,223 displaced households with 362 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Santa Maria should anticipate 168 injuries and four deaths during a 500-year and 378 injuries and 10 deaths during a 2000-year earthquake.

5.10.1 Capability Assessment

FORTHCOMING

5.10.1.1 Existing Institutions, Plans, Policies and Ordinances

FORTHCOMING

5.10.1.2 Fiscal Resources

FORTHCOMING

5.10.2 Goals, Objectives and Actions

FORTHCOMING

5.10.2.1 Goals

FORTHCOMING

5.10.2.2 Objectives

FORTHCOMING

5.10.2.3 Prioritization and Implementation of Action Items

FORTHCOMING

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5.11 CITY OF SOLVANG

The City of Solvang (Solvang) reviewed a set of jurisdictional-level hazard maps including detailed critical facility information and localized potential hazard exposure/loss estimates to help identify the top hazards threatening their jurisdiction. In addition, LPGs were supplied with exposure/loss estimates for Solvang summarized in Table 5.11-1. See Section 4.0 for additional details.

**Table 5.11-1
Summary of Potential Hazard-Related Exposure/Loss in Solvang**

Hazard Type	Exposed Population	Residential		Commercial		Critical Facilities	
		Number of Residential Buildings	Potential Exposure/ Loss for Residential Buildings (x \$1,000)	Number of Commercial Buildings	Potential Exposure/ Loss for Commercial Buildings (x \$1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x \$1,000)
100 Year Flood*	28	22	2,300	13	12,000	0	0
Wildfire							
Extreme	0	0	0	0	0	0	0
Very High	1,989	819	122,865	15	35,062	1	6,158
High	3,328	940	194,245	31	64,677	12	30,225
Moderate	0	0	0	0	0	0	0
Earthquake*							
2000 Year	N/A	N/A	7,152	N/A	8,559	N/A	1,000
500 Year	N/A	N/A	10,939	N/A	575	N/A	54,000
Landslide							
High	0	0	0	0	0	0	0
Moderate	1,279	487	87,351	7	16,659	0	0
Dam Failure	780	350	43,771	4	9,541	1	1,699

*Note: Flood and earthquake value columns represent loss estimate, (percentage of exposure expected to be damaged), for defined hazard areas for specific events. For all other hazards, value columns represent total value of buildings exposed to the threat category.

**Table 5.11-2
Non-Building Earthquake Loss Estimates in Solvang**

	Content Damage (x\$1000)	Inventory Loss (x\$1000)	Relocation Cost (x\$1000)	Income Loss (x\$1000)	Rental Income Loss (x\$1000)	Wage Loss (x\$1000)
500 Year Residential	2,150	0	41	204	922	477
500 Year Commercial	179	12	3	117	58	3,923
2000 Year Residential	1,383	0	32	0	385	0
2000 Year Commercial	3,071	123	42	1,609	788	9,231

In addition to estimating losses, HAZUS provides estimates of casualties, injuries, and housing needs for each earthquake recurrence interval. Solvang may anticipate approximately 28 displaced households, with 26 requiring short term shelter, in the event of a 500-year earthquake, and 408 displaced households with 94 requiring short term shelter for a 2000-year earthquake. HAZUS also predicts that Solvang should anticipate 2 injuries during a 500-year and 16 injuries during a 2000-year earthquake.

5.11.1 Capabilities Assessment

FORTHCOMING

5.11.1.1 Existing Institutions, Plans, Policies and Ordinances

FORTHCOMING

5.11.1.2 Fiscal Resources

FORTHCOMING

5.11.1.3 Goals

FORTHCOMING

5.11.1.4 Objectives

FORTHCOMING

5.11.1.5 Prioritization and Implementation of Action Items

FORTHCOMING

SECTION 6 PLAN MAINTENANCE

A formal process is required to ensure that the Plan will remain an active and relevant document. This section, Plan Maintenance, includes a schedule for monitoring and evaluating the Plan annually, and for revising the Plan every five years. It describes how the county and cities will receive public input throughout the process. Finally, this section explains how jurisdictions will transform the mitigation strategies outlined in this plan into existing planning mechanisms such as the General Plans, Capital Improvement Plans, development regulations and other documents.

6.1 MONITORING, EVALUATING AND UPDATING THE PLAN

6.1.1 Plan Monitoring

The MAC participants and each Local Planning Group (LPG) will review those jurisdictional goals, objectives, and action items listed in the plan on a yearly basis. They shall be responsible for communicating any desired or necessary changes to the County OES. The MAC will convene twice per year to review progress on implementation of the strategies identified in the plan. The LPGs will be invited to participate in those meetings. The mitigation strategies matrix, included in the Appendices will be used to evaluate project status and to update such items as time-line, funding source and responsible entity. The County OES and Public Works Disaster Recovery Manager will be responsible for updating the plan accordingly, on a five year cycle, described below. A memorandum, describing needed changes, and progress on implementation will be provided annually to CA OES and FEMA Region IX.

6.1.2 Plan Evaluation

The MAC and each participating jurisdiction will perform a more comprehensive review of the Plan every two years. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, and success of coordination efforts. They will then evaluate the content of the plan using the following questions:

- Are these programs effective?
- Have there been any changes in land development that affect our mitigation priorities?
- Do our goals, objectives, and action items meet STAPLE/E criteria?
- Are our goals, objectives, and action items relevant, given any changes in our jurisdiction?
- Are our goals, objectives, and action items relevant given any changes to State or Federal regulations and policy?
- Is there any new data that affects the risk assessment portion of The Plan?

Any resulting updates or changes will be included in the Plan. Again, The County OES and Public Works Disaster Recovery Manager will be responsible for making the changes and will provide the updates via a memorandum as described above and will keep files of changes needed for the five year re-submittal described below in Section 6.1.3.

6.1.3 Plan Updates

The County OES and Public Works are responsible for making updates to the Plan, but the MAC participants are responsible for the content of the updates. Local jurisdictions should provide OES with jurisdictional-level updates to the Plan when necessary as described above. The Plan should be submitted for review to CA OES and FEMA every five years.

6.1.4 Implementation through Existing Programs

The multi-jurisdictional participants can use the Plan as a baseline of information on the natural hazards that impact their jurisdictions. Section 5 of The Plan should provide a handy reference to each jurisdiction's existing institutions, plans, policies and ordinances. This will make it easier for County and local jurisdictions to implement their action items through existing programs and procedures. How this will be accomplished is addressed in Section 5.0 of the plan and each jurisdiction's success with implementing through existing programs will be evaluated during monitoring, evaluation and update phases.

6.1.5 Continued Public Involvement

The public should be directly involved in reviewing and updating the Plan. County OES and a representative from each participating jurisdiction should solicit feedback from the public during monitoring, evaluating, and updating the Plan as described above. Both the County and the jurisdictions are responsible for incorporating the public's input.

A maintained copy of the plan will reside on the County Public Works Department Website, on a homepage devoted to Hazard Mitigation. Than annual and biennial status memorandums will also be posted on the site.

A copy of the Plan will be publicized and available for review on the County Public Works website, and additional copies of the plan will be catalogued and kept at appropriate agencies in the county. The existence and location of these copies will also be posted on the county website. The site will contain contact information for members of the MAC to which the public can direct their comments and concerns. All public feedback will be forwarded to the appropriate jurisdiction for review, and to County OES for documentation. During the two year review and five year update cycles, the MAC will issue a press release requesting public comments either immediately after each evaluation, or prior to the evaluation, as appropriate. The press release will direct people to the updated version of the Plan, both on the website and in hardcopy. During these two cycles there will be a public hearing to review progress on implementation of the plan. The County Disaster Recovery Manager will be responsible for using county resources to publicize the press releases and maintain public involvement through public access channels, web pages, and newspapers. Each jurisdiction will be responsible for its own press release and public meeting(s) during these phases.

In addition to these activities, many of the education and outreach activities described in Section 5.0 will contribute to continued public involvement in the plan implementation process.

This section of the Plan describes the formal process that will ensure that the Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the county and

cities will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how jurisdictions intend to incorporate the mitigation strategies outlined in this plan into existing planning mechanisms such as the County Comprehensive Land Use Plan, Capital Improvement Plans, and Building Codes.

Appendix 3A

INTEROFFICE MEMORANDUM

TO: JOHN GRAY, MASSOUD REZAKHANI, AND SCOTT CHOQUETTE
FROM: ANGELA CARMİ
SUBJECT: MEETING MINUTES - COMMITTEE/PUBLIC MEETING IN SANTA BARBARA, CA
DATE: 5/19/2010
MEETING TIME AND DATE: NOVEMBER 19, 2003 1:00PM

ATTENDEES:

Name	Title/Affiliation	Phone	Email
Maria-Luisa and Wallace Carroll	Members of the Public	805-969-2758	wallml@cox.net
Tom Wright	Chemical Engineer/MNS Engineering	805-692-6921	twright@mnsengineers.com
Dave Rickard	Santa Barbara County Department of Public Works	805-739-8761 805-478-4200 – Cell	drickar@co.santa-barbara.ca.us
Zacharias Hunt	GIS Coordinator/Santa Barbara County Department of Public Works	805-568-3023	zhunt@co.santa-barbara.ca.us
Dale Weber	Developing Engineer/Santa Barbara County Flood Control	805-568-3446	weber@co.santa-barbara.ca.us
Michael Parker	Santa Barbara County Flood Control	805-568-3449	mparker@co.santa-barbara.ca.us
Stephen Carlson	Realtor	805-969-1133	scarlson@silcom.com
Justin Van Mullem	Project Planner/On Design Architects, Inc.	805-896-0901	vanmullem@architects-ca.com
Scott Choquette	Project Manager/Dewberry & Davis	617-695-3400	schoquette@dewberry.com
Angela Carmi	Environmental Scientist/URS Corporation	916-679-2344	Angela_carmi@urscorp.com

1:15pm – Mike Parker gives welcome and introductions. He gives a brief overview of the CRS program and the County’s participation history.

Angela Carmi: Gives CRS presentation describing the CRS program.

Mrs. Carroll interrupts presentation to ask about whether this program will address debris in creeks, around bridges and in box culverts, which contribute to flooding. The Oak Creek culverts, that lie under Hwy. 101 get clogged by debris and sedimentation.

Dale Weber responds with a description of the flood control measures and debris removal activities that are currently being conducted by County. There is spring and fall cleaning activities that meet flood prevention standards. Caltrans and the railroad companies are responsible for many properties in the County.

Scott delivers presentation on the planning process and schedule, participation/role of committee members and others, and the resolution formally recognizing the committee.

Mrs. Carroll interrupts Scott's presentation to ask if there is a limit to how much can be covered as an impermeable surface? Is there a ratio standard for lot size to house size?

Dale responds that the question is a zoning question. There is no ratio; the developers must look at CEQA measures, fire protection, and downstream measures that will be affected. Large-scale development will need to address additional drainage. Infrastructure may be required to retard any excess flows. Downstream affects must be accounted for.

Mrs. Carroll asks if in area is zoned for houses but large development is built, will the zoning change.

Dale Weber responds.

Stephen Carlson asked if what is currently being done by developers, etc. be included into the FPM Plan?

Scott discussed the digital GIS maps and the ease of updating developing areas.

Zach asked what ISO was and Scott responded.

Mrs. Carroll asked if Caltrans puts six lanes through Montecito, would they put in applicable drainage for additional flows?

Dale responds that the County doesn't want road improvements that will affect adjacent property flows. There are two issues that must be dealt with, 1. Planning Department and zoning standards, and 2. How flood control looks at flooding – if additional concrete is put on the property, where does excess flows go?

Mrs. Carroll asked about interrupted blocks on property parking lots.

Dale responds that these are filtration blocks, so water percolates/infiltrates. Want the design community to promote permeable pavement and try to disconnect imperviousness.

Mike Parker stated that the Plan would deal with repetitive loss structures and what the County can do to mitigate their losses. Elevating structures, etc. 80-90% of the repetitive loss areas are on the coast.

Mrs. Carroll asks what are the rights of property owner to get rid of runoff water?

Mike Parker responds that the California Drainage Law requires that upstream and downstream property owners must act reasonable and should not contribute to increasing flows by volume or velocity or change the end location of the runoff flow.

Dale responds that a downstream property owner cannot block historic runoff flow. Upstream property owner cannot deliver more than historic runoff.

Mrs. Carroll states that the Mirramar Avenue runoff landed on their property.

Mike Parker responds that the Plan is necessary to avoid repetitive losses.

Stephen states that California floods not as often or as much as in other states, but does any flooding causes a lot of damage.

Mike Parker states that the FPM Plan will identify ways to adjust property design.

Stephen states that we have so many intervening agencies involved now; will the other agencies cooperate with the Plan? Will the Board of Supervisors be involved to move the Plan up to a priority item?

Mike Parker responds that the Annual Maintenance Plan was developed and it identifies projects and their respective contacts for implementation. He stated that this committee has to be recognized by the Board of Supervisors and they will be periodically notified as to the progress, etc. of the Plan.

Stephen asks what the process of will be to move this plan up the Board priority list?

Dale responds that the Board is aware of the Flood Control wish list and needs. It will take coordination with the railroad companies and Caltrans. There are a lot of issues such as old building standards, channel sizes, etc. that will have to be dealt with.

Stephen stated that he is aware that the County has inherited many problems throughout time.

Dale responds that the County can't force old property owners to meet new building standards.

Dale and Mike both state that substantial improvement is considered more than 50% of the fair market value of a structure – and can fix a structure to a new code if it is substantially damaged. The community could modify the 50% but would have to be approved by the Board.

Dale and Mike discuss that Benefits Assessment is what fuels maintenance. Mike states that they use 'replacement cost' instead of 'fair market value' and this could potentially be included in the Plan. This also presents a set of problems, though.

Mrs. Carroll asks what happens next.

Scott discussed what will be done by the next public meeting and that the committee will be notified of the Plan deadline. He also discussed the possibility of DMA 2000 and the possible participation of the community to develop a multi-hazard plan.

Stephen Carlson states that he will be out of town December 11-21.

MEETING MINUTES MEMORANDUM

TO: DAVE RICKARD, SANTA BARBARA COUNTY PUBLIC WORKS

SUBJECT: MEETING MINUTES – MITIGATION ADVISORY COMMITTEE MEETING #1 IN
SANTA BARBARA, CA

DATE: 02/16/2004

MEETING TIME AND DATE: FEBRUARY 12, 2004 10:00 AM

Attendees:

Name	Title/Affiliation	Phone	Email
Dave Rickard	Santa Barbara County Department of Public Works	805-739-8761	drickar@co.santa-barbara.ca.us
Richard Abrams	Santa Barbara County Office of Emergency Services	805-681-5567	Richard.Abrams@sbfire.com
Joe Guzzardi	Santa Barbara County Office of Emergency Services	805-681-5556	joe.guzzardi@sbcfire.com
Lynn Sturtevant	Santa Barbara County Office of Emergency Services	805-681-5526	lynn.sturtevant@sbcfire.com
Michael Parker	Santa Barbara County Flood Control	805-568-3449	mparker@co.santa-barbara.ca.us
Teñell Matlovsky	GIS Coordinator/Santa Barbara County Surveyors Office	805-696-1193	tmatlov@co.santa-barbara.ca.us
Yolanda McGunchey	Carpinteria/Summerland Fire Department		y.mcgunchey@csfd.net
Mitch Jan, sgt.	City of Santa Barbara Police Department/Office of Emergency Services	805-897-3725	mjan@sbgpd.com
Dacè Morgan	Santa Barbara County Department of Transportation	805-568-3047	dmorgan@cosbpw.net
Massoud Rezakhani	Program Manager/URS Corporation	602-861-7412	massoud_rezakhani@urscorp.com

Attendees (continued):

Name	Title/Affiliation	Phone	Email
Scott Choquette	Project Manager/Dewberry & Davis	617-695-3400	schoquette@dewberry.com
Jenny Marr	Civil Engineer/URS Corporation	916-679-2307	jennifer_marr@urscorp.com
David Denniston	GIS/URS Corporation	805-568-3439	david_denniston@urscorp.com

Handouts Provided:

Meeting Agenda
Data Collection Checklist
Copies of kickoff meeting presentation

Meeting Notes:

Dave Rickard welcomed everyone to the meeting and briefly discussed the California Office of Emergency Services (CA OES) Workshop #1 that was held on February 11, 2004. He described how the Hazard Mitigation Plan (HMP) was very in depth and the county, incorporated cities and special districts are all required to have an improved plan. He addressed the possibility of increasing the size of the Mitigation Advisory Committee (MAC).

All committee members were introduced. Following introductions Mr. Rickard turned the floor over to the consultant team. Scott Choquette and Jenny Marr passed out the handouts described above.

Scott Choquette provided some background information on the project and how the consultant team was asked to develop the plan. The consultant team is working with Mike Parker to develop the Santa Barbara County Floodplain Management Plan and Scott identified the efficiencies of developing both plans. Scott discussed how important it is that the communities provide all the current information they have available. As the HMP, is only as good as the information provided. One of the provided handouts was checklist of any existing plans (i.e., community General Plans) and other information that would be helpful in developing the HMP.

Scott Choquette described the history and key features of the Disaster Mitigation Act of 2000 (DMA 2K). Under DMA 2K, all communities/local jurisdictions must have a hazard mitigation plan submitted to the Federal Emergency Management Agency (FEMA) by November 1, 2004. All plans need to be formally adopted by each community/local jurisdiction governing body. Mr. Rickard mentioned to the committee that the communities could still receive some post-disaster recovery funds, but would not be eligible candidates for Hazard Mitigation Grant Program (HMGP) funds without an adopted plan. Mr. Rickard asked if there was a limit to the amount of money requested under the HMGP. His concern is Highway 1 is the main “in and out” to Santa Barbara and has closed during several flooding events. Highway 1 requires large-scale mitigation projects. Scott answered that large-scale infrastructure projects are out of the scope of the HMP.

Scott continued with the presentation and described the planning process for developing the HMP. He also stressed the importance of involving the public and allowing the public into the planning

process, as the public has the can identify local problems areas that should be addressed as part of the HMP. Scott discussed how the MAC would develop risk and capabilities assessments, mitigation strategies, and an action plan.

MAC discussed the County options for developing a multi-jurisdictional plan. The County HMP will be comprehensive and not skip over jurisdictional boundaries. Yolanda McGunchee discussed how during the CA OES Workshop #1 the State stressed that the County plan should be adopted by the cities and special districts should adopt the city plans; the cities and special districts should provide specific annexes to the County plan identifying local risks and mitigation strategies specific to the local jurisdiction. Scott Choquette will provide a letter that better outlines the roles of the incorporated cities and special districts. Richard Abrams stated that the consultant team should provide a deadline for the incorporated cities to decide if they will be included in the County's plan or if they will develop their own HMP. Richard Abrams is the liaison for communication with the eight incorporated cities and Dave Rickard is the point of contact for the County. MAC discussed adding more people to the committee, such as, an elected official, a representative of the County auditors office, and a representative of the planning/development group.

MAC discussed data gathering and hazard profiling. Scott Choquette stated that the CA OES had done a lot of hazard profiling for the entire State. Richard Abrams noted the County HMP will only address natural hazards, but as Dave Rickard mentioned landslides are excluded. FEMA has differentiated between landslides and mudflows.

Greater public involvement was the next topic of conversation. The first public meeting will most likely occur near the end of March. A public survey was distributed to members of the public and state and local agencies regarding hazards and hazard mitigation in Santa Barbara County in December 2003. Santa Barbara County will develop a website for public access, so members of the public can follow the development of the HMP and provide input. Options for further public involvement will be discussed at a later meeting.

Scott Choquette and Dave Rickard closed the MAC meeting. The next meeting date will be determined later. The topic of the next meeting will be formulating goals of the HMP.

Action Items:

- Consultant team will provide a letter to clarify the roles of incorporated cities and special districts.
- Consultant team to work with County OES to determine the last day incorporated cities may choose to be included in the County plan.
- Consultant team will provide project management plan (dates and milestones) to the committee members.
- Plan next MAC meeting #2 (approximately 6 weeks after #1).
- Santa Barbara County Department of Public Works will develop Hazard Mitigation Plan website.
- Consultant team will develop project website for committee members to share information.



Meeting Agenda

Subject:	Multi-Hazard Mitigation Planning Committee Meeting	Date & Time:	1:00 - 3:00 PM February 12, 2004
Leader:	Dave Rickard	Location:	Santa Barbara County Flood Control District Offices 123 E. Anapamu Street Santa Barbara, CA 93101
Purpose:	Project Kick Off Meeting		
Attendees:	See Sign In Sheet		

	Description	Lead	Est. Time
1	Welcome and Introductions	Dave Rickard	5 Minutes
2	Project History and Background	Scott Choquette / Mike Parker	5 Minutes
2	Overview of Disaster Mitigation Act of 2000 Planning Requirements	Scott Choquette	10 minutes
3	Overview of Planning Process	Scott Choquette/ Jenny Marr	15 minutes
4	Data Collection and Needs	Scott Choquette/ Jenny Marr/All	30 minutes
5	Formulation of County Goals	All	30 minutes
7	Mitigation Objectives and Strategy "Homework"	All	20 minutes
8	Project Schedule	Scott Choquette	5 minutes
9	Next Meeting - Closing Comments	All	5 minutes





Data Needs/Capabilities Assessment – April 7, 2004

Please take a few moments to answer the following questions. Answer every question as best of you can; the answers provided will help us complete the Hazard Identification and Risk Assessment (HIRA) and the Capabilities Assessment portions of the Hazard Mitigation Plan. If there are any questions for which you are unsure of the answer please identify another contact within the City that may be able to provide the answer. Thank you for your time!

Name: _____
Title: _____
Affiliation: _____
Phone Number: _____
Email: _____

General

Does the City have a Comprehensive/General Plan? _____
Does the City have a Land Use Plan? _____
Are there any subdivision ordinances? _____
 Zoning Ordinances? _____
 Floodplain Ordinances? _____
 Building Codes? _____
Does the City have a full-time Building Official? _____
 If so, what is their name and phone/email? _____
What is the City's Building Code Effectiveness Grading System Rating? _____

Floodplan Management

Do you have FEMA mapped areas? _____
 If so, when were they last updated? _____
Is there a Floodplain Management Administrator? _____
How many structures are there in the floodplain? _____
How many NFIP policies are there? _____
Does the City maintain elevation certificates? _____
How many repetitive losses are there? _____
Is the City a participant in the CRS program? _____
 If so, what is the rating? _____
Does the City have any structural protection projects (i.e., levees, drainage facilities, detention/retention basins)? _____
Does the City have any property owner protection projects (i.e., buy-outs, elevation of structures, floodproofing, small "residential" levees/berms/floodwalls) _____
Does the City have a Storm Water Program? _____

Capabilities Assessment

Does the City have a Local Emergency Operations Plan? _____
 SEMS Multi-Functional Hazard Mitigation Plan? _____
 Hazard Mitigation Plan? _____
Are there warning systems in place? _____
 NOAA weather radio reception? _____
 Outdoor warning sirens? _____
 Emergency notification? _____
 Cable over-ride? _____



Data Needs/Capabilities Assessment – April 7, 2004

Is the City Storm Ready certified with the National Weather Service? _____

Does the City have GIS Capabilities _____

 Hazard data? _____

 Building footprints? _____

 Is GIS information tied to Assessor data? _____

 Land-use designations? _____

 Any other useful layers? _____

Are at risk critical facilities protected (i.e., power substations, sewage lift stations, water-supply sources, police/fire stations, medical facilities)? _____

Is there a natural resource inventory (wetlands)? _____

Is there a cultural resource inventory (historic structures/districts)? _____

Are there any erosion control projects or regulations in place? _____

Are there any sediment control projects or regulations in place? _____

Are there any ongoing public information programs, not necessarily related to hazards (i.e., regular flyers included in City utility bills, websites)? _____

Are there any public environmental education programs (i.e., environmental programs for kids through the parks and recreation department)? _____

Please use the space below to provide the names and contact information of others in your City who you feel would be willing and able to contribute to this planning process. Also, please feel free to elaborate on any answers you provide above.

IT IS CRITICAL TO THE SUCCESSFUL AND TIMELY COMPLETION OF THIS PROJECT THAT ALL DATA ARE RECEIVED WITHIN TWO WEEKS OF TODAY'S MEETING!! THANKS FOR YOUR HELP!

MEETING MINUTES MEMORANDUM

TO: SANTA BARBARA COUNTY FLOODPLAIN MANAGEMENT AND MULTI-HAZARD MITIGATION ADVISORY COMMITTEES

SUBJECT: MEETING MINUTES – MITIGATION ADVISORY COMMITTEE CONFERENCE CALL

DATE: JUNE 22, 2004

MEETING TIME AND DATE: JUNE 9, 2004, 1:30 PDT

Attendees:

Name	Title/Affiliation	Phone	Email
Dave Rickard	Santa Barbara County Department of Public Works	805-739-8761	drickar@co.santa-barbara.ca.us
Bruce Carter	Santa Barbara County Fire - Office of Emergency Services	805-681-5559	Bruce.Carter@sbfire.com
Michael Parker	Santa Barbara County Flood Control	805-568-3449	mparker@co.santa-barbara.ca.us
Teñell Matlovsky	GIS Coordinator/Santa Barbara County Surveyors Office	805-696-1193	tmatlov@co.santa-barbara.ca.us
Yolanda McGunchee	Carpinteria/Summerland Fire Department		y.mcgunchee@csfd.net
Jenny Marr.	URS Corporation	916-679-2307	Jennifer_marr@urscorp.com
Scott Choquette	Dewberry & Davis	617-695-3400	schoquette@dewberry.com

Meeting Notes:

1. Dave Rickard Opened the meeting
2. Scott Choquette reviewed milestones and delivery dates. Conclusion: due to the addition of modified option 2, the project is about 1 month behind. Efforts will be made to close the gap and consultants will provide modified schedule.
3. City Data Submittals were reviewed for modified option 2. Data submittals have been weak, with some exceptions. Bruce will aggressively follow up with city managers so as not to suffer additional delays
4. The format of the Parks Dept.'s mitigation project list was discussed for use as a template for other departments
5. Yolanda provided a link to the CA State Mitigation Plan which is now on-line

6. There was discussion by all re: the upcoming August public meetings – it was agreed that they would be the focus of the July 22, 2004 Call.

Meeting Agenda

Subject:	Santa Barbara County Floodplain Management and Multi Hazard Mitigation Committee Meeting/Call	Date & Time:	7/22/04 1:30 PDT
Leader:	David Rickard	Location:	888-330-9552 Code: 8490321
Purpose:	Weekly Progress Coordination – Prep for public meetings		
Attendees:	Scott Choquette, Dewberry; Jenny Marr, URS, Dave Rickard, Bruce Carter (or designee), Mike Parker, Tenell Matlovsky, Yolanda McGlinchey, and others as invited by SBC		

Item	Description	Leader	Start Time	Duration (min.)
1	Status of Option II City Data	Scott	1:35	10
2	Public Meeting(s) Agenda (for 8/4-8/5 meetings)	Dave/Scott/All	1:45	15
3	Full Committee Meeting with Cities (week of 8/2)	Scott	2:00	5
4	Misc. activities during week of 8/2	Scott	2:05	10
5	Action Items for 7/29 call	Jenny	2:15	5

MEETING MINUTES MEMORANDUM

TO: SANTA BARBARA COUNTY FLOODPLAIN MANAGEMENT AND MULTI-HAZARD
MITIGATION ADVISORY COMMITTEES

SUBJECT: MEETING MINUTES – MITIGATION ADVISORY COMMITTEE CONFERNECE CALL

DATE: JULY 23, 2004

MEETING TIME AND DATE: JULY 22, 2004, 1:30 PDT

Attendees:

Name	Title/Affiliation	Phone	Email
Dave Rickard	Santa Barbara County Department of Public Works	805-739-8761	drickar@co.santa-barbara.ca.us
Ingrid Cruz	Santa Barbara County Fire - Office of Emergency Services		ingrid.cruz@sbcfire.com
Michael Parker	Santa Barbara County Flood Control	805-568-3449	mparker@co.santa-barbara.ca.us
Yolanda McGunchey	Carpinteria/Summerland Fire Department	805-566-0483	y.mcgunchey@csfd.net
Kimberly Nilsson	City of Goleta	805-961-7565	knilsson@cityofgoleta.org
Dacè Morgan	Santa Barbara County Department of Transportation	805-568-3047	dmorgan@cosbpw.net
Massoud Rezakhani	Program Manager/URS Corporation	602-861-7412	massoud_rezakhani@urscorp.com
Jenny Marr	URS Corporation	916-679-2307	jennifer_marr@urscorp.com
Scott Choquette	Dewberry & Davis	617-695-3400	schoquette@dewberry.com

Meeting Notes:

1. Dave Rickard opened the meeting.
2. Ingrid Cruz is standing in for Bruce Carter while he is on vacation.
3. Since the last conference call, only the City of Buellton had submitted any more city data and the City of Santa Maria submitted the completed questionnaire. The importance of each City's participation in the data gathering process was stressed again. Necessary documents include, the communities General/Comprehensive Plan and the Multi-Functional Hazard Mitigation Plan (hazard element of the General Plan)
4. Scott Choquette reviewed the proposed agenda for the North and South County public meetings. Dave Rickard reminded the city representatives that the cities must also hold separate public meetings, as well as, participate in (attend) the County's public meeting. County Fire shall encourage and remind the cities to attend one of the public meetings (North or South County). Kimberly Nilsson requested that notices go to more city representatives, not just the City Managers.
5. The County's Floodplain Management Plan (FMP) was briefly discussed. The Hazard Mitigation Plan (HMP) public meetings will also be used as a forum for providing the Final Draft of the FMP for public review.
6. A HMP committee meeting will be scheduled prior to the public meetings. The FMP committee will also meet prior to the public meetings.
7. The next conference call will occur Thursday, July 29 at 1:30. The same call in number and code will be used.

Action Items:

1. Consultant team will email agenda and other meeting handouts to Yolanda and Kimberly. **(Completed)**
2. Dave Rickard or Mike Parker will fax a copy of Flood Control's mitigation projects to the consultant team. **(Completed)**
3. County Fire shall contact the incorporated cities to solicit more data and remind them of the committee and public meetings.
4. Dave Rickard or consultant team will send a copy of the public meeting notice to the City of Goleta (Kimberly Nilsson) for posting on the city's website. Other cities will also be contacted in case they are interested in doing this as well.
5. Consultant team will create an organizational chart for each committee.
6. County Fire or Dave Rickard will set up next HMP committee meeting.
7. Mike Parker will set up next FMP committee meeting.
8. Consultant team will set up separate meetings with each incorporated cities.
9. Consultant team will set up meeting calendar for the first week of August.
10. Next call Thursday, July 29 at 1:30.

Important Dates:

August 2		Consultant travel date
August 3	1:30 pm	Consultant meeting with County Department of Transportation
	3:00 pm	Hazard Mitigation Advisory Planning Committee meeting
August 4	10:00 am	Floodplain Management Plan Committee meeting
	2:00 pm	South County public meeting
August 5	10:00 am	North County public meeting
August 6		Consultant travel date



Meeting Agenda

Subject:	Mitigation Advisory Committee Meeting #3	Date & Time:	3:30 PM - 5:00 PM August 3, 2004
Leader:	Dave Rickard	Location:	Santa Barbara County Flood Control District Offices 123 E. Anapamu Street Santa Barbara, CA 93101
Purpose:	Committee Meeting #3		
Attendees:	See Sign In Sheet		

	Description	Lead	Est. Time
1	Call to Order and Complete Sign-in Roster	Dave Rickard	5 minutes
2	Welcome and Introductions	Dave Rickard	5 minutes
3	Discuss Agenda for Public Meetings	Scott Choquette	10 minutes
4	Discuss Progress on Hazard ID	Tenell Matlovsky	15 minutes
5	Discuss Progress on Risk Assessment	Scott Choquette & Jenny Marr	15 minutes
6	Discussion of Mitigation "wish lists"	All	30 minutes
7	Discussion of Progress with Cities/Needs	All	15 minutes
8	Project Schedule - Revise Milestones	David Rickard/ Scott Choquette	15 minutes
9	Next Meeting - Closing Comments	All	5 minutes





Meeting Agenda

Subject:	Santa Barbara County Floodplain Management and Multi-Hazard Mitigation Public Meeting	Date & Time:	August 4, 2004 @ 2:00 PM
Leader:	Dave Rickard	Location:	Santa Barbara County Employees University 267 Camino Del Remedio Santa Barbara, CA 93110
Purpose:	Introduce Preliminary HIRA and Mitigation Projects – Solicit Public Input		
Attendees:	Consultants, Committee Members and the Public (See Roster)		

Item	Description	Lead	Start Time	Duration (min)
1	Introductions and Welcome	Dave Rickard	2:00	10
2	Overview of Mitigation Planning	Scott Choquette and Jenny Marr	2:10	15
3	County Disaster History Overview	Tenell Matlovsky	2:25	15
4	Risk Assessment and Next Steps	Scott Choquette	2:40	10
5	Parks Department Mitigation Projects Wish List	Coleen Lund	2:50	10
6	Flood Control Mitigation Projects Wish List	Mike Parker	3:00	10
7	Department of Transportation Mitigation Projects Wish List	Chris Doolittle	3:10	10
8	Facilitated Discussion of Mitigation Strategies	Dave Rickard/ Jenny Marr/ Scott Choquette	3:20	20
9	Review of Completion Schedule	Scott Choquette	3:40	5
10	Questions and Answers	All	3:45	15





Meeting Agenda

Subject:	Santa Barbara County Floodplain Management and Multi-Hazard Mitigation Public Meeting	Date & Time:	August 5, 2004 @ 10:00 AM
Leader:	Dave Rickard	Location:	Santa Barbara County Board of Supervisors Hearing Room 511 East Lakeside Parkway Santa Maria, CA
Purpose:	Introduce Preliminary HIRA and Mitigation Projects – Solicit Public Input		
Attendees:	Consultants, Committee Members and the Public (See Roster)		

Item	Description	Lead	Start Time	Duration (min)
1	Introductions and Welcome	Dave Rickard	10:00	10
2	Overview of Mitigation Planning	Scott Choquette and Jenny Marr	10:10	15
3	County Disaster History Overview	Tenell Matlovsky	10:25	15
4	Risk Assessment and Next Steps	Scott Choquette	10:40	10
5	Parks Department Mitigation Projects Wish List	Coleen Lund	10:50	10
6	Flood Control Mitigation Projects Wish List	Mike Parker	11:00	10
7	Department of Transportation Mitigation Projects Wish List	Chris Doolittle	11:10	10
8	Facilitated Discussion of Mitigation Strategies	Dave Rickard/ Jenny Marr/ Scott Choquette	11:20	20
9	Review of Completion Schedule	Scott Choquette	11:40	5
10	Questions and Answers	All	11:45	15



Draft Public Notice

Notice of Public Meeting – Santa Barbara County Hazard Mitigation Plan

Pursuant to an Interim Federal Rule, Code of Federal Regulations 44 Parts 201 and 206, Section 201.4(b) and 201.4(c)(1) requiring open public involvement in the formation of the Plan, Santa Barbara County invites the public to a Hazard Mitigation Plan meeting. The meeting will be conducted August 5, 2004 from 10.00 a.m. to 12 noon at the County Board of Supervisors Hearing Room located at 511 East Lakeside Parkway.

Results of 6/ 24 teleconference

1. Weekly teleconference calls at 1.30 PST will occur beginning July 1. The call in number is **888-330-9552 code: 8490321**. There will be NO call July 15.
2. Project Manager has not received Option 2 contract yet, delaying the project by one (1) month.
3. Scott and Jennifer will provide Richard will a bullet list of information needed from each of the cities for the plan. This is similar to the information provided some time ago. Richard will distribute the requested information to the cities.
4. Scott to determine a second date for a south county meeting to coincide with the Aug. 5 north county meeting.
5. Richard to remind each city, that they must establish a hazard mitigation plan project team to evaluate each cities inherent risk assessment and mitigation strategies.
6. Project Manager needs a designated contact person from each city.
7. Workshop #1 work to be completed and presented by Aug 10 (to the State). May be available by Aug. 5 for the public meeting.
8. Abrams made a second request to County Fire for burn history information. First request to Vegetation Management in February, second request to D. Eden 6/24. SB City provided info 2/11.

MEETING MINUTES MEMORANDUM

TO: SANTA BARBARA COUNTY FLOODPLAIN MANAGEMENT AND MULTI-HAZARD MITIGATION ADVISORY COMMITTEES

SUBJECT: TELECONFERENCE MINUTES

DATE: AUGUST 12, 2004 **MEETING TIME AND DATE:** AUGUST 12, 2004 @ 1:30 PDT

Attendees:

Name	Title/Affiliation	Phone	Email
Richard Abrams	Santa Barbara County Fire - Office of Emergency Services	805-681-5567	Richard.Abrams@sbcfire.com
Michael Parker	Santa Barbara County Flood Control	805-568-3449	mparker@co.santa-barbara.ca.us
Linda Reid	City of Buellton	805-688-7474	lindar@cityofbuellton.com
Kimberly Nilsson	City of Goleta	805-961-7565	knilsson@cityofgoleta.org
Jenny Marr	URS Corporation	916-679-2307	jennifer_marr@urscorp.com
Scott Choquette	Dewberry & Davis	617-695-3400	schoquette@dewberry.com

Meeting Notes:

1. Scott Choquette opened the meeting with discussion of project schedule and status. Scott will schedule meeting with Mike Parker to further discuss the Floodplain Management Plan.
2. The HIRA will be completed in the middle of September, the final plan will be submitted by the November 1 deadline, and the plan should be reviewed and adopted by the County in December.
3. The City of Buellton asked when the “template” (further referred to as “Sample Mitigation Strategies and Guidance Document”) would be distributed to the cities for review. The Sample Mitigation Strategies and Guidance Document will be submitted to the cities by the middle of the week of August 23.
4. The City of Buellton also asked how many the cities have contracted with the consultants to finish their plans. One city has a contract set up to finish their plan. The cities have two options for completing their plans, they can finish their mitigation strategies in time to be submitted with the County plan (multi-jurisdictional plan) or they can extract information from the Countywide HIRA and submit a single jurisdiction plan.

5. The CA OES conference call will occur on Tuesday, August 17 at 10:00 am. The call in number and pass code are:
 Phone number: 1-888-330-9552
 Code 8490321
6. Although the 8/17 conference call will be an open discussion, please submit any questions you may have for the call to Scott. Scott will compile the questions and submit them to CA OES, so they will have an opportunity to prepare for the call. The questions will also be used to make the agenda for the meeting, so the call can stay on track and remain productive for everyone involved.
7. Dave Rickard has been in touch with CA OES and Workshop #2 can be scheduled at anytime. Richard Abrams would request that CA OES post the Workshop #2 materials on their website.

Action Items:

1. Submit questions for the Tuesday conference call to consultant team and cc Richard Abrams by Monday (8/16) close of business.
2. Consultant team will email questions to CA OES.
3. Consultant team will email agenda to all persons involved with call.
4. Consultant team will submit Sample Mitigation Strategies and Guidance Document to the cities when complete.

Meeting Agenda

Subject:	Coordination of Multi-Jurisdictional and Single Jurisdiction Mitigation Plans	Date & Time:	8/17/04 10:00 PDT
Leader:	David Rickard/Scott Choquette	Call In #:	888-330-9552 – Code 8490321
Purpose:	Introduce Preliminary HIRA and Mitigation Projects – Solicit Public Input		
Attendees:	Santa Barbara Mitigation Advisory Committee Members, California OES, Dewberry & Davis, URS Corporation, City Representatives to Committee (See Roster)		

Item	Description	Leader	Duration (min.)
1	Introductions and Welcome	Dave Rickard	5
2	Explanation of Planning Process/ Project in Santa Barbara County	Scott Choquette	5
3	Multi-Jurisdictional Vs. Single Jurisdiction	Scott Choquette	5
4	Workshop 1 and 2, Submittal Sequence	S. Choquette/ Frank Hauck	5
5	Consequences of “Planning-in-Progress” After November 1, 2004	All/Frank Hauck	5
6	Levels of Available Data and Detail from City to City	Scott Choquette/ All	5
7	Review Timeline	Frank Hauck	5
8	Workshop 2 Scheduling and Materials on Web	Dave Rickard/ Frank Hauck	5
9	Questions and Answers	All	20

Meeting Agenda

Subject:	Mitigation Advisory Committee	Date & Time:	2:00 - 3:30 PM PDT, Tuesday, October 19, 2004
Leader:	Dave Rickard	Location:	Santa Barbara County Public Works - Conference Room 1 123 E. Anapamu Street Santa Barbara, CA 93101
Purpose:	Final Committee Meeting before Draft Review Submittal		
Attendees:	Mitigation Advisory Committee and Invited Guests - (see roster)		

Item	Description	Lead	Est. Time
1	Welcome and Introductions	D. Rickard	5 Minutes
2	Project Status Update	S. Choquette	10 minutes
3	Submittal process for Committee Review	S. Choquette	10 minutes
4	Process for submittal to cities	S. Choquette	5 minutes
5	How to address cities with no submittal	All	10 minutes
6	Meetings this week	S. Choquette	10 minutes
7	Process for Submittal to OES and FEMA	S. Choquette	5 minutes
8	Next Steps after submittal	All	15 minutes
9	Closing Comments/Questions	D. Rickard	15 minutes

Meeting Agenda

Subject:	Mitigation Advisory Committee - Goleta Local Planning Group Meeting (s)	Date & Time:	1:00 PM - 5:00 PM PDT, Wednesday, 10/20/04 and 8:00 AM - 12:00 PM PDT, Thursday 10/21/04
Leader:	Steve Wagner	Location:	City Offices - Goleta, CA
Purpose:	Capabilities Assessment/Mitigation Strategy Development		
Attendees:	Local Planning Group: Steve Wagner, Kimberly Nilsson, Patricia Miller, Patrick Dugan, Cindy Moore, City Engineer (?) (others as selected by Steve Wagner), Scott Choquette - (see roster)		

Item	Description	Lead	Est. Time
	FULL COMM. MEETING (1:00 - 2:00)		
1	Welcome and Introductions	Steve Wagner	5 Minutes
2	Overview of Plan and Process	S. Choquette	10 minutes
3	Purpose of Meetings	S. Choquette	10 minutes
4	Overview of Hazard ID and Risk Asses.	S. Choquette	15 minutes
4	Overview of plan and projects format	S. Choquette	10 minutes
5	Assign Meeting Times with Individuals and Departments	All	10 minutes
	MEET WITH PLANNING (2:15 - 3:30)		
1	Capabilities Assessment (review Planning docs)	All	30 minutes
2	Project Development	All	40 minutes
3	Next Steps	S. Choquette	5 minutes
	MEET WITH ENGINEERING (3:45 - 5:00)		
1	Capabilities Assessment (review Planning docs)	All	30 minutes
2	Project Development	All	40 minutes
3	Next Steps	S. Choquette	5 minutes
	UPDATE MEETING (w/Steve & Kim) (10/21 - 8:00 - 8:20)		
1	Review Wednesday Progress	Steve/Kim/Scott	20 minutes

Item	Description	Lead	Est. Time
	MEETING WITH EMERGENCY SERVICES (8:30 - 9:30)		
1	Capabilities Assessment (review Planning docs)	All	30 minutes
2	Project Development	All	40 minutes
3	Next Steps	S. Choquette	5 minutes
	OPEN TIME FOR LAST MINUTE DATA COLLECTION - LEFT OVER ACTIONS, WITH DEPARTMENTS (9:45 - 11:00)		
1	Collect last minute data, clean up capability assessment and projects info. Answer remaining questions	All - as needed	1 hr. 15 minutes
	“HOT WASH” MEETING TO DISCUSS PROGRESS AND NEXT STEPS 11:15 - 12:00		
1	Discussion of Action Items	Steve/Scott/Kim	45 minutes

Meeting Agenda

Subject:	Mitigation Advisory Committee - Transportation Dept. Meetings	Date & Time:	8:00 AM - 12:00 PM PDT, Wednesday, 10/20/04 and 1:30 PM - 4:00 PM PDT, Thursday 10/21/04
Leader:	Chris Doolittle	Location:	Conference Room 1, SBCO PW
Purpose:	Capabilities Assessment/Mitigation Strategy Development		
Attendees:	Dace Morgan, Chris Doolittle, Kevin Donnelly, Scott Choquette		

Item	Description	Lead	Est. Time
	PROJECT DEVELOPMENT MEETING #1 (8:00 am - 12:00 PM ON 20th)		
1	Overview of expected outcome	Scott/All	10 Minutes
2	Overview of template and info needed for each project	Scott	10 minutes
3	Summary overview of all projects to rank and discuss which should/not be included	Chris/Scott	30 minutes
4	Break		10 minutes
4	Project-by project population of template	All	3 hours
	PROJECT DEVELOPMENT MEETING #2 (1:30 - 4:00 on 21 st)		
1	Review progress of previous day with Dace Mogan	Scott/All	30 minutes
2	Continue with Project Development and Ranking (if necessary)	Chris/Scott	1 hour
1	Wrap up, schedule next steps, review all projects	All	1 hour

Appendix 3B

SANTA BARBARA COUNTY
FLOODPLAIN MANAGEMENT AND MULTI-HAZARD MITIGATION PLAN COMMENT FORM
DECEMBER 04, 2003

Agency _____
Agency Point of Contact _____
Contact Information
Address _____
Phone _____
Email _____

1. Please select the hazard(s) to the County your agency addresses through its projects:

- | | |
|---|---|
| <input type="checkbox"/> Drought (30%) | <input type="checkbox"/> Earthquake (30%) |
| <input type="checkbox"/> Extreme Heat (10%) | <input type="checkbox"/> Flood (90%) |
| <input type="checkbox"/> Hurricane (0%) | <input type="checkbox"/> Lightning (0%) |
| <input type="checkbox"/> Tornado (0%) | <input type="checkbox"/> Wildfire (20%) |
| <input type="checkbox"/> Other: _____ (0%) | |

2. Have you worked on flood control or floodplain management projects in the past?

- Yes (70%) No (30%)

If "Yes", what were they and how did they address flood control or floodplain management
(please attach additional documents if necessary)?

3. Has your agency conducted any studies involving flood control or floodplain management?

4. What are some steps you think the County should consider to reduce or eliminate the community's vulnerability to disasters?

5. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the County that you think are important?

SANTA BARBARA COUNTY
FLOODPLAIN MANAGEMENT AND MULTI-HAZARD MITIGATION PLAN COMMENT FORM
DECEMBER 03, 2003

Neighborhood or Business Location _____
Name (Optional) _____
Contact Information (If you would like to be contacted by the County about your concerns, ideas, suggestions)
Address _____
Phone _____
Email _____

1. How concerned are you about the possibility of the County of Santa Barbara being impacted by a natural hazard?

- Extremely concerned **(25%)**
- Somewhat concerned **(59%)**
- Not concerned **(16%)**

2. Please select the hazard you think is the highest threat to your neighborhood or business:

- Drought **(10%)**
- Extreme Heat **(0%)**
- Hurricane **(0%)**
- Tornado **(0%)**
- Other: _____ **(2%)**
- Earthquake **(30%)**
- Flood **(30%)**
- Lightning **(0%)**
- Wildfire **(28%)**

3. Do you own or rent your home or place of business?

- Own **(100%)**
- Rent **(0%)**

4. Is your home or place of business located in a floodplain?

- Yes **(85%)**
- No **(10%)**
- Not Sure **(5%)**

5. Do you have flood insurance?

- Yes **(60%)**
- No **(39%)**
- Not Sure **(1%)**

If "No", why not?

- Not located in floodplain
- Too expensive
- Not necessary because it never floods
- Not necessary because I'm elevated or otherwise protected
- Never really considered it
- Other _____

6. Have you taken any actions to make your home or place of business more resistant to hazards?

- Yes **(76%)**
- No **(24%)**

If "Yes", please explain what these actions are:

7. Are you interested in making your home or place of business more resistant to hazards?

- Yes **(76%)**
- No **(24%)**

8. What is the most effective way for you to receive information about how to make your home or workplace more resistant to hazards?

- Newspaper **(20%)**
- Radio **(4%)**
- Mail **(44%)**
- Other _____ **(4%)**
- Telephone **(9%)**
- Internet **(14%)**
- Public meetings **(4%)**
- Phone **(1%)**

9. What are some steps you think the County should consider to reduce or eliminate the community's vulnerability to disasters?

10. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the County that you think are important?

HAZARD REDUCTION ALTERNATIVES

A number of community-wide activities can reduce our risks from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each category is for the County to consider pursuing by checking in the corresponding boxes below.

A. Prevention Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

- Very Important (72%) Somewhat Important (27%) Not Important (1%)

B. Property Protection Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

- Very Important (25%) Somewhat Important (61%) Not Important (14%)

C. Natural Resource Protection Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

- Very Important (65%) Somewhat Important (30%) Not Important (5%)

D. Structural Projects Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls, detention/retention basins, channel modification, retaining walls and storm sewers.

- Very Important (55%) Somewhat Important (42%) Not Important (3%)

E. Emergency Service Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.

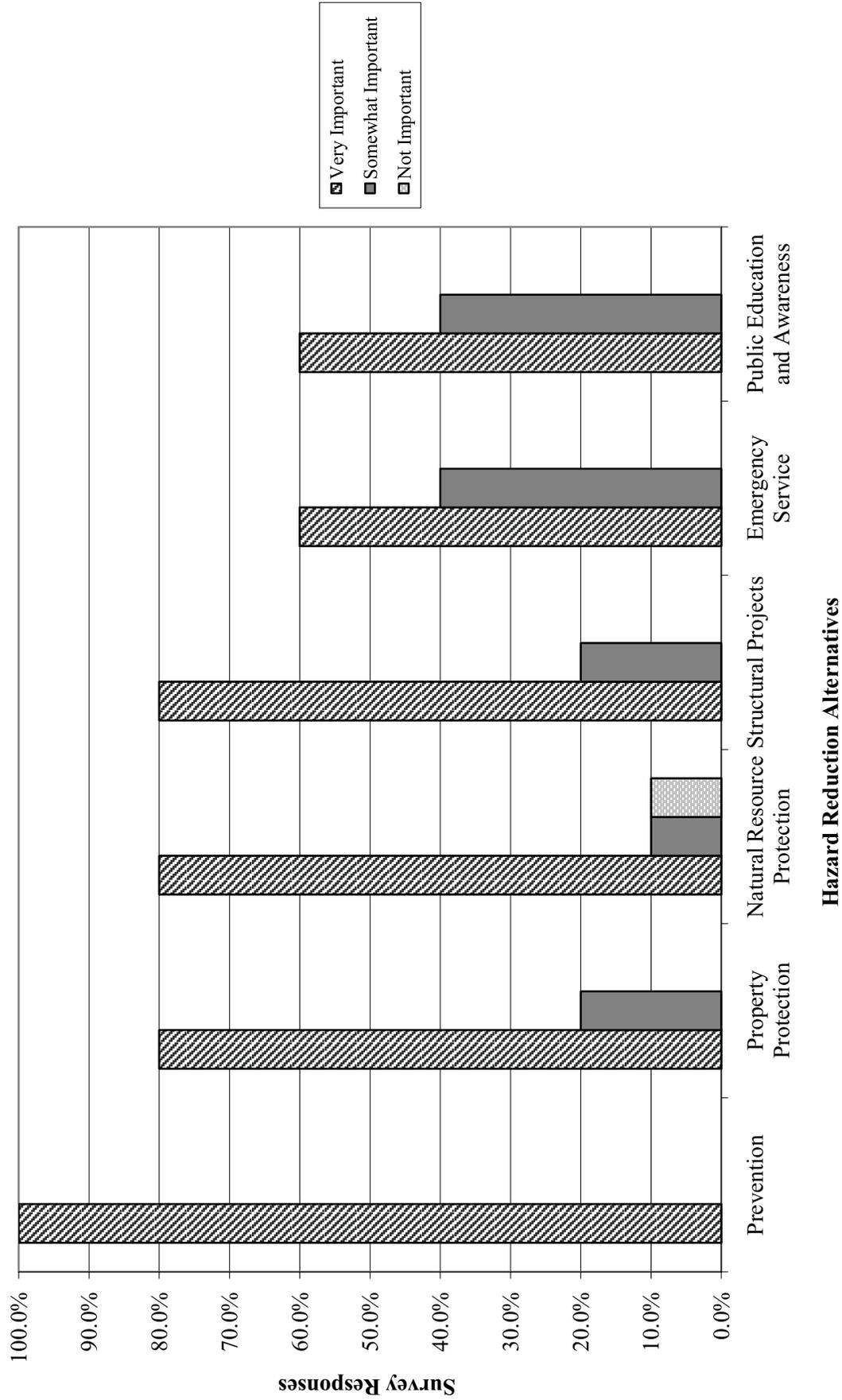
- Very Important (74%) Somewhat Important (23%) Not Important (3%)

F. Public Education and Awareness Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.

- Very Important (59%) Somewhat Important (38%) Not Important (3%)

Please add any additional comments you may have:

Agency Responses - Hazard Reduction Alternative Priority



Appendix 4B

Appendix 4-B HAZARD RANKING WORKSHEET - SANTA BARBARA COUNTY

Hazard Type	Probability	Affected Area	Impact		Total Score	Hazard Planning Consideration
			Primary Impact	Secondary Impacts		
DAM FAILURE	4	1.6	2.8	1	22	Limited
EARTHQUAKE	6	3.2	2.1	1.5	41	Significant
WILDFIRE	8	3.2	2.1	1	50	Significant
FLOODING	8	2.4	2.1	2	52	Significant
COASTAL SURGE/Tsunami	6	2.4	2.1	1.5	36	Moderate
LANDSLIDE/COASTAL EROSION	8	0.8	1.4	1	26	Limited

The probability of each hazard is determined by assigning a level, from 1 to 4, based on the likelihood of occurrence from historical data. The total impact value includes the affected area, primary impact and secondary impact levels of each hazard. These levels are then multiplied by an importance factor to obtain a score for each category. The probability score is multiplied by the sum of the three impact categories to determine the total score for the hazard. Based on this total score, the hazards will be separated into four categories based on the hazard level they pose to the communities: unlikely, possible, critical and highly likely.

Probability
Based on estimated likelihood of occurrence from historical data
Level Probability Importance Score

1	Unlikely	2
2	Somewhat Likely	4
3	Likely	6
4	Highly Likely	8

Secondary Impacts
Based on estimated secondary impacts to community at large
Level Impact Importance Score

1	Negligible - no loss of function, downtime, and/or evacuat	0.5
2	Limited - minimal loss of function, downtime, and/or evacuat	1
3	Moderate - some loss of function, downtime, and/or evacuat	1.5
4	High - major loss of function, downtime, and/or evacuat	2

Affected Area
Based on size of geographical area of community affected by hazard
Level Affected Area Importance Score

1	Isolated	0.8
2	Small	1.6
3	Medium	2.4
4	Large	3.2

Total Score = Probability x Impact, where:
Probability = (Probability Score x Importance)
Impact = (Affected Area + Primary Impact + Secondary Impacts), where:
Affected Area = Affected Area Score x Importance
Primary Impact = Primary Impact Score x Importance
Secondary Impacts = Secondary Impacts Score x Importance

Primary Impact
Based on percentage of damage to typical facility in community
Level Impact Importance Score

1	Negligible - less than 10% damage	0.7
2	Limited - between 10% and 25% damage	1.4
3	Critical - between 25% and 50% damage	2.1
4	Catastrophic - more than 50% damage	2.8

Hazard Level

Total Score (Range)	(Range)	Distribution	Hazard Level
0.0	12.0	2	None
12.1	32.0	1	Limited
32.1	39.6	3	Moderate
39.7	64.0	0	Significant

Hazard Level

Total Score (Range)	Hazard Level	Distribution
0.0	None	0
12.1	Limited	0
32.1	Moderate	0
39.7	Significant	0

Appendix 4C

County of Santa Barbara - 830-00000

1044 - 1995 Winter Storms

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OFDAMAGE TO FACILITY
95053		Y	A	0	\$3,600.00	07/11/95	07/14/00	07/20/95	UNIVERSITY CIRCLE OPEN SPACE
92713		Y	G	0	\$2,132.00	06/13/95	07/14/00	07/20/95	JESUSITA TRAIL
92714		Y	G	0	\$3,763.00	06/13/95	07/14/00	07/20/95	RESERVOIR TRAIL
92715		Y	G	0	\$1,788.00	06/13/95	07/14/00	07/20/95	BUENA VISTA TRAIL
93236		N	G	0	\$0.00	07/11/95	07/14/00	07/20/95	CRESTVIEW EL RODEO OPEN SPACE
26296		Y	A	1	\$1,116.00	07/19/95	08/08/00	08/29/95	TUCKER'S GROVE PARK
26298		Y	A	1	\$2,046.00	07/19/95	08/08/00	08/29/95	POSOLIPO LANE
95055		Y	A	1	\$2,300.00	07/17/95	08/08/00	08/29/95	SAN MIGUEL OPEN SPACE
92723		Y	B	1	\$2,715.00	07/19/95	07/25/00	08/29/95	COUNTYWIDE
95048		Y	B	1	\$8,482.00	07/28/95	08/08/00	08/29/95	BELLA VISTA ROAD, R179
95049		Y	B	1	\$5,858.00	07/28/95	08/08/00	08/29/95	BELLA VISTA ROAD, R169
12537	12537	Y	C	1	\$78,241.00	07/28/95	08/25/00	08/29/95	GIBRALTER ROAD
16818		Y	C	1	\$7,039.00	07/29/95	08/08/00	08/29/95	LILAC DRIVE
16822		Y	C	1	\$10,661.00	07/29/95	08/08/00	08/29/95	SAN YSIDRO LANE
26297		Y	C	1	\$3,624.00	07/19/95	08/08/00	08/29/95	POSOLIDO LANE
26299		Y	C	1	\$1,071.00	07/19/95	08/08/00	08/29/95	ROCKY NOOK PARK
46558		Y	C	1	\$6,770.00	07/29/95	08/08/00	08/29/95	25' OF SOUTHERLY SIDE OF WEST APPROACH
92710	92710	Y	C	1	\$2,872.00	06/16/95	08/08/00	08/29/95	SANTA ROSA PARK ROAD
95037		Y	C	1	\$15,115.00	07/25/95	08/25/00	08/29/95	MISSION CANYON ROAD
95038		Y	C	1	\$2,855.00	07/27/95	08/08/00	08/29/95	SANDSTONE BRIDGE & CULVERT PIPE
95039		Y	C	1	\$1,905.00	07/28/95	08/08/00	08/29/95	BELLA VISTA ROAD, RR 032
95040		Y	C	1	\$2,050.00	07/28/95	08/25/00	08/29/95	BELLA VISTA ROAD, R174
95042		Y	C	1	\$1,548.00	07/28/95	08/08/00	08/29/95	BELLA VISTA ROAD, R169
95043	95043	Y	C	1	\$11,890.00	07/28/95	08/25/00	08/29/95	BELLA VISTA ROAD R193
95045		Y	C	1	\$1,415.00	07/28/95	08/25/00	08/29/95	EAST CAMINO CEILO ROAD R162B
95046		Y	C	1	\$5,514.00	07/28/95	08/25/00	08/29/95	EAST CAMINO CIELO ROAD R162C
95059		N	C	1	\$2,320.00	07/18/95	08/08/00	08/29/95	FOXEN CANYON ROAD
95060	95060	Y	C	1	\$1,763.00	07/18/95	08/25/00	08/29/95	BALLARD CANYON ROAD
95064		Y	C	1	\$6,705.00	07/25/95	08/08/00	08/29/95	952020 - E. MOUNTAIN DR.
95066		N	C	1	\$700.00	07/27/95	08/08/00	08/29/95	RIVEN ROCK ROAD
95067		Y	C	1	\$5,455.00	07/27/95	08/08/00	08/29/95	ROAD
95068		Y	C	1	\$3,125.00	07/27/95	08/08/00	08/29/95	1122 PALOMINO RD
95069		Y	C	1	\$4,000.00	07/27/95	08/09/00	08/29/95	1133 PALOMINO ROAD
11332		Y	D	1	\$5,325.00	07/25/95	08/08/00	08/29/95	24 INCH STORM DRAIN
11329		Y	F	1	\$9,018.00	07/27/95	08/08/00	08/29/95	18 INCH STORM DRAIN PIPE
11333		Y	F	1	\$17,305.00	07/25/95	08/08/00	08/29/95	18 INCH STORM DRAIN

County of Santa Barbara - 830-00000 1044 - 1995 Winter Storms

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OFDAMAGE TO FACILITY
11331		Y	G	1	\$6,621.00	07/27/95	08/08/00	08/29/95	PEDESTRIAN STAIRWAY
16820		Y	G	1	\$1,442.00	07/29/95	08/25/00	08/29/95	PEDESTRIAN STAIRWAY
92725		Y	G	1	\$1,694.00	07/19/95	08/08/00	08/29/95	ARROYO BURRO BEACH
95052	95052	Y	G	1	\$9,937.00	07/18/95	08/08/00	08/29/95	UNIVERSITY CIRCLE OPEN SPACE
95054		Y	G	1	\$19,013.00	07/18/95	08/08/00	08/29/95	UNIVERSITY CIRCLE OPEN SPACE
95056		Y	G	2	\$9,768.00	07/18/95	08/30/00	09/07/95	SAN MIGUEL OPEN SPACE
93327		Y	B	3	\$1,177.00	09/11/95	09/26/00	09/30/95	ADMINISTRATION BUILDING
93329		Y	B	3	\$1,283.00	09/11/95	09/26/00	09/30/95	SANTA BARBARA MAIN COURT HOUSE.
20605		Y	C	3	\$24,406.00	08/04/95	09/08/00	09/30/95	MISSION CANYON ROAD
20606	20606	Y	C	3	\$4,597.00	08/04/95	09/08/00	09/30/95	TUNNEL ROAD
20610		Y	C	3	\$5,901.00	08/19/95	09/26/00	09/30/95	REFUGIO ROAD
20613		Y	C	3	\$43,710.00	08/19/95	09/08/00	09/30/95	REFUGIO ROAD
20614		Y	C	3	\$12,693.00	08/19/95	09/26/00	09/30/95	REFUGIO ROAD
20615	20615	N	C	3	\$15,212.00	08/19/95	09/26/00	09/30/95	COLD SPRINGS ROAD
20616		Y	C	3	\$32,115.00	08/19/95	09/26/00	09/30/95	PICACHO LANE
20617		Y	C	3	\$27,957.00	08/19/95	09/08/00	09/30/95	REFUGIO ROAD
20618		Y	C	3	\$3,198.00	08/19/95	09/26/00	09/30/95	SHEPARDS MESA ROAD
20620		Y	C	3	\$13,489.00	08/14/95	09/26/00	09/30/95	ROMERO CANYON ROAD
95024		N	C	3	\$10,285.00	08/08/95	09/26/00	09/30/95	FARREN ROAD
95025	95025	Y	C	3	\$5,517.00	08/14/95	09/26/00	09/30/95	BELLA VISTA ROAD
95026		N	C	3	\$8,096.00	08/08/95	09/26/00	09/30/95	CALLE REAL
95030		N	C	3	\$683.00	08/19/95	09/26/00	09/30/95	VIEJA DRIVE
95035		N	C	3	\$24,601.00	08/14/95	09/26/00	09/30/95	HOLLISTER AVENUE
95044	95044	Y	C	3	\$12,596.00	07/28/95	09/26/00	09/30/95	CAMINO CIELO ROAD R162A
95150		Y	C	3	\$2,587.00	08/14/95	09/08/00	09/30/95	RINCON HILL ROAD
12270	12270	Y	D	3	\$22,730.00	08/15/95	09/26/00	09/30/95	SAN PEDRO CHANNEL
12277		Y	D	3	\$11,300.00	08/15/95	09/26/00	09/30/95	SANDBAGGED CHANNEL
12279	12279	Y	D	3	\$10,448.00	08/15/95	09/26/00	09/30/95	CONCRETE CHANNEL WALL AT WEST ATASCADERO
12280	12280	Y	D	3	\$13,762.00	08/15/95	09/26/00	09/30/95	CONFLUENCE CREEK AT ATASCADERO
12281	12281	N	D	3	\$4,761.00	08/15/95	09/26/00	09/30/95	CONCRETE SLAB IN CHANNEL, ATASCADERO #2
16819		Y	D	3	\$2,940.00	07/29/95	09/26/00	09/30/95	CIENEGUITAS CREEK
19545	19545	Y	D	3	\$3,003.00	08/28/95	09/29/00	09/30/95	CONCRETE DRAIN PIPE AND EMBANKMENT AT MI
20681		Y	D	3	\$2,065.00	08/15/95	09/29/00	09/30/95	CONCRETE CHANNEL WALL
20682	20682	Y	D	3	\$43,640.00	08/15/95	09/26/00	09/30/95	GROUTED RIP RAP CHANNEL
46572	46572	N	D	3	\$14,218.00	08/15/95	09/26/00	09/30/95	EAST BRANCH MARIA YGNACIA CREEK
93331		N	E	3	\$166.00	08/28/95	09/26/00	09/30/95	ENGINEERING BUILDING.

County of Santa Barbara - 830-00000

1044 - 1995 Winter Storms

5/19/2010

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OFDAMAGE TO FACILITY
19637		Y	A	4	\$29,384.00	09/15/95	10/05/00	10/11/95	VARIOUS CREEKS, COUNTY WIDE. REMOVAL OF
95029	95029	Y	A	4	\$474,589.00	08/19/95	10/04/00	10/11/95	COUNTY ROADS
19606		Y	B	4	\$3,339.00	09/18/95	10/05/00	10/11/95	VETERAN'S BUILDING
12230	12230	Y	D	4	\$11,609.00	08/28/95	10/07/00	10/11/95	D-1218, SAN JOSE CREEK STREAM GAUGE WASH
16845	16845	Y	D	4	\$12,218.00	08/18/95	10/04/00	10/11/95	CONCRETE CHANNEL WALL AT WEST ATASCADERO
19523		Y	D	4	\$3,077.00	09/15/95	10/05/00	10/11/95	ALAMO PINTADA CREEK, RIP RAP
19542	19542	Y	D	4	\$4,856.00	08/28/95	10/04/00	10/11/95	MISION CREEK AT DE LA GUERRA. (THOMAS G
19548	19548	Y	D	4	\$10,125.00	08/28/95	10/05/00	10/11/95	ERODED CONCRETE SACK CHANNEL WALL.
19549	19549	Y	D	4	\$19,921.00	08/28/95	10/05/00	10/11/95	ERODED CONCRETE BAG WALL.
19550	19550	Y	D	4	\$5,012.00	08/28/95	10/05/00	10/11/95	CONCRETE CHANNEL LINING (SITE #9).
19551	19551	Y	D	4	\$3,580.00	08/28/95	10/05/00	10/11/95	CONCRETE ACCESS RAMP, CONCRETE CHANNEL L
20680	20680	Y	D	4	\$51,822.00	08/15/95	10/07/00	10/11/95	CONCRETE CHANNEL (TRAPEZOIDAL)
20684		Y	D	4	\$5,194.00	08/15/95	10/05/00	10/11/95	RATTLE SNAKE CREEK EMBANKMENT
37199		N	D	4	\$6,718.00	09/01/95	10/04/00	10/11/95	ATASCADERO CREEK, SITE #10
94724		N	D	4	\$2,393.00	08/19/95	10/07/00	10/11/95	CHANNEL WALL AT ATASCADERO CREEK #5.
94725		N	D	4	\$2,698.00	08/19/95	10/04/00	10/11/95	HOSPITAL CREEK, SITE #3 CHANNEL WALL
93324		Y	E	4	\$4,844.00	09/01/95	10/05/00	10/11/95	ADMINISTRATION BUILDING
93328		Y	E	4	\$2,514.00	08/30/95	10/05/00	10/11/95	SANTA BARBARA MAIN COURT HOUSE.
16844		N	G	4	\$5,863.00	08/18/95	10/07/00	10/11/95	DRIVEWAY. N34 DEG 27 09.1' W119 DEG 42 0
19543	19543	Y	A	5	\$11,814.00	08/28/95	11/11/00	11/29/95	FRANCISCAN STORM DRAIN.
12538	12537	Y	C	5	\$263,248.00	08/08/95	11/13/00	11/29/95	GIBRALTER ROAD
16821	12537	Y	C	5	\$54,555.00	07/29/95	11/11/00	11/29/95	SITE 1 GIBRALTER ROAD
20600	12537	Y	C	5	\$153,070.00	08/04/95	11/11/00	11/29/95	GIBRALTAR ROAD
20601	12537	Y	C	5	\$184,107.00	08/08/95	11/13/00	11/29/95	GIBRALTAR ROAD
20602	12537	Y	C	5	\$149,313.00	08/04/95	11/13/00	11/29/95	GIBRALTAR ROAD
20603	12537	Y	C	5	\$181,834.00	08/04/95	11/13/00	11/29/95	GIBRALTAR ROAD
20604	20604	Y	C	5	\$106,334.00	08/04/95	11/13/00	11/29/95	EAST MOUNTAIN DRIVE
26289		Y	C	5	\$8,110.00	09/16/95	11/11/00	11/29/95	KRISHENMANN ROAD
93322	93322	Y	C	5	(\$3,890.00)	08/19/95	11/11/00	11/29/95	FOXEN CANYON ROAD
93323		V	C	5	(\$31,954.00)	08/19/95	11/11/00	11/29/95	HOLLISTER AVENUE
94756	20615	V	C	5	(\$15,212.00)	09/15/95	11/11/00	11/29/95	COLD SPRINGS ROAD
95031		N	C	5	\$3,086.00	08/19/95	11/11/00	11/29/95	CATHEDRAL OAKS DR.
95032	95032	Y	C	5	\$56,495.00	08/28/95	11/11/00	11/29/95	BONITA ROAD.
95036		Y	C	5	\$17,150.00	08/14/95	11/11/00	11/29/95	BELL STREET, BRIDGE 51C-157
95047		Y	C	5	\$5,959.00	07/28/95	11/11/00	11/29/95	EAST CAMINO CEILO ROAD-R162D
95058		Y	C	5	\$24,760.00	07/15/95	11/11/00	11/29/95	KINEVAN RD.

County of Santa Barbara - 830-00000

1044 - 1995 Winter Storms

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OFDAMAGE TO FACILITY
95151		Y	C	5	\$22,868.00	08/14/95	11/11/00	11/29/95	GIBALTER ROAD
95152		Y	C	5	\$3,228.00	08/19/95	11/11/00	11/29/95	STAGE COACH ROAD
19634	19634	Y	D	5	\$367,234.00	09/15/95	11/11/00	11/29/95	PIPE AND WIRE FENCING, COUNTY WIDE R/R
46583	46583	Y	D	5	\$49,713.00	10/18/95	11/11/00	11/29/95	CHANNEL LINING AT MISSION CREEK
94723		N	D	5	\$2,563.00	08/19/95	11/11/00	11/29/95	ATASCADERO CREEK, SITE #8
19607	19607	Y	E	5	\$1,008.00	09/18/95	11/11/00	11/29/95	SB VETERAN'S ADMINISTRATION
19652	19652	N	A	6	\$838.00	11/01/95	01/22/00	01/24/96	CIENEGUITAS CREEK
19653		Y	A	6	\$1,599.00	10/13/95	01/22/00	01/24/96	MARGUERITA DRAIN
19663		N	A	6	\$114.00	10/13/95	01/22/00	01/24/96	EL ECANTO CREEK, DRAIN
39766		Y	A	6	\$8,485.00	09/15/95	01/22/00	01/24/96	ARROYO PAREDON CREEK
39767		Y	A	6	\$3,884.00	09/15/95	01/22/00	01/24/96	CARPENTERIA CREEK
39768		Y	A	6	\$57,545.00	09/15/95	01/22/00	01/24/96	FRANKLIN CREEK
39772		Y	A	6	\$21,872.00	09/15/95	01/22/00	01/24/96	GOBERNADOR CREEK
39773		Y	A	6	\$39,457.00	09/15/95	01/22/00	01/24/96	FRANCISCAN BASIN
39919		Y	A	6	\$3,564.00	09/18/95	01/22/00	01/24/96	OAK CREEK
39923		Y	A	6	\$3,967.00	09/18/95	01/22/00	01/24/96	ARROYO BURRO CREEK
39924	39924	Y	A	6	\$34,205.00	09/18/95	01/22/00	01/24/96	TECOLOTE CREEK
39926		Y	A	6	\$23,221.00	09/16/95	01/22/00	01/24/96	SYCAMORE CREEK
39928		Y	A	6	\$2,160.00	09/18/95	01/22/00	01/24/96	A-1108/MISSION CREEK
39929		Y	A	6	\$16,925.00	09/18/95	01/22/00	01/24/96	CARPENTERIA HIGH SCHOOL DRAINAGE CHANNEL
39930		Y	A	6	\$30,544.00	09/18/95	01/22/00	01/24/96	RATTLESNAKE CREEK
39931		Y	A	6	\$1,200.00	09/18/95	01/22/00	01/24/96	A-159/SAN ROQUE CREEK
39932		Y	A	6	\$29,652.00	09/18/95	01/22/00	01/24/96	BELL CANYON CREEK
39933		Y	A	6	\$1,784.00	09/18/95	01/22/00	01/24/96	A-154 WINCHESTER CREEK
39934		Y	A	6	\$26,613.00	09/18/95	01/22/00	01/24/96	GLEN ANNIE/TECOLOTO CREEK
39935		Y	A	6	\$9,437.00	09/18/95	01/22/00	01/24/96	ELLWOOD CREEK
39996		N	A	6	\$300.00	10/13/95	01/22/00	01/24/96	COLD SPRINGS CREEK
98450		Y	A	6	\$28,410.00	10/13/95	01/22/00	01/24/96	SANTA BARBARA CO FLOOD CONTROL DISTRICT
16895	16895	Y	B	6	\$165,467.00	11/06/95	01/22/00	01/24/96	COUNTY WIDE
26295	26295	Y	B	6	\$37,331.00	10/13/95	01/22/00	01/24/96	COUNTY WIDE
39867	39867	N	B	6	\$10,746.00	10/13/95	01/21/00	01/24/96	MAJOR BEACHES, ENVIRONMENTAL HEALTH
98455	98455	Y	B	6	\$94,860.00	10/13/95	01/22/00	01/24/96	SANTA BARBARA CO FLOOD CONTROL DISTRICT
16896		Y	C	6	\$2,000.00	11/06/95	01/21/00	01/24/96	PALOMINO ROAD / CRACKED PAVEMENT
39863		Y	C	6	\$96,423.00	10/13/95	01/22/00	01/24/96	GOBERNADOR CANYON ROAD
39866		Y	C	6	\$2,860.00	11/01/95	01/21/00	01/24/96	BALLARD CANYON ROAD
93332		V	C	6	\$490,010.00	08/30/95	01/20/00	01/24/96	BRIDGE NO 51C-84.

County of Santa Barbara - 830-00000

1044 - 1995 Winter Storms

5/19/2010

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OFDAMAGE TO FACILITY
95680		V	C	6	(\$490,010.00)	09/16/95	01/22/00	01/24/96	FIGUEROA MOUNTAIN ROAD
98466	98466	Y	C	6	\$2,150.00	11/06/95	01/22/00	01/24/96	SAN MARCOS ROAD 4/10 MILE ABOVE TWINRIDG
98467		Y	C	6	\$10,965.00	11/06/95	01/22/00	01/24/96	SAN MARCOS ROAD ABOVE MARIA YGNASCIA CREE
98456		N	D	6	\$8,232.00	10/13/95	01/22/00	01/24/96	CARPENTERIA CREEK CURVE AT LA BREA LANE
19611		Y	E	6	\$4,129.00	09/18/95	01/22/00	01/24/96	THE SAN ANTONIO BUILDING
26294		N	E	6	\$1,448.00	11/01/95	01/22/00	01/24/96	SANTA BARBARA JUVENILE HALL
39862		N	E	6	\$6,801.00	11/01/95	01/22/00	01/24/96	MUNICIPAL COURT
95674		Y	E	6	\$4,848.00	09/15/95	01/22/00	01/24/96	HEALTH CARE SERVICES-BLDG B
95678		N	E	6	\$627.00	11/01/95	01/22/00	01/24/96	GOLETA LIBRARY
95681		N	E	6	\$742.00	11/01/95	01/22/00	01/24/96	SB SOCIAL SERVICES BUILDING
19609	19609	N	B	7	\$15,225.00	11/29/95	01/29/00	01/30/96	DRUM CANYON ROAD
39864		Y	C	7	\$12,537.00	11/01/95	01/25/00	01/30/96	SAN PEDRO CREEK
16890		Y	D	7	\$362.00	12/01/95	01/29/00	01/30/96	BUILDING G201 ROOF AND INTERIOR, EXHIBIT
91715		N	E	7	\$0.00	01/12/96	01/30/00	01/30/96	BUILDING G902 - PROBATION. EXHIBIT B, IT
91716		N	E	7	\$0.00	01/12/96	01/29/00	01/30/96	BUILDING G005 (WALLS, DUCT, HVAC DUCT EX
91720		N	E	7	\$0.00	12/11/95	01/26/00	01/30/96	LAW LIBRARY (BUILD G 001) ROOF AND INTE
91721		Y	E	7	\$1,452.00	12/11/95	01/25/00	01/30/96	JAIL INTERIOR WALLS, FLOOR AND ROOF
91722		N	E	7	\$532.00	12/11/95	01/26/00	01/30/96	INTERIOR WALLS, EXTERIOR DOORS/DOWN DRAI
91732		N	E	7	\$0.00	12/11/95	01/26/00	01/31/96	SANDSPIT ROAD
39872		N	C	8	\$10,324.00	10/13/95	01/30/00	01/31/96	BUILDING 903 - HEALTH CARE
91717		Y	E	8		12/13/95	01/30/00	01/31/96	BUILDING G 904 SOCIAL SERVICES
91718		N	E	8		12/13/95	01/30/00	01/31/96	BUILDING G 905 - ADMINISTRATION
91719		N	E	8	\$0.00	12/11/95	01/30/00	01/31/96	MUNICIPAL COUNTY BUILDING DEPARTMENT BUI
98468		N	E	8	\$0.00	12/11/95	01/30/00	01/31/96	VARIOUS BASINS AND CREEKS R& HAUL
19603	19603	Y	A	9	\$125,017.00	09/16/95	02/07/00	02/08/96	LOS CARNEROS CREEK
19646	19646	Y	A	9	\$328,566.00	10/13/95	02/07/00	02/08/96	SAN JOSE CREEK
19648	19648	Y	A	9	\$709,782.00	10/13/95	02/07/00	02/08/96	TECOLOTTO CREEK (GLEN ANNIE CREEK)
19650	19650	Y	A	9	\$307,324.00	11/01/95	02/07/00	02/08/96	SAN ANTONIO CREEK
19654		Y	A	9	\$2,622.00	10/13/95	02/07/00	02/08/96	SAN PEDRO CREEK
19656	19656	Y	A	9	\$528,166.00	10/13/95	02/07/00	02/08/96	ATASCADERO CREEK
19659	19659	Y	A	9	\$336,694.00	10/13/95	02/07/00	02/08/96	SAN YSIDRO CREEK
19660		Y	A	9	\$32,228.00	10/13/95	02/07/00	02/08/96	BUENA VISTA CREEK
39769		Y	A	9	\$1,860.00	10/13/95	02/07/00	02/08/96	FUEL SUMPS/SENSOR (E-820)
91723		N	C	9	\$3,787.00	12/11/95	02/07/00	02/08/96	CATHEDRAL OAKS ROAD SEDIMENT DISPOSAL SI
19025		Y	A	10	\$3,613.00	01/12/96	02/21/00	02/28/96	CORTONA DRIVE SEDIMENT DISPOSAL SITE
19028		Y	A	10	\$7,710.00	01/12/96	02/21/00	02/28/96	

County of Santa Barbara - 830-00000

1044 - 1995 Winter Storms

5/19/2010

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OF DAMAGE TO FACILITY
19662		Y	A	10	\$48,286.00	11/01/95	02/21/00	02/28/96	MONTECITO CREEK
39765		Y	A	10	\$13,804.00	10/13/95	02/09/00	02/28/96	ROMERO CREEK
39775		Y	A	10	\$10,451.00	11/01/95	02/21/00	02/28/96	HOT SPRINGS CREEK
39921		Y	A	10	\$6,646.00	09/18/95	02/21/00	02/28/96	TORO CREEK
39998		Y	A	10	\$18,324.00	11/01/95	02/21/00	02/28/96	MARIA YGNACIA CREEK
19026		Y	B	10	\$18,763.00	01/12/96	02/21/00	02/28/96	COUNTY WIDE
18409	92710	Y	C	10	\$2,212.00	01/17/96	02/21/00	02/28/96	SANTA ROSA PARK ROAD
20612		Y	C	10	\$25,340.00	08/19/95	02/09/00	02/28/96	REFUGIO ROAD
39871		Y	C	10	\$158,804.00	10/13/95	02/21/00	02/28/96	PAINTED CAVE ROAD
91706		N	E	10	\$696.00	01/12/96	02/09/00	02/28/96	MARSHALLS OFFICE ROOF AND INTERIOR
91708		N	E	10	\$0.00	01/12/96	02/09/00	02/28/96	BUILDING H202 AT BOYS CAMP
91710		N	E	10	\$923.00	01/12/96	02/09/00	02/28/96	BUILDING F620, ROOF AND CEILING, EXHIBIT
91712		N	E	10	\$0.00	01/12/96	02/09/00	02/28/96	BUILDING F402 ROOF AND CEILING TILES, EX
91714		N	E	10	\$0.00	01/12/96	02/09/00	02/28/96	COUNTY BUILDING G202, ROOF AND INTERIOR,
98469		N	E	10	\$976.00	12/11/95	02/09/00	02/28/96	BUILDING F 601, INTERIOR
19630	19630	Y	B	11	\$1,058,940.00	09/15/95	02/28/00	02/29/96	CREEKS; COUNTY WIDE (SEE ATTACHED)
91707		N	E	12	\$0.00	01/12/96	03/12/00	03/26/96	CONDUIT LINE AND CEILING
20619		Y	C	13	\$23,237.00	08/14/95	03/29/00	05/06/96	EAST MOUNTAIN DRIVE
98399		N	C	13	\$897.00	03/01/96	03/29/00	05/06/96	VERONICA SPRINGS ROAD DRAIN
18437	95043	N	C	14	\$16,286.00	02/29/96	05/08/00	06/03/96	BELLA VISTA ROAD - R 193
18476	95060	Y	C	14	\$2,742.00	05/02/96	05/08/00	06/03/96	BALLARD CANYON RD
91711		N	E	14	\$781.00	01/12/96	05/08/00	06/03/96	BUILDING F618 ROOF AND INTERIOR CEILING,
98295		N	G	14	\$1,062.00	03/01/96	05/08/00	06/03/96	ARROYO BURRO BEACH
858	858	Y	E	15	\$1,555.00	05/23/96	06/19/00	06/26/96	SOCIAL SERVICES BLDG- ROOF, WINDOWS (EXH
860		Y	E	15	\$1,454.00	05/23/96	06/19/00	06/26/96	HEALTH CARE SERVICES BUILDING, ROOF AND
19027	19027	Y	A	16	\$189,563.00	01/12/96	07/16/00	08/24/96	GOLETA BEACH PARKING LOT
98458	98458	Y	A	16	\$250,551.00	11/06/95	08/23/00	08/24/96	GOLETA BEACH SEDIMENT DISPOSAL SITE
97359	95025	Y	C	16	\$3,560.00	04/17/96	08/23/00	08/24/96	BELLA VISTA ROAD
29711	46583	Y	D	17	\$47,409.00	07/15/96	09/06/00	09/06/96	DRAINAGE CHANNEL LINING.
12231	12231	Y	D	18	\$3,920.00	08/19/95	09/13/00	09/14/96	SAN JOSE CREEK
19420	19652	V	A	19	\$838.00	08/12/96	11/01/00	11/03/96	CIENEGUITAS CREEK
39685	39924	Y	A	20	\$6,771.00	11/12/96	11/20/00	11/20/96	TECOLOTE CREEK
83812	39867	Y	B	21	\$9,674.00	10/24/96	11/27/00	12/06/96	MAJOR PUBLIC BEACHES
24149	19542	Y	D	21	(\$4,856.00)	10/18/96	12/04/00	12/06/96	MISSION CREEK AT DE LA GUERRA
24162	46583	Y	D	21	(\$49,713.00)	10/18/96	12/04/00	12/06/96	CHANNEL LINING AT MISSION CREEK
24163	19549	Y	D	21	(\$19,921.00)	10/18/96	12/04/00	12/06/96	ERODED CONCRETE BAG WALL

County of Santa Barbara - 830-00000

1044 - 1995 Winter Storms

5/19/2010

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OFDAMAGE TO FACILITY
83823	16845	Y	D	22	(\$12,218.00)	11/05/96	12/13/00	12/17/96	CENCRETE CHANNEL WALL AT WEST ATASCADERO
83824	19550	Y	D	22	(\$5,012.00)	11/05/96	12/13/00	12/17/96	CONCRETE CHANNEL LINING (SITE #9)
71692	39867	Y	B	23	(\$9,674.00)	12/11/96	01/02/00	01/21/97	MAJOR BEACHES, ENVIRONMENTAL HEALTH
91555	95044	Y	C	23	\$23,085.00	12/06/96	01/15/00	01/21/97	EAST CAMINO CEILO ROAD
24188	26295	Y	B	24	\$1,534.00	02/20/97	02/21/00	03/13/97	COUNTY WIDE
24152	12270	Y	D	24	(\$22,730.00)	10/22/96	02/24/00	03/13/97	SAN PEDRO CHANNEL
24150	20680	Y	D	25	(\$51,822.00)	10/22/96	04/29/00	05/05/97	CONCRETE CHANNEL
24153	12279	Y	D	25	(\$10,448.00)	10/22/96	04/29/00	05/05/97	CONCRETE CHANNEL WALL AT WEST ATASCADERO
24154	12280	Y	D	25	(\$13,762.00)	10/22/96	04/29/00	05/05/97	CONFLUENCE CREEK AT ATASCADERO
83590	19551	Y	D	25	(\$3,580.00)	01/27/97	04/29/00	05/05/97	SAN PEDRO CHANNEL
83894	19542	Y	D	25	(\$4,856.00)	11/04/96	04/29/00	05/05/97	MISSION CREEK
17777	19543	Y	A	26	\$82,006.00	03/11/97	10/28/00	10/29/97	FRANCISCAN STORM DRAIN
49686		Y	A	26	\$1,827,721.00	09/05/96	10/28/00	10/29/97	TAJIGUAS LANDFILL AND GOLETA TRANSFER ST
17167	12270	Y	D	26	\$24,390.00	07/24/97	10/28/00	10/29/97	SAN PEDRO CHANNEL
17168	20680	Y	D	26	\$55,872.00	07/24/97	10/28/00	10/29/97	CIENQUITAS CREEK
17735	19542	Y	D	26	\$4,856.00	07/24/97	10/28/00	10/29/97	MISSION CREEK
17711	95052	Y	G	27	(\$994.00)	08/05/97	01/06/00	01/09/98	PEDESTRIAN BRIDGE
29657	19609	Y	B	28	\$5,584.00	11/14/97	02/03/00	02/06/98	COUNTY WIDE EMERGENCY RESPONSE
59471	19634	Y	D	29	\$24,669.00	12/29/97	02/20/00	02/24/98	PIPE AND WIRE FENCING, COUNTY WIDE
59457	19027	Y	A	30	(\$33,922.00)	12/19/97	05/14/00	05/19/98	GOLETA BEACH PARKING LOT
59461	19603	Y	A	30	(\$2,159.00)	12/19/97	05/14/00	05/19/98	VARIOUS BASINS AND CREEKS
59462	19646	Y	A	30	(\$27,903.00)	12/19/97	05/14/00	05/19/98	LOS CARNEROS CREEK
59463	19648	Y	A	30	\$823.00	12/19/97	05/14/00	05/19/98	SAN JOSE CREEK
59464	19650	Y	A	30	\$14,879.00	12/19/97	05/14/00	05/19/98	TECOLITO CREEK
59465	19656	Y	A	30	(\$1,361.00)	12/19/97	05/14/00	05/19/98	SAN PEDRO CREEK
59466	19659	Y	A	30	\$919.00	12/19/97	05/14/00	05/19/98	ATASCADERO CREEK
59467	19630	Y	B	30	(\$17,774.00)	12/19/97	05/14/00	05/19/98	CREEKS,COUNTY WIDE
59468	98455	Y	B	30	\$1,422.00	12/19/97	05/14/00	05/19/98	SANTA BARBARA CO FLOOD CONTROL DISTRICT
37968	95032	Y	C	31	\$1,938.00	06/18/98	07/02/00	07/06/98	BONITA ROAD
58653		Y	D	32	\$27,906.00	07/06/98	07/28/00	07/31/98	CONCRETE ACCESS RAMP, CONCRETE CHANNEL L
10226	95029	Y	A	33	\$160,125.00	08/24/98	08/28/00	09/02/98	COUNTY ROADS
5164	46572	Y	D	34	\$7,817.00	12/15/98	12/15/00	12/30/98	EAST BRANCH MARIA YGNACIA CREEK
5167	12281	Y	D	34	\$5,285.00	12/15/98	12/15/00	12/30/98	CONCRETE SLAB IN CHANNEL, ATASCADERO #2
5845	12280	Y	D	34	\$15,276.00	12/15/98	12/15/00	12/30/98	CONFLUENCE CREEK AT ATASCADERO
5846	16845	Y	D	34	\$13,562.00	12/15/98	12/15/00	12/30/98	CONCRETE CHANNEL WALL AT WEST ATASCADERO
5847	19550	Y	D	34	\$5,563.00	12/15/98	12/15/00	12/30/98	CONCRETE CHANNEL LINING, SITE #9

County of Santa Barbara - 830-00000

1044 - 1995 Winter Storms

5/19/2010

DSR #	Supp DSR	Elig.	Category	Supp #	Amount	1st Rev.	2nd Rev.	PaPed	PHYSICAL DIMENSIONS OFDAMAGE TO FACILITY
30516	12279	Y	D	34	\$11,597.00	12/15/98	12/15/00	12/30/98	CONCRETE CHANNEL WALL AT WEST ATASCADERO
9231	98458	Y	A	35	\$80,957.00	08/24/99	08/24/00	08/26/99	GOLETA BEACH SEDIMENT DISPOSAL SITE
6168	16895	Y	B	35	\$26,100.00	08/24/99	08/25/00	08/26/99	COUNTY WIDE
6170	20604	Y	C	35	\$6,727.00	08/24/99	08/25/00	08/26/99	EAST MOUNTAIN DRIVE
9220	93322	Y	C	35	\$3,890.00	08/24/99	08/25/00	08/26/99	FOXEN CANYON ROAD
9221	20606	Y	C	35	(\$4,597.00)	08/24/99	08/25/00	08/26/99	TUNNEL ROAD
9223	98466	Y	C	35	(\$2,150.00)	08/24/99	08/25/00	08/26/99	SAN MARCOS ROAD 4/10 MILE ABOVE TWINRIDG
10393	12537	Y	C	35	(\$124,784.00)	08/24/99	08/25/00	08/26/99	GIBRALTER ROAD
9213	12230	Y	D	35	(\$11,609.00)	08/24/99	08/25/00	08/26/99	D-1218, SAN JOSE CREEK STREAM GAUGE WASH
9214	12231	Y	D	35	(\$3,920.00)	08/24/99	08/24/00	08/26/99	SAN JOSE CREEK
9216	19545	Y	D	35	(\$3,003.00)	08/24/99	08/25/00	08/26/99	CONCRETE DRAIN PIPE AND EMBANKMENT AT MI
9217	19548	Y	D	35	(\$10,125.00)	08/24/99	08/25/00	08/26/99	ERODED CONCRETE SACK CHANNEL WALL
9219	20682	Y	D	35	(\$35,492.00)	08/24/99	08/25/00	08/26/99	GROUTED RIPRAP CHANNEL
9222	46583	Y	D	35	(\$47,409.00)	08/24/99	08/25/00	08/26/99	DRAINAGE CHANNEL LINING.
9218	19607	Y	E	35	(\$1,008.00)	08/24/99	08/25/00	08/26/99	SB VETERAN'S ADMINISTRATION
9225	858	Y	E	35	(\$1,555.00)	08/24/99	08/25/00	08/26/99	SOCIAL SERVICES BLDG - ROOF WINDOWS (EXH

\$9,988,663.00

268 Records Processed

County of Santa Barbara 083-00000 1046 - Late Winter Storms

DSR #	SUPP #	Elig.	Category	Supp #	Amount	1st REV	2nd REV	PAPed	PHYSICAL DIMENSIONS OF DAMAGE TO FACILITY
92717		Y	A	0	\$1,688.00	06/30/95	07/14/00	07/18/95	PARK ACCESS ROAD
92721		Y	A	0	\$3,281.00	06/27/95	07/14/00	07/18/95	BEACH ACCESS ROADS
92704		Y	B	0	\$1,000.00	06/26/95	07/14/00	07/18/95	CACHUMA SEWER LIFT STATION
92720		N	A	1	\$755.00	06/26/95	07/19/00	07/24/95	MANNING PARK
92705		Y	F	1	\$5,292.00	06/26/95	07/20/00	07/24/95	CACHUMA SEWER LIFT STATION
92718		Y	F	1	\$1,843.00	06/30/95	07/20/00	07/24/95	POWER POLE
12533		Y	A	2	\$5,848.00	07/25/95	08/08/00	08/10/95	STAGE COACH ROAD
12534		Y	A	2	\$3,915.00	07/26/95	08/08/00	08/10/95	STAGE COACH ROAD
92702		Y	A	2	\$14,460.00	06/08/95	07/22/00	08/10/95	WALLER PARK
95063		Y	B	2	\$47,572.00	07/24/95	08/08/00	08/10/95	BRIDGE NO. 51C - 190
46559		Y	C	2	\$2,917.00	07/29/95	08/08/00	08/10/95	25' N SIDE OF W APPROACH & SHOULDER WASH
92709	92709	Y	C	2	\$9,754.00	06/15/95	08/08/00	08/10/95	SANTA BARBARA COUNTY SHERIFF'S DEPT SHOO
95062		Y	C	2	\$2,562.00	07/20/95	08/08/00	08/10/95	VIA CHAPARRAL ROAD
92722		Y	G	2	\$1,400.00	07/20/95	08/08/00	08/10/95	MANNING PARK
46560		Y	D	3	\$9,004.00	07/29/95	08/28/00	09/07/95	RIP RAP AT SAN ANTONIO BR 51C-266
95034	95034	Y	B	4	\$1,900.00	08/14/95	09/12/00	09/13/95	WEST CAMINO CIELO ROAD
95051	95051	Y	B	4	\$4,200.00	08/22/95	09/09/00	09/13/95	GLENN ANNIE ROAD
94753	94753	Y	A	5	\$12,805.00	08/29/95	09/26/00	09/29/95	MARIA YANACIA CREEK DEBRIS
95022	95022	Y	A	5	\$19,665.00	08/08/95	09/26/00	09/29/95	WEST CAMINO CIELO ROAD
92719		Y	B	5	\$31,576.00	08/21/95	09/25/00	09/29/95	BRIDGE NUMBER 51C-84
20607	20607	Y	C	5	\$3,968.00	08/14/95	09/26/00	09/29/95	BELLA VISTA DRIVE
20608		Y	C	5	\$9,741.00	08/14/95	09/26/00	09/29/95	BELLA VISTA DRIVE
46562		V	C	5	\$56,273.00	07/28/95	09/26/00	09/29/95	SAN MARCOS RD EMBANKMENT FAILURE
95021		Y	C	5	\$18,417.00	08/08/95	09/25/00	09/29/95	GLENN ANNIE ROAD
95028		Y	C	5	\$5,070.00	08/21/95	09/25/00	09/29/95	LOCH LOMOND DRIVE
46561		Y	D	5	\$20,778.00	07/28/95	09/25/00	09/29/95	OLD SAN MARCOS BR 51C-002 AT MARIA YGNAC
93330		N	E	5	\$0.00	08/28/95	09/25/00	09/29/95	
12232	12232	N	C	6	\$22,340.00	08/21/95	10/06/00	10/12/95	DRIVEWAY AT 861 VEREDA DEL CIERVO
19501	19501	Y	C	6	\$1,097.00	09/06/95	10/06/00	10/12/95	SAN ROGUE ACCESS ROADWAY AT ONTARE ROAD
46568		Y	C	6	\$26,466.00	08/08/95	10/06/00	10/12/95	TORO CANYON RD, PROJECT 439
46579		N	C	6	\$16,000.00	08/21/95	10/06/00	10/12/95	MARIA YGNACIA MAIN BRANCH ROAD, MARIA YG
93326		Y	C	6	\$167,211.00	08/28/95	10/06/00	10/12/95	WEST MOUNTAIN DRIVE.
12236	12236	Y	D	6	\$9,149.00	08/29/95	10/06/00	10/12/95	SAN JOSE CREEK CATHEDRAL OAKS BRIDGE.
12237		Y	D	6	\$10,165.00	08/21/95	10/06/00	10/12/95	BUENA VISTA CREEK
19506	19506	Y	D	6	\$19,215.00	09/06/95	10/06/00	10/12/95	SAN ROGUE CREEK, RIP RAP

**County of Santa Barbara 083-00000
1046 - Late Winter Storms**

5/19/2010

DSR #	SUPP #	Elig.	Category	Supp #	Amount	1st REV	2nd REV	PAPed	PHYSICAL DIMENSIONS OF DAMAGE TO FACILITY
19509	19509	Y	D	6	\$12,399.00	09/06/95	10/06/00	10/12/95	REPLACE CHECK DAM LOS CARNEROS CREEK
19510		Y	D	6	\$23,382.00	09/06/95	10/06/00	10/12/95	TANGLEWOOD DEBRIS BASIN SPILLWAY AT ORCU
19511		Y	D	6	\$15,643.00	09/06/95	10/06/00	10/12/95	B-335 SAN JOSE CREEK SOUTH OF PATTERSON
46567		Y	D	6	\$22,424.00	08/08/95	10/06/00	10/12/95	BRIDGE NO S1C-45 PROJECT R366
94740		Y	D	6	\$7,604.00	08/21/95	10/06/00	10/12/95	MONTECITO CREEK
94746		Y	D	6	\$8,550.00	08/29/95	10/06/00	10/12/95	CARPINTERIA CREEK RIP RAP.
94749	94749	Y	D	6	\$3,639.00	08/29/95	10/06/00	10/12/95	MARIA YGNACIA CREEK RIP RAP.
94750		Y	D	6	\$3,582.00	08/29/95	10/06/00	10/12/95	EL ENCANTO DRAIN ERODED RIP RAP CHANNEL.
19508	19508	Y	G	6	\$22,200.00	09/07/95	10/06/00	10/12/95	FENCE AND GATES
11334	11334	Y	C	7	\$4,943.00	07/25/95	11/04/00	11/11/95	STAGE COACH ROAD
95023	95023	Y	C	7	\$104,340.00	08/14/95	11/04/00	11/11/95	WEST CAMINO CIELO ROAD
95154		Y	C	7	\$61,862.00	08/28/95	11/04/00	11/11/95	SAN MARCOS ROAD
12227		Y	D	7	\$2,717.00	08/21/95	11/04/00	11/11/95	STREAM GAUGE AT GOLITA SLOUGH
46557		Y	D	7	\$13,100.00	07/29/95	11/04/00	11/11/95	BANK SLOPE PROTECTION BR 51C-47
94738		Y	D	7	\$8,544.00	08/21/95	11/04/00	11/11/95	SAN ROQUE DEBRIS BASIN SPILLWAY
94747	94747	Y	D	7	\$7,592.00	08/29/95	11/04/00	11/11/95	HOSPITAL CREEK RIP RAP
19552		Y	A	8	\$18,829.00	09/13/95	01/20/00	01/21/96	FRANCISCAN BASIN
19569		Y	A	8	\$27,000.00	09/07/95	01/20/00	01/21/96	ROMERO CREEK DEBRIS BASIN
19570		Y	A	8	\$31,000.00	09/07/95	01/20/00	01/21/96	SAN YSIDRO CREEK DEBRIS BASIN
19572		Y	A	8	\$9,200.00	09/07/95	01/20/00	01/21/96	RATTLESNAKE CREEK DEBRIS BASIN
19573		Y	A	8	\$8,000.00	09/07/95	01/20/00	01/21/96	MISSION CREEK DEBRIS BASIN
19574		Y	A	8	\$84,825.00	09/07/95	01/20/00	01/21/96	SAN ANTONIO CREEK DEBRIS BASIN
19581		Y	A	8	\$19,300.00	09/07/95	01/20/00	01/21/96	GOBERNADOR CREEK DEBRIS BASIN
19582	19582	Y	A	8	\$50,214.00	09/07/95	01/20/00	01/21/96	SAN ROQUE CREEK DEBRIS BASIN
19651		Y	A	8	\$10,758.00	10/16/95	01/20/00	01/21/96	MARIA YGNACIA CREEK
19655		Y	A	8	\$4,030.00	10/16/95	01/20/00	01/21/96	SAN ANTONIO CREEK
19661		Y	A	8	\$34,787.00	10/16/95	01/20/00	01/21/96	SAN YSIDRO CREEK
19665		Y	A	8	\$10,692.00	10/16/95	01/20/00	01/21/96	BUENA VISTA CREEK
39774		Y	A	8	\$2,212.00	10/17/95	01/20/00	01/21/96	TURO CREEK
39776		Y	A	8	\$57,904.00	09/13/95	01/20/00	01/21/96	FRANKLIN CREEK
39777		Y	A	8	\$1,657.00	09/13/95	01/20/00	01/21/96	ARROYO PAREDON CREEK
39778		Y	A	8	\$18,524.00	09/13/95	01/20/00	01/21/96	CARPENTERIA CREEK
39925		Y	A	8	\$11,633.00	10/17/95	01/20/00	01/21/96	TECOLOTE CREEK
39936		Y	A	8	\$1,288.00	10/17/95	01/20/00	01/21/96	A-304, ELLWOOD CREEK
91728	91728	N	B	8	\$21,627.00	11/29/95	01/20/00	01/21/96	
98454	98454	N	B	8	\$51,018.00	10/16/95	01/20/00	01/21/96	SANTA BARBARA COUNTY FLOOD CONTROL DISTR

County of Santa Barbara 083-00000 1046 - Late Winter Storms

DSR #	SUPP #	Elig.	Category	Supp #	Amount	1st REV	2nd REV	PAPed	PHYSICAL DIMENSIONS OF DAMAGE TO FACILITY
26276		N	C	8	\$100.00	11/10/95	01/20/00	01/21/96	SHEPARDS MESA ROAD
95061		V	C	8	\$26,250.00	07/15/95	01/20/00	01/21/96	BRIDGE NO. 51C-84
95675		Y	C	8	\$3,881.00	10/17/95	01/20/00	01/21/96	SAN MIGUELITO ROAD
19513		Y	D	8	\$2,332.00	10/17/95	01/10/00	01/21/96	LAKE MARIA DITCH AT MARIA ESTATES
19628		Y	D	8	\$10,239.00	10/17/95	01/20/00	01/21/96	SPILLWAY TO CIENQUITAS CREEK
19631	19631	Y	D	8	\$3,223.00	10/17/95	01/10/00	01/21/96	DROP STRUCTURE MARIA IGNACIA CREEK, RIP
19632		Y	D	8	\$4,910.00	10/17/95	01/10/00	01/21/96	ARROYO BURRO CREEK RIP RAP
19673		N	D	8	\$0.00	11/13/95	01/20/00	01/21/96	ATASCADERO CREEK, CHANNEL
46570		Y	D	8	\$5,442.00	10/17/95	01/10/00	01/21/96	HEADWALL AND BANK PROTECTION
46574	46574	Y	D	8	\$29,440.00	10/17/95	01/10/00	01/21/96	PCC LINING TO EAST AND WEST SIDES OF BAN
46582		Y	D	8	\$11,660.00	10/17/95	01/20/00	01/21/96	MANHOLE
19664		N	A	9	\$602.00	10/13/95	01/22/00	01/23/96	GREEN WELL CREEK
26280		Y	A	9	\$10,373.00	11/13/95	01/22/00	01/23/96	CORTONA DRIVE, SEDIMENT DISPOSAL SITE
46585	46585	Y	D	9	\$18,774.00	10/17/95	01/20/00	01/23/96	MONTECIDO CREEK AT SOUTHERN PACIFIC RAIL
19635		Y	A	10	\$31,562.00	10/17/95	01/26/00	01/30/96	VARIOUS CREEKS, COUNTY WIDE, REMOVAL OF
19640		N	A	10	\$7,111.00	10/17/95	01/26/00	01/30/96	RODEO/SAN PASQUAL DEBRIS BASIN DESILT
19641		N	A	10	\$9,487.00	10/17/95	01/26/00	01/30/96	C GETTY BASIN DESILTATION
19643		N	A	10	\$14,750.00	10/17/95	01/26/00	01/30/96	KOVAR DEBRIS BASIN DESILTATION
39920		Y	A	10	\$12,332.00	10/17/95	01/26/00	01/30/96	OAK CREEK
26282		Y	B	10	\$12,130.00	11/13/95	01/26/00	01/30/96	COUNTY WIDE
46575		N	C	10	\$24,000.00	10/17/95	01/23/00	01/30/96	ROADWAY
95679	95679	Y	C	10	\$308,320.00	01/19/96	01/24/00	01/30/96	BRIDGE NO. 51C - 84
46578	46578	N	D	10	\$29,158.00	10/17/95	01/26/00	01/30/96	TOP OF CREEK BANK ERODED
19512		Y	C	11	\$27,980.00	10/17/95	01/31/00	02/01/96	RODEO SAN PASQUAL BASIN ACCESS ROAD
19521		Y	C	11	\$3,500.00	10/17/95	01/31/00	02/01/96	ACCESS ROAD TO TWIN SCREENS DRIVE-IN AT
39870	39870	Y	C	11	\$36,984.00	11/01/95	01/31/00	02/01/96	BITUMINOUS SURFACE FAILURE
46573		Y	C	11	\$11,000.00	10/17/95	01/31/00	02/01/96	ROADWAY
19644		N	A	12	\$45,593.00	10/17/95	02/02/00	02/05/96	RODEO/SAN PASQUAL CHANNEL DESILTATION
19658		Y	A	12	\$12,561.00	10/13/95	02/02/00	02/05/96	ATASCADERO CREEK CHANNEL
98452	98452	Y	A	12	\$87,271.00	11/10/95	02/02/00	02/05/96	GOLETA BEACH SEDIMENT DISPOSAL SITE
91713		N	B	12	\$437.00	01/27/96	02/02/00	02/05/96	EXCAVATION AREA DUE TO FLOODING
91724		N	B	12	\$0.00	01/27/96	02/02/00	02/05/96	UNDERGROUND SEPTIC TANKS (C511)
46571	46571	N	D	12	\$10,000.00	01/09/96	02/02/00	02/05/96	SLOPE PROTECTION
91709		N	E	12	\$1,191.00	01/27/96	02/02/00	02/05/96	BUILDING F-843 ROOF 2' CEILING EXHIBIT "
91725		Y	E	12	\$351.00	01/29/96	02/02/00	02/05/96	FIRE STATION CARPETING/SEPTIC SYSTEM EXH
19642	19642	Y	A	13	\$168,509.00	10/16/95	02/02/00	02/08/96	VARIOUS BASINS AND CREEKS

County of Santa Barbara 083-00000 1046 - Late Winter Storms

DSR #	SUPP #	Elig.	Category	Supp #	Amount	1st REV	2nd REV	PAPed	PHYSICAL DIMENSIONS OF DAMAGE TO FACILITY
19645	19645	Y	A	13	\$156,243.00	10/13/95	02/02/00	02/08/96	LOS CARNEROS CREEK
19649	19649	Y	A	13	\$235,683.00	10/13/95	02/02/00	02/08/96	SAN JOSE CREEK
19657		Y	A	13	\$290,046.00	10/13/95	02/02/00	02/08/96	SAN PEDRO CREEK
39770		Y	A	13	\$5,491.00	10/13/95	02/02/00	02/08/96	ROMERO CREEK
39771	39771	Y	A	13	\$99,684.00	10/16/95	02/02/00	02/08/96	MONTECITO CREEK
39922		Y	A	13	\$2,659.00	10/17/95	02/26/00	02/08/96	ARROYO BURRO CREEK
39997		Y	A	13	\$1,188.00	10/13/95	02/02/00	02/08/96	COLD SPRINGS CREEK
98451		Y	A	13	\$34,345.00	10/16/95	02/02/00	02/08/96	SANTA BARBARA COUNTY FLOOD CONTROL
12226	12226	N	A	14	\$25,067.00	08/29/95	02/14/00	02/27/96	ARROYO BURRO CREEK
19571		Y	A	14	\$86,000.00	09/07/95	02/14/00	02/27/96	COLD SPRINGS CREEK DEBRIS BASIN
19576		Y	A	14	\$13,400.00	09/07/95	02/14/00	02/27/96	UPPER WEST TORO CREEK DEBRIS BASIN
19577		Y	A	14	\$32,430.00	09/07/95	02/14/00	02/27/96	LOWER WEST TORO CREEK DEBRIS BASIN
19578		Y	A	14	\$13,700.00	09/07/95	02/14/00	02/27/96	EAST TORO CREEK DEBRIS BASIN
19579		Y	A	14	\$105,000.00	09/07/95	02/14/00	02/27/96	SANTA MONICA CREEK DEBRIS BASIN
19580		Y	A	14	\$10,000.00	09/07/95	02/14/00	02/27/96	FRANKLIN MAIN CREEK DEBRIS BASIN
39927	39927	N	A	14	\$135,286.00	10/17/95	02/14/00	02/27/96	SYCAMORE CREEK
98520		Y	B	15	\$11,824.00	07/15/96	07/18/00	07/19/96	COUNTY-WIDE
98400	98400	Y	C	15	\$3,743.00	03/01/96	07/18/00	07/19/96	RINCON HILL ROAD
12218		Y	D	15	\$10,162.00	08/21/95	07/18/00	07/19/96	SAN JOSE CREEK SOUTH OF PATTERSON BRIDGE
19505		Y	D	15	\$3,250.00	09/07/95	07/18/00	07/19/96	TECOLOTE CREEK RIP RAP AND DRAIN PIPE
46577		Y	D	15	\$20,350.00	10/17/95	07/18/00	07/19/96	STREAM BANK-WINCHESTER CREEK
46581		Y	D	15	\$32,400.00	10/17/95	07/18/00	07/19/96	MONTECITO CREEK - CONCRETE LINED SECTION
94745	94745	Y	D	15	\$18,900.00	08/29/95	07/18/00	07/19/96	ATASCADERO CREEK RIP RAP.
94751		Y	D	15	\$7,257.00	08/29/95	07/18/00	07/19/96	TECOLOTE CREEK BRIDGE ABUTMENTS.
94752	94752	Y	D	15	\$18,735.00	08/29/95	07/18/00	07/19/96	MARIA YANACIA CREEK RIP RAP
98397		Y	F	15	\$2,460.00	02/28/96	07/18/00	07/19/96	LOS VERDES DRAIN
19504		N	D	16	\$52,806.00	08/29/95	07/23/00	08/17/96	TECOLOTE CREEK RIP RAP AND SLOPE.
19629		N	D	16	\$8,315.00	10/17/95	07/23/00	08/17/96	MISSION CREEK RIP RAP, GROUTED
46584		N	D	16	\$44,471.00	08/22/95	07/23/00	08/17/96	MISSION CREEK AT OAK PARK AND PADRE STRE
12220		V	D	17	\$16,240.00	08/21/95	08/23/00	08/24/96	SAN JOSE CREEK AT CATHEDRAL OAKS VILLAGE
19502	19502	Y	D	17	\$1,936.00	08/29/95	08/23/00	08/24/96	MISSION CREEK RIP RAP
19507		Y	B	18	\$162,448.00	10/17/95	09/12/00	09/14/96	COUNTY WIDE
39995	39995	N	A	19	\$6,240.00	10/16/95	09/23/00	09/23/96	HOT SPRINGS CREEK
19519		Y	D	20	\$7,168.00	10/17/95	10/02/00	10/02/96	SAN ANTONIO CREEK
94744		Y	D	20	\$6,072.00	08/29/95	10/02/00	10/02/96	ARROYO BURRO CREEK
17579	92709	Y	C	21	\$1,500.00	10/21/96	11/01/00	11/27/96	SANTA BARBARA COUNTY SHERIFF'S DEPTMENT

County of Santa Barbara 083-00000 1046 - Late Winter Storms

DSR #	SUPP #	Elig.	Category	Supp #	Amount	1st REV	2nd REV	PAPed	PHYSICAL DIMENSIONS OF DAMAGE TO FACILITY
83811	46574	Y	D	22	(\$29,440.00)	10/23/96	12/04/00	12/06/96	SAN JOSE CREEK (D-1176)
24161	19508	Y	G	22	\$489.00	10/18/96	12/04/00	12/06/96	FENCE AND GATE
83822	46585	Y	D	23	(\$18,774.00)	11/01/96	12/10/00	12/13/96	MONTECITO CREEK AT SOUTHERN PACIFIC RAIL
19639	19639	Y	A	24	\$235,000.00	10/17/95	02/20/00	03/05/97	SAN MIGUELITO SILTATION BASIN
95065	95065	Y	C	24	\$189,576.00	07/25/95	02/20/00	03/05/97	95R342 GOBERNADOR CANYON ROAD
24139	46578	Y	D	24	\$6,120.00	11/22/96	02/20/00	03/05/97	TOP OF CREEK BANK
83553	12226	Y	A	25	\$9,283.00	01/02/97	03/12/00	03/23/97	ARROYO BURRO CREEK
27190	19509	Y	D	25	\$4,224.00	11/22/96	03/12/00	03/23/97	CHECK DAM IN LOS CANEROS CREEK
83551	39927	Y	A	26	\$135,286.00	01/03/97	04/22/00	04/26/97	SYCAMORE CREEK
91531	39995	Y	A	27	\$84,830.00	09/05/96	05/13/00	06/10/97	MARIA YGNACIA MAIN DEBRIS BASIN
24194	39995	Y	A	28	\$6,240.00	02/13/97	07/09/00	07/22/97	HOT SPRINGS CREEK
38837	95679	Y	C	29	\$13,310.00	07/15/97	07/22/00	07/28/97	BRIDGE NO. 51C-84
17707		Y	B	30	\$10,599.00	06/26/97	08/19/00	09/15/97	FIRE DEPARTMENT
91554	11334	Y	C	31	\$48,773.00	12/07/96	09/17/00	09/23/97	STAGE COACH ROAD
83591	98454	Y	B	32	\$52,818.00	01/15/97	11/20/00	12/10/97	SANTA BARBARA COUNTY FLOOD CONTROL DISTR
59451	19639	Y	A	33	\$16,047.00	12/22/97	03/23/00	03/25/98	SAN MIGUELITO SILATION BASIN
59452	19645	Y	A	33	(\$650.00)	12/22/97	03/23/00	03/25/98	LOS CARNEROS CREEK
59453	19649	Y	A	33	(\$6,001.00)	12/22/97	03/23/00	03/25/98	SAN JOSE CREEK
59454	39771	Y	A	33	(\$25,492.00)	12/22/97	03/23/00	03/25/98	MONECITO CREEK
59455	98452	Y	A	33	\$111.00	12/22/97	03/23/00	03/25/98	GOLETA BEACH SEDIMENT DISPOSAL SITE
59469	19642	Y	A	33	\$10,455.00	12/22/97	03/23/00	03/25/98	NORTH COUNTY - VARIOUS CREEKS AND BASINS
59470	19582	Y	A	33	\$2,406.00	12/22/97	03/23/00	03/25/98	SAN ROGUE CREEK DEBRIS BASIN
59516	91728	Y	B	34	\$7,793.00	02/04/98	03/27/00	04/03/98	
9982	95022	Y	A	35	(\$19,665.00)	05/08/98	06/30/00	07/02/98	WEST CAMINO CIELO ROAD
9981	95034	Y	B	35	(\$1,900.00)	05/08/98	06/30/00	07/02/98	WEST CAMINO CIELO ROAD
9983	95051	Y	B	35	(\$4,200.00)	05/08/98	06/30/00	07/02/98	GLENN ANNIE ROAD
5166	46571	Y	D	36	\$11,100.00	12/15/98	12/15/00	12/30/98	SLOPE PROTECTION
5169	46585	Y	D	36	\$20,839.00	12/15/98	12/15/00	12/30/98	MONTECITO CREEK AT SOUTHERN PACIFIC RAIL
4475	94753	Y	A	37	(\$12,805.00)	01/23/99	02/03/00	02/05/99	MARIA YGNACIA CREEK DEBRIS
4413	19501	Y	C	37	(\$1,097.00)	01/23/99	02/03/00	02/05/99	SAN ROGUE ACCESS ROADWAY AT ONTARE ROAD
4419	20607	Y	C	37	(\$3,968.00)	01/23/99	02/03/00	02/05/99	BELLA VISTA DRIVE
4420	39870	Y	C	37	(\$36,984.00)	01/23/99	02/03/00	02/05/99	BITUMINOUS SURFACE FAILURE
4476	98400	Y	C	37	(\$3,743.00)	01/23/99	02/02/00	02/05/99	RINCON HILL ROAD
4414	19502	Y	D	37	(\$1,936.00)	01/23/99	02/03/00	02/05/99	MISSION CREEK, RIP RAP
4415	19506	Y	D	37	(\$19,215.00)	01/23/99	02/03/00	02/05/99	SAN ROGUE CREEK, RIP RAP
4417	12236	Y	D	37	(\$9,149.00)	01/23/99	02/03/00	02/05/99	SAN JOSE CREEK CATHEDRAL OAKS BRIDGE

**County of Santa Barbara 083-00000
1046 - Late Winter Storms**

5/19/2010

DSR #	SUPP #	Elig.	Category	Supp #	Amount	1st REV	2nd REV	PAPed	PHYSICAL DIMENSIONS OF DAMAGE TO FACILITY
4418	19631	Y	D	37	(\$3,223.00)	01/23/99	02/03/00	02/05/99	DROP STRUCTURE, MARIA YGNACIA CREEK, RIP
4421	94745	Y	D	37	(\$18,900.00)	01/23/99	02/03/00	02/05/99	ATASCADERO CREEK RIP RAP
4422	94747	Y	D	37	(\$7,592.00)	01/23/99	02/02/00	02/05/99	HOSPITAL CREEK RIP RAP
4423	94749	Y	D	37	(\$3,639.00)	01/23/99	02/03/00	02/05/99	MARIA YGNACIA CREEK RIP RAP
4424	94752	Y	D	37	(\$18,735.00)	01/23/99	02/02/00	02/05/99	MARIA YGNACIA CREEK, RIP RAP
4416	19508	Y	G	37	(\$22,689.00)	01/23/99	02/03/00	02/05/99	FENCE AND GATES
9215	12232	Y	C	38	\$22,340.00	06/29/99	09/20/00	09/20/99	DRIVEWAY AT 861 VEREDA DEL CIERVO
9232	95065	Y	C	38	(\$189,576.00)	07/27/99	09/20/00	09/20/99	95R342 GOBERNADOR CANYON ROAD
9233	11334	Y	C	38	(\$53,716.00)	07/27/99	09/20/00	09/20/99	STAGE COACH ROAD
30610	95023	Y	C	38	\$17,363.00	09/16/99	09/20/00	09/20/99	WEST CAMINO CIELO ROAD

\$4,420,211.00

189 Records Processed

2004

Fire Prediction
for
Los Padres National Forest

H.B. “Fritz” Cahill

Los Padres National Forest

Only 10.12” of rain fell this rain season (July 1, 2003 through June 30, 2004). The weighted rainfall was just 8.42”. This mediocre rainfall season began sputteringly in October with .96”. It is important to note that the first 0.4” of rainfall is trapped in the canopy of the shrubs, after which the soil begins to receive moisture.

The rainfall for the months of November, December, January, February, March, April, and May were (respectively .87”, 2.35”, .4”, 4.95”, 0.59”, 0, and 0. June, as a rule does not produce much moisture. The average June rainfall (calculated over a one hundred-and-thirty year period) is .09.”

Table 1 illustrates the 19 years most similar to this one in terms of rainfall; the table also demonstrates where rainfall is tilted toward the autumn and early winter. Beyond this the table includes the following variables: the number of lightning fires, human caused fires, total fires, total burned acreage (in thousands) greatest burn month, weighted rain, and total rain. The burn areas of the 19 sample years average 37,192 acres. The lowest total was 1959’s 700 acres; the highest was 1985—which totaled 231,000 acres. The average acreage loss increases to 47,110 acres if acreage losses below 2600 acres are eliminated.

Table 1.

YEAR	LIGHTNING FIRES	ACRES BURNED*	HUMAN FIRES	ACRES BURNED*	TOTAL FIRES	TOTAL ACREAGE	GREATEST BURN MONTH	"WEIGHTED RAIN	TOTAL RAIN	LARGE FIRES	
1919	0	0	31	10	31	10	August	9.85	12.16	PINE MTN RIDGE	6.4
1924	1	0	26	53.7	27	53.7	August	9.78	8.16	PINE CANYON ?	43.9
1933	4	0	26	46.8	30	46.8	August	6.33	8.64	INDIAN CANYON □	45.2
1934	0	0	32	0.7	32	0.7	August	10.05	13.43	TWIN ROCKS	0.7
1946	8	0	29	3.3	37	3.3	August	10.17	11.33	NAJAVO BLACK	1.94
1947	1	0	27	2.6	28	2.6	June	10.03	13.35	CHUCHUPATE	2.37
1950	7	0	34	39.7	41	39.7	July	10.88	13.15	PINE RIDGE ¥	39.6
1951	0	0	30	21.1	30	21.1	August	10.23	11.29	NAJAVO BLACK £	19.3
1953	1	0	33	31.1	34	31.1	July	9.7	12.98	BIG DALTON	30.6
1959	8	0	23	0.7	31	0.7	August	8.42	9.06	BOTTLEGGER	0.55
1964	6	0	31	64.1	37	64.1	September	10.07	10.19	COYOTE ?	63.58
1966	15	0	53	97.8	68	97.8	June	7.98	14.39	WELLMAN §	97.16
1972	32	0.053	76	20.8	108	20.8	August	4.86	8.64	BEAR ø	20.53
1984	35	1.076	71	1.9	106	3	August	8.39	14.69	HURRICANE ®	1.61
1985	4	65.7	50	166	54	231.7	July	10.49	13.12	WHEELER ç	230.01
1989	2	0	52	1	54	1	July	8.32	9.21	MOLERA	0.66
1990	38	0.041	89	4.38	89	4.4	June	5.84	6.56	PAINT \$	3.304
1997	6	0	56	51.1	62	51.1	August	10.1	20.13	LOGAN *	50.7
2002	5	0.076	42	22.83	47	23.04	June	9.94	9.19	WOLF †	21.92
2004	?	?	?	?	?	?	?	8.42	10.12		

19 years most similar to 2004 where rainfall is tilted toward the autumn and early winter.

Legend	
?	Also Included is Hausna Fire (1924)
□	Also included are the Indian Valley and Big Creek Fires (1933)
¥	Also Includes the Lake Ridge, San Marcos, Clear Creek, Pilitas, Indian Valley, Dalton, and Kornfeldt Fires (1950)
£	Also Includes Pine Flat, Gold Hill, and Piru Fires (1951)
?	Also Includes Polo Fire (1964)
§	Also Includes Schoolhouse Fire (1966)
ø	Also Includes Molera Fire (1972)
®	Also Includes the Blue, Willow Creek, Squaw, and Moretti Fires (1984)
ç	Also Includes the Las Pilitas, Gorda/Rat, and Ferndale Fires (1985)
\$	Also Includes the Foothill Fire (1990)
*	Also Includes the Hopper Fire (1997)
†	Also Includes the Pine & Red Hill Fires (2002)

An analysis of Table 1 reveals the 19 sample years burning an average of 37,191 acres. By dropping all fires less than 2,600 acres the average burn year acreage increases to 47,109 acres. The fires range in acreage from a low of 700 acres in 1934 and 1959 to a high of 231,700 in 1985—the year having the greatest annual loss during 86 years of record.

The green fuel moisture (GFM) of six Chamise plots sampled forestwide on May 1, 2004 totaled 101.75%; last year's total moisture level was 111.61 %. A second sampling (taken from 8 sample plots) of the forest wide GFM was taken on May 15. The GFM was registered at 85.74 % significantly below the long-term average of 97 %. The GFM level average fell to 76.25 % on 06/01/04 compared to 2003's 112.75 %.

On 6/15/04 the average GFM for six plots forestwide registered at 73.9%. However, two interior plots (Buckhorn and Upper Oso) weren't read; they are much lower than the overall forest average. Buckhorn's GFM average (on 5/15/04) was 73.3 %. Upper Oso's average (taken on 6/1/04) was 67.13 %. If the forest wide average includes these two plots, it dives below 70 %. Chamise is the most common and the most flammable plant on the Los Padres National Forest; its green fuel moisture is completely dependent on the weather. There is a chance that the living plant moisture levels will wane if relatively cool temperatures and low wind speed prevail. However there is also the possibility that the GFM will fall drastically if the elevated temperature and windy weather prevail. If this occurs then the critical moisture level could be reached in early or mid-July and prolong the critical fire season. *Although summer has just begun, the accelerated decrease in GFM seems to be in effect.*

From January 1, 2004 until June 13, 2004 only 5.94 inches of rain fell in Santa Barbara. The average rainfall calculated over a 130-year period is 12.35 inches. .59 of an inch fell this Spring March 1, through the present; the long term average is 4.55 inches spring moisture is the most desirable because it tends to keep the living plants (Chamise) at higher moisture levels through the late autumn.

Forestwide, all sample fuel plots trending downward. There is almost no additional moisture in the soil mantle to add to the green living brush and the soil won't be replenished by any substantial rainfall until this October at the earliest. The only hope for this district is frequent coastal fogs. Unfortunately, these fogs will not touch much of the back country. The forest may be subjected to ignition problems as heat spells appear off and on; if not caught by the initial fire suppression attack, catastrophic acreage loss may occur.

The Gaviota fire indicates severe fires can break out, even when there is only moderate fire danger. The fire burned 7443 acres (1464 of those acres burned were on the National Forest System (NFS)). The fire's acreage was maximized by wind, rough topography and 49-year-old fuel. The fire's acreage may grown up to 20,000 acres or more if windy and hotter weather prevailed. .

Several locations on the forest are vulnerable to ignition and the resulting conflagration. Many areas of the forest that have hosted massive fire episodes in the past are again set for ignition. This is evidenced by the Gaviota Fire; another area susceptible to burning is the Mission Canyon (1917), old Coyote Burn (1964), the Romero Fire (1971) and several areas on the Monterey and Santa Lucia Districts.

Frequent coastal fogs that penetrate into the canyons of the forest is the best natural barrier against frequent and large fires, especially in the Santa Barbara front. This year fog is particularly important due to the lack of large air tankers.

Helicopters are essential to the Los Padres Forest. This is because of the lack of existing roads and the poor quality of many of the existing roads. It must be emphasized: Helicopters are this forest's salvation. The initial attack capability should improve with the addition of another helicopter and its fire-crew to the three already assigned to the forest. This aircraft will be based at Casitas. Table 2 provides data on the effects of the lack of helicopters when fighting fires.

Table 2.

Years	Acres Burned	Remarks
1900-1909	85,900	Young Brush age classes forest established 1898
1910-1919	186,600	older brush and dry year (1917)
1920-1929	431,600	largest acreage loss on forest(older brush and several dry years
1930-1939	315,400	1932 Matilija Fire (219,254 acres)
1940-1949	62,900	War Years (forest Closed)
1950-1959	180,800	use of helicopter started
1960-1969	188,900	additional helicopter used
1970-1979	272,500	peak use of helicopters (5 forestwide)
1980-1989	267,400	only three copters on forest
1990-1999	342,900	lowest # of helicopters and greatest acreage losses since 1920's
2000-2003	61,440	three copters on forest

Note the 1990 decade when the most acres burned as a result of fewer helicopters. This is measured on a decade-by decade basis.

The air tanker situation throughout the National Forest System is dire. As of this date most of the large tankers are not under contract. This means that smaller airplanes and helicopter will have to fill the gap. The smaller retardant capacity of these aircraft will hamper initial attack effectiveness.

The smaller load capacity of the smaller planes will require more trips. Furthermore there is a distinct possibility that by the time a smaller plane makes another sortie the fire may dry out the initial retardant drop.

Another of this fire season's problems is the lack of moisture in Southern California—the Angeles, San Bernardino, Cleveland National Forests are as dry as the Los Padres. If a major fire develops on one of these forests, it will divert resources from the others. An exacerbating factor is if there is a heat wave in Southern California it will affect all four forests simultaneously.

Sierra Nevada's snow cover is almost depleted; it follows that vegetation will develop and gradually dry out and become more susceptible to fire than it was this time last year. This might hamper reinforcement from Northern California's National Forests to their southern neighbors.

There is close to a 32 % of having lightning fires on the forest mostly on the Mount Pinos Ranger District. . Other Districts susceptible to lightning fires in descending order are the Monterey, Ojai, Santa Lucia and Santa Barbara Districts. This projection is based upon an analysis of six of the 19 years, which had eight or more lightning fires.

There is nearly a 21 % chance of having sundowner winds in the Santa Barbara front during this year's fire season, this is predicated on their occurrence in 1964's Coyote Fire, the 1984 Twin Ridge Fire, the Wheeler #2 fire in 1985, and 1990's Paint Fire

Table 3 below is a more intensive analysis of Table 1 which shows the Ranger District with the largest acreage losses, the worst burn month and the total acreage loss for the entire forest for the given month. I.e. the Santa Lucia Ranger District burned 250,300 acres during July whereas the total July losses forest-wide was 301,786 acres for the fires in Table 1 (1919-2002 inclusive).

Table 3. Analysis of Table 1.

MOST FIRES	LARGEST ACREAGE LOSS	GREATEST BURN MONTH	ACREAGE
SLRD	SLRD"250,300	July	301,786
MRD	ORD "183,976	August	177,921
SBRD	MRD"128,700	June	95,960
ORD	SBRD"99,930	September	68,330
MPRD	MPRD"12,700	October	15,005

In Table 4 the historic fire record for the 1900-2003 inclusive by month for all fires above 300 acres in size on the Los Padres N.F. This indicates the forest has to suffer through another 4 ¼ months of critical fire season before it rains.

Table 4. Historical Fire Record for the Los Padres National Forest (1900-2003)

MONTH	NUMBER OF FIRES	ACREAGE LOSSES
September	78	789,292
August	120	600,539
July	91	434,983
June	51	199,844
October	62	186,088
November	13	28,670
May	15	15,371
December	7	4,356
January	6	3,630
April	3	3,435
February	2	200
March	2	914
TOTAL	450	2,329,123

This analysis indicates the Santa Lucia District will have a large wildfire exceeding 10,000 acres and it should occur during late July and it may occur as a lightning fire—possibly within the San Rafael Wilderness area. Despite its third place finish, The Santa Barbara District could have a sundowner fire in the Santa Barbara front in September and will burn approximately 40,000 acres. The total burned acreage forest wide would be about 50,000 acres.

H.B. "Fritz" Cahill

SUMMARY OF WATER CONDITIONS

May 1, 2004

April continued in the warm dry pattern established in March. The only break was a spell of cool showery weather the third week of the month. Snowpack melting continued at much above normal April rates and only about half the April 1 pack remained on May 1. Snowmelt runoff seems to be about one month early this year and can be expected to taper off relatively early. Runoff forecasts were lowered because of the dry April and still show a strong north to south gradient, much below average in the southern half of the State. Reservoir storage is near average which will help meet most water needs this year, but supplies in the southern part of the Central Valley and eastern Sierra region may be short.

Forecasts of April through July runoff are 65 percent of average overall, ranging from near normal in the Trinity and the northern Shasta Lake tributaries to 55 percent in the southern Sierra. Water year forecasts are somewhat better at 80 percent of average statewide.

Snowpack water content dropped at about double the normal rate in April and now stands at about 50 percent of average for May 1 overall or 40 percent of the average for April 1. The rapid rate of melting swelled monthly streamflow to near normal on a number of major snowfed rivers in spite of the lack of rain. Last year the pack was 105 percent of average at this time as a result of a wet cool April.

Precipitation from October 1 through April 30 was about 90 percent of average compared to 110 percent one year ago. Precipitation during April was only 50 percent of average statewide, barely three quarters of average in the far northwest and little in the south, apart from the Colorado Desert Area at 400%

Runoff so far this year has been about 90 percent of average compared to 100 percent at this time last year. Runoff during April was nearly 80 percent of average for the month. Estimated runoff of the 8 major rivers of the Sacramento and San Joaquin River regions was 2.7 million acre-feet during April. The May estimate of the Sacramento River Index at the 90% exceedence level is 15.6 MAF and the May San Joaquin 60-20-20 Index at the 75% exceedence level is 2.2.

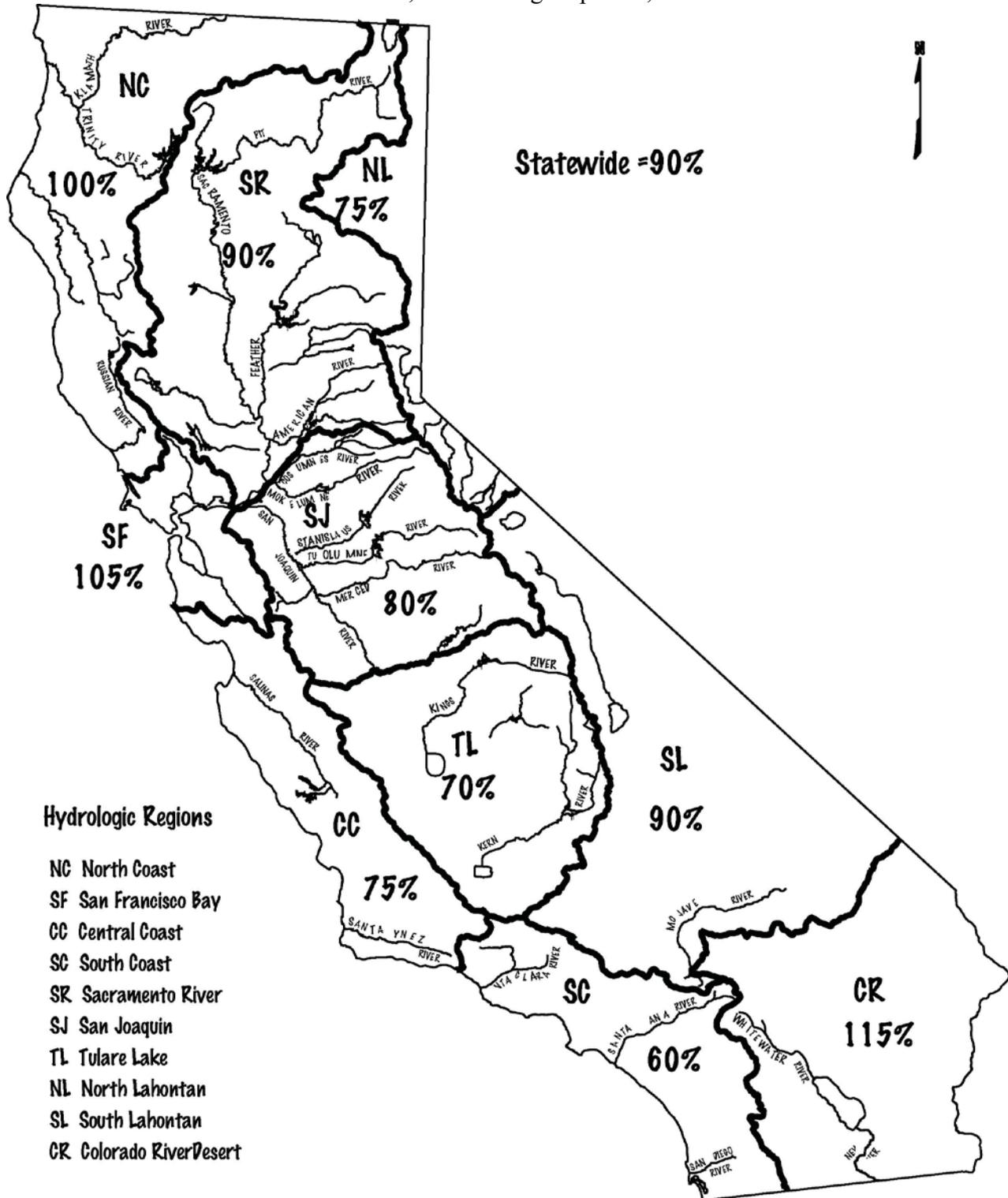
Reservoir storage gained about 0.4 million acre-feet during the month, to end at just over average for the date. This was less than the normal gain of about 1.4 million acre feet expected in April. With the reduction in expected late season snowmelt, not many of the major foothill reservoirs are likely to fill. Last year at this time, reservoir storage stood at 105 percent.

SUMMARY OF WATER CONDITIONS IN PERCENT OF AVERAGE

HYDROLOGIC REGION	PRECIPITATION OCTOBER 1 TO DATE	MAY 1 SNOW WATER CONTENT	MAY 1 RESIVOIR STORAGE	RUNOFF OCTOBER 1 TO DATE	APR-JULY RUNOFF FORCAST	WATER YEAR RUNOFF FORCAST
NORTH COAST	100	110	110	95	95	95
SAN FRANCISCO BAY	105	--	--	90	--	--
CENTRAL COAST	75	--	--	50	--	--
SOUTH COAST	60	--	--	30	--	--
SACRAMENTO RIVER	90	55	55	90	70	85
SAN JOAQUIN RIVER	80	40	40	75	60	65
TULARE LAKE	70	35	35	75	55	60
NORTH LAHONTAN	75	50	50	85	60	65
SOUTH LAHONTAN	90	40	40	65	80	70
COLORADO RIVER-DESERT	115	--	--	--	--	--
STATEWIDE	90	50	50	90	65	80

**DEPARTMENT OF WATER RESOURCES
CALIFORNIA COOPERATIVE SNOW SURVEYS
SEASONAL PRECIPITATION**

IN PERCENT OF AVERAGE TO DATE
October 1, 2003 through April 30, 2004

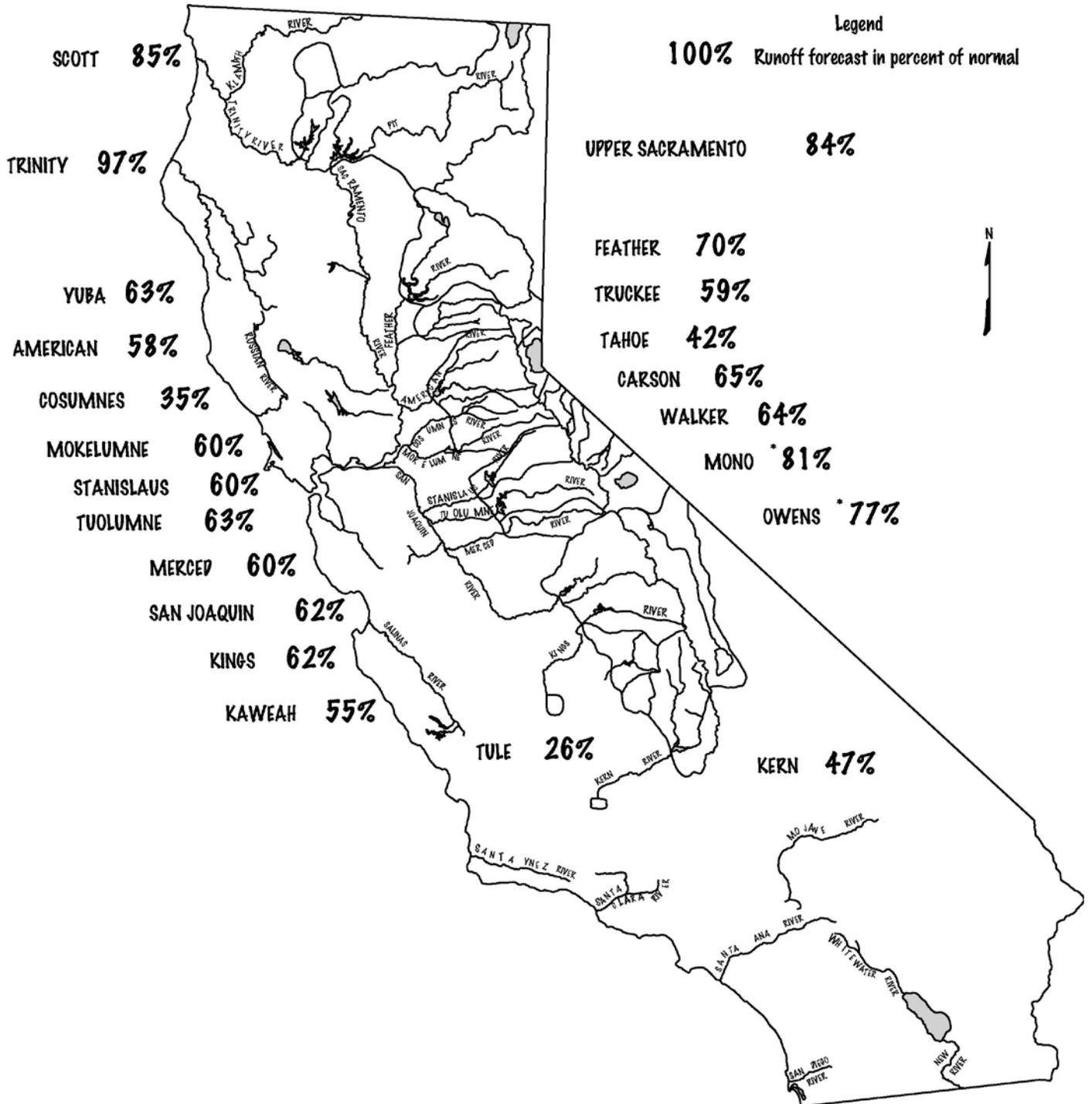


WATER YEAR IS OCTOBER 1 THROUGH SEPTEMBER 30

**DEPARTMENT OF WATER RESOURCES
CALIFORNIA COOPERATIVE SNOW SURVEYS**

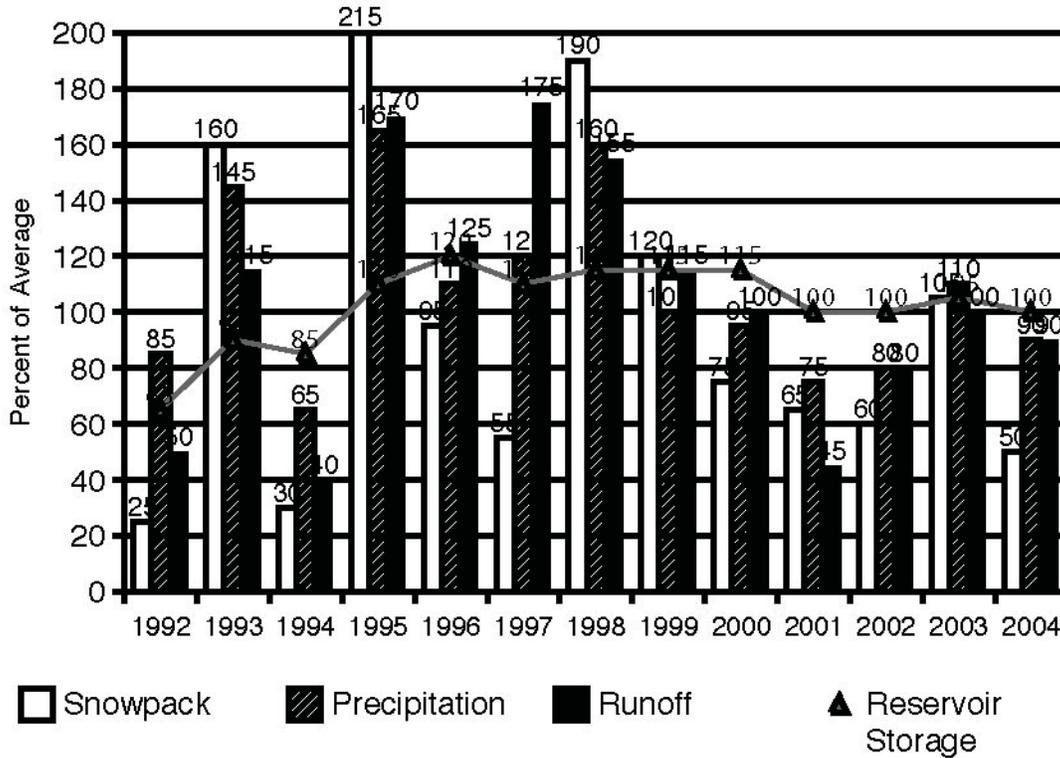
**FORECAST OF APRIL – JULY
UNIMPAIRED SNOWMELT RUNOFF**

May 1, 2004



* FORECAST BY DEPARTMENT OF WATER AND POWER, CITY OF LOS ANGELES

May 1 Statewide Conditions



SNOWLINES

This year's annual meeting of the California Cooperative Snow Survey program will be its 75th anniversary. The meeting will be held this coming fall. Please plan on attending this event. Details will be posted on cdec.water.ca.gov/snow as they are available.

April did not provide the boost to spring snowpack that it did last year.

<http://www.wrh.noaa.gov/cnrfc/snowmelt.pdf> has the latest 5 to 20 day spring snowmelt forecasts along with the day on which a river peaked.

On this month's cover is the final in the series of historic scenes of early snow surveys in the San Joaquin drainage courtesy of Gene Rose. In this photograph Ed Steen is shown with “illegal skies” on a 1927 survey along Big Creek. Perhaps skies were too avant-garde for that era. Note the pistol, apparently snow surveys were more dangerous back then.

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

DR	DSR	SUPP	APPROVED	P-4 CLAIM	LOCATION	FACILITY	Department	Retention	Subtotal
Flood Control									
1203	07183	07183	\$153,913.00	\$147,750.00	BASIN	FRANKLIN CREEK	Flood Control	14,775.00	
1203	94467	07183	(\$6,163.00)		BASIN	FRANKLIN CREEK	Flood Control		
1203	07185	07185	\$190,277.00	\$190,277.00	BASIN / HOLLISTER AVENUE	CARNEROS CREEK	Flood Control	19,027.00	
1203	94468	07185	(\$846.00)		BASIN / HOLLISTER AVENUE	CARNEROS CREEK	Flood Control		
1203	07193	07193	\$289,185.00	\$289,185.00	STREET	DEBRIS BASIN	Flood Control	28,918.00	
1203	20478	07193	\$112,686.00		STREET	DEBRIS BASIN	Flood Control		
1203	21824	21824	\$203,262.00		SECTION OF SAN JOSE CREEK	SEDIMENT BASIN	Flood Control	20,326.00	
1203	94489	21824			SECTION OF SAN JOSE CREEK	SEDIMENT BASIN	Flood Control		
1203	21825	21825	\$65,832.00	\$67,172.00	1500' EAST OF CRAVEN'S LANE	'KIMS'	Flood Control	6,717.00	
1203	74686	21825	\$1,340.00		REAL, 1500 FT EAST OF CRAVEN'S	'KIMS'	Flood Control		
1203	72466	72466	\$66,473.00		ON SANTA MONICA CREEK.	DEBRIS BASIN	Flood Control		
1203	74688	72466	\$207,622.00	\$274,095.00	192 ON SANTA MONICA CREEK.	DEBRIS BASIN	Flood Control	27,409.00	
1203	74643	74643	\$59,706.00	\$59,466.00	SANTA BARBARA / COUNTY WIDE	SYSTEM	Flood Control	5,946.00	
1203	74694	74643	(\$240.00)		SANTA BARBARA / COUNTY WIDE	SYSTEM	Flood Control		
1203	07158	07158	\$168,005.00	\$168,005.00	WEST OF BONITA SCHOOL ROAD	LEVEE	Flood Control	16,805.00	
1203	07179	07179	\$49,236.00	\$49,236.00	UPSTREAM OF OCEAN AVENUE	RODEO CHANNEL	Flood Control	4,923.00	
1203	07182	07182	\$65,097.00	\$65,097.00	THE SANTA YNEZ RIVER	CREEK	Flood Control	6,510.00	
1203	07184	07184	\$122,910.00	\$122,910.00	UPSTREAM OF CATHEDRAL OAK	SAN PEDRO CREEK	Flood Control	12,291.00	
1203	20396	20396	\$350,612.00	\$349,250.00	FOWLER ROAD ON SAN PEDRO	SEDIMENT BASIN	Flood Control	34,925.00	
1203	74685	20396	(\$1,362.00)		FOLWER ROAD ON SAN PEDRO	SEDIMENT BASIN	Flood Control		
1203	20397	20397	\$169,147.00	\$173,199.00	HOLLISTER AVE ON CARNEROS	SEDIMENTATION	Flood Control	17,319.00	
1203	94472	20397	\$4,052.00		HOLLISTER AVENUE ON	SEDIMENTATION	Flood Control		
1203	72468	72468	\$64,632.00	\$84,275.00	HOLLISTER AVENUE ON	SEDIMENTATION	Flood Control	8,427.00	
1203	94495	72468	\$19,643.00		HOLLISTER AVENUE ON	SEDIMENTATION	Flood Control		
1203	21822	21822	\$61,389.00	\$61,389.00	DOWNSTREAM OF WARD DRIVE	CREEK BASIN	Flood Control	6,138.00	\$ 230,456.00
Parks									
1203	07195	07195	\$78,054.00	\$43,282.00	EMBARCADERO STREET	CONCRETE BEACH	Parks	4,328.00	
1203	96306	07195	(\$34,772.00)		EMBARCADERO STREET	CONCRETE BEACH	Parks		
1203	20809	20809	\$177,666.00	\$177,666.00	GUADALUPE DUNES	SEA / SAND WALL	Parks Open		
1203	96374	20809	\$248,000.00	\$248,000.00	GUADALUPE DUNES COUNTY PARK	SEA/SAND WALL	Parks Open		\$ 4,328.00
Roads									
1203	07196	07196	\$178,000.00	\$186,260.00	246. SOUTH OF SANTA YNEZ	SUMMIT,	Roads	18,626.00	
1203	10302	07196	\$8,250.00		26. SOUTH OF SANTA YNEZ.	S UMMIT,	roads		

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	20374	20374	\$334,024.00	\$336,084.00	GRASIOSA ROAD, R-102	GRASIOSA ROAD	Roads	33,608.00
1203	94469	20374	\$1,060.00		GRASIOSA ROAD, R-102	GRASIOSA ROAD	Roads	
1203	20386	20386	\$55,400.00	\$61,267.00	REFUGIO ROAD)	AND ROADBED	Roads	6,126.00
1203	94470	20386	\$5,867.00		REFUGIO ROAD)	AND ROADBED R	Roads	
1203	20388	20388	\$52,815.00	\$71,813.00	ROAD OFF HWY 166	CROSSING AND	Roads	7,181.00
1203	94471	20388	\$18,998.00		ROAD OFF HIGHWAY 166	CROSSING AND	Roads	
1203	20802	20802	\$207,432.00	\$290,186.00	COUNTY WIDE	ROAD DIVISION	Roads	29,018.00
1203	94473	20802	\$82,754.00		COUNTY WIDE	ROAD DIVISION	Roads	
1203	20934	20934	\$124,033.00	\$123,286.00	MILE POST 5.78 BROWN ROAD	EMBANKMENT,	Roads	12,328.00
1203	27116	20934	(\$747.00)		BROWN ROAD MILEPOST 5.78	EMBANKMENT,	Roads	
1203	21823	21823	\$106,107.00	\$70,765.00	ORTEGA RIDGE ROAD	& EMBANKMENT R-	Roads	7,076.00
1203	94488	21823	(\$35,342.00)		ORTEGA RIDGE ROAD	& EMBANKMENT R-	Roads	
1203	52042	52042	\$55,849.00	\$59,472.00	FINNEY STREET (WALLACE)	ROADBED,	Roads	5,947.00
1203	94490	52042	\$3,623.00		FINNEY STREET (WALLACE)	ROADBED,	Roads	
1203	72407	72407	\$95,264.00	\$48,612.00	COUNTY OF SANTA BARBARA	COUNTY WIDE	Roads	4,861.00
1203	74687	72407	(\$46,652.00)		COUNTY OF SANTA BARBARA	COUNTY WIDE	Roads	
1203	72448	72448	\$83,670.00	\$147,480.00	THROUGH 2.35 R-186, 335, 336	SHOULDER AND	Roads	14,748.00
1203	94491	72448	\$63,810.00		MILEPOST 2.0 THROUGH 2.34 R-	SHOULDER AND	Roads	
1203	72450	72450	\$60,102.00	\$60,907.00	8.0 R-213	& ROAD SURFACE	Roads	6,010.00
1203	94492	72450	\$805.00		MILEPOST 8.0 R-213	& ROAD SURFACE	Roads	
1203	72453	72453	\$120,112.00	\$269,599.00	2.49 R-54	HEADWALL, DROP	Roads	26,959.00
1203	75695	72453	\$149,487.00		MILEPOST 2.49, R-54	HEADWALL, DROP	Roads	
1203	72454	72454	\$52,199.00	\$51,046.00	8.06 R-208	CULVERT	Roads	5,104.00
1203	94493	72454	(\$1,153.00)		MILEPOST 8.06 R-208	CULVERT	Roads	
1203	72456	72456	\$124,411.00	\$129,689.00	NORTH OF HIGHWAY 154	CULVERTS R226,	Roads	12,968.00
1203	94494	72456	\$5,278.00		NORTH OF HIGHWAY 154	CULVERTS R226,	Roads	
1203	72459	72459	\$89,820.00	\$89,182.00	OF 890 GLEN-ANNIE ROAD	ASPHALT ROAD	Roads	8,918.00
1203	74693	72459	(\$638.00)		OF 890 GLEN-ANNIE ROAD	ASPHALT ROAD	Roads	
1203	01118	72462	\$192,650.00	\$649,495.00	HIGHWAY 192	CANYON ROAD	Roads	64,949.00
1203	03194	72462	\$51,000.00		HIGHWAY 192	CANYON ROAD	Roads	
1203	10303	72462	\$3,184.00		MILES NORTH OF STATE HWY 192)	AND ROAD	Roads	
1203	72462	72462	\$213,085.00		MILES NORTH OF STATE HIGHWAY	AND ROAD	Roads	
1203	75158	72462	\$189,576.00		HIGHWAY 192	CANYON ROAD	Roads	
1203	07259	73565	\$48,441.00	\$258,438.00	ASHLEY ROAD, BESIDE COYOTE	DRIVE	Roads	25,843.00
1203	73565	73565	\$209,997.00		ASHLEY ROAD, BESIDE COYOTE	DRIVE	Roads	

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	10301	73891	(\$35,019.00)	\$60,418.00	HWY 26-R128	REFUGIO ROAD	Roads	6,041.00
1203	73891	73891	\$95,437.00		HIGHWAY 246 R-128	REFUGIO ROAD	Roads	
1203	73894	73894	\$74,392.00	\$71,497.00	HOLLISTER RANCH, R003	BRIDGE AND	Roads	7,149.00
1203	94496	73894	(\$2,895.00)		HOLLISTER RANCH R003	BRIDGE AND	Roads	
1203	76360	76360	\$9,727.00	\$47,407.00	BETWEEN TRIVOLA STREET & PINE	FARADAY STREET	Roads	4,740.00
1203	80034	76360	\$37,680.00		BETWEEN TRIVOLA STREET AND	FARADAY STREET	Roads	
1203	76365	76365	\$58,681.00	\$84,303.00	WITH STATE HIGHWAY 246	ROAD - AREA R254	Roads	8,430.00
1203	94497	76365	\$25,622.00		WITH STATE HIGHWAY 246	ROAD - R 254	Roads	
1203	76375	76375	\$85,791.00	\$86,229.00	POST MILE 4.92	AREA R182	Roads	8,622.00
1203	94498	76375	\$438.00		MILEPOST 4.92	AREA R 182	Roads	
1203	76376	76376	\$115,820.00	\$177,567.00	AVENUE AND NOJOQUI AVENUE	ALAMO PINTADO	Roads	17,756.00
1203	94499	76376	\$1,747.00		AVENUE AND NOJOQUI AVENUE	ALAMO PINTADO	Roads	
1203	76380	76380	\$162,696.00	\$163,445.00	NORTH OF HWY 246	ROAD AREA R198	Roads	16,344.00
1203	94500	76380	\$749.00		7,400 FT NORTH OF HIGHWAY 246.	ROAD AREA R 198	Roads	
1203	74682	76384	\$3,708.00		MILEPOST 1.5	AREA R 070	Roads	
1203	76384	76384	\$100,643.00	\$104,361.00	POST MILE 1.5	AREA R070	Roads	10,436.00
1203	74683	76385	\$2,532.00		MILEPOST 1.55	AREA R 325	Roads	
1203	76385	76385	\$125,855.00	\$128,387.00	POST MILE 1.55	AREA R325	Roads	12,838.00
1203	10300	76387	(\$9,118.00)		EAST OF BASELINE AVENUE -	BRIDGE 51-C-189	Roads	
1203	76387	76387	\$75,552.00	\$66,434.00	CANYON ROAD 2.2 MILES E. OF	CHANNEL	Roads	6,643.00
1203	74691	76390	(\$263.00)		OF HAPPY CANYON ROAD	BRIDGE, BR51C-190-	Roads	
1203	76390	76390	\$94,660.00	\$94,397.00	OF HAPPY CANYON ROAD AND	BRIDGE, BR51C-190	Roads	9,439.00
70977	75117	76392	(\$15,591.00)		154E / REFUGIO ROAD WEST	CIELO ROAD, AREA	Roads	
1203	74684	76394	\$686.00		MARIA RIVER	ROAD - AREA R 309	Roads	
1203	76394	76394	\$47,175.00	\$47,861.00	MARIA RIVER.	ROAD - AREA R309	Roads	4,786.00
1203	02735		\$45,673.00	\$45,954.00	COUNTY WIDE	COUNTY ROADS	Roads	
1203	02736		\$37,553.00	\$43,470.00	COUNTY WIDE	COUNTY	Roads	
1203	02760		\$21,579.00	\$41,517.00	HIGHWAY 246	ROAD PAVEMENT	Roads	
1203	02761		\$11,594.00	\$10,832.00	INTERSECTION	EMBANKMENT AND	Roads	
1203	02762		\$16,587.00	\$24,999.00	4.36 MILES FROM PALMER ROAD	AND EMBANKMENT	roads	
1203	02773		\$2,717.00	\$5,587.00	INTERSECTION	EMBANKMENT AND	Roads	
1203	20382		\$51,377.00	\$51,377.00	HIGHWAY 101	SUMMER	Roads	5,137.00
1203	20911		\$70,983.00	\$70,963.00	6.2	ROAD AND	Roads	7,983.00
1203	20915		\$78,770.00	\$78,770.00	BALLARD CANYON ROAD MP 2.94	ROAD AND	Roads	7,877.00
1203	71454		\$52,199.00	\$52,199.00	8.06 R-208	CULVERT	Roads	5,220.00

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	76377		\$84,865.00	\$84,865.00	POST MILE 1.92	AREA R006	Roads	8,486.00
1203	76382		\$68,624.00	\$68,624.00	PM 7.06 TO PM 7.10	- AREA R265	Roads	6,862.00
1203	94671	94671	\$225,000.00		TO GAVIOTA STATE PARK	ROAD BRIDGE NO	Roads Open	-
1203	05099		\$3,000,000.00		STATE PARK	AND APPROACH	Roads Open	- \$ 445,059.00
Solid Waste								
1203	74689	94401	(\$2,348.00)		ON HIGHWAY 33	LANDFILL	Solid Waste	
1203	94401	94401	\$74,565.00	\$72,217.00	ON HIGHWAY 33	LANDFILL	Solid Waste	7,221.00 \$ 7,221.00
Projects								
1203	52007	52007	\$38,195.00		RANCH ROAD R 003	BRIDGE & ACCESS	Roads	
1203	74695	52007	\$0.00		RANCH ROAD R 003	BRIDGE AND		
1203	94669	52007	(\$38,195.00)		RANCH, ROAD R-003	BRIDGE AND		
1203	72463	72463	\$1,713.00	\$0.00	ROAD	R109		
1203	94658	72463	(\$1,713.00)		ROAD	R 109		

1203	76392	76392	\$15,591.00		154 (EAST END) AND REFUGIO	CIELO ROAD, AREA		
1203	75145	94671	\$0.00		TO GAVIOTA STATE PARK	ROAD BRIDGE NO.		
1203	06727		\$34,387.00	\$37,345.00	COUNTY WIDE	COUNTY ROADS		
1203	06728		\$36,508.00	\$37,204.00	COUNTY WIDE	AND BRIDGES		
1203	06729		\$45,950.00	\$64,322.00	COUNTY WIDE	COUNTY ROADS		
1203	06730		\$46,600.00	\$54,478.00	'192', 0.65 MILES EAST OF DRUM	DRUMN CANYON		
1203	06731		\$38,082.00	\$38,082.00	COUNTY WIDE	LOCATIONS		
1203	06732		\$37,339.00	\$40,238.00	CAMP ROAD	ROADWAYS		
1203	06733		\$24,248.00	\$23,170.00	(PUMPS), JALAMA BEACH PARK -	SUMP PUMPS		
1203	06734		\$38,840.00	\$40,345.00	VARIOUS PARKS	BRIDGE FOOTINGS,		
1203	06753		\$3,865.00	\$3,865.00	SOLOMON UPSTREAM FOR 2 MILES	CANYON CREEK		
1203	06754		\$16,753.00	\$19,537.00	HIGHWAY 192	CREEK		
1203	06755		\$1,544.00	\$1,544.00	CREEK TO BASIN	CREEK		
1203	06756		\$13,939.00	\$13,939.00	CREEK .25 MILES UPSTREAM	CANYON		
1203	06757		\$3,061.00	\$3,061.00	CREEK TO CATHEDRAL OAKS	HOSPITAL CREEK		
1203	06758		\$5,749.00	\$5,749.00	TULAROSA ROAD	CHANNEL		
1203	06759		\$2,908.00	\$2,908.00	HWY 101	CREEK		
1203	06760		\$2,568.00	\$2,568.00	MIGUELITO BASIN FOR ABOUT	CHANNEL		
1203	06762		\$3,457.00	\$3,457.00	OF ARROYO BURRO CREEK TO	CREEK		
1203	06763		\$3,686.00	\$3,686.00	RIVER TO .75 MILES UPSTREAM	SOLOMON CREEK		

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	06764	\$8,725.00	\$8,725.00	\$8,725.00	LOMPOC - SOUTH OF HWY 246	CHANNEL
1203	06765	\$7,865.00	\$7,865.00	\$7,865.00	EIGHTH STREET TO THE SANTA	DITCH
1203	06766	\$28,189.00	\$28,189.00	\$28,189.00	OF FOOTHILL ROAD	CREEK
1203	06767	\$2,609.00	\$2,609.00	\$2,609.00	NORTH OF HWY 246	BOB HUNT DITCH
1203	07127	\$12,115.00	\$12,115.00	\$12,115.00	AVENUE OF FLAGS	98002
1203	07128	\$6,137.00	\$6,137.00	\$6,137.00	LEVEE ENTRANCE	LEVEE ENTRANCE
1203	07129	\$2,515.00	\$2,515.00	\$2,515.00	ORCUTT RANCH TRAILER PARK	98027
1203	07130	\$25,114.00	\$25,114.00	\$25,114.00	LOCATIONS)	CREEK, 98028
1203	07132	\$21,178.00	\$21,178.00	\$21,288.00	GOLETA, 293 CARLO DRIVE	STORM DRAIN,
1203	07133	\$27,401.00	\$27,401.00	\$27,401.00	AVENIDA PEQUENA	98034
1203	07134	\$28,765.00	\$28,765.00	\$28,534.00	DRIVE	CREEK BANK,
1203	07136	\$8,428.00	\$8,428.00	\$6,111.00	FROM HOT SPRINGS ROAD	BANK, 98042
1203	07137	\$12,970.00	\$12,970.00	\$12,970.00	246, WEST OF TULAROSA ROAD	CHANNEL, 98048
1203	07138	\$3,767.00	\$3,767.00	\$3,767.00	TRAILER PARK NORTH OF 101	CREEK, 98067
1203	07139	\$15,684.00	\$15,684.00	\$15,684.00	GUERRA STREET	DEPARTMENT
1203	07140	\$11,726.00	\$11,726.00	\$11,726.00	CANYON ROAD	DEPARTMENT
1203	07141	\$8,059.00	\$8,059.00	\$8,059.00	HIGHWAY 101 OF BETTERAVIA	DEPARTMENT
1203	07142	\$17,602.00	\$17,602.00	\$17,602.00	OF VIA REAL AT 3805 VIA REAL	CREEK, 98115
1203	07143	\$18,859.00	\$18,859.00	\$18,859.00	LIONS CLUB PROPERTY	CREEK, 98117
1203	07149	\$11,505.00	\$11,505.00	\$11,210.00	FREEMONT CREEK AND CAMINO	FREEMONT CREEK,
1203	07151	\$6,031.00	\$6,031.00	\$6,031.00	MONTECITO, AT POSILIPO LANE	CREEK BANK,
1203	07152	\$16,535.00	\$16,535.00	\$16,535.00	DOWNSTREAM OF HIGHWAY 246	98040
1203	07153	\$4,046.00	\$4,046.00	\$4,046.00	BRIDGE	CREEK, 98109
1203	07154	\$9,518.00	\$9,518.00	\$9,518.00	HIGHWAY 101 OF BETTERAVIA	OIL DITCH, 98112
1203	07155	\$11,301.00	\$11,301.00	\$11,301.00	FROM CALIFORNIA BOULEVARD	DEPARTMENT -
1203	07156	\$0.00	\$0.00	\$0.00	ORCUTT, AT SOLOMAN CREEK	98024
1203	07157	\$5,707.00	\$5,707.00	\$5,707.00	DOWNSTREAM OF BLOSSER ROAD	STRUCTURE, 98025
1203	07160	\$2,526.00	\$2,526.00	\$2,340.00	MILE WEST OF BONITA SCHOOL	LEVEE - NORTH
1203	07161	\$29,233.00	\$29,233.00	\$29,233.00	SANTA MARIA, STATION 847+00	SANTA MARIA
1203	07162	\$8,356.00	\$8,356.00	\$8,356.00	COUNTY WIDE	COUNTY OF - 98064
1203	07163	\$5,126.00	\$5,126.00	\$5,526.00	OF HIGHWAY 101	DAM STRUCTURE,
1203	07164	\$1,144.00	\$1,144.00	\$1,144.00	SOUTH OF HIGHWAY 246	CHANNEL, 98049
1203	07168	\$3,426.00	\$3,426.00	\$3,426.00	FROM OCEAN TO BASIN	ROMERO CREEK
1203	07169	\$12,015.00	\$12,015.00	\$14,948.00	UPSTREAM OF FOOTHILL ROAD	CREEK
1203	07170	\$10,117.00	\$10,117.00	\$11,013.00	UPSTREAM OF CATHEDRAL OAKS	CARNEROS CREEK

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	07171	\$19,129.00	\$19,129.00	OF PATTERSON AVENUE	\$19,129.00	OF PATTERSON AVENUE	SAN JOSE CREEK
1203	07172	\$6,590.00	\$6,590.00	FROM BASIN TO HIGHWAY 154	\$6,590.00	FROM BASIN TO HIGHWAY 154	CREEK
1203	07173	\$41,588.00	\$41,588.00	(SEE NARRATIVE)	\$65,861.00	(SEE NARRATIVE)	VARIOUS
1203	07174	\$4,188.00	\$4,188.00	LEANDRO LANE	\$5,076.00	LEANDRO LANE	CREEK
1203	07175	\$4,638.00	\$4,638.00	RIVER	\$4,638.00	RIVER	CEBADA CHANNEL
1203	07177	\$4,050.00	\$4,050.00	UPSTREAM OF CATHEDRAL OAKS	\$4,050.00	UPSTREAM OF CATHEDRAL OAKS	TECOLOTITO
1203	07178	\$14,065.00	\$14,065.00	SPRINGS ROAD	\$14,065.00	SPRINGS ROAD	MONTECITO CREEK
1203	07180	\$12,146.00	\$12,146.00	UPSTREAM, 2 MILES	\$12,146.00	UPSTREAM, 2 MILES	TECOLOTE CREEK
1203	07181	\$40,676.00	\$40,676.00	GOLETA SLOUGH	\$40,676.00	GOLETA SLOUGH	CREEK
1203	07186	\$8,720.00	\$8,720.00	AT HIGHWAY 101. UPSTREAM SIDE	\$8,720.00	AT HIGHWAY 101. UPSTREAM SIDE	CREEK, GOLETA
1203	07188	\$21,363.00	\$21,363.00	HIGHWAY 150	\$30,507.00	HIGHWAY 150	R-257
1203	07190	\$5,582.00	\$5,582.00	246	\$5,582.00	246	DITCH
1203	07191	\$8,088.00	\$8,088.00	CEBADA CANYON ROAD BETWEEN	\$8,088.00	CEBADA CANYON ROAD BETWEEN	ROAD R-295
1203	20371	\$14,328.00	\$14,328.00	CANYON ROAD R-258, R144, R-145	\$19,961.00	CANYON ROAD R-258, R144, R-145	CULVERTS ON
1203	20372	\$14,550.00	\$14,550.00	ALISOS CANYON ROAD R-19, R-91	\$14,551.00	ALISOS CANYON ROAD R-19, R-91	ALISOS CANYON
1203	20373	\$10,147.00	\$10,147.00	JONATA PARK ROAD R131	\$10,147.00	JONATA PARK ROAD R131	BOX CULVERT
1203	20375	\$1,032.00	\$1,032.00	MILES NORTH OF STATE HIGHWAY	\$913.00	MILES NORTH OF STATE HIGHWAY	CANYON ROAD,
1203	20376	\$1,135.00	\$1,135.00	REFUGIO ROAD)	\$1,135.00	REFUGIO ROAD)	AND SUB-BASE, R-
1203	20377	\$1,051.00	\$1,051.00	WASIOJA ROAD OFF 166	\$1,051.00	WASIOJA ROAD OFF 166	WASHOUTS, R-190
1203	20379	\$4,183.00	\$4,183.00	ROAD	\$4,183.00	ROAD	CIELO, VARIOUS
1203	20380	\$1,196.00	\$1,196.00	HIGHWAY 101	\$1,161.00	HIGHWAY 101	ROAD 004
1203	20381	\$1,055.00	\$1,055.00	HIGHWAY 101	\$2,106.00	HIGHWAY 101	REFUGIO ROAD,
1203	20383	\$1,432.00	\$1,432.00	LOMPOC - SWEENEY ROAD	\$1,432.00	LOMPOC - SWEENEY ROAD	POST MARK 3.82, R-
1203	20384	\$20,309.00	\$20,309.00	SANTA BARBARA CANYON ROAD	\$9,552.00	SANTA BARBARA CANYON ROAD	ROAD SHOULDER
1203	20385	\$10,558.00	\$10,558.00	CREEK	\$10,556.00	CREEK	CROSSING R 309
1203	20387	\$7,023.00	\$7,023.00	ORTEGA RIDGE ROAD	\$9,751.00	ORTEGA RIDGE ROAD	OVERSIDE DRAIN
1203	20390	\$38,408.00	\$38,408.00	COUNTY WIDE FLOOD CONTROL	\$48,505.00	COUNTY WIDE FLOOD CONTROL	CHANNELS
1203	20393	\$11,088.00	\$11,088.00	BARBARA CO. BOWL)	\$11,088.00	BARBARA CO. BOWL)	OVER DRY WASH
1203	20399	\$42,721.00	\$42,721.00	PLACE	\$42,721.00	PLACE	BUELLTON BASIN
1203	20400	\$3,043.00	\$3,043.00	OF HIGHWAY 192 ON WEST TORO	\$3,043.00	OF HIGHWAY 192 ON WEST TORO	TORO DEBRIS
1203	20805	\$11,279.00	\$11,279.00	LAKE LOS CARNEROS	\$14,093.00	LAKE LOS CARNEROS	ACCESS ROAD
1203	20806	\$42,960.00	\$42,960.00	LOS CARNEROS DAM	\$43,853.00	LOS CARNEROS DAM	STRUCTURE AND
1203	20807	\$41,113.00	\$41,113.00	GOLLETA BEACH	\$35,098.00	GOLLETA BEACH	PARK
1203	20808	\$43,031.00	\$43,031.00	SOLVANG	\$36,735.00	SOLVANG	SANTA YNEZ PARK
1203	20810	\$39,657.00	\$39,657.00	COUNTY WIDE	\$39,657.00	COUNTY WIDE	FIRE DEPARTMENT

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	20905	\$8,433.00	\$8,525.00	1041 PALOMINO ROAD	AND EMBANKMENT
1203	20908	\$1,348.00	\$595.00	1116, 1122, 1148 PALOMINO ROAD	AREAS R072-2,-3,-4
1203	20910	\$10,932.00	\$26,374.00	1000 BLOCK PALOMINO ROAD	AREA R O 72 - 1
1203	20912	\$30,933.00	\$30,993.00	HIGHWAY 154	ROAD, AREA R279
1203	20913	\$4,872.00	\$15,207.00	1133 PALOMINO ROAD, AREA R350	R350
1203	20916	\$7,516.00	\$3,805.00	MP 5.78, BROWN ROAD	EMBANKMENT
1203	20919	\$2,134.00	\$2,134.00	SAL ROAD	AREA R150
1203	20932	\$44,681.00	\$27,624.00	BROWN ROAD, MP 6.1	EMBANKMENT
1203	20933	\$31,860.00	\$26,304.00	ROAD	EMBANKMENT
1203	21021	\$9,380.00	\$9,380.00	LAKE CACHUMA, BRADBURY DAM	AGENCY, LAKE
1203	21023	\$11,913.00	\$11,913.00	FROM JAMESON LANE BRIDGE AND	SLOPES
1203	21024	\$2,654.00	\$2,654.00	COUNTY WIDE	COUNTY WIDE
1203	21025	\$2,814.00	\$2,814.00	SANTA BARBARA COUNTY WIDE	COUNTY WIDE
1203	21026	\$5,883.00	\$6,360.00	SANTA BARBARA COUNTY WIDE	COUNTY WIDE
1203	21164	\$1,580.00	\$1,580.00	COUNTY WIDE PARKS	SERVICES, PARKS
1203	21819	\$13,005.00	\$20,556.00	KIRSHENMANN ROAD	ROAD, STATE
1203	21820	\$3,657.00	\$1,418.00	WASIOJA ROAD OFF HIGHWAY 166	CROSSING AND
1203	22052	\$10,000.00	\$4,837.00	SOLVANG, SANTA YNEZ PARK	BUILDING
1203	39172	\$33,488.00	\$34,436.00	ROAD R053	ROAD AND
1203	39175	\$13,895.00	\$13,895.00	055	ROAD AND DITCH
1203	50901	\$7,826.00	\$7,826.00	FROM OCEAN TO BASIN	CREEK
1203	50902	\$2,891.00	\$2,891.00	FROM OCEAN TO BASIN	MISSION CREEK
1203	52008	\$17,524.00	\$20,154.00	211	SLUICE &
1203	52009	\$40,450.00	\$41,088.00	MAIL ROAD AT MP 0.36 R-195	CULVERT
1203	59181	\$4,251.00	\$4,251.00	LILLINGSTON CANYON / US 192	CANYON, VARIOUS
1203	59182	\$7,610.00	\$7,610.00	GOBERNADOR CANYON ROAD	CANYON ROAD,
1203	59183	\$7,724.00	\$7,724.00	RIDGE ROAD	ROAD, R-229
1203	59184	\$3,546.00	\$3,546.00	CHALK HILL ROAD	R-057
1203	59185	\$4,389.00	\$4,851.00	LAKE.	BRADBURY DAM
1203	59186	\$5,321.00	\$5,321.00	OCEAN TO BASINS	CREEK
1203	59187	\$2,991.00	\$2,991.00	ROAD	OAK CREEK
1203	59188	\$8,816.00	\$8,816.00	ROAD	CREEK
1203	59189	\$1,015.00	\$1,015.00	DRIVE	SYCAMORE CREEK
1203	59190	\$3,633.00	\$3,633.00	CREEK / UPSTREAM TO BASIN	CREEK
1203	72409	\$20,472.00	\$20,472.00	SHERIFF - COUNTY WIDE	COUNTY OF

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	72414	\$46,687.00	\$46,687.00	COUNTY WIDE PARKS	\$46,687.00	COUNTY WIDE PARKS	PARKS DIVISION
1203	72415	\$4,771.00	\$4,771.00	COUNTY WIDE PARKS	\$4,771.00	COUNTY WIDE PARKS	PARKS DIVISION
1203	72416	\$1,334.00	\$1,334.00	MIGUELITO COUNTY PARK	\$1,334.00	MIGUELITO COUNTY PARK	FENCE
1203	72417	\$1,950.00	\$1,950.00	NOJOQUI FALLS COUNTY PARK	\$1,950.00	NOJOQUI FALLS COUNTY PARK	POWER LINE
1203	72418	\$10,977.00	\$10,977.00	DRIVE	\$8,000.00	DRIVE	ACCESS
1203	72449	\$27,882.00	\$27,882.00	TO VANDENBERG AIR FORCE	\$24,347.00	TO VANDENBERG AIR FORCE	ROADBED
1203	72451	\$39,559.00	\$39,559.00	7.95 R-164	\$38,585.00	7.95 R-164	ASPHALT
1203	72452	\$6,254.00	\$6,254.00	2.49 R-54	\$6,362.00	2.49 R-54	AND DISSIPATOR
1203	72457	\$39,005.00	\$39,005.00	GOVERNADOR CANYON ROAD AT	\$39,480.00	GOVERNADOR CANYON ROAD AT	ROAD 332
1203	72458	\$10,258.00	\$10,258.00	STAGE COACH ROAD	\$10,008.00	STAGE COACH ROAD	AND SUB-BASE R-
1203	72460	\$13,787.00	\$13,787.00	GLENN ANNIE ROAD	\$13,774.00	GLENN ANNIE ROAD	ROADWAY R-129
1203	72461	\$15,194.00	\$15,194.00	GLENN-ANNIE ROAD)	\$15,194.00	GLENN-ANNIE ROAD)	ROADWAY R-099
1203	72470	\$20,736.00	\$20,736.00	166	\$294.00	166	SUMMER
1203	73895	\$6,617.00	\$6,617.00	HOLLISTER RANCH R 003	\$6,757.00	HOLLISTER RANCH R 003	ROAD
1203	73896	\$0.00	\$0.00	RANCH ROO3		RANCH ROO3	BRIDGE
1203	74645	\$31,386.00	\$31,386.00	HIGHWAY 154	\$32,153.00	HIGHWAY 154	MOUNTAIN ROAD
1203	74646	\$3,399.00	\$3,399.00	FROM STATE HIGHWAY 246	\$1,469.00	FROM STATE HIGHWAY 246	ROAD (PROJECT
1203	74647	\$13,449.00	\$13,449.00	246	\$19,215.00	246	ROAD
1203	76358	\$38,904.00	\$38,904.00	MILE POST 7.0 AREA R 194	\$38,953.00	MILE POST 7.0 AREA R 194	MOUNTAIN ROAD
1203	76359	\$1,262.00	\$1,262.00	POST MILE 8.0 AREA R 152	\$1,268.00	POST MILE 8.0 AREA R 152	MOUNTAIN ROAD
1203	76361	\$11,967.00	\$11,967.00	WHERE SAGUNTO STREET ENDS	\$14,334.00	WHERE SAGUNTO STREET ENDS	SAGUNTO STREET
1203	76362	\$3,680.00	\$3,680.00	SWEENEY ROAD AREA R206	\$3,469.00	SWEENEY ROAD AREA R206	SWEENEY ROAD
1203	76363	\$11,048.00	\$11,048.00	POST MILE 2.3	\$11,126.00	POST MILE 2.3	AREA R248
1203	76364	\$11,237.00	\$11,237.00	WITH STATE HIGHWAY 246	\$13,327.00	WITH STATE HIGHWAY 246	ROAD, AREA R220
1203	76378	\$3,420.00	\$3,420.00	CANYON & BASELINE ROADS)	\$3,504.00	CANYON & BASELINE ROADS)	ROAD - AREA R207
1203	76379	\$4,952.00	\$4,952.00	CAMINO ROAD TO INTERSECTION	\$4,945.00	CAMINO ROAD TO INTERSECTION	AREA R146
1203	76381	\$45,263.00	\$45,263.00	HAPPY CANYON & BASELINE	\$41,463.00	HAPPY CANYON & BASELINE	ROAD / BRIDGE NO
1203	76383	\$8,152.00	\$8,152.00	POST MILE 4.63	\$9,968.00	POST MILE 4.63	- AREA R017
1203	76388	\$13,923.00	\$13,923.00	MILE POST 3.56	\$19,783.00	MILE POST 3.56	ROAD - AREA R308
1203	76389	\$18,649.00	\$18,649.00	MILE POST 3.98	\$23,573.00	MILE POST 3.98	ROAD - AREA R326
1203	76391	\$31,917.00	\$31,917.00	BELL STREET HALF WAY BETWEEN	\$34,012.00	BELL STREET HALF WAY BETWEEN	BRIDGE, BR 51C -
1203	76393	\$41,305.00	\$41,305.00	VANDENBURG AIR BASE	\$26,213.00	VANDENBURG AIR BASE	AREA R151
1203	76397	\$19,199.00	\$19,199.00	WEST OF MAINLAND	\$19,199.00	WEST OF MAINLAND	ISLAND TOWER
1203	76398	\$1,130.00	\$1,130.00	OF EAST CAMINO CIELO /	\$1,130.00	OF EAST CAMINO CIELO /	COMMUNICATION
1203	94405	\$5,763.00	\$5,763.00	1051 PALOMINO ROAD	\$6,325.00	1051 PALOMINO ROAD	DRAIN PIPE

Summary of Funds to be Distributed to Divisions from FEMA-1203 Retention
1998 Storm

1203	94406	\$38,564.00	\$45,200.00	REAL, 1500' EAST OF CRAVENS	SEDIMENTATION
1203	94410	\$35,963.00	\$4,500.00	246	CROSSING ROAD
1203	94420	\$23,684.00	\$23,505.00	COUNTY WIDE	AND BRIDGE
1203	94659	\$37,461.00			
		<u>\$13,105,986.00</u>			

"EXHIBIT B" List of Project Sites

ITEM #	LOCATION	DESCRIPTION OF DAMAGE AND SCOPE OF WORK	COST ESTIMATE	ENTER "SP" IF SMALL PROJECT OR "LP" IF LARGE PROJECT	ENTER "EW" FOR EMERG. WORK OR "PW" FOR PERM. WORK	WAS WORK COMPLETED BY FORCE ACCT. (FA), CONTRACT (C) OR BOTH (F/C)?	ENTER "ENV" IF THERE ARE ENVIRONMENTAL ISSUES OR "HIST" FOR HISTORIC ISSUES, OR BOTH	WOULD YOU LIKE TO PROPOSE HAZARD MITIGATION? (yes or no)	WAS THERE INSURANCE COVERAGE? IF YES, ENTER DEDUCTIBLE AMOUNT	WAS THE FACILITY DAMAGED IN A PRIOR DISASTER(S)? IF YES, ENTER DISASTER NAME(S) OR NUMBER(S)
APPLICANT: Santa Barbara, County		DATE COMPLETED: 5/19/01		IS THIS AN AMENDED EXHIBIT "B"? NO						
CONTACT NAME AND PHONE NUMBER: Dave Rickard (805) 568-3000 X 3552										
1	Fairview @ Holiday Hill Road (R002)	A 60" corrugated metal pipe (CMP) culvert X 102-foot long failed along the invert causing erosion in various locations and causing a sink hole and failure of a water line. Scope of Work (1) ER repairs stabilize road and fill around pipe (2) Slipline existing culvert by installing a 54" OD, outside diameter HDPE plastic pipe inside old pipe and seal in place (3) Repair damage of existing culvert at the outlet (4) install 105 feet of plastic liner and seal at each end (5) Repair erosion from over topping of outside drain (6) Replace the capacity and outside drain.	\$ 53,964.00							

"EXHIBIT B" List of Project Sites

<p>2 East Camino Cielo starting @ Painted Cave to Gibraltar (R004)</p>	<p>Damage consisted of (1) 15 foot long X 6 foot wide roadway failure (2) 200 foot long X 2 foot wide dirt shoulder washout (3) 30 foot long roadway support failure southern side causing unsafe conditions. Scope of Work: (1) Grade Drainage Swale (2) 350 CY of structure excavation (3) 490 CY of structure backfill (4) 640 SF of Mechanically Stabilized embankment Retaining Wall (5) 50 CY of Class 2 Aggregate Base (6) 70 Ton asphalt concrete (Type B) (7) 250 LF furnish 3.5" X 3.5" steel tubing (8) Install 3.5" X 3.5" steel tubing (9) Provide Engineering expenses @ 15%</p>	<p style="text-align: right;">\$ 91,500.00</p>		PW	F/C			<p style="text-align: center;">FEMA 1044 (DSRs) 95045 & 95046 FEMA 1203 (DSR) 20379</p>
<p>3 Gibraltar to City Limits (R005)</p>	<p>2.2 Miles of re-establishing asphalt roadway from debris off hillides and re-establishing shoulders and asphalt patch repairs at various locations. Scope of Work: (1) Remove debris from roadway and regrade 2.2 miles of 3' to 4' shoulders and (2) Use 10 tons of asphalt to patch washouts at various locations.</p>	<p style="text-align: right;">\$ 18,274.00</p>		PW	F/C			<p style="text-align: center;">FEMA 1044 (DSRs) 12538, 16821, 20600, 20601, 20602, 20603</p>

"EXHIBIT B"
List of Project Sites

<p>4 Refugio Rd. from Calle Real to West Camino Cielo (R006)</p>	<p>Debris fills 5 concrete low water crossings 24 inch culverts - two to three 24 inch culverts at each crossing going N on Refugio Rd from Calle Real. <u>Scope of Work:</u> Remove debris from inlets and outlets at the 5 locations to re-establish flows and (2) flush out pipes at all locations to re-establish culverts to pre disaster conditions.</p>	<p>\$ 30,000.00</p>	<p>PW</p>	<p>F/C</p>	<p>\$</p>	<p>FEMA-1044 (DSR) 20612 - FEMA-1203 (DSRs) 73891, 94410, 20382, 07196</p>
<p>5 Calle Real 0.5 miles east of Refugio Rd. (R007)</p>	<p>A 50 ft long X 15 ft wide X 4 foot deep (111 CY) debris in road. <u>Scope of Work</u> Clear road to pre-disaster conditions</p>	<p>\$ 620.00</p>	<p>PW</p>	<p>F/C</p>	<p>\$</p>	<p>FEMA-1203 (DSR) 94470</p>
<p>6 Foxen Canyon Rd. @ MP 15.36 (R008)</p>	<p>Resulting erosion from creek caused a 15' vertical drop-off adjacent to edge of pavement with a width of 25 feet, length 50 feet. Slipout caused RCB concrete box culvert damage in the outlet flow and took out 100 LF of barbed wire fencing. <u>Scope of Work:</u> (1) Replace missing embankment shoulder and slope by using 800 CY of import borrow - rebuild embankment with import base to be raised in staggered benching operation with each bench receiving the compaction and key cuts required. (2) Inclusive with the fill, the placement of 2-10 inch diameter culverts pipes 80 feet each (H.D.P.P.) was placed. (3) Finish & bring to grade. (4) repair and replace 100 LF of 5 strand barbed wire fence.</p>	<p>\$ 15,000.00</p>	<p>PW</p>	<p>F/C</p>	<p>\$</p>	<p>FEMA-1044 (DSR) 09220</p>

"EXHIBIT B" List of Project Sites

	7 Drum Cyn Rd @ MP 2.09 (R009)	<p>(1) Washout roadway embankment failure 75' L X 30' D (2) 100' L X 15'W R & R Asphalt (3) Regard 100' shoulder. Scope of Work: to include reconstruction of roadway inbankment by placing a pipe and tire revetment wall at the toe of the slope and placing fill. Damaged AC pavement, roadside ditch and barbed wire fence will be replaced.</p>	\$ 75,000.00		PW	F/C							
	8 Mail Rd @ MP 1.64 (R010)	<p>4 inch "gopher" hole started by storm runoff caused a 20 foot square AC failure. Scope of Work: repair 8 inch deep 20 foot X 20 foot section of AC with Class II base</p>	\$ 761.00		PW	F/C							
	9 San Marcos Rd. Bridge (R011)	<p>Washout cause 60 LF of embankment washout at N/W corner of Bridge. Scope of Work: Use 60 LF pipe and wire reventment replacement / hydro seeding = 30' W X100' L</p>	\$ 30,800.00		PW	F/C	ENV					FEMA-1046 (DSR) 46561 - 95679	
	10 Gaviota Creek Crossing (R012)	<p>120 ft long X 20 ft width X 3 ft deep (266 CY) of debris on concrete low-water crossing closed road 3 days to adjacent Hollister Ranch citizens. Scope of Work: Re-establish roadway by removing debris to restore road to pre-disaster conditions</p>	\$ 2,565.00		PW	F/C	ENV					FEMA-1203 (DSRs) 73894, 73896, 73894,	

"EXHIBIT B" List of Project Sites

11	Tequesquet Rd @ Sisquoc River Crossing (R013)	<p>a 24' W X 90' L section of crossing (dirt) washed out. Scope of Work: Re-establish crossing by using 8 sections of 60 foot long X 48" piping and (2) re-grade 90' X 24' section.</p>	\$ 12,000.00		PW	F/C	ENV		
12	Bonita School Rd.,Xing. (R014)	<p>Bonita School Road crosses the Santa Maria River . High flows (approximately 25K cfs) during the March, 2001 storms cantilever and failed. Scope of Work: <u>Repair</u> (1) 486 feet of failed slope (2) repair a 60 foot breach on a 2000 foot cement treated, embankment filled road. (Note) On average the existing road is 6 to 7 feet above the elevation of the river, with a 2:1 slope, from the road elevation, down to the river.</p>	\$ 80,000.00		PW	F/C	ENV		FEMA-1044 (DSRs) 95032, FEMA-1203 - 74684, 76394
13	Armour Ranch Rd @ Bridge # 51C-074 (R015)	<p>30'L x 10' W x 15' H scour hole behind concrete grouted rock rip rap slope protection. Scope of Work Repair by removing grouted rock over scour hole, filling in hole with dirt fill and rebuilding grouted rock slope protection.</p>	\$ 20,000.00		PW	F/C			

"EXHIBIT B" List of Project Sites

<p>Kinevan Rd (R016), , Sites I, II, III</p>	<p>Washouts at Various Locations: (Site I) Bridge 51C-214 a 10' H X 15'L sandstone wall washed out (Site II) Br.51C-215 a 25' L X 10' W X 10'h section of stream bank with 1 ton rock washed away, scour behind a sacked concrete wingwall caused a void of 2 ft dia, 8 ft H (Site III) Sacked Concrete stream bank wall failure 50 ft Long by 12 ft high. Scope of Work: (Site I) Collect displaced sandstone blocks from creek bottom and rebuild wing wall. Repair eroded slope upstream of wing wall with 15 LF of grouted rock riprap; (Site II) Retrieve displaced rock from creek bottom and return to stream bank, Place additional rock riprap along eroded streambank, pour slurry into void behind sacked wing wall, improve road side ditch so that runoff does not enter behind wing wall; (Site III) Remove remaining portions of broken sacked concrete wall and place rock groins along bank in place of the failed wall, remove fallen redwood</p>	<p style="text-align: right;">\$ 30,000.00</p>	<p style="text-align: center;">PW F/C</p>			
<p>14</p>	<p>Flood waters broke a 24" joint concrete pipe Scope of Work: Salvage and reuse pipe section by placing MIRAFI 600X filter fabric , (2) back fill wing wall with facing class rip rap</p>	<p style="text-align: right;">\$ 5,000.00</p>	<p style="text-align: center;">PW F/C</p>			
<p>15</p>	<p>Cathedral Oaks @ Glenn Annie (R017)</p>					

"EXHIBIT B" List of Project Sites

16 Mail Rd. @ MP 1.32 (R018)	Road shoulder washout 50' long X 55' wide x 30' deep, cracking and slump of 600 sq. ft. of asphalt roadway. Scope of Work: Bench washout area and place rock at bottom bench, backfill slope and road shoulder, remove damaged road surface and replace in kind.	\$ 60,000.00		PW	F/C				
17 960 East Mountain Drive (R019)	Damage @ 960 East Mountain Dr. consisted of 20-foot wide X 26-foot deep sink hole in middle of roadway. Scope of Work: (1) Build a soldier pile tie back retaining wall 20-foot long X 26 feet deep to stabilize existing stone retaining wall (2) Use 10 CY of fill (3) Pave over asphalt hole using approximately 3 tons of concrete asphalt (Type B).	\$ 60,000.00		PW	F/C				
18 Mail Rd. @ MP 0.15 south of Hwy 246 (R020)	(1) approx. 200 LF shoulder undercut by flood waters (2) approx. 190 LF of supporting roadway slope has eroded to unsafe conditions SCOPE of WORK: Re-establish approx. 200 LF of shoulder by shifting roadway approx. 5-feet and rebuilding shoulder and supporting slope	\$ 95,000.00		PW	F/C			ENV	FEMA -979

"EXHIBIT B" List of Project Sites

19 Mail Road @ MP 0.36 south of Hwy 246 (R021)	<p>Heavy rainfall washout out a large area of the 250' L X 5' W road shoulder, took down the large pine tree near the 24" CMP culvert, and exposed the downstream end of the culvert.</p> <p>Scope of Work: (1) Remove tree (2) use 75 CY of imported borrow (3) use 30 CY of rock slope grouted protection provide (4) Traffic Control</p>	\$ 19,467.00	PW	F/C			FEMA-1203 DSR 52009
20 Cebada Cyn Rd @ 400' of Avana Rd. (R022)	<p>100' L X 20' W roadway slope washout and 12" outside drain.</p> <p>Scope of Work: Reconstruct roadway slope by placing (1) 75 CY of imported borrow (2) 30 CY of rock slope protection (RSP) and (3) 1 12" outside drain.</p>	\$ 14,309.00	PW	F/C			
21 Cebada Cyn Rd @ 200' north of Cooper Rd. (R023)	<p>50' L section of roadway embankment slide at slip plane.</p> <p>Scope of Work: Use 30 CY of RSP and 60 CY of imported borrow to restore to pre disaster conditions.</p>	\$ 12,737.00	PW	F/C			
22 South Bradley Rd (R024)	<p>Damage was a 20'X20' sink hole in asphalt. Scope of Work: County forces repaired a 15' W X 20' L X 5' deep hole with 11 tons Type "B" AC.</p>	\$ 645.00	PW	F/C			

"EXHIBIT B"
List of Project Sites

23	Figueroa Mt. Rd Bridge 51C-082 (R025)	<p>Flowing debris caused a (1) 4 foot metal post at end to bend (2) 5' lateral guard rail X 2 bent become unattached & (3) re-seat wooden post @ southern end of bridge Scope of Work: Replace 4' metal post, (2) reattach 5' later guard rail and (3) re-seat 2 wooden post at bridge ends.</p>	\$ 5,000.00	PW	F/C		
24	Marina Dr - Roble Dr. (R026)	<p>36" W X 60" L CMP failure. Scope of Work: Replace using new 30" W X 60" L CMP</p>	\$ 30,000.00	PW	F/C		
25	El Sueno Dr @ Atascadero Creek (R027)	<p>(1) A 12" W X 40' L Oversize drain hanging as a result of washout (2) Washout caused a 20' L X 30' W X 8' D void. Scope of Work: re-establish drain foundation by (1) providing 177 CY of local fill to Bridge (2) re-attach and secure drain using 10 gage cable and spread bolts attach to box culvert and (3) Clear drain</p>	\$ 9,000.00	PW	F/C	ENV	
26	Paradise Rd Bridge 51C-073 (R028)	<p>40' long X 6' deep X 5' wide Embankment washout (2) approx 3 CY of concentrated woody debris under bridge. Scope of Work: Remove woody debris and place rock along eroded stream bank.</p>	\$ 15,000.00	PW	F/C		
27	Mattoral - Ribera Intersection (R029)	<p>A 15' W X 14' L X 12' deep sink hole in dirt bike path. Scope of Work: (1) use 93 CY of fill to fill void and compact (2) regarde 23 SY of bike path</p>	\$ 2,500.00	PW	F/C		

"EXHIBIT B"
List of Project Sites

28	Patterson - east of Camino Meleno (R030)	<p>(1) Erosion / Damaged to a 18" RCP X 10' L Culvert & (2) 30" X 150' CMP damaged Scope of Work: Excavate 3' W X 150' (50 SY) to pull up damaged RCP and asphalt covering (2) Install 18" X 10' L RCP (3) Use 2 CY of fill (4) Pave a 150' L X 6' W X 6" (5) Replace 100 LF of 30" CMP</p>	\$ 20,000.00	PW	F/C		
29	Refugio Road from W. Camino Cielo to First Summer X-ing on Santa Ynez Side (R031)	<p>Damage was 30 CY of scattered debris/fallen trees on 3.4 miles of dirt roadway including shoulders (berm) - Scope of Work: Re-establish 3.4 miles of dirt roadway by removing debris and using 5 CY of fill at various locations (2) Regrade 3.4 miles of road to drain into existing drainage structures (3) Cut drainage ditches entire length of road (4) Rebuild eroded 3.4 miles of 2-foot shoulders (burms)</p>	\$ 25,000.00	PW	F/C	FEMA-1203 DSR 73891	
30	Refugio Road from 0.5 mi from Calle Real (R032)	<p>70' + Arc Slide has eroded the shoulder and dislocated a utility pole Scope of Work (1) use 15 CY of local fill and grade to code (2) replace utility pole</p>	\$ 20,000.00	PW	F/C		
31	Refugio Rd., North of W. Camino Cielo, Site #19, 1/19 MP 9.77 (R033)	<p>100 foot long roadway support collapse and sumped. Scope of Work: Re-establish roadway support using three to six H-piles and 6ft wide X 60 roadway ties (2) Overlay 100-foot section of asphalt roadway using 60 tons of asphalt (3) Traffic Control.</p>	\$ 90,000.00	PW	F/C	FEMA-1203 DSR 07196	

"EXHIBIT B"
List of Project Sites

34	Refugio summer X-ing #6 (R036)	<p>A 25' L X 14' W 6" section of concrete summer crossing washed out. Scope of Work: (Phase I) Construct a temporary 38 " long single span bridge over Quiota Creek; (Phase II) Construct permanent Bridge Abutments and center the 38 ft. long bridge over the creek. Construct upstream and downstream stream bank protection. Remove remaining portion of concrete summer crossing.</p>	\$ 100,000.00		PW	F/C	ENV			
35	Jalama Rd @ MP. 10.15 (R037)	<p>Runoff caused roadside shoulder erosion (approx 20 LF) on the South side of the Jalama Rd.. Scope of Work: Construct a concrete Structure with Overside drain and CMP. Jack a 24' CMP pipe under Jalama Rd to convey the flows from the roadside ditch on the North side of the road.</p>	\$ 12,500.00		PW	F/C				FEMA-1044 / FEMA 1406 / FEMA 1203

"EXHIBIT B" List of Project Sites

36	Mahoney Rd @ M.P. 0.5 south of Betteravia Rd. (R038)	<p>The existing culvert which underpasses Mahoney Rd. failed on the west, downstream side. A seven foot section of 64" diameter Reinforced Concrete Pipe (RCP) and attached sixteen foot wide headwall (16-ft) has sheared off. This detached section of the culvert was undercut by drainage water and as a result was left cantilevered. It was unable to support its own weight and failed. Also, approximately 185 cubic yards of the surrounding slope, which consists of native material and some asphalt concrete slope protection, has been eroded.</p> <p>Scope of Work: Replace a 64" X 16-FT section of RCP.</p>	\$ 15,000.00	PW	F/C					
37	Cathedral Oaks Rd. @ Bridge #51C-213 (2750' West of Los Cameros) (R039)	Erosion behind guardrail	\$ 20,000.00	PW	F/C					
38	Maria Ygnacia Creek Bikeway repair south of U.P.R.R. Bridge. (R040)	<p>30' L X 5 W X 20' High embankment washou. Scope of Work: Backfill using rock slope 111 CY (RSP) protection and native material.</p>	\$ 7,000.00	PW	F/C				\$	
39	Baron Ranch (County Facility)	<p>DAMAGE: 1) Lower Creek Crossing was washed out (30 feet long x 15 feet wide). 2) Upper Creek Crossing was washed out (18 feet long x 12 feet wide).</p>	\$ 100,000.00	PW	F/C	ENV			\$	NO

"EXHIBIT B"
List of Project Sites

40	Baron Ranch (County Facility)	<p>SCOPE OF WORK: 1) The Lower Creek Crossing repair will consist of County staff preparing a grading plan and a small bridge or box culvert design. County staff will regrade the area and a contractor will construct the bridge or culvert. 2) Pending approval by California Department of Fish & Game, the Upper Creek Crossing repair will consist of a replacement culvert designed by County staff or an engineering consultant. County staff will regrade the washed out area. A contractor or County staff will install a 36-inch diameter x 20 foot long CMP pipe and cover with soil to restore the area to pre-disaster conditions in compliance with regulatory standards.</p>	\$	10,000.00				PW	F/C			\$	NO
		<p>DAMAGE: Horizontal well and conveyance system were damaged. Horizontal wells were sheared off at the rock face, and the piping that conveyed well water over the creek was washed out.</p>											
		<p>SCOPE OF WORK: Repairs to horizontal well and conveyance piping system consists of fitting sleeves into the sheared well casings at the rock face and replacing the piping that extended across the creek bed.</p>											
41	Baron Ranch (County Facility)	<p>DAMAGE: Washed out roads at various locations on site.</p>	\$	20,000.00				PW	FA			\$	NO

"EXHIBIT B"
List of Project Sites

	42 Site Location -14730 Calle Real and Old Highway 101	<p>SCOPE OF WORK: Repairs will consist of County personnel removing debris and regrading the roads.</p> <p>DAMAGE: The channel below the outfall of the 6-foot diameter in Lower Canada de la Pila Creek has been washed out and a 200 foot-long section of the creek embankment downstream of the concrete apron has been eroded. The creek channel has degraded (cut vertically down) about 6-8 feet below the existing concrete apron at the outfall of the pipe.</p>	\$ 150,000.00		PW	F/C	ENV	\$	NO
		<p>SCOPE OF WORK An engineering consultant has been hired to evaluate the damage and formulate repairs to the erosion. The pipe and the roadway above it are in jeopardy of collapse due to head cutting by the creek. Degradation of the creek will continue unless work is undertaken. Repairs will be needed to stabilize creek in the vicinity of the pipe and to prevent creek scour from undermining the</p>							
43	Landfill Location Site - Foothill Landfill - Site A	<p>DAMAGE: Embankment failure into reach of drainage course at Site A: (East of Transfer Station, Downhill from Road Yard)</p>	\$ 54,000.00		PW	F/C		\$	NO

List of Project Sites

44	Landfill Location Site - Foothill Landfill - Site B	<p>SCOPE OF WORK: Repair of SITE A has been started by County staff to stabilize the eroded slopes for safety. An engineering consultant is preparing the design of the repair. The repair concept includes two components: i) Installation of a HDPE storm drainpipe, about 200 feet long. The stream hydraulics are unknown at this time, but it is estimated that 24-inch diameter pipe may be adequate. ii) Following the construction of the storm drain, County staff will install jute matting and seed the finished surface for erosion control.</p>	\$ 171,000.00		PW	F/C				\$						NO
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"EXHIBIT B" List of Project Sites

"EXHIBIT B"
List of Project Sites

		\$	25,000.00		PW	FA		\$		NO
46	Landfill Location Site - Tajiguas Landfill West Ridge	<p>DAMAGE: 1) 700 feet of 2-inch diameter water line pipes and 1,600 feet of 3-inch diameter water line pipes were undermined and broken. 2) 20 feet of electrical wire for the water level sensors in the water storage tank were undermined and broken in the area between the ground water production well and the water storage tank.</p>								
		<p>SCOPE OF WORK: Emergency repairs were performed by County personnel which involved removing the broken water lines, regrading the areas where the water and electric wires were damaged, grading the areas for the new alignment of the water lines and electrical wires, reconnecting the water lines and the water chlorination system, pressure testing the water lines, and testing the water chlorination system. Emergency repairs completed by a Contractor included removing, repairing and reconnecting the broken electrical wires to the water level sensors in the water storage tanks.</p>								
47	Landfill Location Site - Tajiguas Landfill	<p>DAMAGE: 1) The conveyance system piping for 3 Horizontal Wells was disconnected due to minor slope erosion. 2) One (1) Ground Water Monitoring Well was damaged due to a slope failure in native material from storm water runoff.</p>	\$	50,000.00	PW	F/C		\$		NO

"EXHIBIT B" List of Project Sites

		\$	PW	F/C		NO
51	South Coast Transfer Station	5,000.00				
	<p>DAMAGE: 200-foot long section of roadway was blocked by a minor slump that occurred in the native rock formation behind the South Coast Transfer Station.</p> <p>SCOPE OF WORK: Emergency repairs performed consisted of clearing the debris from the roadway. Additional repairs will consist of regrading the slump area to promote positive drainage. The regraded slope area will be covered with a soil stabilization material for erosion control.</p>					
52	Landfill Location Site - Tajiguas Landfill	95,000.00				
	<p>DAMAGE: Washouts and debris from slumps in native soil and bedrock caused damage to the Tajiguas Landfill Main Access Road and the Landfill Service Roads. Erosion also occurred along the shoulders of the roadways and around three storm drain inlets along the main landfill access road.</p>					

List of Project Sites

		<p>SCOPE OF WORK: Emergency repairs performed by County personnel included removal of debris from the main access road and service roads, regrading of a number slumps that occurred in native soil and bedrock slopes along the the main access road and service roads, and the regrading of the eroded shoulder areas along the roadways. A contractor will regrade the eroded areas around the three damaged storm drain inlets and a hard surface will be installed around all three storm drain inlets.</p>	<p>\$ 25,000.00</p>		PW	F/C				
53	Landfill Location Site - Tajiguas Landfill	<p>DAMAGE: Storm water run off flooded the scalehouse area. Storm water run off sediment intruded inside the below-ground truck scale at the Tajiguas Landfill.</p>								NO

"EXHIBIT B"
List of Project Sites

	<p>SCOPE OF WORK: Emergency repairs performed included pumping out the storm water sediment from the below-ground truck scale pit. County personnel trained to work under confined space conditions removed residual sediment from inside the below-ground scale pit area. A contractor will repair the truck scale that has been impacted by the storm water and sediment. Additional repairs include the preparation of a design by an engineering consultant for a 30-foot long x 4-foot wide drainage swale, a 30-foot long x 4-foot wide x 4-inch high asphalt curb, and a non-erosive overside drain, all located uphill from the scalehouse. A contractor will construct these repairs which will divert the storm water runoff away from the scalehouse and scale area and direct the flow into Lower Canada de la Pila Creek.</p>	<p>\$ 2,000.00</p>							
54	Landfill Location Site - New Cuyama Landfill			PW	FA				NO
	<p>SCOPE OF WORK: Repairs include regrading and stabilizing the slope above Ground Water Monitoring Well #5, installing reinforcement supports around the well, and placing soil stabilization material on the regraded areas to minimize erosion.</p>								

"EXHIBIT B"
List of Project Sites

55	Buellton Basin #1 @ La Pita Pl - GPS 120 11' 38" W & 34 36' 55" N	Debris Basin - restore to pre disaster condition, Remove 1500 yards of material. Last Maint. 12/00	\$ 20,000.00	PW	F/C				FEMA-1044 & 1046
56	Buellton Basin #2 @ La Pita Pl & Paula Ray Ln. GPS 120 11' 42" W & 34 36' 57" N	Debris Basin - restore to pre disaster condition, Remove 1000 yards of material. Last Maint. 12/00	\$ 10,000.00	PW	F/C				FEMA-1044 & 1046
57	San Pedro Creek downstream of James Fowler Rd GPS 119 49.84 W, 34 25.58 N	Removal of silt - sedimentation and other debris from channel - 7000 yds. Last Maint. 11/00	\$ 57,000.00	PW	F/C		ENV		FEMA-1044 & 1046
58	Carmeros Creek downstream of Hollister Ave. GPS 119 50.82 W & 34 25.87 N	Removal of silt - sedimentation and other debris from channel - 5000 Yards Last Maint. 11/00	\$ 30,000.00	PW	F/C		ENV		FEMA-1044 & 1046
59	Santa Rosa Creek Check Structure @ Dominguez Rd & Mail Rd GPS 120 17' 3" W & 34 37' 30" N	Check Dam Repair - filling voids with 50 yds. concrete to prevent further erosion and failure.	\$ 5,000.00	PW	F/C				
60	Lilley/Hayes Channel South of Hwy 246, & East of Purissima Rd. GPS 120 24' 30" W & 34 39' 46" N	Removal of 3000 yds.silt, sedimentation and other debris Last Maint. 12/99	\$ 10,000.00	PW	F/C				
61	Hoag/Santa Rita Channel South of Hwy 246, West of Santa Rita Rd. GPS 12022' W & 34 39'42" N	Removal of 3000 yds of silt, sedimentation and other debris including destroyed pipe and wire revetment. Last Maint. 11/00	\$ 20,000.00	PW	F/C				
62	Buellton Basin #2 Interceptor above #2 GPS 120 11'44" W & 34 36'59" N	Erosion repair at Drainage structure - import 100 yds material, place with excavator & then grout	\$ 2,000.00	PW	F/C				
63	Cebada Channel downstream of Hwy 246, East of Rucker Rd. GPS 120 25'30" W & 34 40' N	Removal of 2000 yds of silt, sedimentation and other debris. Last Maint. 11/00	\$ 20,000.00	PW	F/C				FEMA-1044
64	Rodeo/San Pasqual Basin South of Ocean ave @ San Pasqual Ave GPS 120 39' W & 34 38'25" N.	Removal of 40,000 yds of silt, sedimentation and other debris. Last Maint. 12/00	\$ 60,000.00	PW	F/C				FEMA-1044
65	San Pasqual Channel South of Ocean Ave - tributary to the basin in # 10 GPS 120 30' 54"W & 34 38' 20" N	Removal of 1000 of silt, sedimentation and other debris. Last Maint. 12/00	\$ 6,000.00	PW	F/C				FEMA-1044
66	Rodeo Channel S. of Ocean GPS 120 31' 10"W & 34 38'25" N	Removal of 1000 YDS silt, sediment and other debris. Last Maint. 12/00	\$ 10,000.00	PW	F/C				FEMA-1044

"EXHIBIT B"
List of Project Sites

67	Santa Maria Levee West of Bonita School Rd. GPS 120 31.88° W & 34 56.68° N.	Place 630 yds of 1/2 to 2 ton Rip Rap at 3 identified locations Last Maint. 12/00 (detailed plans available)	\$ 100,000.00	PW	F/C				FEMA-1046
68	East Ditch South of SM Levee & East of Bonita School Rd. GPS 120 28.16° W & 34 59.33° N	Removal of 2000 yds of silt, sedimentation and other debris. Last Maint. 10/00	\$ 10,000.00	PW	F/C				
69	Cat Canyon @ Sisuoc N of Long Canyon Rd GPS 120 17.30° W & 34 52° N.	Erosion repair at Drainage structure - import 200 yds material, place with excavator & then grout	\$ 5,000.00	PW	F/C				
70	Dutra Basin Southeast of Sisuoc GPS 120 17.16° W & 34 41'42" N.	Removal of 3500 yds of silt, sedimentation and other debris. Last Maint. 9/00	\$ 20,000.00	PW	F/C				FEMA-1046
71	Diaz Ditch South of Foxen Cryn Rd, & East of Sisuoc GPS 120 18'43" W & 34 53' 22" N.	Removal of 1500 yds of silt, sedimentation and other debris. Last Maint. 2/01	\$ 8,000.00	PW	F/C				FEMA-1046
72	Unit II Tailwater Channel South of the SM Levee, East of Bonita School Rd GPS 120 29.12° W & 34 58.15° N	Removal of 4000 yds of silt, sedimentation and other debris. Last Maint. 10/00	\$ 20,000.00	PW	F/C				
73	Newton Access Rd / CtnBwl	DAMAGE: (1) Two locations of asphalt failures on road. One location is 25' L X 10' W and the other location is 20' L X 10' W. (2) 250 linear feet of chain link 10 gage fence destroyed by fallen boulders and dirt at walkway. (3) 250' L X 5' W X 4' H washout at walkway. SCOPE OF WORK: Due to unsafe conditions, the storm damage repair at this site has been completed. It involved the removal of the chain link fence and washout area, the placement of 250 linear feet of K-rail, and the repair of two asphalt concrete sections of the road.	\$ 15,975.00	PW	F/C			\$	
74	Toro Cyn Park	DAMAGE: (1) 4' W X 8' L X 4' D inlet area of 18" culvert under roadway eroded. Culvert plugged with sediment.	\$ 6,200.00	PW	F/C			\$	

"EXHIBIT B"
List of Project Sites

75	Goleta Beach County Park	<p>SCOPE OF WORK: Repair will consist of clearing all dirt and gravel from the pipe, inlet area and swale. Also some concreted sand bags will be placed around the inlet area that collapsed.</p> <p>DAMAGE: (1) Eroded 1,536' L X 12' H sand berm along park lawn. (2) Undermined concrete toe between the AC roadway and the wooden pier. (3) Major structural damage to pile.</p>	\$ 47,663.00		PW	F/C			\$			
76	Cachuma Lake Domestic Water Plant	<p>SCOPE OF WORK: An emergency repair was performed when one of the pier piles showed signs of imminent failure during one of the storms. The existing sand berm that protects the lawn area of the park from erosion was reconstructed.</p> <p>DAMAGE: (1) Wave action destroyed and washed out 180' L X 10' H X 8' W of shore protection which caused two of the main water filter lines to get exposed. (2) The wave action also eroded an area near one of the corners of the water treatment plant leaving only a four foot gap between the structure and the edge of the water.</p> <p>SCOPE OF WORK: Place 180 linear feet of 1 ton rip-rap along the shoreline to protect the structure and the waterlines. It is estimated that about 850 tons of rip-rap will be needed.</p>	\$ 40,200.00		PW	F/C	ENV		\$			FEMA-1046 DSR 92704

"EXHIBIT B"
List of Project Sites

		\$	23,300.00		PW	F/C		\$	
77	Cachuma Lake Boat House	DAMAGE: (1) 250 lb seaward anchor broke off (lost in debris at bottom of lake). (2) 20 wood planks of access ramp washed away. (3) Three 12'x4' roof panels were blown away. (4) Four 4'x8' floatation panels were washed away. (5) Six sheets of siding lost. (6) Various hinges and bolts broke off. (7) Three 15 foot long metal supports that held the ends of the base of the house were washed away.							
		SCOPE OF WORK: Replace all broken or missing structural members, floatation panels and siding to their previous condition.							
78	Guadalupe Dunes Park Parking lot	DAMAGE: Washed out 100' X 200' Asphalt Parking lot	\$ 25,950.00		PW	F/C		\$	
		SCOPE OF WORK: Replace approximately 350 tons of asphalt concrete.							
79	Tuckers Grove Park	DAMAGE: (1) 50' L X 21' W X 4' D creek crossing embankment erosion and rip rap loss (SW side). (2) 30' L X 5' W X 3' D creek crossing embankment erosion and rip rap loss (SE side). (3) 160' L X 20' W section upstream sedimentation deposit. (4) 13' X 5' W X 8' H access road washout. (5) 16' L X 5' W X 8' H access road washout. (6) 40' L X 3' W "v" ditch undermined.	\$ 26,175.00		PW	F/C	ENV	\$	

"EXHIBIT B" List of Project Sites

	<p>SCOPE OF WORK: Removal of the upstream sedimentation, placement of approximately 150 tons of grouted ¾ ton rip-rap at the eroded embankments behind the existing grouted rip-rap on both sides of the creek crossing. Approximately 65 tons of non-grouted ¾ ton rip-rap will be placed at the toe of the two washouts and built up to the top of the embankment. Reconstruction of the existing "V" ditch to its previous condition.</p>	<p>\$ 54,700.00</p>								
80	Cachuma Lake Mohawk trail & pier	<p>DAMAGE: (1) 200 linear feet of trail washed out. (2) Washed out 50'x6' access ramp. (3) Washed out hand railings at access ramp.</p>	<p>\$</p>	PW	F/C					
		<p>SCOPE OF WORK: Repair will consist of placing rock slope protection (rip-rap) along the edge of the embankment to reconstruct the section of trail. The access ramp area will be backfilled and regraded and the hand railings reconstructed to their original condition.</p>								
81	El Capitan Ranch Trail	<p>DAMAGE: (1) 40'x20' erosion of southeast corner of downstream side of crossing. (2) Damaged 60 linear feet of fence.</p>	<p>\$ 11,650.00</p>	PW		ENV				
	<p>SCOPE OF WORK: Place 150 tons of rock slope protection and replace 60 linear feet of fence.</p>		<p>\$</p>							<p>\$</p>

"EXHIBIT B"
List of Project Sites

82	Santa Maria Court House @ 312 Cook St	Water intrusion damage a 30' X 20 - glue down (Basement computer room) & Replace a section of 5'X8' flue down in evidence closet room): SOW: Clean	\$ 300.00	PW	F				\$
83	Santa Maria Health Center	Water intrusion damage #35 2' X 2 ceiling tiles: SOW: Replace	\$ 250.00	PW	F				\$
84	Lompoc Health Center	Water intrusion damage #45 2' X 2' 20' X 25' ceiling tiles: SOW: Replace	\$ 150.00	PW	F				\$
85	Santa Maria Social Services	Water intrusion damaged #50 2' X 2' 20' X 25' ceiling tiles: SOW: Replace	\$ 300.00	PW	F				\$
86	Santa Maria Facilities Shop	Water intrusion damage #10 2' X 2' ceiling tiles: Scope of Work Replace	\$ 100.00	PW	F				\$
87	Santa Maria Court House @ 312 Cook St	Various ER Repairs to exterior wood facility - SOW: Patching	\$ 3,000.00	PW	F/C				\$
88	Santa Maria Court House @ 312 Cook St	Water intrusion from basement area soaked a 300' X 300' SF of glued down carpet SOW: Cleaning	\$ 800.00	PW	F/C				\$
89	Veterans Hospital @ 4440 Calle Real	Approx. 200' L X 6' W glue down carpet damaged SOW: Replace	\$ 2,500.00	PW	F/C				\$
90	Veterans Hospital @ 4440 Calle Real	3 Rooms (1 wall side = 12' X 12') & 1 Hallway Wall (40' L X 10' H) wall paper coverings destroyed by water intrusion SOW: Remove and repair wall by paint and replace wall paper damaged areas (in kind)	\$ 2,000.00	PW	F/C				\$
91	Veterans Hospital @ 4440 Calle Real	Ceiling tile damage (approx. 60 tiles 1' X 1' in various rooms) SOW Replace	\$ 1,000.00	PW	F				\$
92	Veterans Hospital @ 4440 Calle Real	Water intrusion damaged a wood Cabinetry (1 section 8' X 8') SOW: Replace	\$ 1,000.00	PW	F				\$
93	Los Prietos Boys Camp - Paradise Road in Santa Ynez	Damaged "Simplex" Fire Alarm System water shorted out = <u>may</u> have to replace	\$ 15,000.00	PW	F/C				\$

"EXHIBIT B"
List of Project Sites

94	Environmental Health Services @ Camino Del Reminio	Water intrusion carpeting (glue down low pile) in office area approx. 40' X 40 was damaged SOW: Replace	\$ 3,600.00	PW	F/C				
95	Environmental Health Services @ Camino Del Reminio	25 Ceiling tiles 2' X 4' had water damage. SOW: Replace	\$ 300.00	PW	F				
96	Environmental Health Services @ Camino Del Reminio	Water intrusion from ceiling ruined #3 T-8 Light Fixtures / SOW = Replace	\$ 250.00	PW	F				
97	District Attorney's Office Facility Down Town "sunken gardens" across from Court House Main	Water came in through walls and up through floor SOC: Replace Flooring (Carpet in two offices 20' X 20') Painting 8 walls (20'L X 8'H) in two offices and #2 20' X 8' ceilings.	\$ 3,000.00	PW	F/C				
			\$						\$

COUNTY OF SNATA BARBARA - 083-00000
1203 - EL NINO FLOODS

DSR#	SUPP.	ELIG	CAT	SUPP PKG	AMOUNT	PAPED	Project	% COMP	DAMAGE TO FACILITY
1118	72462	Y	C	20	\$ 192,650.00	06/09/99	1 GOBERNADOR CANYON ROAD, 6 MILES NORTH OF STATE HIGHWAY 192	100	COUNTY WIDE
2735		Y	C	10	\$ 45,673.00	11/23/98	100 COUNTY ROADS	100	COUNTY WIDE
2736		Y	A	10	\$ 37,553.00	11/23/98	100 SANTA BARBARA COUNTY	100	COUNTY WIDE
2760		Y	C	15	\$ 21,579.00	01/11/99	0 CRAT CANYON ROAD PAVEMENT AND EMBANKMENT	0	7.05 MILES NORTH OF STATE HIGHWAY 246
2761		Y	C	15	\$ 11,594.00	01/11/99	0 CAT CANYON ROAD EMBANKMENT AND PAVEMENT	0	4.6 MILES FROM PALMER ROAD INTERSECTION
2762		Y	C	15	\$ 16,587.00	01/11/99	0 CAT CANYON ROAD AND EMBANKMENT	0	4.36 MILES FROM PALMER ROAD
2773		Y	C	15	\$ 2,717.00	01/11/99	0 CAT CANYON ROAD EMBANKMENT AND PAVEMENT	0	2.86 MILES FROM PALMER ROAD INTERSECTION
3194	72462	Y	A	25	\$ 51,000.00	06/15/00	100 GOBERNADOR CANYON ROAD	100	6 MILE NORTH OF STATE HIGHWAY 192
6727		Y	A	11	\$ 34,387.00	11/24/98	100 COUNTY ROADS	100	COUNTY WIDE
6728		Y	B	10	\$ 36,508.00	11/23/98	100 COUNTY ROADS AND BRIDGES	100	COUNTY WIDE
6729		Y	C	10	\$ 46,950.00	11/23/98	100 COUNTY ROADS	100	COUNTY WIDE
6730		Y	C	15	\$ 46,600.00	10/11/99	100 PICACHO LANE, DRUM CANYON LATERAL ROADWAY	100	PICACHO LANE EAST OF HIGHWAY *192*, 0.65 MILE INTERSECTION ON DRUM CANYON ROAD LATERAL
6731		Y	B	10	\$ 38,092.00	11/23/98	100 VARIOUS LOCATIONS	100	COUNTY WIDE
6732		Y	C	14	\$ 37,339.00	12/28/98	100 ROADWAYS	100	NEWTON ROAD AND LIVE OAK CAMP ROAD
6733		Y	F	9	\$ 24,248.00	11/13/98	0 WATERLINES AND SUMP PUMPS	0	CACHUMA LAKE LIFT STATION (PUMPS), JALAMA BEA
6734		Y	G	9	\$ 38,840.00	11/13/98	0 EMBANKMENTS, BRIDGE FOOTINGS, STORM DRAINS, B	0	CONFLUENCE WITH ORCUTT / SOLOMON UPSTREAM FOR
6753		Y	A	7	\$ 3,865.00	10/23/98	95 UPPER GREEN CANYON CREEK	95	OCEAN TO 1000' UPSTREAM OF HIGHWAY 192
6754		Y	A	7	\$ 16,753.00	10/23/98	95 CARPINTERIA CREEK	95	CONFLUENCE OF MARIA YGNACIA CREEK TO BASIN
6755		Y	A	7	\$ 1,544.00	10/23/98	95 SAN ANTONIO CREEK	95	CONFLUENCE WITH ELWOOD CREEK .25 MILES UPSTRE
6756		Y	A	7	\$ 13,939.00	10/23/98	95 WINCHESTER CANYON	95	CONFLUENCE OF ATASCADERO CREEK TO CATHEDRAL O
6757		Y	A	7	\$ 3,061.00	10/23/98	95 HOSPITAL CREEK	95	SOUTH OF HWY 246, WEST OF TULAROSA ROAD
6758		Y	A	6	\$ 5,749.00	10/09/98	95 HOAG SANTA RITA CHANNEL	95	LOS ALAMOS, UPSTREAM OF US HWY 101
6759		Y	A	6	\$ 2,908.00	10/09/98	95 ALSOS CANYON CREEK	95	LOMPOC - UPSTREAM FROM MIGUELITO BASIN FOR AB
6760		Y	A	6	\$ 2,588.00	10/09/98	95 MIGUELITO CHANNEL	95	SANTA BARBARA - CONFLUENCE OF ARROYO BURRO CRUIROAD,
6762		Y	A	6	\$ 3,457.00	10/09/98	95 SAN ROQUE CREEK	95	CONFLUENCE WITH SANTA MARIA RIVER TO .75 MILE
6763		Y	A	7	\$ 3,686.00	10/23/98	95 ORCUTT / SOLOMON CREEK	95	LOMPOC - SOUTH OF HWY 246
6764		Y	A	6	\$ 8,725.00	10/09/98	95 LILLIE HAYES CHANNEL	95	GUADALUPE - WEST END OF EIGHTH STREET TO THE
6765		Y	A	6	\$ 7,865.00	10/09/98	95 GUADALUPE CITY DITCH	95	FROM OCEAN TO 1000' UPSTREAM OF FOOT-HILL ROAD
6766		Y	A	6	\$ 28,189.00	10/09/98	95 ARROYO BURRO CREEK	95	NORTH OF HWY 246
6767		Y	A	6	\$ 2,609.00	10/09/98	95 BOB HUNT DITCH	95	BUELLTON, 100' DOWNSTREAM OF AVENUE OF FLAGS
7127		Y	B	6	\$ 12,115.00	10/09/98	100 ZACA CREEK, 98002	100	SANTA MARIA, BLOSSER DITCH AT LEVEE ENTRANCE
7128		Y	B	6	\$ 6,137.00	10/09/98	100 BLOSSER DITCH AT LEVEE ENTRANCE STRUCTURE, 98	100	ALAMO PINTADO CREEK (VARIOUS LOCATIONS)
7129		Y	B	6	\$ 2,515.00	10/09/98	100 SOLOMAN CREEK, 98027	100	GOLETA, 283 CARLO DRIVE
7130		Y	B	6	\$ 25,114.00	10/09/98	100 ALAMO PINTADO CREEK, 98028	100	GOLETA, PASEO CAMEO AND AVENIDA PEQUENA
7131		Y	B	6	\$ 21,178.00	10/09/98	100 CARLO DRIVE STORM DRAIN, 98033	100	SANTA BARBARA, 1020 PALERMO DRIVE
7133		Y	B	6	\$ 27,401.00	10/09/98	100 SAN JOSE CREEK, 98034	100	MONTICITO, 2000' DOWNSTREAM FROM HOT SPRINGS
7134		Y	B	6	\$ 28,765.00	10/09/98	100 ARROYO BURRO CREEK BANK, 98108	100	BUELLTON, SOUTH OF HIGHWAY 246, WEST OF TULAR
7136		Y	B	6	\$ 8,428.00	10/09/98	100 MONTICITO CREEK BANK, 98042	100	LOS ALAMOS, LOS ALAMOS TRAILER PARK NORTH OF
7137		Y	B	6	\$ 12,970.00	10/09/98	100 HOAG SANTA RITA CHANNEL, 98048	100	SANTA BARBARA, 311 WEST DE LA GUERRA STREET
7138		Y	B	6	\$ 3,767.00	10/09/98	100 SAN ANTONIO CREEK, 98067	100	SANTA BARBARA, 1435 SYCAMORE CANYON ROAD
7139		Y	B	6	\$ 15,684.00	10/09/98	100 PUBLIC WORKS DEPARTMENT 98079, MISSION CREEK	100	SANTA MARIA, 3 MILES EAST OF HIGHWAY 101 OF B
7140		Y	B	6	\$ 11,726.00	10/09/98	100 PUBLIC WORKS DEPARTMENT 98080, SYCAMORE CREEK	100	ORCUTT, 1000' DOWNSTREAM FROM CALIFORNIA BOUL
7141		Y	B	6	\$ 8,059.00	10/09/98	100 PUBLIC WORKS DEPARTMENT 98113, BATTLES / UNIO	100	ORCUTT, AT SOLOMAN CREEK
7142		Y	B	6	\$ 17,602.00	10/09/98	100 ARROYO PAREDON CREEK, 98115	100	ORCUTT, SOLOMAN CREEK, 2500' DOWNSTREAM OF BL
7143		Y	B	6	\$ 18,859.00	10/09/98	100 CARPINTERIA CREEK, 98117	100	SANTA MARIA LEVEE, .25 MILE WEST OF BONITA SC
7149		Y	B	6	\$ 11,505.00	10/09/98	100 CUTOFF WALL IN FREEMONT CREEK, 98119	100	SANTA MARIA, STATION 847+00
7151		Y	B	6	\$ 6,031.00	10/09/98	100 SAN YSIDRO CREEK BANK, 98122	100	SANTA BARBARA, COUNTY OF - 98064
7152		Y	B	6	\$ 16,535.00	10/09/98	100 ADOBE CREEK - 98040	100	4000' SOUTH OF PRELL ROAD EAST OF HIGHWAY 101
7153		Y	B	6	\$ 4,046.00	10/09/98	100 SAN YSIDRO CREEK, 98109	100	SOUTH OF OCEAN TO BASIN
7154		Y	B	6	\$ 9,518.00	10/09/98	100 BATTLES / UNION OIL DITCH, 98112	100	FROM VIA REAL TO 1000' UPSTREAM OF FOOTHILL R
7155		Y	B	6	\$ 11,301.00	10/09/98	100 PUBLIC WORKS DEPARTMENT - 98023, SOLOMAN CREE	100	SEDIMENT BASIN TO 1000' UPSTREAM OF CATCHEDRA
7156		N	B	6	\$ 2,699.00	10/09/98	100 OLIVE HILL ROAD, 98024	100	
7157		Y	B	6	\$ 5,707.00	10/09/98	100 CHECK STRUCTURE, 98025	100	
7158		Y	B	7	\$ 168,005.00	10/23/98	100 LEVEE	100	
7160		Y	B	6	\$ 2,526.00	10/09/98	100 SANTA MARIA LEVEE - NORTH SIDE, 98114	100	
7161		Y	B	6	\$ 29,233.00	10/09/98	100 SANTA MARIA, SANTA MARIA LEVEE, 98078	100	
7162		Y	B	6	\$ 8,356.00	10/09/98	100 SANTA BARBARA, COUNTY OF - 98064	100	
7163		Y	B	6	\$ 5,126.00	10/09/98	100 BRADLEY LAKE DAM STRUCTURE, 98059	100	
7164		Y	B	6	\$ 1,144.00	10/09/98	100 LILLIE HAYES CHANNEL, 98049	100	
7168		Y	A	7	\$ 3,426.00	10/23/98	95 ROMERO CREEK	95	
7169		Y	A	7	\$ 12,015.00	10/23/98	95 ARROYO PAREDON CREEK	95	
7170		Y	A	7	\$ 10,117.00	10/23/98	95 CARNEROS CREEK	95	

COUNTY OF SNATA BARBARA - 083-00000
1203 - EL NINO FLOODS

7171	Y	A	7	\$	19,129.00	10/23/98	08/10/98	95	SN JOSE CREEK	FROM BASIN TO 1000' UPSTREAM OF PATTERSON AVE
7172	Y	A	7	\$	6,590.00	10/23/98	08/10/98	95	ATASCADERO CREEK	FROM BASIN TO HIGHWAY 154
7173	Y	A	7	\$	41,588.00	10/23/98	08/10/98	95	DUMP SITES AT VARIOUS LOCATIONS	VARIOUS LOCATIONS IN COUNTY (SEE NARRATIVE)
7174	Y	A	7	\$	4,188.00	10/23/98	08/10/98	95	SAN Ynez CREEK	FROM HIGHWAY 101 TO SAN LEANDRO LANE
7175	Y	A	7	\$	4,638.00	10/23/98	08/10/98	95	YSBADA CHANNEL	FROM PURISIMA ROAD TO THE RIVER
7177	Y	A	7	\$	4,050.00	10/23/98	08/10/98	95	GLEN ANNIE / TECOLOITTO CREEK	FROM SEDIMENT BASIN TO 3000' UPSTREAM OF CATH
7178	Y	A	7	\$	14,065.00	10/23/98	08/10/98	95	MONTECITO CREEK	2000' DOWNSTREAM FROM HOT SPRINGS ROAD
7179	Y	A	7	\$	49,236.00	10/23/98	08/10/98	95	RODEO CHANNEL	UPSTREAM OF OCEAN AVENUE
7180	Y	A	7	\$	12,146.00	10/23/98	08/10/98	95	TECLOLITE CREEK	GOLETA, FROM CALLE REAL, UPSTREAM, 2 MILES
7181	Y	A	7	\$	40,676.00	10/23/98	08/10/98	95	TECLOLITO CREEK	FROM BASIN DOWNSTREAM TO GOLETA SLOUGH
7182	Y	A	7	\$	65,097.00	10/23/98	08/10/98	95	ALAMO PINTADO CREEK	SANTA YNEZ, HIGHWAY 154 TO THE SANTA YNEZ RIV
7183	Y	A	7	\$	153,913.00	10/23/98	08/10/98	95	FRANKLIN CREEK	CARPINTERIA, FROM OCEAN TO BASIN
7184	Y	A	7	\$	122,910.00	10/23/98	08/10/98	95	SAN PEDRO CREEK	FOWLER ROAD TO 1000' UPSTREAM OF CATHEDRAL OA
7185	Y	A	7	\$	190,277.00	10/23/98	08/10/98	95	CARNEROS CREEK	FROM BASIN, DOWNSTREAM OF BASIN / HOLLISTER A
7186	Y	A	7	\$	8,720.00	10/23/98	08/10/98	99	SAN ANTONIO CREEK, GOLETA CULVERT	AT HIGHWAY 101, UPSTREAM SIDE
7188	Y	C	7	\$	21,363.00	10/23/98	08/10/98	99	RINCON HILL ROAD, R-257	RINCON HILL ROAD, SOUTH OF HIGHWAY 150
7190	Y	B	9	\$	5,582.00	11/13/98	09/09/98	100	PEGLEG - SILVA DITCH	OFF HAPGOOD ROAD / HIGHWAY 246
7191	Y	C	7	\$	8,088.00	10/23/98	08/10/98	10	VIA CRUCERO ROAD R-285	LOMPOC, CRUCERO ROAD AT CEBADA CANYON ROAD BE
7192	Y	D	17	\$	54,498.00	02/12/99	08/10/98	95	ATSCADERO CREEK CHANNEL	GOLETA - ATASCADERO CREEK / TURNPIKE AVENUE
7193	Y	A	9	\$	176,499.00	11/13/98	12/15/99	25	SAN MIGUELITO DEBRIS BASIN	LOMPOC, OFF OF OLIVE AND "O" STREET
7195	Y	G	9	\$	78,054.00	11/13/98	09/15/00	0	ASPHALT AND CONCRETE BEACH ACCESS RAMP	ISLA VISTA, TERMINUS OF EL EMBARCADERO STREET
7196	Y	C	15	\$	178,000.00	01/11/99	09/15/00	0	REFUGIO ROAD AT SUMMIT, INTERSECTION CAMINO C	REFUGIO ROAD, SOUTH HIGHWAY 246, SOUTH OF SAN
7259	Y	C	24	\$	48,441.00	01/25/00	10/07/98	100	WEST MOUNTAIN DRIVE	BETWEEN GIBALTER ROAD AND ASHLEY ROAD, BESID
20371	Y	C	2	\$	14,328.00	07/09/98	06/08/98	100	SLOPES AT CULVERTS ON ALSOS CANYON ROAD	VARIOUS LOCATIONS ON ALSOS CANYON ROAD, R-2
20372	Y	C	2	\$	14,550.00	07/20/98	06/08/98	100	BOX CULVERT ON ALSOS CANYON ROAD	ALSOS CANYON ROAD, R-19, R-91
20373	Y	C	2	\$	10,147.00	07/08/98	06/11/98	100	BOX CULVERT	JONATA PARK ROAD R131
20374	Y	C	4	\$	334,024.00	07/28/98	08/10/99	99	GRASIOSA ROAD	GRASIOSA ROAD, R-102
20375	Y	A	6	\$	1,032.00	10/09/98	06/29/98	100	GOBERNADO CANYON ROAD, R240	GOBERNADO CANYON ROAD, 4 MILES NORTH OF STATE
20376	Y	B	6	\$	1,135.00	10/09/98	07/14/98	95	ROAD SURFACE AND SUB-BASE, R-307	CALLE REAL (600' SOUTH OF REFUGIO ROAD)
20377	Y	C	6	\$	1,051.00	10/09/98	08/10/99	100	WASIOJA ROAD WASHOUTS, R-190	WASIOJA ROAD OFF 166
20379	Y	A	6	\$	4,183.00	10/09/98	08/10/98	95	EAST CAMINO CIELO, VARIOUS LOCATIONS, R-286	EAST CAMINO CIELO, SANTA ROSA ROAD
20380	Y	B	6	\$	1,196.00	10/09/98	07/23/98	100	REFUGIO ROAD, ROAD 004	REFUGIO ROAD OFF CALIFORNIA HIGHWAY 101
20381	Y	A	6	\$	1,055.00	10/09/98	07/23/98	100	SECTION OF REFUGIO ROAD, ROAD 004	SECTION OF REFUGIO ROAD OFF HIGHWAY 101
20382	Y	C	6	\$	51,377.00	10/09/98	08/10/99	95	ROAD AND SUMMER CROSSING ON REFUGIO ROAD	SECTION OF REFUGIO ROAD OFF HIGHWAY 101
20383	Y	C	6	\$	1,432.00	10/09/98	08/10/99	95	SWEENEY ROAD POST MARK 3.82, R-205	LOMPOC - SWEENEY ROAD
20384	Y	C	6	\$	20,309.00	10/09/98	08/10/99	95	ROAD SURFACE, ROAD SHOULDER AND ASPHALT SUMME	SANTA BARBARA CANYON ROAD
20385	Y	C	6	\$	10,558.00	10/09/98	08/10/99	99	SUMMER CROSSING, R 309	ALSO CANYON ROAD AT BITTER CREEK
20386	Y	C	6	\$	55,400.00	10/09/98	08/10/99	100	ROAD SURFACE AND ROADBED, R207	CALLE REAL (600 FT SOUTH OF REFUGIO ROAD)
20387	Y	C	6	\$	7,023.00	10/09/98	07/14/98	100	12 INCH CMP OVERSIDE DRAIN, R126	ORTEGA RIDGE ROAD
20388	Y	C	6	\$	52,815.00	10/09/98	08/10/99	95	SUMMER CROSSING AND VARIOUS WASHOUTS, R-289	CUAYWA, COTTONWOOD CANYON ROAD OFF HWY 166
20390	Y	A	6	\$	38,408.00	10/09/98	06/08/98	100	FLOOD CONTROL CHANNELS	COUNTY WIDE FLOOD CONTROL
20393	Y	G	6	\$	11,098.00	10/09/98	08/10/99	100	FOOTBRIDGE OVER DRY WASH (COVENOUND CREEK)	BETWEEN THE RIVIERAS (SANTA BARBARA CO. BOWL)
20396	Y	A	6	\$	350,612.00	10/09/98	08/04/98	100	SAN PEDRO SEDIMENT BASIN	GOLETA - DOWNSTREAM FROM FOWLER ROAD ON SAN P
20397	Y	A	6	\$	169,147.00	10/09/98	08/04/98	100	CANEROS SEDIMENTATION BASIN	GOLETA - DOWNSTREAM OF HOLLISTER AVE ON CARNE
20399	Y	A	6	\$	42,721.00	10/09/98	08/04/98	100	BUELLTON BASIN	BUELLTON, NORTH OF LA PITA PLACE
20400	Y	A	6	\$	3,043.00	10/09/98	08/04/98	100	LOWER WEST TORO DEBRIS BASIN, 98101	MONTECITO, 1000' DOWNSTREAM OF HIGHWAY 192 ON
20602	Y	B	6	\$	207,432.00	10/09/98	08/10/98	98	ROAD DIVISION	COUNTY WIDE
20605	Y	C	4	\$	11,279.00	07/28/98	08/10/99	10	ACCESS ROAD	LAKE LOS CARNEROS
20606	Y	D	6	\$	42,960.00	10/09/98	08/10/99	10	OUTLET STRUCTURE AND TOE OF DAM	LOS CARNEROS DAM
20607	Y	G	4	\$	41,113.00	07/28/98	09/15/00	0	GOLETA BEACH PARK	GOLLETA BEACH
20608	Y	G	4	\$	43,031.00	07/28/98	06/10/00	0	SANTA YNEZ PARK	SOLVANG
20609	Y	B	6	\$	177,666.00	10/09/98	06/10/00	0	PARKING LOT AND SEA / SAND WALL	GUADALUPE DUNES
20610	Y	B	3	\$	39,657.00	07/20/98	08/10/98	0	FIRE DEPARTMENT	COUNTY WIDE
20605	Y	C	6	\$	8,433.00	10/09/98	08/10/99	15	PALOMINO ROAD AND EMBANKMENT AREA R 305	1041 PALOMINO ROAD
20608	Y	C	3	\$	1,348.00	07/20/98	12/30/99	0	PALOMINO ROAD, AREAS R072-2,-3,-4	1116, 1122, 1148 PALOMINO ROAD
20910	Y	C	8	\$	10,932.00	10/29/98	12/30/99	0	PALOMINO ROAD, AREA R 072 - 1	1009 BLOCK PALOMINO ROAD
20911	Y	C	5	\$	70,983.00	09/04/98	06/26/98	100	HAPPY CANYON ROAD AND EMBANKMENT AREA R068	HAPPY CANYON ROAD, MILE POST 6.2
20912	Y	C	3	\$	30,933.00	07/20/98	06/10/98	100	BALLARD CANYON ROAD, AREA R279	FROM CHALK HILL ROAD TO HIGHWAY 154
20913	Y	C	8	\$	4,872.00	10/29/98	12/30/99	100	PALOMINO ROAD, R350	1133 PALOMINO ROAD, AREA R350
20915	Y	C	5	\$	78,770.00	09/04/98	06/06/98	100	BALLARD CANYON ROAD AND EMBANKMENT AREA R201	BALLARD CANYON ROAD MP 2.94
20916	Y	C	6	\$	7,516.00	10/09/98	08/10/99	0	ROAD CULVERT EMBANKMENT AREA R149	MP 5.78, BROWN ROAD
20919	Y	A	6	\$	2,134.00	10/09/98	07/05/99	100	BROWN ROAD AREA R150	BROWN ROAD, MP 5.78 TO POINT SAL ROAD
20932	Y	C	6	\$	44,681.00	10/09/98	08/10/99	0	BROWN ROAD AND EMBANKMENT AREA R343	BROWN ROAD, MP 6.1
20933	Y	C	6	\$	31,860.00	10/09/98	08/10/99	0	ROAD EMBANKMENT AREA R327	215 FT EAST OF MP 4.90, BROWN ROAD
20934	Y	C	5	\$	124,033.00	09/04/98	08/10/99	0	BROWN ROAD AND EMBANKMENT AREA R150	MILE POST 5.78 BROWN ROAD
20934	Y	A	7	\$	9,390.00	10/23/98	08/10/98	99	COUNTY WATER AGENCY, LAKE CACUHUAMA DAM	LAKE CACUHUAMA, BRADBURY DAM
21021	Y	B	9	\$	11,913.00	11/13/98	08/10/98	99	OAK CREEK SLOPES	MONTECITO, OAK CREEK, SOUTH FROM JAMESON LANE/BLANE
21023	Y	B	9	\$	2,654.00	11/13/98	08/10/98	99	COUNTY WIDE	COUNTY WIDE

COUNTY OF SNATA BARBARA - 083-00000
1203 - EL NINO FLOODS

21025	Y	B	9	\$	2,814.00	11/13/98	08/10/98	99	COUNTY WIDE	SANTA BARBARA COUNTY WIDE
21026	Y	B	9	\$	5,883.00	11/13/98	08/10/98	99	COUNTY WIDE	SANTA BARBARA COUNTY WIDE
21164	Y	A	3	\$	1,580.00	07/20/98	08/10/98	98	EMERGENCY SERVICES, PARKS DIVISION	COUNTY WIDE PARKS
21819	Y	A	3	\$	13,005.00	10/09/98	08/10/98	95	KIRSCHENMANN ROAD, STATE ROAD 166 TO Foothills	KIRSCHENMANN ROAD
21820	Y	C	6	\$	3,657.00	10/09/98	12/30/00	0	SUMMER CROSSING AND CULVERT, ROAD - 190	WASIOJA ROAD OFF HIGHWAY 166
21821	Y	A	6	\$	97,774.00	10/09/98	08/04/98	100	MARIA YGNACIA MAIN BASIN	1 MI UPSTREAM FROM SAN MARCOS ROAD
21822	Y	A	6	\$	61,389.00	10/09/98	08/04/98	100	ATASCADERO CREEK BASIN	DOWNSTREAM OF WARD DRIVE
21823	Y	A	6	\$	106,107.00	10/09/98	08/10/98	0	ROAD SHOULDER & EMBANKMENT R-126	ORTEGA RIDGE ROAD
21824	Y	A	6	\$	205,859.00	10/09/98	08/04/98	100	SAN JOSE SEDIMENT BASIN	GOLETA - DOWNSTREAM OF LINED SECTION OF SAN J
21825	Y	A	6	\$	65,832.00	10/09/98	08/04/98	100	FRANCISCAN "KIMS" SEDIMENTATION BASIN	CARPENTERIA - N. OF VIA REAL, 1500' EAST OF C
22052	Y	A	6	\$	10,000.00	11/23/98	06/10/00	0	STORAGE BUILDING	SOLVANG, SANTA YNEZ PARK
27116	Y	C	19	\$	(747.00)	06/02/99	03/10/99	100	BROWN ROAD AND EMBANKMENT, AREA R 150	BROWN ROAD MILEPOST 578
39172	Y	C	3	\$	33,488.00	07/20/98	06/08/98	100	BALLARD CANYON ROAD AND SHOULDER	600 BLOCK, BALLARD CANYON ROAD R053
39175	Y	C	2	\$	13,895.00	07/20/98	06/08/98	100	BALLARD CANYON ROAD AND DITCH	2300 BALLARD CANYON ROAD R 055
50901	Y	A	7	\$	7,826.00	10/23/98	06/11/98	95	SAN YSIDRO CREEK	FROM OCEAN TO BASIN
50902	Y	A	7	\$	2,891.00	10/23/98	06/11/98	95	MISSION CREEK	FROM OCEAN TO BASIN
52007	Y	C	3	\$	38,195.00	07/20/98	08/10/98	90	GAVIOTA BEACH BRIDGE & ACCESS ROAD	GAVIOTA ROAD AT HOLLISTER RANCH ROAD R 003
52008	Y	C	3	\$	17,524.00	07/20/98	06/11/98	100	36' CULVERT SLUICE & EMBANKMENT	MAIL ROAD AT MILE POST 0.91 R-211
52009	Y	C	3	\$	40,450.00	07/20/98	06/11/98	100	CULVERT & CULVERT SPILLWAY	MAIL ROAD AT MP 0.36 R-195
52042	Y	C	6	\$	55,849.00	10/09/98	08/10/98	97	ROAD SURFACE, ROADBED, EMBANKMENT AND CULVERT	FINNEY STREET (WALLACE)
59181	Y	A	6	\$	4,251.00	10/09/98	08/10/98	95	LILLINGSTON CANYON, VARIOUS SITES, R - 238	LILLINGSTON CANYON / US 192
59182	Y	A	6	\$	7,610.00	10/09/98	08/10/98	95	GOBERNADOR CANYON ROAD, VARIOUS SITES, R-354	GOBERNADOR CANYON ROAD
59183	Y	A	6	\$	7,724.00	10/09/98	08/10/98	95	OLD SAN MARCOS ROAD, R-229	OLD SAN MARCOS ROAD / TWIN RIDGE ROAD
59184	Y	A	6	\$	3,546.00	10/09/98	08/10/98	95	CHALK HILL ROAD, R-057	CHALK HILL ROAD
59185	Y	A	6	\$	4,389.00	10/09/98	08/10/98	95	BRADBURY DAM	SANTA BARBARA - CACHUMA LAKE.
59186	Y	A	7	\$	5,321.00	10/23/98	08/10/98	95	TORO CANYON CREEK	OCEAN TO BASINS
59187	Y	A	7	\$	2,991.00	10/23/98	08/10/98	95	OAK CREEK	FROM OCEAN TO EAST VALLEY ROAD
59188	Y	A	7	\$	8,816.00	10/23/98	08/10/98	95	GARRAPATA CREEK	FROM OCEAN TO TORO CANYON ROAD
59189	Y	A	7	\$	1,015.00	10/23/98	08/10/98	95	SYCAMORE CREEK	FROM OCEAN TO STANWOOD DRIVE
59190	Y	A	7	\$	3,633.00	10/23/98	08/10/98	95	MARIA YGNACIA CREEK	CONFLUENCE WITH ATASCADERO CREEK / UPSTREAM T
72407	Y	A	0	\$	95,264.00	06/24/98	08/10/98	90	COUNTY WIDE	COUNTY OF SANTA BARBARA
72409	Y	B	3	\$	20,472.00	07/20/98	08/10/98	99	SANTA BARBARA, COUNTY OF	SHERIFF - COUNTY WIDE
72414	Y	A	1	\$	46,687.00	07/01/98	08/10/98	99	PARKS DIVISION	COUNTY WIDE PARKS
72415	Y	B	1	\$	4,771.00	07/01/98	08/10/98	99	PARKS DIVISION	COUNTY WIDE PARKS
72416	Y	B	1	\$	1,334.00	07/01/98	08/10/98	0	WALKWAY AND FENCE	MIGUELITO COUNTY PARK
72417	Y	G	1	\$	1,950.00	07/01/98	06/02/98	100	POWER LINE	NOJQUI FALLS COUNTY PARK
72418	Y	G	1	\$	10,977.00	07/01/98	08/10/98	0	HAMMONDS BEACH ACCESS	MONTECITO, 1457 BONNYMEDE DRIVE
72448	Y	C	6	\$	83,670.00	10/09/98	08/10/98	90	VARIOUS ROAD SHOULDER AND CULVERTS	DRUM CANYON ROAD AT MP 2.0 THROUGH 2.35 R-18
72449	Y	C	5	\$	27,882.00	09/04/98	08/10/98	90	ROAD AND ROADBED	SUDDEN ROAD (BOUNDARY ROAD TO VANDENBERG AIR
72450	Y	C	5	\$	60,102.00	09/04/98	08/10/98	90	84-INCH CULVERT & ROAD SURFACE	MIGUELITO CANYON ROAD AT MP 6.0 R-213
72451	Y	C	3	\$	39,599.00	07/20/98	08/10/98	90	ROADWAY, AND ASPHALT PAVEMENT REPAIR	MIGUELITO CANYON ROAD AT MP 7.95 R-164
72452	Y	B	3	\$	6,254.00	07/20/98	08/10/98	0	ROAD, CULVERT, AND DISSIPATOR STRUCTURE AND H	BALLARD CANYON ROAD AT MP 2.49 R-54
72453	Y	C	5	\$	120,112.00	09/04/98	08/10/98	0	84" CULVERT, HEADWALL, DROP STRUCTURE AND ROA	BALLARD CANYON ROAD AT MP 2.49 R-54
76595	Y	C	5	\$	149,487.00	03/05/01	08/10/98	0	84" CULVERT, HEADWALL, DROP STRUCTURE AND ROA	BALLARD CANYON ROAD AT MP 2.49 R-54
72454	Y	C	5	\$	52,198.00	09/04/98	08/10/98	80	ROADWAY & CULVERT	MIGUELITO CANYON ROAD AT MP 8.06 R-208
72456	Y	C	7	\$	124,411.00	09/04/98	08/10/98	90	ROADWAY & CULVERTS R226, R251	PAINTED CAVE ROAD - 2 MIN NORTH OF HIGHWAY 15
72457	Y	C	7	\$	39,005.00	10/23/98	08/10/98	90	BOX CULVERT AND ROAD 332	STANLEY PARK ROAD AT GOBERNADOR CANYON ROAD A
72458	Y	A	4	\$	10,288.00	07/28/98	06/18/98	100	ROAD SURFACE AND SUB-BASE R-259	STAGE COACH ROAD
72459	Y	C	6	\$	89,820.00	10/09/98	08/10/98	100	CULVERT & ASPHALT ROAD R155, R008	GLEN-ANNIE ROAD 200 FT SOUTH OF 890 GLEN-ANN
72460	Y	C	4	\$	13,787.00	07/28/98	08/10/98	90	CULVERT AND ROADWAY R-129	GLEN ANNIE ROAD
72461	Y	C	4	\$	15,194.00	07/28/98	08/10/98	90	CULVERT AND ROADWAY R-099	GLEN ANNIE (525' NORTH OF 890 GLEN-ANNIE RO
72462	Y	C	15	\$	213,085.00	01/11/99	08/10/98	1	ROAD SURFACE AND ROAD EMBANKMENT, R-12	GOBERNADOR CANYON ROAD (6 MILES NORTH OF STA
72463	Y	A	6	\$	1,713.00	10/09/98	06/29/98	100	GIBALTOR ROAD - R109	ENTIRE LENGTH OF GIBALTOR ROAD
72466	Y	A	6	\$	66,473.00	10/09/98	08/25/98	100	SANTA MONICA DEBRIS BASIN	3000 FT UPSTREAM OF HWY 192 ON SANTA MONICA C
72468	Y	A	6	\$	64,632.00	10/09/98	08/04/98	100	TECOLITTO SEDIMENTATION BASIN	GOLETA - DOWNSTREAM OF HOLLISTER AVENUE ON TE
72470	Y	C	6	\$	20,736.00	10/09/98	08/15/00	100	CUYAMA RIVER SUMMITER CROSSING, ROAD 333	FOOTHILLS ROAD OFF HIGHWAY 166
73565	Y	C	16	\$	209,987.00	01/20/99	08/10/98	5	WEST MOUNTAIN DRIVE	BETWEEN GIBALTOR ROAD AND ASHLEY ROAD, BESI
73891	Y	C	6	\$	95,437.00	10/09/98	08/10/98	85	REFUGIO ROAD	SAN YNEZ VALLEY SOUTH OF HIGHWAY 246 R-128
73894	Y	A	4	\$	74,392.00	07/28/98	08/10/98	90	GAVIOTA BEACH BRIDGE AND ACCESS ROAD	GAVIOTA BEACH ROAD AT HOLLISTER RANCH, R003
73895	Y	A	3	\$	6,617.00	07/20/98	06/02/98	100	GAVIOTA BEACH ROAD	GAVIOTA BEACH ROAD AT HOLLISTER RANCH R 003
74643	Y	B	10	\$	46,200.00	11/23/98	08/10/98	0	GAVIOTA ROAD BRIDGE	GAVIOTA ROAD @ HOLLISTER RANCH R003
74645	Y	C	15	\$	59,706.00	01/11/99	08/10/98	98	FLOOD CONTROL SYSTEM	SANTA BARBARA / COUNTY WIDE
74646	Y	C	15	\$	3,389.00	01/11/99	09/30/00	0	DRUM CANYON ROAD (PROJECT #R324)	8.5 MILES FROM INTERSECTION OF HIGHWAY 154
74647	Y	C	15	\$	13,449.00	01/11/99	09/30/00	0	DRUM CANYON ROAD EMBANKMENT AND PAVEMENT	DRUM CANYON ROAD 6.60 MILES FROM STATE HIGHWA
74682	Y	C	23	\$	3,708.00	07/22/99	04/21/99	100	SWEEENEY ROAD AREA R 070	6.90 MILES FROM STATE HIGHWAY 246
74683	Y	C	23	\$	2,532.00	07/22/99	05/07/98	100	SWEEENEY ROAD, AREA R 325	MILEPOST 1.5
74684	Y	C	23	\$	686.00	07/22/99	05/06/98	100	BONITA SCHOOL ROAD - AREA R 309	ROAD CROSSING AT THE SANTA MARIA RIVER

COUNTY OF SNATA BARBARA - 083-00000
1203 - EL NINO FLOODS

74685	20396	Y	A	19	\$	(1,362.00)	06/02/99	100	SAN PEDRO SEDIMENT BASIN	GOLETA - DOWNSTREAM FROM FOLWER ROAD ON SAN P
74686	21625	Y	A	23	\$	1,340.00	01/27/99	100	FRANCISCAN "KIMS" SEDIMENTATION BASIN	CARPINTERIA - NORTH OF VIA REAL, 1500 FT EAST
74687	72407	Y	A	19	\$	(46,652.00)	05/10/98	100	COUNTY WIDE	COUNTY OF SANTA BARBARA
74688	72466	Y	A	19	\$	207,622.00	07/22/99	100	SANTA MONICA DEBRIS BASIN	3000 FT UPSTREAM OF HIGHWAY 166 ON SANTA MONI
74689	94401	Y	B	22	\$	(2,348.00)	02/23/99	100	VENTUCOPA LANDFILL	3 MILES SOUTH OF HIGHWAY 166 ON HIGHWAY 33
74691	76390	Y	C	23	\$	(263.00)	07/22/99	100	ALISOS AVENUE BRIDGE, BR51C-190-AREA R047	0.5 MILE SOUTH OF INTERSECTION OF HAPPY CANY
74693	72459	Y	C	23	\$	(638.00)	05/10/99	100	CULVERT & ASPHALT ROAD R155, R008	GLEN-ANNIE ROAD 200 FT SOUTH OF 890 GLEN-ANN
74694	74643	Y	B	23	\$	(240.00)	04/23/99	100	FLOOD CONTROL STRUCTURE	SANTA BARBARA / COUNTY WIDE
74695	52007	S	C	\$	\$	50,775.00	07/22/99	30	GAVIOTA BEACH BRIDGE AND ACCESS ROAD	GAVIOTA ROAD AT HOLLISTER RANCH ROAD R 003
75117	76392	Y	C	18	\$	(15,591.00)	04/27/99	100	WEST CAMINO CIELO ROAD, AREA R 289	JUNCTION WITH STATE HIGHWAY 154E / REFUGIO RO
75158	72462	Y	C	18	\$	188,576.00	04/27/99	100	GOBERNADOR CANYON ROAD	.6 MILE NORTH OF STATE HIGHWAY 162
76356		Y	C	2	\$	38,904.00	07/08/98	99	FIGUEROA MOUNTAIN ROAD	MILE POST 7.0 AREA R 194
76359		Y	A	2	\$	1,262.00	07/08/98	99	FIGUEROA MOUNTAIN ROAD	POST MILE 8.0 AREA R 152
76360	76360	Y	A	3	\$	9,727.00	07/20/98	99	FARADAY STREET	64-INCH DIAMETER CMP CULVERT, BETWEEN TRIVOLA
76361		Y	A	2	\$	11,967.00	07/08/98	99	SAGUNTO STREET	THE 72" DIAMETER CULVERT WHERE SAGUNTO STREET
76362		Y	A	3	\$	3,680.00	07/20/98	99	SWEENEY ROAD	FROM HIGHWAY 246 TO END OF SWEENEY ROAD, AREA
76363		Y	C	3	\$	11,048.00	07/20/98	99	SWEENEY ROAD, AREA R248	POST MILE 2.3
76364		Y	C	3	\$	11,237.00	07/20/98	99	CEBADA CANYON ROAD, AREA R220	5600' NORTH OF INTERSECTION WITH STATE HIGHWA
76365	76365	Y	C	3	\$	98,681.00	07/20/98	99	CEBADA CANYON ROAD - AREA R254	7200' NORTH OF INTERSECTION WITH STATE HIGHWA
76375	76375	Y	C	5	\$	85,791.00	08/10/98	99	SWEENEY ROAD - AREA R182	POST MILE 4.92
76376	76376	Y	C	5	\$	115,820.00	09/04/98	99	BRIDGE ON / AND ALAMO PINTADO ROAD - AREA R 0	BETWEEN SANTA BARBARA AVENUE AND NOJOUKI AVEN
76377		Y	C	5	\$	84,865.00	09/04/98	99	SWEENEY ROAD, AREA R006	POST MILE 1.92
76378		Y	C	6	\$	3,420.00	10/09/98	99	HAPPY CANYON ROAD - AREA R207	PM 1.4 (NEAR JUNCTION OF HAPPY CANYON & BASEL
76379	76379	Y	C	6	\$	4,952.00	10/09/98	99	KINEVAN ROAD, AREA R146	FROM INTERSECTION AT WEST CAMINO ROAD TO INTE
76380	76380	Y	C	6	\$	162,686.00	10/09/98	99	CEBADA CANYON ROAD, AREA R198	FROM STATE HWY 246 TO 7,400 FT NORTH OF HWY 2
76381		Y	C	6	\$	45,263.00	10/09/98	83	HAPPY CANYON ROAD / BRIDGE NO 51C - 75 - AR	AT BRIDGE AT INTERSECTION OF HAPPY CANYON & B
76382		Y	C	6	\$	88,624.00	10/09/98	99	CAT CANYON ROAD - AREA R265	PM 7.06 TO PM 7.10
76383		Y	A	6	\$	8,152.00	10/09/98	99	CAT CANYON ROAD - AREA R017	POST MILE 4.83
76384	76384	Y	C	7	\$	100,643.00	10/23/98	94	SWEENEY ROAD, AREA R070	POST MILE 1.5
76385	76385	Y	C	7	\$	125,855.00	10/23/98	95	SWEENEY ROAD, AREA R325	POST MILE 1.55
76387		Y	C	7	\$	75,552.00	10/23/98	60	BRIDGE 51C-189, CHANNEL LINING/DROP STRUCTURE	BRIDGE 51C-189 ON HAPPY CANYON ROAD 2.2 MILES
76388		Y	C	6	\$	13,923.00	10/09/98	99	DRUM CANYON ROAD - AREA R308	INTERSECTION - AREA R071
76389		Y	C	6	\$	16,649.00	10/09/98	99	DRUM CANYON ROAD - AREA R326	MILE POST 3.96
76390	76390	Y	C	9	\$	94,660.00	11/13/98	96	ALISOS AVENUE BRIDGE, BR51C-190 - AREA R047	0.5 MILE SOUTH OF INTERSECTION OF HAPPY CANYO
76391		Y	C	6	\$	31,917.00	10/09/98	0	BELL STREET BRIDGE, BR 51C - 157 - AREA R230	1 MILE NORTH OF LOS ALAMOS ON BELL STREET HAL
76392	76392	Y	C	13	\$	15,591.00	12/18/98	0	WEST CAMINO CIELO ROAD, AREA R289	JUNCTION WITH STATE HIGHWAY 154 (EAST END) A
76393		Y	C	6	\$	41,305.00	10/09/98	0	POINT SAL ROAD - AREA R151	JUNCTION WITH BROWN ROAD TO VANDENBURG AIR BA
76394	76394	Y	G	13	\$	47,175.00	10/09/98	0	BONITA SCHOOL ROAD - AREA R309	ROAD, CROSSING AT THE SANTA MARIA RIVER
76397		Y	G	13	\$	19,199.00	12/18/98	95	SANTA CRUZ ISLAND TOWER AND ANTENNA	SANTA CRUZ ISLAND, 30 MILES WEST OF MAINLAND
76398		Y	B	14	\$	1,130.00	12/28/98	100	LACUMBRE PEAK COMMUNICATION FACILITY	1.5 MILES WEST OF INTERSECTION OF EAST CAMINO
80034	76360	Y	C	10	\$	37,690.00	11/23/98	100	FARADAY STREET	64" DIAMETER CMP CULVERT, BETWEEN TRIVOLA STR
94401	94401	Y	B	15	\$	74,565.00	01/11/99	100	VENTUCOPA LANDFILL	3 MILES SOUTH OF HIGHWAY 166 ON HIGHWAY 33
94405		Y	C	13	\$	5,763.00	12/18/98	0	DRAIN PIPE	1051 PALOMINO ROAD
94406		Y	A	13	\$	38,564.00	12/18/98	50	FRANCISCAN SEDIMENTATION BASIN INLET CULVERT	CARPENTERIA, NORTH OF VIA REAL, 1500' EAST O
94410		Y	A	13	\$	35,963.00	12/18/98	0	SUMMER CROSSING ROAD	REFUGIO ROAD, SOUTH OF HWY 246
94420		Y	A	12	\$	23,684.00	12/07/98	100	COUNTY ROADS AND BRIDGE	COUNTY WIDE
94467	7183	Y	A	23	\$	(6,163.00)	07/22/99	100	FRANKLIN CREEK	CARPINTERIA, FROM OCEAN TO BASIN
94468	7185	Y	A	19	\$	(846.00)	06/02/99	100	CARNEROS CREEK	FROM BASIN, DOWNSTREAM OF BASIN / HOLLISTER A
94469	20374	Y	C	19	\$	1,060.00	06/02/99	100	GRASIOSA ROAD	GRASIOSA ROAD, R-102
94470	20386	Y	C	19	\$	5,867.00	06/02/99	100	ROAD SURFACE AND ROADBED R 307	CALLE REAL (600 FEET SOUTH OF REFUGIO ROAD)
94471	20388	Y	C	19	\$	18,998.00	06/02/99	100	SUMMER CROSSING AND VARIOUS WASHOUTS R-269	CUAYMA, COTTONWOOD CANYON ROAD OFF HIGHWAY 16
94472	20397	Y	A	23	\$	4,052.00	07/22/99	100	CARNEROS SEDIMENTATION BASIN	GOLETA - DOWNSTREAM OF HOLLISTER AVENUE ON CA
94473	20302	Y	B	19	\$	82,754.00	06/02/99	100	ROAD DIVISION	COUNTY WIDE
94488	21623	Y	C	19	\$	(35,342.00)	06/02/99	100	ROAD, SHOULDER & EMBANKMENT R-126	ORTEGA RIDGE ROAD
94489	52042	Y	C	23	\$	3,623.00	07/22/99	100	SAN JOSE SEDIMENT BASIN	GOLETA, DOWNSTREAM OF LINED SECTION OF SAN JO
94490	72448	Y	C	19	\$	63,810.00	06/02/99	100	VARIOUS ROAD SHOULDER AND CULVERTS	FINNEY STREET (WALLACE)
94491	72450	Y	C	23	\$	805.00	07/22/99	100	84-INCH CULVERT & ROAD SURFACE	DRUM CANYON ROAD AT MILEPOST 2.0 THROUGH 2.34
94493	72454	Y	C	23	\$	(1,153.00)	05/07/99	100	ROADWAY & CULVERT	MIGUELITO CANYON ROAD AT MILEPOST 8.0 R-213
94494	72456	Y	C	23	\$	5,278.00	07/22/99	100	ROADWAY & CULVERTS, R226, R251	MIGUELITO CANYON ROAD AT MILEPOST 8.06 R-208
94495	72468	Y	A	23	\$	19,643.00	07/22/99	100	TECLOTTITO SEDIMENTATION BASIN	PAINTED CAVE ROAD - 2 MINUTES NORTH OF HIGHWA
94496	73694	Y	A	21	\$	(2,895.00)	06/11/99	100	GAVIOTA BEACH BRIDGE AND ACCESS ROAD	GOLETA, DOWNSTREAM OF HOLLISTER AVENUE ON TEC
94497	76365	Y	C	23	\$	25,622.00	05/06/99	100	CEBADA CANYON ROAD - R 254	GAVIOTA BEACH ROAD AT HOLLISTER RANCH R003
94498	76375	Y	C	23	\$	438.00	07/22/99	100	SWEENEY ROAD - AREA R 182	7200 FT NORTH OF INTERSECTION WITH STATE HIGH
94499	76376	Y	C	23	\$	1,747.00	05/12/99	100	BRIDGE ON / AND ALAMO PINTADO ROAD - AREA R 0	MILEPOST 4.92
94500	76380	Y	C	23	\$	749.00	07/22/99	100	CEBADA CANYON ROAD, AREA R 188	BETWEEN SANTA BARBARA AVENUE AND NOJOUKI AVEN
					\$	9,527,796.00				FROM STATE HIGHWAY 246 TO 7,400 FT NORTH OF H

Approved State Locations DSRs for Flood Control 01-Storm

County District	Exhibit B Identification	Location	Damage	FEMA/State Categories	Engineer/Inspector	Est. Amount	Funded Amount @ 75%	State DSR #	Actual Close Out Requested	Status
3	F/C Item # 55	Buellton	2 Debris Basins - restore to pre disaster condition	D	Larry Fausett	\$ 30,000.00	\$ 16,918.30	163		
3	F/C Item # 57	San Pedro and Cameros Creeks	Desilting -	D	Karl Treiberg	\$ 85,000.00	\$ 16,918.30	163		
4	F/C Item # 60	Lilley/Hayes Channel	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 10,000.00	\$ 16,918.30	163		
4	FC Item # 61	Hoag/Santa Rita Channel	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 20,000.00	\$ 16,918.30	163		
4	FC Item # 62	Buellton Basin #2 Interceptor	Erosion repair at Drainage structure	C	Larry Fausett	\$ 2,000.00	\$ 17,156.25	163		
5	FC Item # 68	East Ditch	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 10,000.00	\$ 16,918.30	163		
5	FC Item # 70	Dutra Basin	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 20,000.00	\$ 16,918.30	163		
5	FC Item # 71	Diaz Ditch	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 8,000.00	\$ 16,918.30	163		
5	FC Item # 72	Unit II Tailwater Channel	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 20,000.00	\$ 16,918.30	163		
4	FC Item # 63	Cebada Channel	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 20,000.00	\$ 16,918.30	163		
4	FC Item # 64	Rodeo/San Pasqual Basin	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 60,000.00	\$ 16,918.30	163		
4	FC Item # 65	San Pasqual Channel	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 6,000.00	\$ 16,918.30	163		

Approved State Locations DSRs for Flood Control 01-Storm

County District	Exhibit B Identification	Location	Damage	FEMA/State Categories	Engineer/Inspector	Est. Amount	Funded Amount @ 75%	State DSR #	Actual Close Out Requested	Status
4	FC Item # 66	Rodeo Channel Rip Rap Replacement @ Santa Maria Levee	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 10,000.00	\$ 16,918.30	163	\$ 269,048.00	
5	FC Item # 67	Santa Rosa Creek Check Structure	Various Locations	D	Jon Frye	\$ 200,000.00	\$ 11,437.00	164	\$ 16,950.00	
3	FC Item # 59	Marua Yagnicia Creek @ Pia Parva & San Marcos Rd.	Check Dam Damage	C	Larry Fausett	\$ 15,000.00	\$ 11,437.00	164	\$ 142,079.00	
3	FC Item # 100	Rodeo San Pasqual Channel @ San Pasqual Ave	Two location approximately 150' apart and 5 LF from roadway voids	D	tom Fayram/Scott McGolpin	\$ 176,353.00	\$ 58,363.00	167	\$ 80,563.00	
	FC Item #99 Addendum	Rodeo San Pasqual Channel @ San Pasqual Ave	Debris Removal	D	Larry Fausett	\$ 10,000.00	Denied	177	\$ -	
4	FC Item # 99 Addendum	Rodeo San Pasqual channel @ San Pasqual Ave	Removal of silt - sedimentation and other debris	D	Larry Fausett	\$ 30,000.00	Denied	177	\$ -	
5	FC Item # 69	Cat Canyon @ Sisquoc	Erosion repair at Drainage structure	C	Larry Fausett	\$ 5,000.00	\$ 16,918.30	163 & 164		
Flood Control							\$ 318,331.15	Totals	\$ 508,640.00	

Summary of Approved DSRs and Funded Cost for General Services - 01 Storm

County District	Exhibit B Identification	Location	Damage	FEMA/State Categories	Engineer/Inspector	Est. Amount	Funded Amount @ 75%	State DSR #	Amount Claimed
01 Strm	ITEM # 89	Veterans Hospital	200' L X 6' W glue down carpet damaged	E	Paddy	\$ 2,500.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM # 90	Veterans Hospital	Paint Rooms	E		\$ 2,000.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM # 91	Veterans Hospital	Ceiling Repairs	E		\$ 1,000.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM # 92	Veterans Hospital	Cabinetry Repairs	E		\$ 1,000.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM #93	Los Prietos Boys Camp - Paradise Rd in Sant Ynez	Damaged Simplex Fire Alarm system	F	Paddy	\$ 15,000.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM 94	Environmental Health Services	Carpet Damage	E		\$ 3,600.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM 95	Environmental Health Services	Ceiling tiles fell - replace	F	Paddy	\$ 300.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM 96	Environmental Health Services	3 T-8 Light Fixtures replace	F		\$ 250.00	\$ 2,388.00	150	\$ -
01 Strm	ITEM 97	District Attorney's Office Facility Down Town	Carpet Damage	E	Paddy	\$ 3,000.00	\$ 2,388.00	150	\$ -
GENERAL SERVICES						\$ 28,650.00	\$ 21,492.00		\$ -

List of Projects

APPLICANT: Santa Barbara, County of _____ DATE COMPLETED: _____ 2/4/2004

CONTACT NAME AND PHONE NUMBER: Dave Rickard - 805-739-8761

IS THIS AN AMENDED LIST OF PROJECTS? ___ No

ITEM #	LOCATION	DESCRIPTION OF DAMAGE AND SCOPE OF WORK	COST ESTIMATE	CATEGORY*	WAS WORK COMPLETED BY FORCE ACCT. (FA), CONTRACT (C) OR BOTH (F/C)?	ENTER "ENV" IF THERE ARE ENVIRONMENTAL ISSUES OR "HIST" FOR HISTORIC ISSUES, OR BOTH	WAS THERE INSURANCE COVERAGE? IF YES, ENTER DEDUCTIBLE AMOUNT	WAS THE FACILITY DAMAGED IN A PRIOR DISASTER(S)? IF YES, ENTER DISASTER NAME(S) OR NUMBERS	ARE THERE COST EFFECTIVE HAZARD MITIGATION MEASURES THAT MAY PREVENT FUTURE DAMAGE?		
2	Santa Barbara County Laguna Sanitation Wastewater Treatment Plant (3400 Black Rd)- Santa Maria CA - Main Office @ 2400 Professional Parkway, Suite 2150 Santa Maria	Operation of Emergency Operating Center (EOC) Sheriff and Fire Operations Damage (1)Wave action caused by the earthquake broke the fiberglass baffles on the secondary clarifier (2)Wave action also appears to have broken a feed pipe on the inside of the secondary digester. Repairs: (1) Replacement of fiberglass baffles (2) (a) Liquid from the primary digester is decanted to the secondary digester for further digestion and settling. (b) Bypassed the feed pipe and then replace piping. (stake digester out of service, empty, accessing inside it, damage evaluation and repairs. (d)Contact contractors and get estimates. (e) Replacement & Repairs	10,000 \$250,000	B	FA	NA	NA	NA	Yes, \$500,000	No	No

List of Projects

3	Public Defender Building Facility-312A Cook Street, Santa Maria (ID#T04006)	<p>Damage: Quake caused interior cracking to the men's and women's 10'X10' toilet facilities (N.Wall) (2) and exterior cracking to a 200'L X 15'H entry hallway (N) and minor cracking to a 30'H X 15'L westerly facing wall. Repairs: a) Replace damage tile with new tile in men's and women's facility and paint and grout damaged areas (b) patch and paint exterior hallway and westerly facing wall Facility A.</p>	\$25,000 E	NA	No	Yes, \$500,000	No	No
4	Court House - 312 Cook Street - Santa Maria - Building "G"	<p>Damage: Interior: (a) Quake caused butter-knife size cracking (3/8" to a 1/4") at structural understructure (basement-roof) and minor cracking on basement walls throughout facility. (b) extensive "spider" cracking inside of jail area - interior yard and 2 sheriff rooms. Exterior: Cracking on columns East.(exit) area; Cracking South entire side of facility at windows and planter areas; cracking at Court Entrance. Repairs: (a) Contract engineer / architect for assessment of interior basement area for safety evaluation and repairs: (b) patch and paint damage interior walls of basement and jail facility interior walls and adjacent rooms</p>	250,000 E	NA	No	Yes, \$500,000	No	No
5	Court House-Bldg "C" Cook Street- Santa Maria	<p>Damage: Quake broke apart column support and caused minor cracking on exterior East and West walls and 6' X 9' concrete slab sidewalk around facility. Repairs: Patch and paint damage exterior walls and support column - remove and replace damage sidewalks.</p>	3,000 E		Yes	Yes, \$500,000	No	No
6	Court House Facilities- 312 E Cook Street - Concrete Slabs	<p>Damage: Quake has cracked and exasperated cracking through concrete facility walkway - especially at Facility "A" "B" and "C". Concrete slabs are 6' X 9' - Repairs: Remove and Replace damaged concrete. Estimated 17 slabs @ \$250 a slab</p>	4,250 E	NA	No	Yes, \$500,000	No	No

List of Projects

7	Planter Support Court House Facility on 312 E. Cook and Miller Street	Damage: Quake damage a 35' long X 2' high planter with cracking in various locations; Repairs: Patch and Paint over cracking.	1,000	G	NA	No	Yes, \$500,000	No	No
8	Building "B" 312 E Cook Street	Damage: Quake has cracked and exasperated cracking through concrete walls on the Entrance side of the facility. 35H X 40'L typical cracking in several places. Repairs: Patch and paint facility to restore to original design.	6,000	E	NA	No	Yes, \$500,000	No	No
9	Juvenile Hall, 4500 Hollister Ave - Santa Barbara - 93110	Damage: Ground movement separated gas line valve/ causing ruptures and broken pipes (various sizes) at facility - Repairs: Remove and replace damaged valves and ruptured piping.	25,000	F	NA	No	Yes, \$500,000	No	No
			\$				\$		

*CATEGORY: A) Debris Clearance; B) Protective Measures; C) Road System; D) Water Control Facility; E) Buildings and Equipment;
F) Public Utility System; G) Other. (Note: if a single site has more than one category, indicate the category that represents the majority of damage.)

Summary of DSR and Scope of Work Approved -01 Storm Parks Division

Exhibit B Identification	Facility	Location	Damage	Category	Engineer/Inspector	Est. Amount	Stated Funded	DSR#	Request in Close Out	Comments
Item # 73 Parks	Newton Access Rd / County Bowl	DAMAGE: (1) Two locations of asphalt failures on road. One location is 25' L X 10' W and the other location is 20' L X 10' W. (2) 250 linear feet of chain link 10 gage fence destroyed by fallen boulders and dirt at walkway. (3) 250' L X 5' W X 4' H washout at walkway. SCOPE OF WORK: Due to unsafe conditions, the storm damage repair at this site has been completed. It involved the removal of the chain link fence and washout area, the placement of 250 linear feet of K-rail, and the repair of two asphalt concrete sections of the road.	\$ 15,975.00	C	Dimma Ortez	\$ 15,975.00	\$ 3,219.00	155	\$14,597	Closed
Item # 74 Parks	Toro Cyn Park	DAMAGE: (1) 4' W X 8' L X 4' D inlet area of 18" culvert under roadway eroded. Culvert plugged with sediment. SCOPE OF WORK: Repair will consist of clearing all dirt and gravel from the pipe, inlet area and swale. Also some concreted sand bags will be placed around the inlet area that collapsed.	\$ 6,200.00		Dimma Ortez	\$ -	denied by oes	156	denied	

Completed

Summary of DSR and Scope of Work Approved -01 Storm
Parks Division

Item # 75 Parks	Goleta Beach County Park	<p>DAMAGE: (1) Eroded 1,536' L X 12' H sand berm along park lawn. (2) Undermined concrete toe between the AC roadway and the wooden pier. (3) Major structural damage to pile.</p> <p>SCOPE OF WORK: An emergency repair was performed when one of the pier piles showed signs of imminent failure during one of the storms. The existing sand berm that protects the lawn area of the park from erosion was reconstructed.</p>	\$ 47,663.00	G	Dimma Ortez	\$ 47,663.00	27,397	157	\$ 39,340.00
Item # 76 Parks	Cachuma Lake Domestic Water Plant	<p>DAMAGE: (1) Wave action destroyed and washed out 180' L X 10' H X 8' W of shore protection which caused two of the main water filter lines to get exposed. (2) The wave action also eroded an area near one of the corners of the water treatment plant leaving only a four foot gap between the structure and the edge of the water.</p> <p>SCOPE OF WORK: Place 180 linear feet of 1 ton rip-rap along the shoreline to protect the structure and the waterlines. It is estimated that about 850 tons of rip-rap will be needed.</p>	\$ 40,200.00	G	Dimma Ortez	\$ 40,200.00	\$ 66,803.00	158	\$

Closed

Summary of DSR and Scope of Work Approved -01 Storm Parks Division

Item 77 Parks	Cachuma Lake Boat House	<p>DAMAGE: (1) 250 lb seaward anchor broke off (lost in debris at bottom of lake). (2) 20 wood planks of access ramp washed away. (3) Three 12'x4' roof panels were blown away. (4) Four 4'x8' floatation panels were washed away. (5) Six sheets of siding lost. (6) Various hinges and bolts broke off. (7) Three 15 foot long metal supports that held the ends of the base of the house were washed away.</p> <p>SCOPE OF WORK: Replace all broken or missing structural members, floatation panels and siding to their previous condition.</p>	\$ 23,300.00	Dimma Ortez	\$ 23,300.00	\$ 30,045.00	159
Item 78 Parks	Guadalupe Dunes Park Parking lot	<p>DAMAGE: Washed out 100' X 200' Asphalt Parking lot</p> <p>SCOPE OF WORK: Replace approximately 350 tons of asphalt concrete.</p>	\$ 25,950.00	Dimma Ortez	\$ 25,950.00	\$ 51,430.00	159
Item # 79 Parks	Tuckers Grove Park	<p>DAMAGE: (1) 50' L X 21' W X 4' D creek crossing embankment erosion and rip rap loss (SW side). (2) 30' L X 5' W X 3' D creek crossing embankment erosion and rip rap loss (SE side). (3) 160' L X 20' W section upstream sedimentation deposit. (4) 13' X 5' W X 8' H access road washout. (5) 16' L X 5' W X 8' H access road washout. (6) 40' L X 3' W "v" ditch undermined.</p>	\$ 26,175.00	Dimma Ortez	\$ 26,175.00	\$ 33,401.00	159

Summary of DSR and Scope of Work Approved -01 Storm Parks Division

<p>SCOPE OF WORK: Removal of the upstream sedimentation, placement of approximately 150 tons of grouted _ ton rip-rap at the eroded embankments behind the existing grouted rip-rap on both sides of the creek crossing. Approximately 65 tons of non-grouted _ ton rip-rap will be placed at the toe of the two washouts and built up to the top of the embankment. Reconstruction of the existing "V" ditch to its previous condition.</p>		<p>\$ 54,700.00</p>	<p>\$ 54,700.00</p>	<p>\$ 33,401.00</p>	<p>158</p>	<p>\$</p>
<p>DAMAGE: (1) 200 linear feet of trail washed out. (2) Washed out 50'x6' access ramp. (3) Washed out hand railings at access ramp.</p> <p>SCOPE OF WORK: Repair will consist of placing rock slope protection (rip-rap) along the edge of the embankment to reconstruct the section of trail. The access ramp area will be backfilled and regraded and the hand railings reconstructed to their original condition.</p>	<p>Cachuma Lake Mohawk trail & pier</p>	<p>\$ 11,650.00</p>		<p>\$ 30,045.00</p>	<p>159</p>	<p>\$</p>
<p>DAMAGE: (1) 40'x20' erosion of southeast corner of downstream side of crossing. (2) Damaged 60 linear feet of fence.</p>	<p>El Capitan Ranch Trail</p>					
<p>Item 80 Parks</p>						
<p>Item 81 Parks</p>						

Summary of DSR and Scope of Work Approved -01 Storm
Parks Division

	<p>SCOPE OF WORK: Place 150 tons of rock slope protection and replace 60 linear feet of fence.</p>				
PARKS			\$ 233,963.00	\$ 275,741.00	\$

RLIST

979 083-00000 47751	0 Y A	\$343,963.00	6/22/1993	8/4/1993	9/2/1993 ROADWAYS AND STREETS
979 083-00000 47760	1 Y A	\$42,043.00	6/22/1993	11/15/1993	11/30/1993 FLOOD CONTROL FACILITIES
979 083-00000 47762	0 Y A	\$7,176.00	6/25/1993	6/29/1993	9/2/1993 DOWNED TREES
979 083-00000 47764	0 Y A	\$83,951.00	6/17/1993	6/22/1993	9/2/1993 CULVERT CHANNELS,SILT BASINS
979 083-00000 47752	0 Y B	\$124,752.00	6/22/1993	7/22/1993	9/2/1993 ROADS, STREETS, CULVERTS
979 083-00000 47753	0 Y B	\$9,627.00	6/17/1993	7/28/1993	9/2/1993 COUNTY WIDE
979 083-00000 47768	0 Y B	\$11,870.00	6/17/1993	6/24/1993	9/2/1993 VARIOUS
979 083-00000 47771	3 Y B	\$6,590.00	6/25/1993	6/29/1993	5/12/1994 HEALTH CARE SERVICES, BLDGS A & B
979 083-00000 47958	0 Y B	\$54,089.00	6/22/1993	7/19/1993	9/2/1993 FLOOD CONTROL SYSTEM
979 083-00000 47959	0 Y B	\$569.00	6/17/1993	6/24/1993	9/2/1993 PLOWSHARE PEAK COMMUNICATIONS STATION
979 083-00000 17889 47769	4 Y C	(\$30,043.00)	11/13/1996	11/13/1996	11/14/1996 SWEENEY ROAD
979 083-00000 17890 47770	4 Y C	(\$44,440.00)	11/13/1996	11/13/1996	11/14/1996 SWEENEY ROAD
979 083-00000 47749	0 Y C	\$70,000.00	6/22/1993	8/2/1993	9/2/1993 ROAD WASHOUT
979 083-00000 47756	0 Y C	\$179,977.00	6/30/1993	8/4/1993	9/2/1993 ROADWAYS AND BRIDGES
979 083-00000 47763	0 Y C	\$3,570.00	6/25/1993	7/8/1993	9/2/1993 CREEK CROSSING
979 083-00000 47766	0 Y C	\$16,866.00	6/17/1993	6/29/1993	9/2/1993 CULVERT AND ESCAPE RAMP
979 083-00000 47769 47769	0 Y C	\$30,043.00	6/17/1993	6/24/1993	9/2/1993 SWEENEY ROAD
979 083-00000 47770 47770	2 Y C	\$44,440.00	6/22/1993	12/8/1993	12/15/1993 SWEENEY ROAD
979 083-00000 47773	0 Y C	\$10,812.00	7/15/1993	8/6/1993	9/2/1993 ARMOUR RANCH ROAD
979 083-00000 47798	0 N C	\$0.00	6/17/1993	6/22/1993	9/2/1993 BRIDGES/ROADWAYS
979 083-00000 47953 47953	0 Y C	\$80,228.00	6/17/1993	6/22/1993	9/2/1993 SAN MARCOS ROAD
979 083-00000 47956	0 Y C	\$198,695.00	6/30/1993	8/6/1993	9/2/1993 ROADWAY AND BRIDGES
979 083-00000 65524 47953 2 Y C	2 Y C	\$48,103.00	12/2/1993	12/3/1993	12/15/1993 ROADWAY RIGHT LANE
979 083-00000 17891 92017 4 Y D	4 Y D	(\$8,706.00)	11/13/1996	11/13/1996	11/14/1996 CHECK DAM
979 083-00000 17892 92018 4 Y D	4 Y D	(\$66,200.00)	11/13/1996	11/13/1996	11/14/1996 SPILLWAY SUPPORT
979 083-00000 47777	0 N D	\$0.00	6/22/1993	7/22/1993	9/2/1993
979 083-00000 92017 92017 3 Y D	3 Y D	\$8,706.00	6/25/1993	9/10/1993	5/12/1994 CHECK DAM
979 083-00000 92018 92018 0 Y D	0 Y D	\$66,200.00	6/25/1993	7/2/1993	9/2/1993 SPILLWAY SUPPORT
979 083-00000 92020	0 Y D	\$7,550.00	6/22/1993	7/19/1993	9/2/1993 TRAINING DIKE
979 083-00000 92023	0 Y D	\$18,719.00	6/22/1993	8/4/1993	9/2/1993 BRIDGE PIER EROSION
979 083-00000 47772	3 Y E	\$66,171.00	6/25/1993	7/22/1993	5/12/1994 HEALTH CARE SERVICES, BLDGS A & B
979 083-00000 47954	0 Y E	\$1,162.00	6/22/1993	6/25/1993	9/2/1993 SOLVANG JUSTICE COURT BLDG.

\$1,386,483.00

\$1,386,483.00

Summary of Approved State DSR's funded for the 01 Storm Solid Waste Division
Santa Barbara County

Solid Waste /Utilities	Official Number	Location	Description	Category	Manager	Estimate	Approved	State DSR #	Actual Cost Invoiced to OES	Approved by OES
3	Item # 39 Solid Waste	Baron Ranch (County Facility)	1 Lower 24" X 30' long culvert with rock cover washout.	C	John Haines	\$ 189,523.00	\$ 180,736.00	165 & Supplement 381	\$ 315,855.00	completed
3	Item # 40 Solid Waste	Baron Ranch (County Facility)	Horizontal well repair	F	Everett King	\$ 10,000.00	\$ 4,797.00	166 & Supplement 405	\$ 101.09	completed
3	Item 45 Solid Waste	Ballard Cyn	Impacted Drainage Systems -	C	Imelda Cragin	\$ 1,000.00		168		completed
3	Item 46 Solid Waste	Tajiguas West Ridge	3" Water Lines undermined and broken	F	Imelda Cragin	\$ 25,000.00		168		completed
3	Item #48 SOLID WASTE	Protecting Landfill-lower Pila Creek	10 gage fencing 200'	F	Imelda Cragin	\$ 2,500.00		168		completed
3	ITEM #50 SOLID WASTE	Foxen Canyon LF	Storm Drain tea post slid out - replace pipe and post	C	Imelda Cragin	\$ 10,000.00		168		completed
2	ITEM #51 SOLID WASTGE	Transfer Station	200' Dirt Rd Repair	C	Imelda Cragin	\$ 5,000.00		168		completed
3	ITEM #52 SOLID WASTE	Landfill Location-Site Tajiguas	Washed out Road Repairs Tajiguas Access & Service Rd.	C	Imelda Cragin	\$ 95,000.00		168		completed
5	ITEM #54 SOLID WASTE	New Cuyama Landfill	Monitoring well #5 replacement	F	Chris Wilson	\$ 2,000.00	\$ 20,509.00	168 & 405	\$ 212,021.00	9,947.00
2	Item #44 Solid Waste	Foothill Landfill Location Site @ Transfer Station	Embankment failure into reach of drainage channel @ Site A & B	F	Imelda Cragin	\$ 225,000.00	\$ 88,380.00	171	\$ 67,015.00	(21,366.00)
3	Solid Waste Item #43	Foothill Landfill Site A	Embankment failure into reach of drainage channel @ Site A	C	Imelda Cragin		\$ 4,200.00	172	\$ 22,982.00	18,782.00

Summary of Approved State DSR's funded for the 01 Storm Solid Waste Division
Santa Barbara County

3	Item 47 Solid Waste	Landfill Location Site - Tajiguas	Two (2) Ground Water Monitoring Wells & 2 Horizontal Well Convenience System, piping disconnected	F	Imelda Cragin	\$ 50,000.00	\$ 55,378.00	173	\$ 378.00	(55,756.00)
3	Solid Waste Item #42	Landfill Location Site - 14730 off of HWY 101 (old hwy)	6' Concrete Apron Culvert washout & embankment washout	C	Imelda Cragin	\$ 150,000.00	\$ 58,936.00	174	\$ 1,190.00	(57,756.00)
3	Item 49 Solid Waste	Lower Pila Creek	Trash Racks filled with debris and eroded and washed racks - replace	C	Imelda Cragin	\$ 5,000.00	\$ 23,500.00	175	\$ 26,304.00	2,804.00
3	Item 41 Solid Waste	Baron Ranch (County Facility)	Washed out roads at various locations	C	Everett King	\$ 20,000.00	\$ 4,152.00	176	\$ 2,261.00	(1,891.00)
3	Item 53 Solid Waste	Landfill Location Site - Tajiguas	Scalehouse - water intrusion =scale repairs	F	Imelda Cragin	\$ 1,500.00		176	Invoiced	Completed
	Solid Waste /Utilities					\$ 791,523.00	\$ 440,588.00			
						\$ 791,523.00	\$ 440,588.00	<Totals>	\$ 648,107.09	(105,236.00)
						Estimate/Exh "B"	given		Invoiced to date	

August Summary of Open Road Projects for 01 Storm

District	Exhibit B Identification	Location	Damage	FEMA/ State Categories	Engineer/Inspector	Est. Amount	Funded Amount @ 75%	State DSR #	Notes /Comments	Close Out Requested	OES Approved IN ADDITION TO THE FUNDED AMOUNT	Deadline
3	Item # 26 R028	Paradise Rd Bridge 51C-073	40' long X 6' deep X 5' wide Embankment washout (2) approx 3 CY of concentrated woody debris under bridge	C	Rob Tyzzer	\$ 15,000.00	see below	143	Completed / and Closed Out		see below 143	
3	ITEM 29 R031	Refugio Road from W. Camino Cielo to First Summer X-ing on Santa Ynez Side	Slides, Fallen Trees, Washouts blocking road, 70' + Arc	C	Christian Doolittle	\$ 5,000.00	see below	143	Completed / and Closed Out		see below 143	
3	ITEM 30 R032	Refugio Road from 0.5 mi from Calle Real	Slide has eroded the shoulder and dislocated a utility pole	C	Chris Doolittle & Rob Tyzzer	\$ 20,000.00	\$ 25,370.00	143	Completed / and Closed Out - No Invoice	-\$15,789.00	\$15,789.00	
2	Item # 24 R026	Marina Dr - Roble Dr.	Culvert Failure	C	Richard Navarro	\$ 25,000.00	\$ 14,923.00	144	no invoice yet			
2	ITEM #28 R030	Patterson - east of Camino Meleno	Erosion / Damaged Culvert	C	Richard Navarro	\$ 15,000.00	\$ 14,923.00	144	no invoice yet			
4	ITEM 36 R038	Mahoney Rd @ M.P. 0.5 south of Betteravia Rd.	60" CMP culvert and reconnect concrete headwall	C	Walter Rubalcava	\$ 186,832.00	\$ 136,550.00	144 & 387	Time Extension Scope Change Funding Increase Requested & Approved			8/30/2004
3	Item # 31 R033	Refugio Rd., North of W. Camino Cielo, Site #19, MP 9.77	30' + failure of downslope shoulder	C	Christian Doolittle	\$ (1,890.00)	\$ 1,890.00	147	Repaired under the 98 Storm R282	-\$1,890.00	\$1,890.00	

August Summary of Open Road Projects for 01 Storm

3	Item # 35 R037	Jalama Rd @ MP. 10.15	Concrete Structure with Overside drain and 15' Culvert washout	C	Rob Tyzzer			\$ 11,489.00	149	Completed / and Closed Out	\$6,134.00	
3	ITEM #38 R040	Maria Ygnacia Creek Bikeway	Washed out emankment 30"L X 5'W X 20'H	C	Ron Bensel			\$ 11,489.00	149	Project Completed	\$6,288.00	
3	ITEM 37 R039	Cathedral Oaks Rd. @ Bridge #51C-213 (2750' West of Los Carneros)	Erosion behind guardrail	C	Bill Tracy	\$ 33,209.00		\$ 7,659.00	149	Completed / and Closed Out	\$20,786.00	\$3,033.00
3	Item # 32 R034	Santa Rosa Rd	Repair Retaining Wall	C	Eddy Pressey	\$ 85,000.00		\$ 64,406.00	151	Completed / and Closed Out	\$84,188.00	\$956.00
3	item # 33 R035	Refugio Rd @ summer X-ing #2	A 50' L X 14' W 6"concrete summer crossing washout	C	Rob Tyzzer	\$ 325,000.00		\$ 211,945.00	152 & 384	Time Extension & Additional Funding Requested & Approved		10/31/2003
3	Item # 34 R036	Refugio summer X-ing #4	A 50' L X 14' W 6"concrete summer crossing washout	C	Rob Tyzzer	\$ 325,000.00		\$ 213,326.00	153 & 385	Time Extension & Additional Funding haveHas Been Requested		10/31/2003
3	Item #98 R041	Santos Road @ Santa Rosa Creek @ Bridge 51C-227		C	Dacy Morgan - Chris Doolittle	\$ 294,492.00		\$ 220,869.00	154 & 404	time Extension has & Supplement DSR has been Requested & approved	\$210,112.00	\$62,045.00
2	Item # 101 R001	Vieja Drive from Vieja Cayente to Vieja Vistosa	Road Undermined / Culvert Damage	C	Eddy Pressey	\$ 75,000.00		\$ 58,363.00	167	Completed / and Closed Out	\$142,259.00	
3	Item # 001 R#002	Fairview @ Holiday Hill Road	Sink Hole	C	Mark Rynkiewicz	\$ 60,000.00		\$ 45,006.00	201	Completed / and Closed Out	\$59,356.00	\$831.00

August Summary of Open Road Projects for 01 Storm

3	Item # 2 R004	East Camino Cielo starting @ Painted Cave to Gibraltar	Mud Slides / Road & Shoulder Washouts-R&R from Painted Cave to Knap Castile	C	Dianna Estorga/Don Villafana	\$ 100,000.00	\$ 52,161.00	202	Completed / and Closed Out	\$85,393.00	\$22,065.00
1	Item # 3 R005	Gibraltar to City Limits	Mud Slides / Road Washout @ various locations - culvert clean out	C	Ken Stovalle	\$ 35,000.00	\$ 13,433.00	203	Completed / and Closed Out	\$27,351.00	\$15,512.00
3	ITEM # 4 R006	Refugio Rd. from Calle Real to West Camino Cielo	Slides - Trees Plugged Culvert	C	Bobby Fernandez	\$ 30,000.00	Denied Not Eligible	204	Completed / and Closed Out	\$0.00	
All	R000	County Wide	Minor Permanent Repairs to Asphalt and Culverts	C	Gary Christiansen		\$ -	205	Denied by State		
5	Item # 6 R#008	Foxen Canyon Rd. @ MP 15.36	Washout & sinkhole	C	Cliff Replogle	\$ 15,000.00	\$ 16,817.00	206	Completed / and Closed Out	\$21,901.00	\$0.00
3	Item # 7 R009	Drum Cyn Rd @ MP 2	(1) Washout roadway embankment failure 75' L X 30' D (2) 100' L X 15'W R & R Asphalt (3) Regard 100' shoulder	C	Rob Tyzzer	\$ 75,000.00	\$ 54,702.00	207	Completed / and Closed Out	\$71,022.00	\$2,693.00
3	Item # 8 R#010	Mail Rd @ MP 1.64	Failed AC pipeing under roadway	C	John McGray	\$ 15,000.00	\$ 571.00	208	Completed / and Closed Out	\$761.00	\$0.00
2	Item # 9 R011	San Marcos Rd. Bridge	(1) 40'X10' gabion washout (2) Pipe Revempment	C	Diana Estorga / Ron Bensel	\$ 20,000.00	\$ 24,047.00	209	Completed / and Closed Out	\$19,084.00	\$12,260.00
3	R012	Gaviota Creek Crossing	Debris	A	Charlie Elbert		Denied Not Eligible	210	New Bridge under FEMA	\$0.00	\$0.00

August Summary of Open Road Projects for 01 Storm

5	Item # 11 R013	Tequsquet Rd @ Sisquoc River Crossing	C	Dean Clouse	\$ 25,000.00	\$ 8,833.00	214	Completed / and Closed Out	\$18,350.00	\$6,890.00
5	Item # 12 R014	Bonita School Rd. Xing.	C	Walter Rubalcava	\$ 80,000.00	\$ 55,607.00	215	Completed / and Closed Out	\$110,443.00	\$36,301.00
3	Item # 13 R#015	Armor Ranch Rd @ Bridge # 51C-074	C	Rob Tyzzer	\$ 15,000.00	\$ 18,485.00	216	Completed / and Closed Out	\$102,873.00	\$80,973.00
3	Item # 14 R016	Kinevan Rd	C	Sara Craig	\$ 156,000.00	\$ 17,475.00	217	Time Extension Approved - Scope Change Requested (not yet approved)		8/30/2003
3	Item 15 R017	Cathedral Oaks @ Glenn Annie	C	Mark Rynkiewicz	\$ 5,000.00	\$ 4,475.00	218	Completed / and Closed Out	\$1,272.00	\$4,185.00
3	Item 16 R018	Mail Rd. @ MP 1.32	C	Rob Tyzzer	\$ 92,000.00	\$ 34,454.00	219	completed / and Closed Out	\$46,805.00	\$2,896.00
1	Item # 17 R019	960 East Mountain Drive	C	John Parsons	\$ 60,000.00	\$ 55,034.00	220	Completed / and Closed Out	\$70,674.00	\$131.00

August Summary of Open Road Projects for 01 Storm

3	Item # 18 R020	Mail Rd @ MP 0.15 south of Hwy 246	Road Washout	C	Jemmi Irabon	\$ 40,000.00	\$ 112,103.00	221	Completed / and Closed Out	\$174,004.00	\$31,211.00	
		Check Dam failure Road Culvert	Washout	C	Tom Fayram/Jimm i Irabon	\$ 40,000.00	\$ 24,580.00	222	Completed / and Closed Out	\$33,254.00	\$909.00	
3	Item # 20 R022	Cebada Cyn Rd @ 400' of Avana Rd.	Road Washout	C	Jemmi Irabon	\$ 16,000.00	\$ 7,505.00	223	Completed / and Closed Out	\$12,142.00	see below 223	
3	Item # 21 R023	Cebada Cyn Rd @ 200' north of Cooper Rd.	Road Washout	C	Jemmi Irabon	\$ 13,000.00	\$ 7,505.00	223	Completed / and Closed Out	\$7,874.00	\$6,415.00	
4	Item # 22 R024	South Bradley Rd	20'X20' Sink hole in Asphalt Rd.	C	Cliff Replogle	\$ 15,000.00	\$ 10,234.00	224	Completed / and Closed Out	\$ 645.00		
3	Item # 23 R025	Figuroa Mt. Rd Bridge 51C-082	Bridge Rail Damage	C	Bill Vachon	\$ 5,000.00	\$ 10,234.00	224	Completed / and Closed Out	\$ 8,285.00		
2	ITEM #25 R027	El Sueno Dr @ Atascadero Creek	Oversize drain hanging as a result of washout - re-establish drain foundation and repair drain	C	Richard Navarro / Rick Thomisemie (5635)	\$ 20,000.00	\$ 10,234.00	224	Completed / and Closed Out	\$ 33,100.00	\$1,094.00	
3	R007	Calle Real 0.5 miles east of Refugio Rd.	Slides	C	Bobby Fernandez	\$	\$ -	DENIED	\$ -	\$0.00		
2	R029	Mattoral - Ribera Intersection	Sink Hole in road	C	Jarad	Removed	REMOVED	0	0	\$0.00		
						\$ 2,334,643.00	\$ 1,576,697.00			\$1,356,677.00	\$115,741.00	
						Eng Est	Paid Out / Received			Invoice	Additional	

Appendix 4D

APPENDIX 4D - ESTIMATED LOSSES FOR 100-YEAR RIVERINE FLOOD EVENT - Santa Barbara County, CA

Jurisdiction	Type of Complex	Total Number of Flood Prone Properties	Average Riverine Depth Above Grade	Assumed Building Type	Building Damage %	Building Structure	Building Damage (\$)	Estimated Building Damage			Contents Value as % of Building	Contents Damaged %	Estimated Contents Structure Damage (\$)	Estimated Contents Damage per Jurisdiction (\$)	Total Buildings and Content Damage per Jurisdiction		
								Estimated Total Building Damage (\$)	Estimated Total Building Damage (\$)	Estimated Total Building Damage (\$)							
Buellton	Agriculture	20	3.5	1 w/o	27.5%	\$580,800	\$11,616,000	50%	\$1,056,000	41.3%	\$435,600	\$8,712,000	\$153,902,545	\$277,325,270			
	Commercial	41	3.5	2 w/o	18.5%	\$387,745	\$15,897,553	50%	\$1,047,960	27.8%	\$290,809	\$11,923,165					
	Education	1	3.5	2 w/o	18.5%	\$328,005	\$328,005	100%	\$1,773,000	27.8%	\$492,008	\$492,008					
	Industrial	33	3.5	1 w/o	27.5%	\$2,468,263	\$81,452,663	100%	\$8,975,500	41.3%	\$3,702,394	\$122,178,994					
	Residential	187	3.5	1 w/o	27.5%	\$75,554	\$14,128,505	50%	\$137,370	41.3%	\$56,665	\$10,596,378					
TOTALS		282					\$123,422,725										
Carpinteria	Commercial	20	3.2	2 w/o	19.0%	\$352,839	\$7,056,781	50%	\$928,524	28.5%	\$264,629	\$5,292,586	\$67,834,867	\$156,678,900			
	Education	1	3.2	2 w/o	19.0%	\$416,290	\$416,290	100%	\$2,191,000	28.5%	\$624,435	\$624,435					
	Industrial	1	3.2	1 w/o	28.0%	\$811,487	\$811,487	100%	\$2,898,167	42.0%	\$1,217,230	\$1,217,230					
	Religion	2	3.2	2 w/o	19.0%	\$374,680	\$749,360	75%	\$1,479,000	28.5%	\$421,515	\$843,030					
	Residential	1,612	3.2	1 w/o	28.0%	\$49,510	\$79,810,115	50%	\$88,411	42.0%	\$37,132	\$59,857,586					
TOTALS		1,636					\$88,844,033										
Goleta	Agriculture	11	4.4	1 w/o	28.0%	\$42,314	\$465,456	50%	\$75,561	42.0%	\$31,736	\$349,092	\$220,314,718	\$416,138,941			
	Commercial	181	4.4	2 w/o	19.0%	\$348,289	\$63,040,375	50%	\$916,551	28.5%	\$261,217	\$47,280,281					
	Education	4	4.4	2 w/o	19.0%	\$1,136,200	\$4,544,800	100%	\$5,980,000	28.5%	\$1,704,300	\$6,817,200					
	Government	2	4.4	2 w/o	19.0%	\$177,579	\$355,158	50%	\$467,313	28.5%	\$133,184	\$266,368					
	Industrial	121	4.4	1 w/o	28.0%	\$764,400	\$92,492,400	100%	\$2,730,000	42.0%	\$1,146,600	\$138,738,600					
Lompoc	Religion	4	4.4	2 w/o	19.0%	\$445,767	\$1,783,069	75%	\$1,759,607	28.5%	\$501,488	\$2,005,952	\$79,117,559	\$158,007,079			
	Residential	730	4.4	1 w/o	28.0%	\$45,401	\$33,142,966	50%	\$81,074	42.0%	\$34,051	\$24,857,224					
	TOTALS		1,053					\$195,824,223									
	Agriculture	24	3.2	1 w/o	28.0%	\$759,220	\$18,221,280	50%	\$1,355,750	42.0%	\$569,415	\$13,665,960			\$13,665,960	\$16,217,074	
	Commercial	42	3.2	2 w/o	26.0%	\$514,828	\$21,622,765	50%	\$990,053	39.0%	\$386,121	\$16,217,074					
Education	2	3.2	2 w/o	26.0%	\$3,265,080	\$6,530,160	100%	\$12,558,000	39.0%	\$4,897,620	\$9,795,240						
Industrial	7	3.2	1 w/o	28.0%	\$2,867,200	\$20,070,400	100%	\$10,240,000	42.0%	\$4,300,800	\$30,105,600						
Residential	278	3.2	1 w/o	28.0%	\$44,766	\$12,444,914	50%	\$79,939	42.0%	\$33,574	\$9,333,686						
TOTALS		353					\$78,889,519										
Santa Barbara	Agriculture	2	1.5	1 w/o	29.5%	\$3,080,095	\$6,160,190	50%	\$5,220,500	44.3%	\$2,310,071	\$4,620,143	\$1,207,120,908	\$2,188,071,449			
	Commercial	503	1.5	2 w/o	21.0%	\$446,455	\$224,566,842	50%	\$1,062,988	31.5%	\$334,841	\$168,425,131					
	Education	8	1.5	2 w/o	21.0%	\$4,698,330	\$37,586,640	100%	\$22,373,000	31.5%	\$7,047,495	\$56,379,960					
	Industrial	220	1.5	1 w/o	29.5%	\$2,679,072	\$589,395,840	100%	\$9,081,600	44.3%	\$4,018,608	\$884,093,760					
	Religion	6	1.5	2 w/o	21.0%	\$520,508	\$3,123,047	75%	\$1,858,957	31.5%	\$585,571	\$3,513,428					
TOTALS		2,095					\$120,117,982										
Santa Maria	Agriculture	3	7.0	1 w/o	18.0%	\$1,650,780	\$4,952,340	100%	\$9,171,000	27.0%	\$2,476,170	\$7,428,510	\$115,694,137	\$158,007,079			
	Commercial	33	7.0	2 w/o	11.0%	\$202,857	\$6,694,284	50%	\$922,078	16.5%	\$152,143	\$5,020,713					
	Education	1	7.0	2 w/o	11.0%	\$385,990	\$385,990	100%	\$3,509,000	16.5%	\$578,985	\$578,985					
	Industrial	48	7.0	1 w/o	18.0%	\$447,686	\$21,488,951	100%	\$2,487,147	27.0%	\$671,530	\$32,233,426					
	Religion	2	7.0	2 w/o	11.0%	\$300,787	\$601,574	75%	\$2,050,821	16.5%	\$338,386	\$676,771					
TOTALS		689					\$20,361,481										

APPENDIX 4D - ESTIMATED LOSSES FOR 100-YEAR RIVERINE FLOOD EVENT - Santa Barbara County, CA

Jurisdiction	Type of Complex	Total Number of Flood Prone Properties	Average Riverine Depth Above Grade	Assumed Building Type	% Building Damage	Estimated Building Damage			Contents Value as % of Building			Estimated Contents			Total Buildings and Content		
						Damage per structure (\$)	Building Total Damage (\$)	Estimated Total Building Damage (\$)	Value	% Damaged	Value per Structure	Contents Damaged	Damage per Structure (\$)	Estimated Contents Damage per Jurisdiction (\$)	Building Damage per Jurisdiction (\$)	Estimated Contents Damage per Jurisdiction (\$)	Total Buildings and Content Damage per Jurisdiction (\$)
Solvang	Agriculture	1	0.0	1 w/o	27.5%	\$793,375	\$793,375	\$2,885,000	100%	41.3%	\$2,885,000	\$2,885,000	\$1,190,063	\$1,190,063	\$3,010,632		
	Commercial	11	0.0	2 w/o	18.5%	\$364,925	\$4,014,176	\$1,972,568	50%	27.8%	\$986,284	\$823,694	\$3,010,632	\$3,010,632	\$3,010,632		
	Industrial	1	0.0	1 w/o	27.5%	\$2,268,200	\$2,268,200	\$8,248,000	100%	41.3%	\$8,248,000	\$3,402,300	\$3,402,300	\$3,402,300	\$3,402,300		
	Residential	1	0.0	2 w/o	18.5%	\$370,062	\$370,062	\$2,000,333	75%	27.8%	\$1,500,250	\$416,319	\$416,319	\$416,319	\$416,319		
	TOTALS	49				\$1,680,280	\$1,680,280	\$1,174,575	50%	41.3%	\$87,287	\$36,006	\$1,260,210	\$1,260,210	\$1,260,210		
Unincorporated	Agriculture	1035	0.0	1 w/o	35.5%	\$794,476	\$822,283,018	\$2,237,962	100%	53.3%	\$2,237,962	\$1,191,715	\$1,191,715	\$1,191,715	\$1,191,715		
	Commercial	196	0.0	2 w/o	23.0%	\$504,623	\$98,906,135	\$2,194,014	50%	34.5%	\$1,097,007	\$378,467	\$74,179,602	\$74,179,602	\$74,179,602		
	Education	19	0.0	2 w/o	23.0%	\$9,332,710	\$177,321,490	\$40,577,000	100%	34.5%	\$40,577,000	\$13,999,065	\$265,982,235	\$265,982,235	\$265,982,235		
	Government	7	0.0	2 w/o	23.0%	\$293,752	\$2,056,263	\$1,277,182	50%	34.5%	\$638,591	\$220,314	\$1,542,197	\$1,542,197	\$1,542,197		
	Industrial	89	0.0	1 w/o	35.5%	\$1,216,193	\$108,241,144	\$3,425,895	100%	53.3%	\$3,425,895	\$1,824,289	\$162,361,716	\$162,361,716	\$162,361,716		
	Residential	21	0.0	2 w/o	23.0%	\$661,173	\$13,884,640	\$2,874,667	75%	34.5%	\$2,156,000	\$743,820	\$15,620,220	\$15,620,220	\$15,620,220		
	TOTALS	2576				\$155,164,252	\$1,377,856,943	\$169,675	50%	53.3%	\$84,837	\$45,176	\$1,116,373,189	\$1,116,373,189	\$3,247,340,629		

Appendix 5A

Appendix 5-A - Santa Barbara County Multi-Jurisdictional Multi-Hazard Mitigation Plan
Mitigation Actions Implementation Matrix

Priority	Title	Description	Responsible Department	Target Completion	Annual Update Comments
Very High	Increase Participation in Floodplain Re-mapping Initiative	The digital maps will provide a platform from which updated flood data (hydrologic, topographic and hydraulic analysis and coastal storm surge modeling) can be added at a fraction of the cost and time previously required. FEMA Region IX has begun a process of scoping mapping needs in Santa Barbara County. The county will seek an increased role in the remapping process via a Cooperating Technical Partnership (CTP) agreement with FEMA to ensure the accuracy and quality of new countywide mapping. [SAMPLE PROJECT]	Flood Control	CTP Agreement within 1 year, project completion within 2 years	
Very High	Floodplain Management and Flood Mitigation Education and Outreach	The County has developed multiple outreach and education strategies to encourage self-responsible actions in these areas and other flood prone areas in general. The County will target education and outreach programs to a variety of audiences to not only encourage retrofit and flood loss reduction activities but to encourage flood resistant future development. [SAMPLE PROJECT]	Public Works, Flood Control and Disaster Recovery, and County OES	Start within 1 year, provide annually	
		[TABLE TO BE POPULATED WITH ALL PROJECTS WHEN STATE AND FEMA REVIEW COMMENTS ARE INCORPORATED, AS PROJECTS MAY CHANGE]			

Appendix 5B

Appendix 5-B

Santa Barbara County's Hazard Mitigation Grant Program Application

FEMA-1505-DR-CA



**Governor's Office of Emergency Services
Hazard Mitigation Grant Program Application DR-1505**

Section I: Notice of Interest

1. **Federal Information Processing Number (FIPS#):** 083-00000xxx-xxxxx
2. **Applicant Name:** County of Santa Barbara
3. **Applicant Address:** 105 East Anapamu Street - Suite 406
City: Santa Barbara State: CA Zip Code: 93101 County: Santa Barbara
4. **Applicant Type:** City [] County [] State [] Non-Profit [] If Non-Profit provide EIN # _____
Special District [] Other: [] If Other, please specify _____
Native American Tribe []
5. **Legislative Districts**
- | | <u>Applicant</u> | <u>Project Site</u> |
|-----------------------------|-----------------------|-----------------------|
| State Assembly | # <u>Beth-Jackson</u> | # <u>Beth-Jackson</u> |
| State Senate | # <u>Boxer</u> | # <u>Boxer</u> |
| U.S. congressional District | # <u>Capps</u> | # <u>Capps</u> |
6. **Authorized Applicant's Agent**
Name and Title: James Laponis, Deputy County Administrator
Address (if different from applicant): 105 East Anapamu Street, Suite 406
City: Santa Barbara State: CA Zip Code: 93101
Phone: 805.568.3400 Fax # 805.568.3414 Email: Jlaponis@co.santa-barbara.ca.us
7. **Activity Location:**
Countywide court facilities (see attachment)
8. **Project Manager/Working Contact:**
Name and Title: David Rickard
Address (if different from applicant): 2400 Professional Parkway, Suite 150
City: Santa Maria State: CA Zip Code: 93455
Phone: 805.739.8757 x8761 Fax # 805.739.8753 Email: drichar@co.santa-barbara.ca.us
9. **Alternate Contact:**
Name and Title: Robert Ooley, AIA County Architect
Address (if different from applicant): 1100 Anacapa Street, Annex
City: Santa Barbara State: CA Zip Code: 93101
Phone: 805.568.3085 Fax # 805.568.3249 Email: countyarchitect@co.santa-barbara.ca.us
10. **Activity Type:** Planning Project Other _____
11. **Activity Title/Name:** SB 1732 Court Deficiency Program

12. Brief Summary of the Problem: (Describe the problem you are attempting to mitigate in the space provided below)

There are fourteen court facilities within the County inventory, some with non-court related functions. The sizes range from 3,000 square feet to multiple thousand square feet. One facility, the Santa Barbara Courthouse is designated as a State Historic Landmark (no. 1037) and under consideration as a National Historic Landmark.

The majority of the structures are two story, plaster with clay tile roofs. One structure contains up to seven floors of office or jail space. None of the structures has experienced a change of use since construction. The scope of seismic deficiency range from lack of positive roof to wall attachment; missing or undersized wall or roof diaphragms; height to wide ratio of shear walls; weak vertical steel column to horizontal beam connections; moment frame connections; attachment of decorative details; heavy interior ceiling attachment and cross bracing; mechanical equipment anchoring; wall to foundation attachments; shear wall to foundation attachments and cross framing member lateral transfers. Just to name a few. The primary reason for these deficiencies results from lack of local, state or federal mandate to retrofit buildings whose occupancy use has not changed. In addition, the lack of funding to carry out a massive volunteer retrofit program has just not made itself available.

13. Brief Summary of the Proposed Solution: (Describe the proposed mitigation solution in the space provided below)

As indicated above a majority of the buildings in the inventory are one-story and represent the bulk of the retrofit effort. The solutions to roof to wall connections, shear wall attachments and lateral transfer issues are straightforward in application. As an example, the application of a positive connection from the roof framing members to the wall framing can be accomplished with approved metal straps or angles. The disproportionate size of shear walls can be resolved by increasing the width of a shear wall, removing the existing shear wall materials, then applying a new shear wall. In cases where a vertical column to horizontal beam has insufficient connection; the insertion of a connection shear wall or a “shrouding” of the column could mitigate the aged existing connection. The majority of retrofit work and therefore cost will be in the historic Santa Barbara Courthouse. Because this building is a State Historic Landmark, the (State) Office of Historic Preservation requires any work on historic buildings to follow the US Department of Interior—“Standards” for the care of historic buildings. An Advisory Committee is being formulated now to help the County in dealing with the historic courthouse. With respect to the other thirteen facilities, the work is fairly straightforward. The interruption to existing operations, public access and staff will be the biggest logical element while executing any retrofit work.

14. Duplicate Programs: Has this activity received funding or is being considered for funding from another federal program such as the NRCS Emergency Watershed Protection Act or the FEMA Public Assistance Program ? Yes No If yes, identify the program and the Disaster Survey Report, Project Worksheet, or application number(s). FEMA-1505-DR-CA.

15. Total Activity Cost

Federal Requested Share:	\$ 6,600,000	(Maximum is 75% of the eligible activity cost)
Applicant Match:	\$ 3,400,000_	(Minimum is 25% of the eligible activity cost)
Total Activity Cost:	\$ 10,000,000	

Section II: Activity Description

16. Detailed Description of the Problem: (Use additional pages as needed)

Santa Barbara Courthouse, 1926-1929

- Our Facility ID Numbers are F02001-Hall of Records, F02002-Annex, F02003-Anacapa/Fig and F02004-Jail
- 1. This building is a City and State Historic Landmark
- 2. Gross building square footage is 152,191 sf.
- 3. An ASCE Tier 1 Review was performed in 2002
- 4. There are four individual buildings connected by arches or bridges.
- 5. Heavy plaster ceilings can be found throughout the interior.
- 6. Heavy stone detailing can be found on many of the exterior surfaces.



Santa Barbara – Figueroa Courts 1954, 1966 & 1990

1. Our Facility ID Number is F01008, Courts
2. Reinforced Concrete Structure—poured in-place.
3. Gross building square footage is 47,370 sf.
4. 1990 Addition was an in-fill of the basement for Traffic Court, holding facility and office space. Minor seismic work was completed. No expansion of the perimeter walls occurred.
5. This structure has column to beam connection deficiencies, which will in-fill shear walls between columns or existing columns being shrouded.



Lompoc – Courts (one story—right in photo), 1956

2. Our Facility ID Number is P03001, Courts
3. This building is rated IV on the DGSA Risk Chart
4. There have been two additions to the original structure:
 1. One-story wing extension in 1961 One-story longitudinal extension in 1999
 2. Gross building square footage is 14,856 sf.



Lompoc – Courts (two story—left in photo), 1961

1. Our Facility ID Number is P03002, Courts
2. Gross building square footage is 23,712 sf.
3. Shear walls are solid wood members, blocked and sheathed both sides with $\frac{3}{4}$ " plywood—glued and nailed.
4. Drawings indicate the structure as a steel column/steel beam load bearing system with solid wood roof/floor members.
5. Work required in this facility includes improved shear wall to foundation connections; wall to roof connections and shear wall ratio corrections.

Santa Maria – Courts – 312 E. Cook St. - North Wing

1. Our Facility ID Number is T04007, Courts/DA
2. This building is 11,807 sf,
3. Structure received a ASCE Tier 2 review, rated V.
4. Work required in this facility includes improved shear wall to foundation connections; wall to roof connections and shear wall ratio corrections.



Santa Maria – Courts - 312 E. Cook St. - South Wing

1. Our Facility ID Number is T04004, Courts
2. This building is 19,407sf.
3. Work required in this facility includes improved shear wall to foundation connections; wall to roof connections and shear wall ratio corrections.



Santa Maria Court Clerks– 312 E. Cook St.

1. Our Facility ID Number is T04001, Court Clerk Modular
2. This is a modular court facility and excluded from review.
3. This facility is scheduled for demolition---no work planned

Santa Maria Court Offices– 312 E. Cook St.

1. Our Facility ID Number is T04005, Court Offices
2. This building is 3,450 sf
3. Work required in this facility includes improved shear wall to foundation connections; wall to roof connections and shear wall ratio corrections.



Santa Maria – Jury Assembly Building - 312-East Cook St.

1. Our Facility ID Number is T04003, Jury Assembly
2. This building is 3,344 sf.
3. This a one-story wood frame, stucco, tile roof structure.
4. Work required in this facility includes improved shear wall to foundation connections and wall to roof connections.



Santa Maria – Juvenile Court - 812-B Foster Rd.

1. Our Facility ID Number is T03302, Juvenile Hall Court
2. This building is 12,000 sf.
3. This building is a one-story masonry structure.
4. Work required in this facility includes improved shear wall to foundation connections and wall to roof connections.

Santa Barbara – Jury Assembly Bldg

1. Our Facility ID Number is F01007, Jury Assembly Building
2. This building is 8,157 sf.
3. **There is no evaluation report included on the Summary Report CD.**
4. There is no Screening Report on this facility.
5. There is no T-1 Evaluation Report on this facility.



Santa Maria – Bail Review Bldg

1. Our Facility ID Number is _____, Bail Review Building
2. This building is 7,150 sf.
3. Work required in this facility includes improved shear wall to foundation connections and wall to roof connections.

Santa Barbara – Juvenile Court - Hollister Ave.

1. Our Facility ID Number is J01020, Court Modular
2. This building is 2,840 sf.
3. This is a modular court facility and excluded from review.
4. There is no Screening Report on this Facility.



Solvang – Court/Sheriff/Library

1. Our Facility ID Number is N02001, SY Office/Court/Library
2. This building is 10,144 sf.
3. This a one-story wood frame, stucco, tile roof structure.
4. Work required in this facility includes improved shear wall to foundation connections and wall to roof connections.



17. Detailed Description of How the Proposed Activity Will Eliminate or Reduce the Problem:
(Use additional pages as needed)

Santa Barbara Courthouse, 1926-1929

The retrofit work on the historic county courthouse will take about 3 years due to the high degree of historic resources requiring protection during the project. Once the stone detailing, heavy clay roof tiles and other ornamental elements are affixed to the structure with stronger anchors, the risk of these elements coming free during a seismic event is greatly reduced.

The heavy ornament on the interior requires stronger anchorage to the structure as well. In addition, lateral bracing of the large plaster ceilings is required. Once these elements are secured with stronger anchors, the risk of coming free during a seismic event is reduced.

Santa Barbara – Figueroa Courts 1954, 1966 & 1990

The major effort on this facility requires the strengthening of the column to beam connections. There are a number of ways to achieve stronger connections. Widening the column to provide greater positive connection to the horizontal beams is one way. Inserting concrete shear walls between columns will also provide a great amount of connection to the beams, thus helping to reduce the stresses at the column to beam connections. The work is estimated to take at least one-year and completely disrupt the court in this building.

Lompoc – Courts (one story), 1956

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Lompoc – Courts (two story), 1961

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Santa Maria – Courts – 312 E. Cook St. - North Wing

This is a two story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria – Courts - 312 E. Cook St. - South Wing

This is a two story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria Court Clerks– 312 E. Cook St.

This is a modular building and planned for demolition.

Santa Maria Court Offices– 312 E. Cook St.

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria – Jury Assembly Building - 312-East Cook St.

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Santa Maria – Juvenile Court - 812-B Foster Rd.

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Santa Barbara – Jury Assembly Bldg

This is a two story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria – Bail Review Bldg

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Santa Barbara – Juvenile Court - Hollister Ave.

This is a one story modular structure. No retrofit work is planned for this facility.

Solvang – Court/Sheriff/Library

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

18. Project Alternatives Considered

Alternative 1 (no action)

Santa Barbara Courthouse, 1926-1929

A project is being identified to execute a complete historic restoration of the Santa Barbara Courthouse. The seismic scope of work will be included in the restoration over a ten year period of time.

Santa Barbara – Figueroa Courts 1954, 1966 & 1990

The State Judicial Council schedules the facility for a major reconstruction in 2008 or 2009. The County has no plan to work in this building.

Lompoc – Courts (one story), 1956

The County has no plan to work in this building past transfer to the State Judicial Council

Lompoc – Courts (two story), 1961

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Maria – Courts – 312 E. Cook St. - North Wing

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Maria – Courts - 312 E. Cook St. - South Wing

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Maria Court Clerks– 312 E. Cook St.

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Maria Court Offices– 312 E. Cook St.

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Maria – Jury Assembly Building - 312-East Cook St.

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Maria – Juvenile Court - 812-B Foster Rd.

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Barbara – Jury Assembly Bldg

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Maria – Bail Review Bldg

The County has no plan to work in this building past transfer to the State Judicial Council

Santa Barbara – Juvenile Court - Hollister Ave.

The County has no plan to work in this building past transfer to the State Judicial Council

Solvang – Court/Sheriff/Library

The County has no plan to work in this building past transfer to the State Judicial Council

Alternative 2

Santa Barbara Courthouse, 1926-1929

A project is being identified to execute a complete historic restoration of the Santa Barbara Courthouse. The seismic scope of work will be included in the restoration over a ten-year period of time.

Santa Barbara – Figueroa Courts 1954, 1966 & 1990

Where possible with minimal disruption to court operations, insert concrete shear panels at key interior column locations and key exterior window locations. This will strengthen and redirect the horizontal stresses currently taken by the column/beam connections

Lompoc – Courts (one story), 1956

Install positive metal connections at roof-wall assemblies.

Lompoc – Courts (two story), 1961

Install positive metal connections at roof-wall assemblies.

Santa Maria – Courts – 312 E. Cook St. - North Wing

Install positive metal connections at roof-wall assemblies.

Santa Maria – Courts - 312 E. Cook St. - South Wing

Install positive metal connections at roof-wall assemblies.

Santa Maria Court Clerks– 312 E. Cook St.

This is a modular building, no work planned.

Santa Maria Court Office– 312 E. Cook St.

Install positive metal connections at roof-wall assemblies.

Santa Maria – Jury Assembly Building - 312-East Cook St.

Install positive metal connections at roof-wall assemblies.

Santa Maria – Juvenile Court - 812-B Foster Rd.

Install positive metal connections at roof-wall assemblies.

Santa Barbara – Jury Assembly Bldg

No work planned

Santa Maria – Bail Review Bldg

Install positive metal connections at roof-wall assemblies.

Santa Barbara – Juvenile Court - Hollister Ave.

This is a modular building, no work planned.

Solvang – Court/Sheriff/Library

Install positive metal connections at roof-wall assemblies.

Alternative 3:

Santa Barbara Courthouse, 1926-1929

The retrofit work on the historic county courthouse will take about 3 years due to the high degree of historic resources requiring protection during the project. Once the stone detailing, heavy clay roof tiles and other ornamental elements are affixed to the structure with stronger anchors, the risk of these elements coming free during a seismic event is greatly reduced.

The heavy ornament on the interior requires stronger anchorage to the structure as well. In addition, lateral bracing of the large plaster ceilings is required. Once these elements are secured with stronger anchors, the risk of coming free during a seismic event is reduced.

Santa Barbara – Figueroa Courts 1954, 1966 & 1990

The major effort on this facility requires the strengthening of the column to beam connections. There are a number of ways to achieve stronger connections. Widening the column to provide greater positive connection to the horizontal beams is one way. Inserting concrete shear walls between columns will also provide a great amount of connection to the beams, thus helping to reduce the stresses at the column to beam connections. The work is estimated to take at least one-year and completely disrupt the court in this building.

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Santa Maria – Courts – 312 E. Cook St. - North Wing

This is a two story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria – Courts - 312 E. Cook St. - South Wing

This is a two story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria Court Clerks– 312 E. Cook St.

This is a modular building and planned for demolition.

Santa Maria Court Offices– 312 E. Cook St.

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria – Jury Assembly Building - 312-East Cook St.

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Santa Maria – Juvenile Court - 812-B Foster Rd.

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Santa Barbara – Jury Assembly Bldg

This is a two story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The lateral forces will be transferred to the foundation through additional interior shear walls and reinforced exterior shear walls. The installation of these positive connections could occur from the exterior with minimal disruption to the courts. While the interior work will be targeted for minimal disruption.

Santa Maria – Bail Review Bldg

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

Santa Barbara – Juvenile Court - Hollister Ave.

This is a one story modular structure. No retrofit work is planned for this facility.

Solvang – Court/Sheriff/Library

This is a one story, wood-frame structure. The primary effort required in this facility is the positive connection between the roof framing/diaphragm members and the wall framing/shear wall members. The installation of these positive connections could occur from the exterior with minimal disruption to the courts.

19. **Work Schedule**

<u>Task</u>	<u>Duration</u>	<u>Start</u>	<u>Resource</u>
Scoping	60 days	January 2005	County/Consultant
Preliminary Design	180 days	March 2005	County/Consultant
Detail Design/Engineering	365 days	September 2005	Consultants
Plan Check	90 days	August 2006	County
Bidding (staggered)	120 days	November 2006	County
Construction (180-730 days)	730 days	March 2007	County & Various Contractor's
Total	1545 days	Jan 05 to Mar 09	

20. **Budget**

Please provide an estimate of the breakdown of activity costs in the following FEMA-approved categories:

<u>Task</u>	<u>Estimated Cost (\$)</u>
Planning	150,000
Management	120,000
Labor	0
Materials	120,000
Equipment	150,000
Land Acquisition	0
Studies	250,000
Engineering	525,000
Relocation	500,000
Demolition	450,000
Other	\$2,265,000.00

Please remember: Contingency is **not** a FEMA-allowable cost item; and Grant Administration is calculated separately.

Section III: Supplemental Information

21. **Floodplain Management and Protection of Wetlands** Hazard mitigation projects must be evaluated for potential impact on floodplains or wetlands (attach additional information as necessary).

A. Is the project in or near a wetland, swamp, marsh, etc. Yes ___ No If yes, explain:

Answer the following questions using FIS and FIRM information:

B. Is the project in: 100-year floodplain? Yes No 500-year floodplain? Yes No
A floodway? Yes No Coastal high-hazard area? Yes No

C. Does the proposed action have the potential to affect or be affected by a wetland and/or floodplain? Yes ___ No If yes, explain:

D. Does the project support development in a floodplain? Yes ___ No If yes, explain:

If you answered NO to all of the above questions, skip to Environmental Review (22).

If you answered yes to any of the above Floodplain Management questions, complete the rest of this section.

E. Has the public been notified to assist with the planning aspect of the proposed action?

F. Are there practical alternatives to the proposed action that can be completed outside of the wetland and/or floodplain?

G. Have the potential direct and indirect impacts associated with the occupancy and modification of the wetland and/or floodplain been identified?

H. Have steps been identified to minimize the impact to the proposed action?

I. Has the public been notified of the findings and final decision that taking the action in the wetland and/or floodplain is the only practical alternative?

J. Circle type of land use upstream and downstream:

Pasture/cropland (sparse development)	Upstream	Downstream
Forest/desert (undeveloped)	Upstream	Downstream
Urban (developed)	Upstream	Downstream
Wetland (marsh or sloughs)	Upstream	Downstream

K. Floodplain Manager

Who is the local floodplain manager? _____ Title: _____

Address: _____

Fax #: _____ Phone: _____ Email: _____

22. **Environmental Review** (attach detailed information as necessary)

A. Are there any completed environmental documents, consultations, or permit applications related to project, site or area? Yes _____ No

Dates of Studies _____ If yes, attach a copy.

B. Are there any biological studies completed in or around the project area?
Yes No _____ If yes, attach a copy.

C. Does the project area contain any endangered species? Yes No _____

D. Is there potential for controversy? Yes No _____ Explain: The Santa Barbara Courthouse is a treasured State and Local historic landmark. Many community members will be very interested in the scope of work and whether that work will result in the loss of historic resources. We can mitigate against these concerns by adhering to the Department of Interior Standards for the care of historic structures.

E. Is additional **environmental review** information attached to application? Yes _____ No

23. **Historical Review Checklist** (attach additional detailed information when necessary)

A. Are any of the structures in the project area over fifty years old? Yes No _____
If yes, list address(es) of structure(s). Santa Barbara Courthouse, 1100 Anacapa Street_

B. Does the proposed project affect historic properties on, or eligible for, the National Register of Historic Places? Criteria for eligibility:

- Associated with significant events, activities, or individuals
- Is a building of distinction or by an important master
- Is important for the information that can be obtained
- Contains sufficient historic integrity to convey its period of significance

Yes No _____ If yes, how is/are the structure(s) listed? Yes
Address(es) of structure(s)
Santa Barbara Courthouse, 1100 Anacapa Street _

C. Is the proposed project site located in a historic district? Yes No _____
If yes, how will the proposed project have an impact on the historic district? The project will not impact the historic district. The retrofitting of ornamental details on the historic Santa Barbara Courthouse will provide protection for the historic resources.

D. Will the project disturb previously undisturbed soil? Yes _____ No
If yes, explain: _____

E. Will the project disturb or have adverse effects outside the currently disturbed area (e.g., drainage systems or culverts under existing streets/bridges) or outside the footprint of an existing facility? Yes _____ No If yes, explain:

F. Does the construction site or surrounding area contain any cultural or archaeological resources? Yes ____ No If yes, explain:

G. If the answer to any of the questions above (A – F) is “yes,” attach recent or historic photographs of the historic properties. Are photos with application? Yes No ____

H. Is additional historical consultation information attached with application?
Yes No _____

24. Supplemental Analysis

A. If the proposed Activity is a project, complete the appropriate benefit cost worksheets in the appendix for the proposed project.

- 1) For flood mitigation projects, complete the Flood Supplement.
- 2) For seismic mitigation projects, complete the Seismic Supplement.**
- 3) For fire mitigation projects, complete the Fire Supplement.

B. If the proposed Activity is a plan or administrative measure, provide the information requested in the Planning/Administrative Measure Supplement

FLOOD SUPPLEMENT

FEMA requires a benefit-cost analysis of all projects. Benefits must be equal to or greater than the project cost for a project to be eligible for funding. The benefits considered are the reduction in expected future damages and losses due to the mitigation project.

If exact information is not available, it is acceptable to use **approximate data, reasonable estimates, or informed judgments**. However, all estimates must be clearly identified and be justified by a written explanation. Since benefit-cost analysis uses mathematical calculations, all prior damage estimates, probable future losses, duration, etc., must be quantified.

Only completed applications and supplements will be reviewed; if you have additional questions or need technical assistance while completing this supplement, please call (916) 845-8150.

or need technical assistance while completing this supplement, please call (916) 845-8150.

1. Please provide a 7.5 minute Quad Map and general area map with the location of the project on the map. Are the Maps attached? Yes
2. Were public facilities or structures damaged during a declared disaster? Yes
3. Describe the damage(s), the repair, and the cost of the repair. **Minor cracking to the concrete interior and stucco exterior (see attached PW). The total cost is estimated under \$40,000 but is believed will cost approximately \$50,000 at close out.**
4. Were the damages addressed in a Public Assistance Project Worksheet (PW)?
Yes

If yes, what is/are the PW Number(s) Project # SBC-04 – FIPS ID#083-99083-00
5. Has the PW(s) been approved for funding by FEMA or OES? Yes
6. Attach a copy of the PW(s). (ATTACHED)
7. If there is no PW for the repair of a damaged facility or structure, please explain why there was no PW written. The PW attached is for minor damage to the Courthouse facilities in North County. There was no quake damage discovered in South County, therefore, no PW's were written.
8. Were any non-profit organizations or institutions that perform essential governmental services in the project area displaced during the flood event? This is NOT a flood event.

9. What service does the non-profit or institution provide? Local Government

10. Did the non-profit or service provider temporally relocate? Yes ___ No
If yes, for how long?

11. Did another organization or government entity provide substitute services?
Yes ___ No

12. What is the usual cost to provide the service? Please separate cost into line items (moving cost, rent, computer rentals, staff members etc.).

13. What were the additional costs to provide the service during and after the flooding? Zero

14. Please explain the financial benefits of the service to the community. _____

Please review the following worksheets and questions that best describe each element of your project, and then complete the appropriate worksheet(s).

- Worksheets A, A1, and A2 are for Culvert, Detention Basin, Water Conveyance System, Openspace, Wetland, and Channel Restoration projects.
- Worksheets B, B1, and B2 are for Single Family Home Elevations and Acquisitions.

SEISMIC SUPPLEMENT

See Insert Document

FIRE SUPPLEMENT

FEMA requires a benefit-cost analysis of all projects. Benefits must be equal to or greater than the project cost for a project to be eligible for funding. The benefits considered are the reduction in expected future damages and losses due to the mitigation project.

If exact information is not available, it is acceptable to use **approximate data, reasonable estimates, or informed judgments**. However, all estimates must be clearly identified and be justified by a written explanation. Since benefit-cost analysis uses mathematical calculations, all prior damage estimates, probable future losses, duration, etc., must be quantified.

Only completed applications and supplements will be reviewed; if you have additional questions or need technical assistance while completing this supplement, please call (916) 845-8150.

Site-Specific Information for Vegetation Management: Fuel Breaks

1. Is this a fuel modification project? Yes ____ No ____
2. What methods will be used to modify the fuels?
Prescribed Fire ____ Grazing ____ Mechanical Clearing ____ Manual Clearing ____
3. How many structures will be protected by the fuel break? _____
4. What is the replacement value of the structures that this fuel break will protect?

5. Does the proposed fuel break provide infrastructure protection (e.g., bridges, roads)?
Yes ____ No ____ If yes, what is the replacement value of the infrastructure protected?

6. What is the cost per acre for the proposed fuel break? _____
7. Annually, how many fires occur in the area protected by the proposed fuel break?

8. Annually, how many fires in the area protected by the proposed fuel break exceed 100 acres?

9. Annually, how many fires in the area protected by the proposed fuel break exceed 500 acres?

Site-Specific Information for Vegetation Management: Defensible Space

1. Is this a defensible space project? Yes ____ No ____
2. What methods will be used to provide defensible space?
Enforcement of defensible space standards _____
Installation of fire resistive landscaping around existing structures _____
3. How many structures will be protected by improving defensible space?

4. What is the average replacement value of the structures that will be protected by improving their defensible space? _____
5. Annually, how many fires occur in the area protected by the improved defensible space?

6. Annually, how many fires occur in the area protected by the improved defensible space exceed 100 acres? _____

Annually, how many fires occur in the area protected by the improved defensible space exceed 500 acres? _____

PLANNING/ADMINISTRATIVE MEASURE SUPPLEMENT

This supplement is to be used for requesting funding for all or a functional part of either a Local Hazard Mitigation Plan or the California State Hazard Mitigation Plan as defined by Sec. 322. This section must also be completed when submitting an application for an administrative measure.

1. Will the plan/measure include more than one jurisdiction? Yes__ No_✓_
2. Please provide the following information for each of the jurisdictions to be included in the plan (plans only):
 - a. Jurisdiction Name
 - b. County in which the jurisdiction is located
 - c. Population of the jurisdiction
 - d. If the jurisdiction is a special district, what is the function
 - e. A map of the jurisdiction
 - f. CID Number
 - g. CRS Rating
 - h. Indicate if the jurisdiction participates in any of the following
 - i. Firewise Community
 - ii. Firesafe Councils
 - iii. Cooperating Technical Partner
 - iv. National Fire Protection Association (NFPA) 5000 Code
 - v. International Building Code
 - vi. Building Code Effectiveness Grading Schedule (BCEGS). If so what is the jurisdiction's rating?
 - vii. Mutual Aid agreement
3. Do any of the jurisdictions have any of the following plans (plans only)?
 - a. General Plan (provide status if not updated)
 - b. FEMA-approved flood mitigation plan
 - c. FEMA multi-hazard mitigation plan (Provide status if not approved)
 - d. Any other hazard mitigation plans
4. In general, identify the hazards and the vulnerabilities that will be addressed in the plan/measure, the general locations and the criticality of addressing the hazards and vulnerabilities.
5. In general, provide an overview of the plan/measure development process. Indicate if the effort will update or augment other plans.
6. If the plan is for multiple jurisdictions, please provide a map of the planning area containing the boundary of the included jurisdictions (plans only).
7. Please discuss the applicant's GIS mapping capabilities.

Section IV: Administrative Documents

25. Private Nonprofit Status (if applicable)

A. Does the applicant have private nonprofit status? Yes ____ No _____

If yes, provide the following four items:

1. The Internal Revenue Service (IRS) ruling letter granting tax exemption under sections 501 (c), (d) or (e) of the IRS Code of 1954. If you do not have such a ruling letter, you must provide satisfactory evidence that your organization or entity is organized or doing business under state law as a nonprofit entity or organization (e.g., certification from the Secretary of State). Is the above proof included with your application? Yes ___ No ___ If Yes, please attach.

2. Articles of incorporation and bylaws.

3. What essential governmental type services does the applicant provide to the general public?

4. Other supporting documents from Government Agencies.

B. Please provide a copy of any published literature describing the services your organization provides.

26. Grant Funding

A. What is the source of the applicant's matching funds? Courthouse Construction Fund and Criminal Justus Fund

Is there more than one source of the applicant's matching funds? Yes ___ No If yes, identify the sources.

<u>Source</u>	<u>Amount</u>
<u>Courthouse Construction Fund</u>	<u>\$4.3 million</u>
_____	_____
_____	_____
_____	_____
Total	<u>\$4.3 million</u>

B. Will your project require a funding advance? Yes ___ No If yes, please provide a justification.

C. Identify the entity that will be responsible for the long-term maintenance of the activity. State of California upon transfer of the facility from Santa Barbara County

What will be the cost of maintenance "per year" for this activity?

Zero

What is the funding source for the long-term maintenance of this activity?

County General Fund and State Judicial Council Funds

27. Activity and Grant Management

Please provide a description of how the activity and the grant will be managed, showing the classifications and responsibilities of those who will ensure that the activity is completed and the conditions of the grant are fulfilled. Include an organization chart showing the functions and responsible parties for completing the activity and managing the grant.

28. Designation of Applicant's Agent Resolution and Certification

Be It Resolved By The _____, of the _____
(Board of Directors or Governing body) (Name of organization)

that _____, _____ or
(name of Designated Agent) (Title)

_____, _____ or
(name of Designated Agent) (Title)

_____, _____ or
(name of Designated Agent) (Title)

is hereby authorized to execute for and on behalf of the _____
(Name of Organization)

a local government entity, state agency, special district or nonprofit organization established under the laws of the state of California, this application and to file it in the Governor's Office of Emergency Services for the purpose of obtaining certain federal financial assistance under the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, P.L. 93-288, as amended.

That the _____, hereby authorizes its agent to provide
(Name of Organization)

to the Governor's Office of Emergency Services for all matters pertaining to such disaster assistance the assurances and agreements required.

Passed and approved this _____ day of _____, 19_____
(Date) (Month) (Year)

(Name and Title of Approving Board or Council Member)

(Name and Title of Approving Board or Council Member)

CERTIFICATION

I, _____, duly appointed _____ of
(Name) (Title of Clerk or Certifying Official)

_____, do hereby certify that the above
(Name of Organization)

is a true and correct copy of a resolution passed and approved by the

_____ of the _____ (Board of
Directors or Governing Body) (Name of Organization)

on the _____ day of _____, 19_____
(Date) (Month) (Year)

(Clerk or Certifying Official)

(Signature)

(Date)

29. Subgrantee Assurance State of California Hazard Mitigation Grant Program (Section 404, Stafford Act) Note: Certain of these assurances may not be applicable to your activity or program. If you have questions, please contact OES. Further, certain federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for federal assistance, and the institutional, managerial, and financial capability (including funds sufficient to pay the nonfederal share of activity costs) to ensure proper planning, management and completion of the activity described in this application.
2. Will give the awarding agency, the Comptroller General of the United States, and if appropriate, the State of California, through any authorized representative, access to and the right to examine all records, books, papers or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose, modify use of, or change terms of real property title, or other interest in the site and facilities without permission and instructions from the awarding agency. Will record federal interest in title of real property in accordance with awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with federal assistance funds to assure non-discrimination during the useful life of the activity.
4. Will comply with the requirements of the assistance-awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progress reports and such other information as may be required by the assistance awarding agency or state.
6. Will initiate and complete the work within applicable frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest or personal gain.
8. Will comply with Intergovernmental Personnel Act of 1970 (42 U.S.A. §§ 4728-4763) relating to prescribed standards for merit systems for programs funded under one of the nineteen statutes or regulations specified in Appendix A of OEM's Standards for a Merit System of Personnel Administration (5 C.P.R. 900, Subpart F).
9. Will comply with all federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments 1972, as amended (20 U.S.A. 1681-1683 and 1685-1686) which prohibits discrimination on basis of sex; (c) Section 504 of the Rehabilitation Act 1973, as amended (29 U.S.A. 794), which prohibits discrimination on basis of handicaps; (d) the Age Discrimination Act 1975, as amended (42 U.S.A. 6101-6107) which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act 1972 (P.L. 93-255), as amended, relating to nondiscrimination on basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention Treatment and Rehabilitation Act 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) 523 and 527 of the Public Health Service Act 1912 (42 U.S.A. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act 1968 (42 U.S.A. 3601, et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for federal assistance is being made, and (j) the requirements on any other nondiscrimination statute(s) which may apply to the application.
10. Will comply, or has complied, with requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act 1970 (P.L. 91-646) which provides equitable treatment of persons displaced or whose property is acquired as a result of federal and federally assisted programs. These requirements apply to all interests in real property acquired for activity purposes regardless of federal participation in purchases.
11. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.A. §§ 4801, et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
12. Will comply with the provisions of the Hatch Act (5 U.S.A. 1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with federal funds.

13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.A. 276a to 276a-7), the Copeland Act (40 U.S.A. 276c and 18 U.S.A. 874), the Contract Work Hours and Safety Standards Act (40 U.S.A. 327-333) regarding labor standards for federally assisted construction subagreements.

14. Will comply with the flood insurance purchase requirements, Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a Special Flood Hazard Area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.

15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of activity consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.A. 1451, et seq.); (f) conformity of federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.A. 7401 et seq.); (g) protection of underground drinking water under the Safe Drinking Water Act 1974, as amended (P.L. 93-523); (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205); and (i) addresses environmental justice in minority and low-income populations in compliance with EO 12898.

16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.A. 1271, et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.A. 470), EO 11593 (identification and preservation of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.A. 469a-1, et seq).

18. Will cause to be performed in the required financial and compliance audits in accordance with the Single Audit Act of 1984.

19. Will comply with all applicable requirements of all other federal laws, Executive Orders, regulations and policies governing this program.

The undersigned represents that he/she is authorized by the subgrantee to enter into this agreement for and on behalf of the said subgrantee.

_____	_____
Name or Authorized Applicant's Agent	Title
_____	_____
Signature of Authorized Applicant's Agent	Date

30. Authorization

I, _____, do hereby certify as the authorized representative or officer of
(Name)

_____, that the information contained in this application is true and
(Name of Organization)

correct.

_____	_____	_____
(Title)	(Signature)	(Date)

31. Document Checklist

Compliance Review for Environmental Laws

To help assure an expeditious review of your application by FEMA, here are some guidelines for providing environmental documentation. Please place a check mark next to the appropriate maps, documents, or other items you have included with your application.

- A clear written description of the entire scope of work, including any alternatives that may be under consideration, and any additional work, not funded by FEMA, that will be performed at substantially the same time. Include any available studies, plans, drawings, sketches, or schematics to help describe the entire project.
- Photos as required showing the proposed project area in the context of its surroundings. If the project is a building, show all sides of the entire building (at least from opposite corners), and the context of the building in its setting including the surrounding buildings. If the project is in a rural setting, show the project area in the foreground with the background of the surrounding area in all four directions.
- Location maps (e.g., USGS maps, Thomas Bros. Maps or city maps), as necessary to show the undertaking in the context of its surroundings. For projects in rural settings or for projects with ground disturbing activities, USGS maps are mandatory.
- Documentation of any other agency's environmental determinations within the scope of the project and surrounding areas.

A. National Historic Preservation Act

- Documentation of the date of construction for the original, existing facility (e.g., building permit records, tax records, newspaper accounts, architectural drawings, etc.).
- Plans showing the limits of proposed excavations or other ground-disturbing activities associated with the project.
- Location maps, in addition to those provided above, showing the project within local, state, or national historic districts.
- Local, state or national landmark listings of historic properties within the project area, including the National Register of Historic Places.
- Any existing cultural resource surveys or reports describing the archaeological/historic properties (e.g., archaeological sites, historic buildings, historic landmarks, etc.) that exist within the project area or could be affected by the project.
- Copies of any available plans for the existing facility as well as documentation of any changes made since the original construction.

B. Endangered Species Act

- Documentation (e.g., California Natural Diversity Data Base Report, Biological Assessment, Initial Study, Environmental Impact Report) evaluating biological resources that might be affected by the project activities.
- Documentation of coordination with other agencies (e.g., USFWS, CDF&G, etc.), including reports, studies and recommendations.
- Species lists identifying endangered or threatened species that might be affected by the proposed project.

C. Fish and Wildlife Coordination Act

- Detailed plans and studies for the control or modification of a natural stream or body of water.
- Documentation of coordination with other agencies (e.g., USFWS, NOAA and NMFS, etc.), including reports, studies and recommendations.
- Detailed maps, reports and studies documenting the scope of the project and surrounding areas including construction of dams, levees, impoundments, stream relocation, and water-diversion structures.
- Detailed descriptions and related reports and studies of proposed discharges of pollutants including industrial, mining, and municipal wastes or dredged and fill material into a body of water or wetlands.
- Recommendations of the USFWS and affected state(s) for protecting fish and wildlife.

D. Wild and Scenic Rivers Act

- Detailed plans and studies for the construction of any water resource project (e.g., dam, water conduit, reservoir, powerhouse, transmission line, discharge to water, or development project).
- Documentation of coordination with other agencies (e.g., NPS, BLM, USFWS, and FS, etc.), including reports, studies, and recommendations.
- Detailed maps, reports, and studies documenting the scope of the project and surrounding areas including scenic, recreational, geological, fish and wildlife, historic, cultural, or similar areas.

E. Coastal Zone Management Act

- Detailed maps, reports, and studies documenting the scope of the project and surrounding areas as they relate to the nation's coastal zones (e.g., islands, beaches, transitional and intertidal areas, salt marshes, etc., including any land extending inward to the extent necessary to control shorelines).
- Documentation of coordination with other agencies (e.g., Office of Ocean and Coastal Resource Management, USFWS, NOAA, etc.) and the state, including reports, studies, and recommendations.
- Documentation of compliance/consistency with state coastal management programs and plan.

F. Executive Order 11988 - Floodplain Management, May 24, 1977

- Detailed maps (e.g., FIRM, FBFM, State designated floodway maps, etc.) defining floodplain/floodway boundaries within the project area.
- Reports and studies (e.g., hydrology, hydraulics, etc.), documenting the scope of the project and surrounding areas as they relate to the occupancy or modification of floodplains including direct and indirect effects.
- Documentation of compliance/consistency with federal, state, local, and county floodplain management programs and plans.
- Documentation of coordination with other agencies (e.g., USACE, NRCS, DWR, USBR, NFIP, USFWS, DF&G, etc.), including reports, studies, and recommendations.
- Documentation of any Public Notices or public meetings.

G. Executive Order 11990 - Protection of Wetlands, May 24, 1977

- Detailed maps (e.g., USACE, USFWS Wetland Maps) defining wetland boundaries within the project area.
- Reports and studies (e.g., wetland assessment, hydrology, hydraulics, etc.), documenting the scope of the project and surrounding areas as they relate to the occupancy or modification of wetlands including direct and indirect effects.
- Documentation of compliance/consistency with federal, state, local and county floodplain management programs and plans.
- Documentation of coordination with other agencies (e.g., USACE, NRCS, DWR, USBR, NFIP, USFWS, DR&G, etc.), including reports, studies, and recommendations.
- Documentation of any Public Notices or public meeting.

H. Executive Order 12898 - Environmental Justice for Low Income and Minority Populations

- Documentation of coordination with other agencies (e.g., US Census Bureau, Local and Community Planning and Development Agencies, etc.), including reports, studies and recommendations.
- Reports and studies (e.g., traffic, noise, odor, etc.), documenting the scope of the project and surrounding areas as they relate to low income and minority populations including direct and indirect effects.
- Census data and income information on affected populations (e.g., location of Section 8 Housing, etc.).

I. Other Relevant Laws and Environmental Regulations

- See examples above.

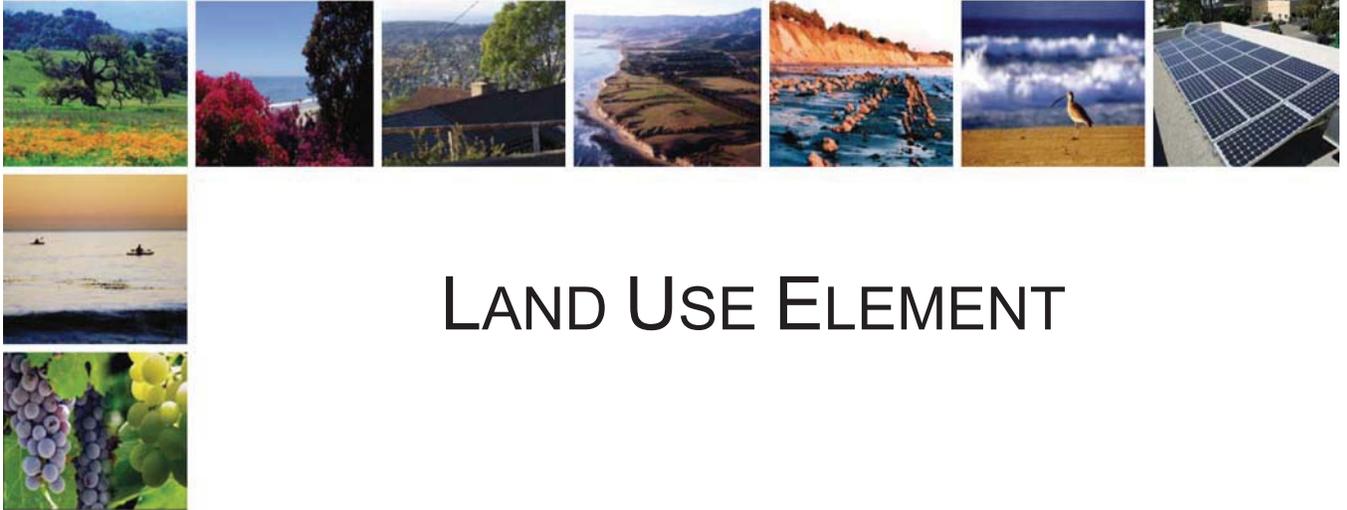
32. Application Checklist

Indicate page numbers in your application where the following items may be found.

- 1. Federal Information Processing (FIPS) Number
- 2. Applicant Name
- 3. Applicant's Address
- 4. Applicant Type
- 5. Legislative Districts
- 6. Authorized Applicant's Agent
- 7. Activity Location
- 8. Activity Manager/Working Contact
- 9. Alternate Contact
- 10. Activity Type
- 11. Activity Title/Name
- 12. Brief Summary of the Problem
- 13. Brief Summary of the Proposed Solution
- 14. Duplication of Programs
- 15. Total Activity Cost
- 16. Detailed Description of the Problem
- 17. Detailed Description of How the Proposed Activity Will Eliminate or Reduce the Problem
- 18. Activity Alternatives
- 19. Work Schedule
- 20. Budget
- 21. Floodplain Management and Protection of Wetlands
- 22. Environmental Review
- 23. Historical Review Checklist
- 24. Supplemental Analysis
- 25. Private Nonprofit Status
- 26. Grant Funding
- 27. Activity and Grant Management
- 28. Designation of Applicant's Agent Resolution and Certification
- 29. Subgrantee Assurances
- 30. Authorization
- 31. Document Checklist

- 32. Application Checklist

Exhibit B
To
Attachment C



LAND USE ELEMENT

ADOPTED 1980
REPUBLICATED MAY 2009

SANTA BARBARA COUNTY
COMPREHENSIVE GENERAL PLAN



County of Santa Barbara
Planning and Development
123 E. Anapamu Street
Santa Barbara, CA 93101

The electronic version of the Santa Barbara County Comprehensive Plan can be found at: <http://longrange.sbcountyplanning.org>



Former Land Use Element Cover – Replaced March 2009

Board of Supervisors

David M. Yager, First District
Robert E. Kallman, Second District
William B. Wallace, Third District
DeWayne Holmdahl, Fourth District
Harrell Fletcher, Fifth District

Planning Commission

Joan Wells, First District
Peg Hamister, Second District
Ralph Philbrick, Third District
Ken Stillman, Fourth District
Don Lahr, Fifth District

Santa Barbara County Resource Management Department

Dianne Guzman, Director
Comprehensive Planning Division:
Kirvil Skinnarland, Deputy Director
Noel Langle, Graphics

PREAMBLE

The Comprehensive Plan is a means by which more orderly development and consistent decision making can be accomplished. The Plan involves a continuing process of research, analysis, goal-setting and citizen participation. The major purpose of the Comprehensive Plan is to enable the Santa Barbara County Board of Supervisors and Planning Commission to more effectively determine matters of priority in the allocation of resources, and to achieve the physical, social and economic goals of the communities.

The land uses proposed within this plan and depicted on the land use maps are to be used to guide the public and the decision-makers as to what uses are appropriate if and when development occurs. The question of whether that development can occur at any given time will be based on the site specific evaluation of the project's overall impact on available resources, public services, and environmental factors.

TABLE OF CONTENTS

INTRODUCTION.....	8
I. OVERVIEW	8
II. METHODOLOGY	8
III. PLANNING AREAS – CITIZEN PARTICIPATION	12
LAND USE ELEMENT	15
I. INTRODUCTION	15
II. POPULATION AND ECONOMIC TRENDS	16
III. MAJOR ISSUES	23
AIR QUALITY	23
HOUSING	30
LAND USE AND ENERGY	32
LAND USE AND CONVENTIONAL ENERGY SOURCES	32
ALTERNATE ENERGY AND LAND USE	33
RECREATION	38
RECREATION SECTION MAPS:	66
IV. GOALS AND POLICIES	67
REGIONAL	67
LAND USE DEVELOPMENT POLICIES	68
PLANNED DEVELOPMENT POLICIES	74
HILLSIDE AND WATERSHED PROTECTION POLICIES	77
STREAMS AND CREEKS POLICIES	78
FLOOD HAZARD AREA POLICIES	78
HISTORICAL AND ARCHAEOLOGICAL SITES POLICIES	80
PARKS/RECREATION POLICIES	80
OTHER OPEN LANDS POLICIES (For Parcels designated Other Open Lands)	80
VISUAL RESOURCE POLICIES	81
PUBLIC FACILITIES	81
SOUTH COAST POLICIES	84
V. AREA/COMMUNITY GOALS	88
CARPINTERIA	89
SUMMERLAND	90
MONTECITO	90
SANTA BARBARA AREA	91
GOLETA	94
SANTA YNEZ VALLEY	95
LOMPOC AREA	96
SANTA MARIA/ORCUTT AREA	99
ORCUTT	101
LOS ALAMOS PLANNING AREA:	101
LAND USE HOLDING CAPACITY	103
METHODOLOGY FOR CALCULATING DWELLING UNIT CAPACITY AND DISTRIBUTION	103
METHODOLOGY FOR CALCULATING DEVELOPED AND UNDEVELOPED LAND	104
HOLDING CAPACITY TABLES BY PLANNING AREA	105
CARPINTERIA AREA	105
SANTA BARBARA AREA	109
GOLETA VALLEY AREA	112
SANTA YNEZ VALLEY	116
LOMPOC AREA	120
SANTA MARIA/ORCUTT AREA	124
GUADALUPE-CASMALIA AREA	128

SISQUOC-GAREY AREA	131
CUYAMA VALLEY	134
LAND USE DEFINITIONS	137
LAND USE ELEMENT MAPS	152
APPENDIX.....	154
Participating County Staff.....	154
Other Information Sources.....	154
Area Advisory Committees	155
Community Plans	156
BIBLIOGRAPHY.....	157
INDEX	158
CITATIONS.....	160

LIST OF FIGURES

A COMPREHENSIVE PLAN COMPONENT RELATIONSHIPS	11
B SANTA BARBARA COUNTY PLANNING AREAS	13
C POPULATION AGE STRUCTURE, SANTA BARBARA COUNTY 1975.....	20
D AIR QUALITY ATTAINMENT AREAS.....	27
E ANNUAL ENERGY CONSUMPTION.....	35
F CARPINTERIA-SUMMERLAND PLANNING AREA	105
FIGURE G [DELETED, CASE NO. 92-GP-14, BOARD RESOLUTION 92-516, 9/15/92.]	108
H SANTA BARBARA PLANNING AREA	109
I GOLETA PLANNING AREA	112
J SANTA YNEZ VALLEY PLANNING AREA.....	116
K LOMPOC PLANNING AREA.....	120
L SANTA MARIA-ORCUTT AREA.....	124
M GUADALUPE-CASMALIA PLANNING AREA	128
N LOS ALAMOS-SISQUOC-GAREY PLANNING AREA	131
O CUYAMA VALLEY PLANNING AREA	134
P LAND USE MAP KEY.....	151

LIST OF TABLES

1. SANTA BARBARA COUNTY POPULATION 1940-1977	17
2. SANTA BARBARA COUNTY POPULATION 1975	18
3. RELATIONSHIP BETWEEN CHANGE IN POPULATION AND CHANGE IN HOUSEHOLDS, SANTA BARBARA COUNTY 1970-1975	19
4. [DELETED, CASE NO. 91-GP-3, BOARD RESOLUTION 91-536, 9/3/91.].....	37
5. PROPOSED PARKS AND JOINT USE FACILITIES.....	43
6. RECREATION DEMAND SUMMARY	46
7. RECREATION FACILITY STANDARDS	47
8. RECREATION DEMAND PROJECTIONS	48
9. EXISTING FACILITIES INVENTORIES.....	58
10. RECREATION UNIT TYPE DEFINITIONS.....	63
11.A CARPINTERIA-SUMMERLAND PLANNING AREA – DWELLING UNIT CAPACITY.....	106
11.B CARPINTERIA-SUMMERLAND PLANNING AREA – LAND USE CAPACITY	107
TABLE 12 [DELETED, CASE NO. 92-GP-14, BOARD RESOLUTION 92-516, 9/15/92.]	108
13.A SANTA BARBARA PLANNING AREA – DWELLING UNIT CAPACITY.....	110
13.B SANTA BARBARA PLANNING AREA – LAND USE CAPACITY	111
14.A GOLETA PLANNING AREA – DWELLING UNIT CAPACITY	113
14.B GOLETA PLANNING AREA – LAND USE CAPACITY.....	114
15.A SANTA YNEZ VALLEY PLANNING AREA – DWELLING UNIT CAPACITY.....	117
15.B SANTA YNEZ VALLEY PLANNING AREA – LAND USE CAPACITY	118
16.A LOMPOC PLANNING AREA – DWELLING UNIT CAPACITY	121
16.B LOMPOC PLANNING AREA – LAND USE CAPACITY.....	122
17.A SANTA MARIA – ORCUTT PLANNING AREA – DWELLING UNIT CAPACITY	125
17.B SANTA MARIA - ORCUTT PLANNING AREA – LAND USE CAPACITY	126
18.A GUADALUPE – CASMALIA PLANNING AREA – DWELLING UNIT CAPACITY	129
18.B GUADALUPE – CASMALIA PLANNING AREA – LAND USE CAPACITY	130
19.A LOS ALAMOS-GAREY-SISQUOC PLANNING AREA – DWELLING UNIT CAPACITY	132
19.B LOS ALAMOS-GAREY-SISQUOC PLANNING AREA – LAND USE CAPACITY	133
20.A CUYAMA VALLEY PLANNING AREA – DWELLING UNIT CAPACITY	135
20.B CUYAMA VALLEY PLANNING AREA – LAND USE CAPACITY	136

INTRODUCTION¹

I. OVERVIEW

State Planning Law (California Government Code, § 65300) requires each county and city to adopt “a comprehensive long-term general plan.” This plan shall consist of the following nine elements:

1. Land Use
2. Circulation
3. Conservation
4. Open Space
5. Seismic Safety
6. Noise
7. Housing
8. Safety
9. Scenic Highways

In addition to these nine mandatory documents the county may adopt optional elements such as air quality, energy, recreation, historical preservation, etc., or “such additional elements dealing with other subjects which in the judgment of the planning agency relate to the physical development of the county or city.”

This document of the Santa Barbara County Comprehensive Plan includes the Land Use Element, the Circulation Element, and the Environmental Resources Management Element (ERME). The ERME combines the findings of the Seismic Safety, Conservation, and Open Space Elements. The Safety Element has been combined with Seismic Safety and its findings are included in the ERME. A chapter on recreation is also included within this document. The Housing, Noise, and Agricultural Elements for the county are separate documents.² In November of 1975 the Board of Supervisors approved the County Scenic Highways Element. Figure A illustrates the internal structure of the Comprehensive Plan and the relationship among the elements.

The formulation of the Land Use and Circulation Elements was based on the technical data and analysis contained in the other seven Comprehensive Plan Elements. An index to the major topics of these elements is included at the back of this document. In addition various departments, agencies and programs were involved in the Comprehensive Plan process. These are noted in Figure A and summarized below.

II. METHODOLOGY

The most critical part of the Comprehensive Plan work program was the systematic correlation and analysis of a wide variety of input data. The staff's initial efforts were in synthesizing this volume of information with the recommendations of the various agencies and committees. The outline below briefly reviews the various informational sources. These are not, however, sequential steps, since in most cases the information was accumulated in overlapping phases.

Livingston and Associates “Workbooks”

Base material was prepared under the direction of Livingston and Associates by Moore and Taber, Consulting Engineers and Geologists; Royston, Hanomoto, Beck and Abey, Environmental Planners and Landscape Architects; Environmental Systems Research Institute, Computer Graphics; and a team of environmental biologists and archaeologists from UCSB. This material was revised and updated by the staff for the Seismic Safety, Conservation, and Open Space Elements to produce the Environmental Resources Management Element (ERME).

1965 County General Plan (Updated to 1977) and Existing County Land Use

The existing County General Plans (Land Use, Circulation, and Open Space) as well as the existing county land use patterns were computed and analyzed in relation to the proposed County Comprehensive Plan Elements.

General Plan Advisory Committees (GPAC’s)

Staff worked with seven area advisory committees to formulate statements of goals and policies, and land use and circulation recommendations for each planning area.

City Plans

The Comprehensive Plan Land Use and Circulation Elements were coordinated with the general plans of Carpinteria, Santa Barbara, Lompoc, Guadalupe, and Santa Maria cities.

Local Coastal Program (LCP)

The staff cooperated with the Local Coastal Program in formulating the Comprehensive Plan.

Air Quality Maintenance Plan (AQMP) and Air Quality Attainment Program (AQAP)

Where appropriate, the recommendations of the AQMP and AQAP were incorporated into the Land Use Element.

Area Planning Council (APC)

The findings of the Regional Housing Element, Regional Land Use Element, and Transportation Plans were related to the Comprehensive Plan (Housing, Land Use, and Circulation Elements).

District Plans

The staff contacted water, sanitary, school, and fire districts for their recommendations in developing the Land Use Element.

County Water Agency

Planning staff incorporated relevant findings from the Water Agency “Program of action for Water Resources Planning” reports into the Conservation and Land Use Elements.

Local Agency Formation Commission (LAFCO)

The sphere of influence studies developed by LAFCO were related to the Comprehensive Plan Land Use and Circulation Elements.

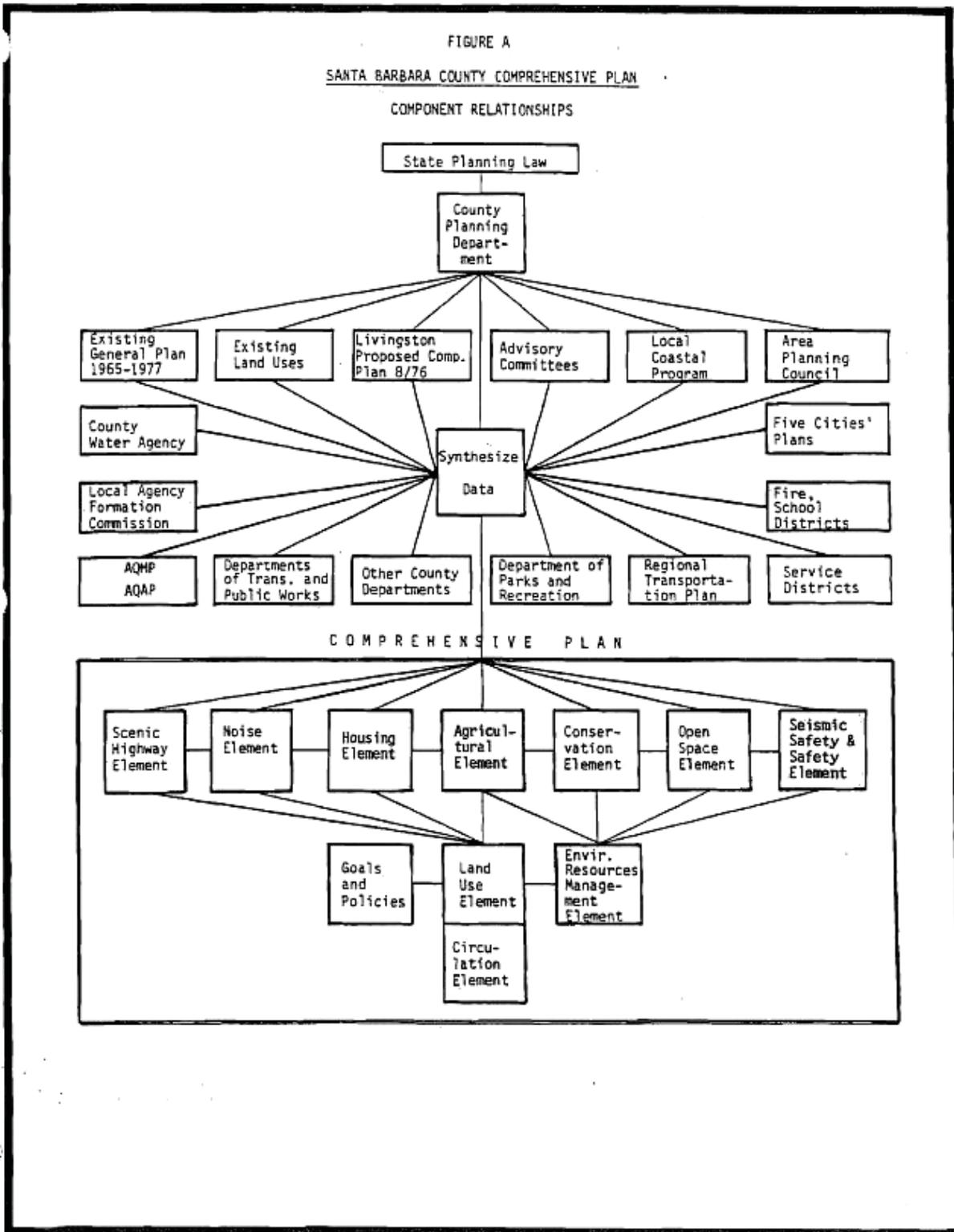
Federal and State Agencies

Appropriate federal and state agencies were contacted for information and plan preparation--U.S. Forest Service; Vandenberg Air Force Base; University of California, Santa Barbara; State Department of Parks and Recreation; and Office of Planning and Research.

Generally, in preparing the Comprehensive Plan, all undeveloped lands were subject to a wide range of environmental studies to determine those lands that unquestionably should be preserved in open land use such as drainage areas, steep terrain, existing and potential prime agricultural lands, etc. The remaining land areas were then reviewed for potential development to meet future population and economic needs.

Although the Comprehensive Plan focuses on environmental factors, human values were also considered as equally important. The Land Use Element provides areas for such uses as housing, employment, education, recreation and public facilities while preserving the character and aesthetic quality of the various regions of the county. This plan includes the entire Santa Barbara County unincorporated area.

A Comprehensive Plan Component Relationships

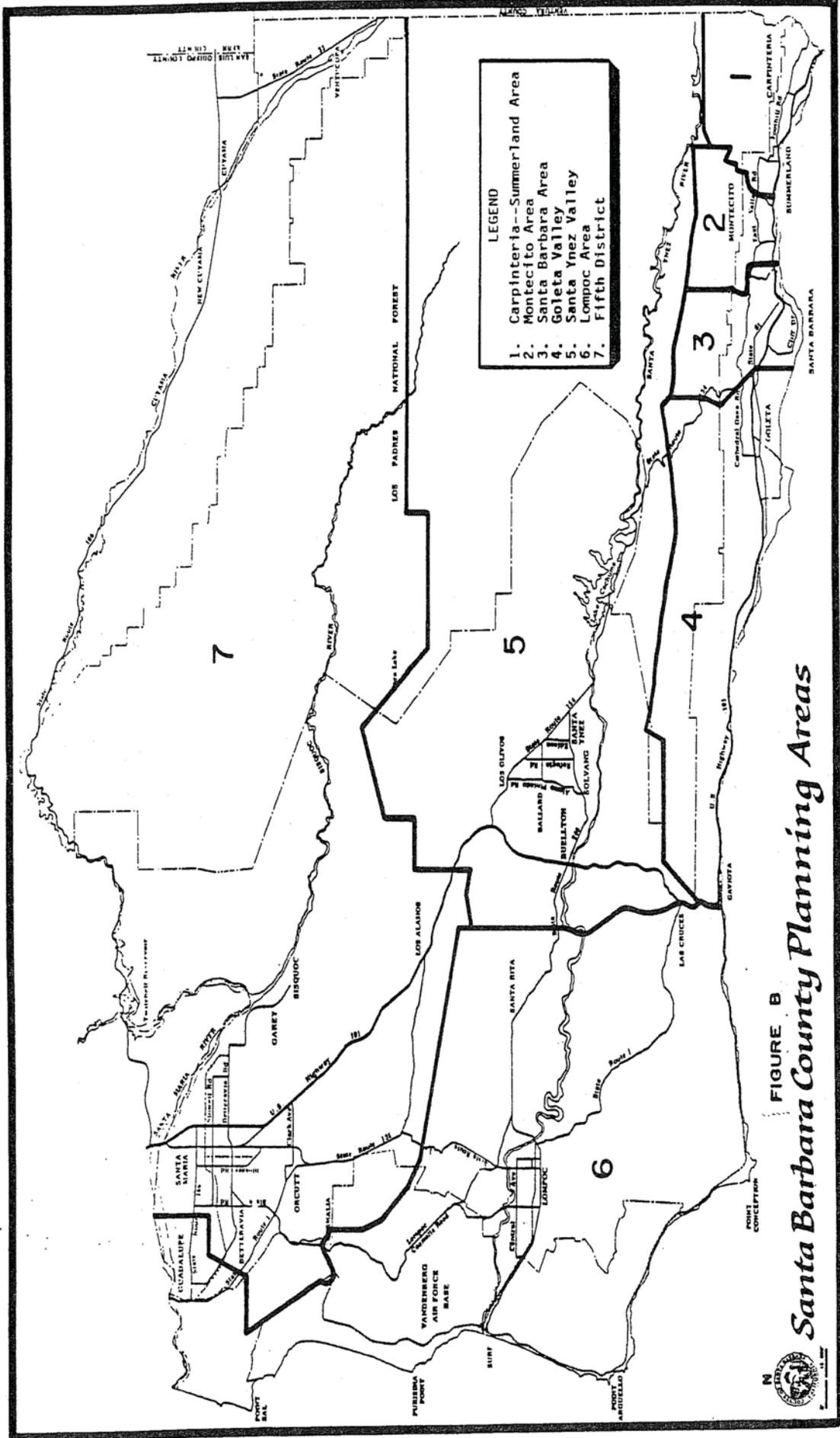


III. PLANNING AREAS – CITIZEN PARTICIPATION

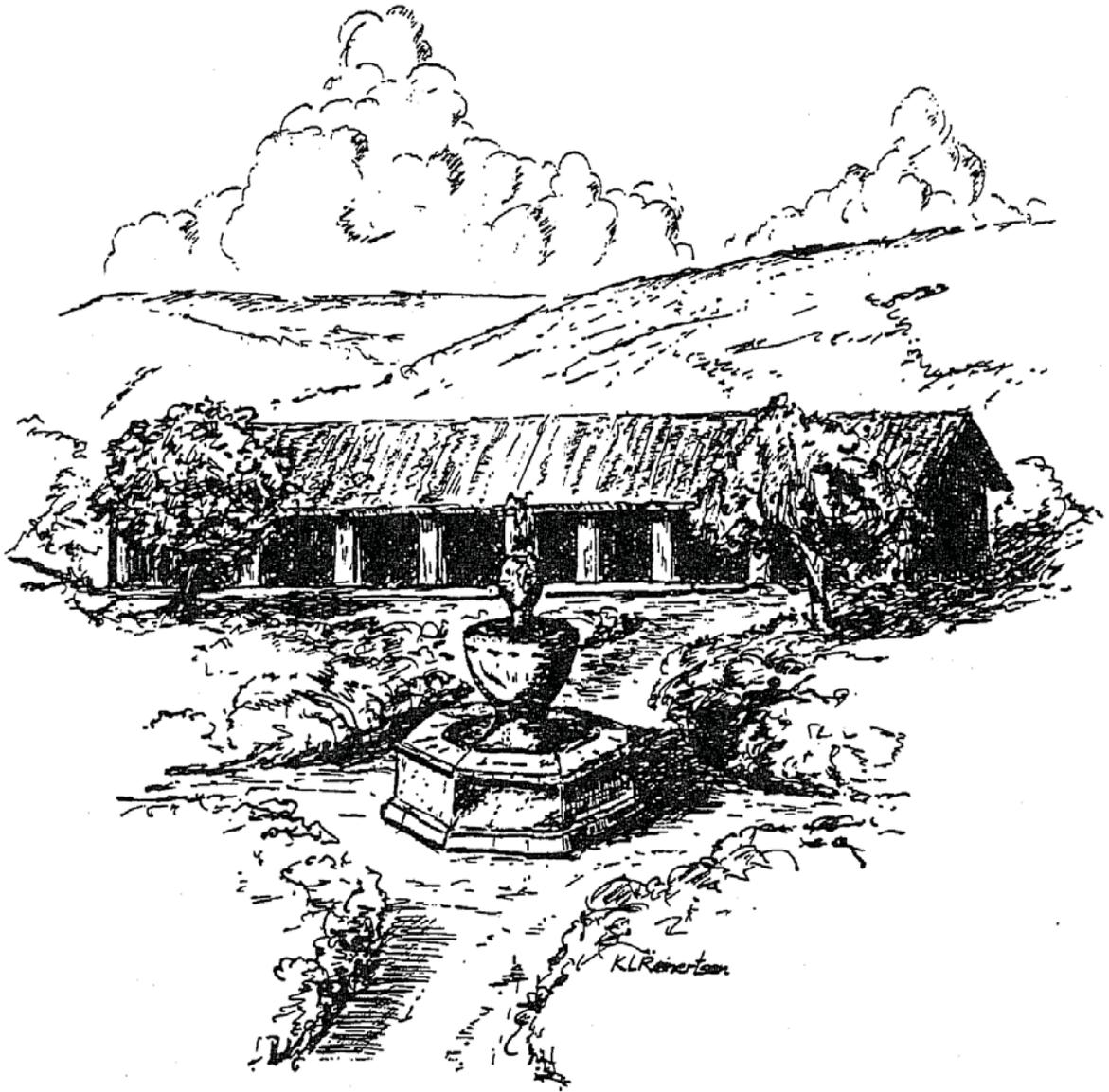
Santa Barbara County encompasses 2,774 square miles and has considerable physical, historical, and cultural diversity. For many studies, converting or summarizing the data to countywide totals and averages is sometimes necessary. However, this does not permit the analysis and description of individually identifiable areas of the county, nor does it permit the determination of interrelationships and distinctions between communities.

For this reason it was necessary to collect and interpret data within the framework of planning areas. These areas were used as a base for developing the Land Use and Circulation plans. The seven county planning areas were selected to coincide with the area advisory committees previously established by the Board of Supervisors for county citizen participation in the planning and zoning process. Figure B shows these county planning areas and their respective advisory committee representation.

B Santa Barbara County Planning Areas



LAND USE ELEMENT



La Purisima Mission

LAND USE ELEMENT

I. INTRODUCTION

The Land Use Element brings together the variety of research findings, Advisory Committee goals and policies, and proposals from the other Comprehensive Plan Elements. As stated in the General Plan Guidelines.

In differing degrees all of the elements of the general plan will contain policies or proposals which relate to the land use element. The land use and circulation elements are almost inseparably related. The nature, routing and design of circulation facilities are among the major determinants of the form of human settlement and of the uses of the land. Conversely, land uses create demand for circulation facilities.

The safety and seismic safety elements provide information and policies regarding natural and man-made hazards which need to be recognized in the land use element. Together with the open space element, they define lands to be reserved in a natural state and other lands for urban purposes or for production of food, fiber or minerals. Considered along with the conservation element, they define criteria and standards and identify programs needed to control the impact of man's activities on the natural environment.

The Land Use Element matches the environmental factors and open space preservation recommendations of the Environmental Resources Management Element with the urban land needs identified by the County General Plan Advisory Committees and Resource Management Department staff.

The purpose of this element is to interrelate all of the different factors that affect population growth, urban development and open land preservation and to represent the county's policy on land use. No specific horizon year was selected for land use buildout because of the uncertainty of projecting physical development needs beyond 1990. The Land Use Element should be reviewed every five years (i.e., 1985, 1990, 1995, etc.) to keep it up to date and responsive to changing issues and conditions. This review should take the form of a thorough needs assessment within each planning area.

The land use plan for each area has been designated to represent ultimate development with no designated planning period. Although resource constraints on development may affect the rate of growth, the Resource Management Department staff and Advisory Committees worked under the premise that the land use plan should represent the best possible development for each community. This does not imply that the land uses for any area will be fully developed by any particular date. Charts are provided in a subsequent section of the Land Use Element to indicate the dwelling unit holding capacities and acreages of the various land use designations within each planning area. Similar tables for areas within the Coastal Zone can be found in the Local Coastal Plan.

No urban development should be permitted beyond boundaries of land designated for urban uses. The resulting concentration of urbanization not only will avoid costly scattered development, but also will help minimize energy usage and impacts on air quality. The Land Use Element may be amended to designate additional urban development within the urban boundary only when it has been clearly demonstrated that a land use category in an area is insufficient to permit a reasonable choice of sites for development of appropriate types. It is the policy of the Santa Barbara County Planning Commission to require the applicant for a General Plan amendment to submit “evidence supporting the need for such amendment” (Resolution No. 78-53). In 1974, the State Planning Law was amended to require that zoning ordinances be consistent with the general plans. All zone changes and general plan amendments must be consistent with the other general plan elements, and no element may be amended more frequently than three times during a calendar year except for projects providing at least 25 percent affordable housing.

It should be emphasized that the Land Use Element does not guarantee that a particular project will be allowed at the density or intensity of use shown on the land use maps. Although environmental factors were one of the criteria used in establishing the land use designations, it was impossible to do specific site analysis for all of these factors in all areas. For example, a parcel designated as “residential, one acre or more per dwelling unit” could include areas with excessively steep slopes. A proposed project under this designation would require specific design review to insure that this problem is mitigated. As a result, the development may be of a lesser density than shown on the land use map. Similarly, new or more detailed information may be found during project review which could necessitate project design changes or amendment of the land use designation.

II. POPULATION AND ECONOMIC TRENDS

Population Characteristics

Santa Barbara County is currently the sixteenth most populous county in California, accounting for 1.3 percent of the total state population. According to the California Department of Finance, total population in the County was 288,900 in July, 1977.

1. Santa Barbara County Population 1940-1977

TABLE 1:
 Santa Barbara County Population 1940-1977

	<u>Population</u>	<u>Percent Change</u>
<u>U.S. Census</u>		
1940 April 1	70,555	
1950 April 1	98,220	+39.2
1960 April 1	168,962	+72.0
1970 April 1	264,324	+56.4
<u>California Dept. of Finance Estimates</u>		
1970 July 1	265,700	+ 0.9
1971 July 1	269,600	+ 1.5
1972 July 1	270,400	+ .3
1973 July 1	273,700	+ 1.2
1974 July 1	277,600	+ 1.4
1975 July 1	281,100	+ 1.3
1976 July 1	286,300	+ 1.9
1977 July 1	288,900	+ .9

Source: California Employment Development Department,
 "Annual Planning Information," 1978-1979

This represented an increase of approximately 23,200, or 8.7 percent, since July, 1970.

The annual growth in the seventies of 1.2 percent is a much slower growth rate than in the prior decade, when the development of Vandenberg Air Force Base and the build-up of University of California at Santa Barbara spurred a population increase of 5.6 percent annually.

At the time of the October, 1975 Special Census of population, there were 281,906 people living in Santa Barbara County. Approximately 51% of the population resided in incorporated cities. Of the remaining population in the unincorporated area (138,664), approximately 62% resided in the more urbanized South Coast portion of the County, approximately 4% in the area surrounding the City of Lompoc, and 14% in the area surrounding Santa Maria City. Table 2 summarizes the results of the 1975 Special Census.

2. Santa Barbara County Population 1975

TABLE 2:
 Santa Barbara County Population, 1975

<u>Jurisdiction</u>	<u>Number</u>	<u>Population Percent</u>
City of Guadalupe	3,078	1.1%
City of Santa Maria	33,853	12.0%
City of Lompoc	24,399	8.7%
City of Santa Barbara	72,526	25.7%
City of Carpinteria	9,386	3.3%
Unincorporated	<u>138,664</u>	<u>49.2%</u>
TOTAL	281,906	100.0%

Figure C depicts the age profile of the residents of Santa Barbara County at the time of the 1975 Special Census. The peak in the curve, between approximately age 10 and age 30, corresponds to the years of higher birth rates which began after World War II and extended into the 1960s. An additional factor which raises the 20-24 year old peak somewhat higher than the national average is the influence of UCSB and other institutions of higher education which comprised approximately 33,000 students in 1976.

The maturing younger age group will have special effects on services and resources such as increasing demand for housing and jobs, and decreasing demand for primary and secondary education (as seen by recent elementary school enrollment decreases in most school districts in the South Coast). If jobs are not available, employment opportunities will have to be sought in other areas, thus reducing the number of people in the younger population age group. The decline in birth rates has another direct affect on community development. The number of households is increasing; however, these new households are smaller because family size is smaller. Also, older people are living longer, and their children move out and form their own households at an earlier age than formerly. Additional reasons why the number of households is increasing are divorce, single-parent households, and the formation of single-person households. As a result, the number of households increases, even though the population may not increase. Presently it appears households increase at two to three times the population increase (See Table 3).

**3. Relationship Between Change in Population and Change in Households, Santa Barbara County
1970-1975**

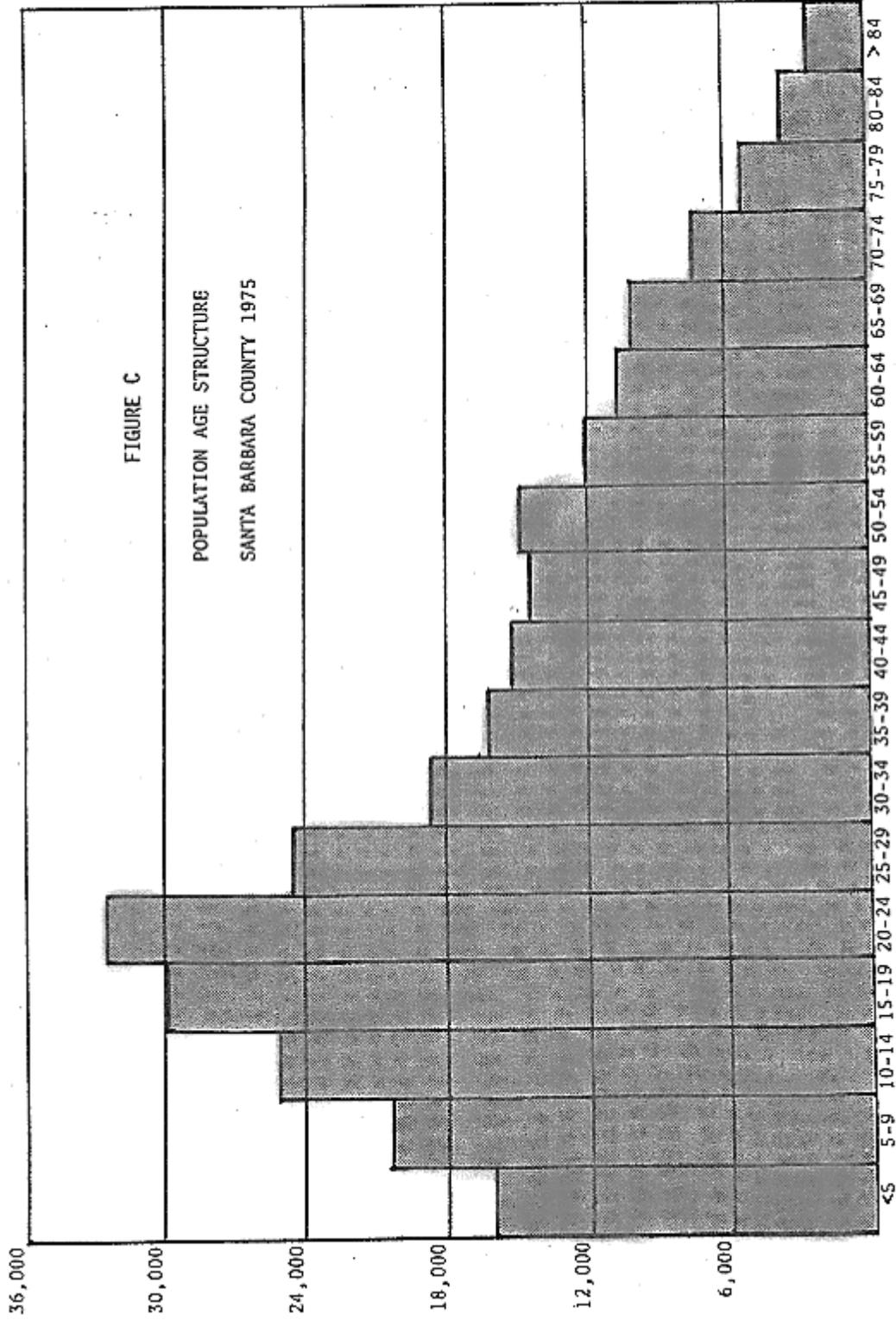
TABLE 3:
Relationship Between Change in Population and
Change in Households, Santa Barbara County, 1970-1975.

	<u>Increase in Population</u>	<u>Increase in Households</u>
North County	Less than 1/2%*	13%
South County	11%	21%
County Average	6%**	18%

*3% without Vandenberg AFB

**7% without Vandenberg AFB

C Population Age Structure, Santa Barbara County 1975



Economics and Employment

The following is a description of economic and employment centers in Santa Barbara County, primarily those categorized by the Standard Industrial Classification System (SIC).

Agriculture. Agricultural employment averaged 6,500 workers per month and is not expected to rise significantly above this level. Use of seasonal farm workers in 1977 was estimated at around 40 percent of the total farm workers employed (Santa Barbara County, 1978).

Mining. Employment in the mining sector has grown in proportion to firms engaging in the exploration for crude petroleum and natural gas. The current forecast holds employment in this sector steady; however, increases in employment can be expected from expanded production in the north county oil fields, continued development of offshore oil from existing oil leases, development resulting from new lease sales in the Santa Barbara Channel, and the prospects of a Liquefied Natural Gas (LNG) terminal at Point Conception (Santa Barbara County, 1978).

Construction. Development is often counter cyclical to the national economy. Although the number of building permits has risen, the continued demand for construction is expected to shift toward the north county.

Manufacturing, Research and Development. This sector provides the greatest input into the economy of the south coast. Because of the nature of the industry, this sector of the local economic base is especially subject to fluctuations in the national economy (Santa Barbara County, 1978).

Transportation and Public Utilities. The employment in this sector has reported only moderate gains. Most of the gains were recorded in transportation areas (trucking, etc.) as a response to the industrial expansion (Santa Barbara County, 1978).

Wholesale Trade. Wholesale trade employment is expected to resume its upward trend as the local economy continues to improve. The nondurable goods wholesaling is dependent on the success of the agricultural sector whereas durable goods will grow in proportion to the local economy (Santa Barbara County, 1978).

Retail Trade. Retail trade is the second largest provider of new jobs in the county. Moreover, the total dollar evaluation of all taxable retail sales in Santa Barbara County rose in 1977, increasing 16 percent to \$855.8 million. Santa Barbara City, accordingly, made up 50 percent of these retail sales, with the other incorporated north county entities providing the remaining amount of retail sales. (Santa Barbara County, 1978).

Finance, Insurance, and Real Estate. Employment in these sectors is proportional to general improvement in business conditions in the County. Real estate and finance will increase as growth creates new demands (Santa Barbara County, 1978).

Services. Services continue to post the largest gain in employment and remains the largest employee sector in the County. The variety of needs required (local serving sector) to meet the growing population will continue the growth in services throughout the County (Santa Barbara County, 1978).

Property Income. Property income includes royalties on patents, copyrights, rights to natural resources and imputed net rents, personal interest incomes and cash dividends. It has been suggested that approximately 13 percent of the reported property income is imputed, i.e., it does not represent an actual flow of funds.

Proprietors Income. This sector includes net business earnings of owners of unincorporated enterprises, including farmers, doctors, dentists, lawyers, etc.

Student Expenditures. Higher educational institutions often draw enrollments from outside the region. In addition to tuition and fees paid directly to the schools, the students spend money for goods and services in the local economy. Thus, they represent a basic input to the County. Past surveys indicate that students spend an average of about \$2,500 per year in the local economy or for 1977, about \$39 million was contributed to the local economy by student expenditures.

Tourism and Visitors. Tourism is another basic activity that is not indicated directly in the conventional sources of economic data. Tourists and other visitors spend money within the region for food, lodging and services. The economic contribution of tourism and visitors is, of course, included with the payrolls of selected retail and service sectors. Tourism accounted for \$62 million net input into the County's economy during 1970 (Santa Barbara Count, 1978).

Transfer Payments. Transfer payments are a category of funds that enter the region and are spent throughout the local economy. These include various government sponsored programs such as Social Security, V.A. benefits, Civil Service Retirement, etc.

The University of California, Santa Barbara, plays a dominant role in the South Coast economy. However, with enrollment at 14,700 (Fall 1979) a significant increase in its contribution over the long term is not expected. A decreasing number of young people are entering "college bound" age on a state-wide basis, and there are community pressures to place a ceiling on total enrollment.

Government (other than military). Government in 1979 was just behind the service sector in total employment. The overall growth is not expected to keep pace with the growth in population as a result of Proposition 13. Future growth in education is expected to be minimal as the County is currently experiencing a change toward an average older population without children (Santa Barbara County, 1978).

Military Expenditures. A Vandenberg Air Force Base impact analysis for the year 1976 estimates that military personnel spent \$33.7 million off base in the County. In 1970,

Vandenberg provided approximately \$100 million into the north county economy. In 1979, 6,500 persons were employed at the base of which 2,550 were military. Future growth is largely dependent upon the Space Shuttle and MX Missile programs.

III. MAJOR ISSUES

This chapter includes a discussion of air quality, housing, energy land use, and recreation. Other important issues, such as water resources and agriculture, are analyzed in the Comprehensive Plan Elements. An index to these subjects is located at the back of this document. Additional information for areas within the Coastal Zone may be found in the Santa Barbara County Coastal Plan.

AIR QUALITY^{i 4}

Land Use Planning For Air Quality Purposes

The Comprehensive Plan, by determining future land use patterns, has effects on air quality. This is due to the influence land use patterns have on the type of transportation used for shopping, work, and social trips. Presently, the automobile is the primary transportation mode used for these trips. The automobile is also the largest source of ozone precursors and carbon monoxide. Hence, efforts to minimize automobile use are beneficial to air quality. The following sections address three aspects of the Comprehensive Plan that have influence over the amount of automobile use that will be necessary in future years: the designation of residential densities; the balance of jobs and housing; and the designation of urban/rural boundaries.

Residential Densities

Residential densities can impact the level of emissions by influencing the amount of driving within different communities. Indications of the nature of this situation are made in several reports. The Costs of Sprawl analyzed several different community development patterns, their associated vehicle trip generations, distance factors, and resultant vehicle miles traveled (VMT) (Real Estate Research, 1974). The additional increment of VMT from a land use pattern fashioned with the selected application of: 1) increased densities in areas with high accessibility to commercial and employment opportunities, and 2) decreased densities in areas with low accessibility, would be approximately 3/4 of the VMT which could be expected if the future densities did not take into account accessibility to commercial and employment opportunities. This would be a one-quarter reduction in the potential level of pollutants from future growth.

ⁱ On March 9, 1981, the Board of Supervisors adopted an Air Quality Supplement to the Land Use Element.

A second study which analyzed the use of the automobile relative to a series of land development scenarios is "Energy and Land Use: Analysis of Alternative Development Patterns" (Rogers, 1976). Significant variations were evident in the VMT increases forecast for different patterns further supporting the effect of land-use patterns on VMT. The land development pattern based upon a greater urban density and access to transit showed a significant increase in transit use on the order of 1/3 to 1/2 over the baseline ridership figure.

The differences in automobile use by residents of lower-density, single-family units versus typically more-dense, multi-family housing and PUD's have been long recognized by transportation planners. The trip generation tables used in forecasting the number of daily trips from the different types of dwelling units display these differences. Relative to the number of trips forecast for a single-family unit, PUD's are forecast at a level 20% lower, townhouses and condominiums 45% lower, and two-story garden-apartments 45% lower. The Institute of Transportation Engineers, in compiling these forecast tables, note that the factors tending to increase trip generation rates are greater distances between the dwelling units and the central business district, larger dwelling unit sizes, and higher incomes of the occupant. Trip generation rates used in the traffic forecasting efforts in Santa Barbara County by SCOTS differentiate between multiple housing units and single housing units. In seven of the ten categories of "type of housing" and "vehicle availability," drivers in single housing units are expected to generate 7-35% more trips than drivers in multiple housing units. These trip generation rates are only a reflection of an existing situation and should not be interpreted to indicate that a shift in the type of housing units would be followed by a respective shift in trip generation rates. However, these rates are indicative of a trend in automobile use and housing type that is recognized and applied in Santa Barbara County.

Another aspect of development at increased densities is the greater feasibility of transit use. A study of density and transit use in major urban areas indicates that a threshold exists around seven dwelling units per acre (Pushkarev, 1977). Above seven units per acre, densities are present to sustain significant transit use. This threshold is supported in another report which identifies a level of six to eight dwelling units per gross acre as necessary to achieve the densities necessary for economical mass transit (Rogers, 1976). Moreover, an increase in density above seven units per acre also includes a reduction in auto travel. This reduction is related in part to a decrease in automobile ownership brought about by diminished convenience and increased cost associated with the storage and use of the automobile. A second factor involved in the transit use and density relationship concerns a greater accessibility by transit to nonresidential uses as the density of the non-residential uses increases. As such, the potential transit user has a greater variety of stores, offices, and places of employment available from a single transit stop, and hence is more likely to choose transit as the mode of transportation.

Before people can be expected to make any significant shifts away from using automobiles, feasible alternatives must be provided and this requires proper land use design at the neighborhood level. The first step is recognizing the factors that influence

and determine accessibility via all transportation modes including automobiles, bicycles, walking, and transit. These factors include the mixture of land uses, the transportation network connecting the land uses, and the characteristics of the community. Planning for accessibility via bicycles, walking, and transit will provide people with alternatives for the necessary work, shopping, and social trips. It is through a shift in transportation modes from automobiles to bicycles, walking, and transit that automotive emissions can be reduced and energy can be conserved.

Balance of Jobs and Housing

The balance of jobs and housing opportunities that is provided within each Housing Market Area (HMA) of the County has effects on the amount of driving between different areas of the County. The Comprehensive Plan has a significant influence over this by determining the amount of vacant land that is available for expansion of employment-generating land uses and residential land uses. By providing a balance of job and housing opportunities employees will be able to select housing located within the same HMA as their job. If the housing opportunities are not available employees will be placed in a position of selecting housing in another HMA with the attendant adverse impacts upon air quality. The adverse impacts are based upon increases in the length of the work trip because the affected employees will have to commute longer distances to their jobs. The average trip length for the work trip in Santa Barbara County is 4.9 miles (Burnworth, 1980). However, the long distances between the HMA's of the County range from 24 miles between Lompoc and Santa Maria to 32 miles between Santa Ynez and Santa Maria (The average distance between adjacent HMA's is 27 miles). If the proportion of employees commuting the long distances between HMA's is significantly increased then the VMT projections for work trips could increase, possibly affecting the accuracy of the region-wide VMT projections.

Long-distance commuting also brings problems to the air quality situation due to the following circumstances. Pollutants are emitted in more than one region if the commute is from either Lompoc or Santa Ynez to Santa Barbara or Santa Maria. Mitigation measures for the long-distance commute are very limited. Service by public transit is prohibitively expensive and alternative transportation modes such as car pools or van pools for the work trip can reach only a very limited portion of the available commuters due to difficulties in scheduling, destination, and convenience. The availability of mitigation measures or transportation alternatives for the shopping and other long-distance trips is nonexistent. As a result, long-distance trips induced by job/housing imbalances remain mitigated only to very limited degrees.

Urban/Rural Boundaries

The designation of urban/rural boundaries effects automobile use by establishing outward limits of urban development. The location and size of the areas included within the urban/rural boundary affect the future land use patterns, the progression of development, and the type of transportation used by the residents. The latter is exemplified by: the distances people walk and bicycle to shopping or work; the extent to

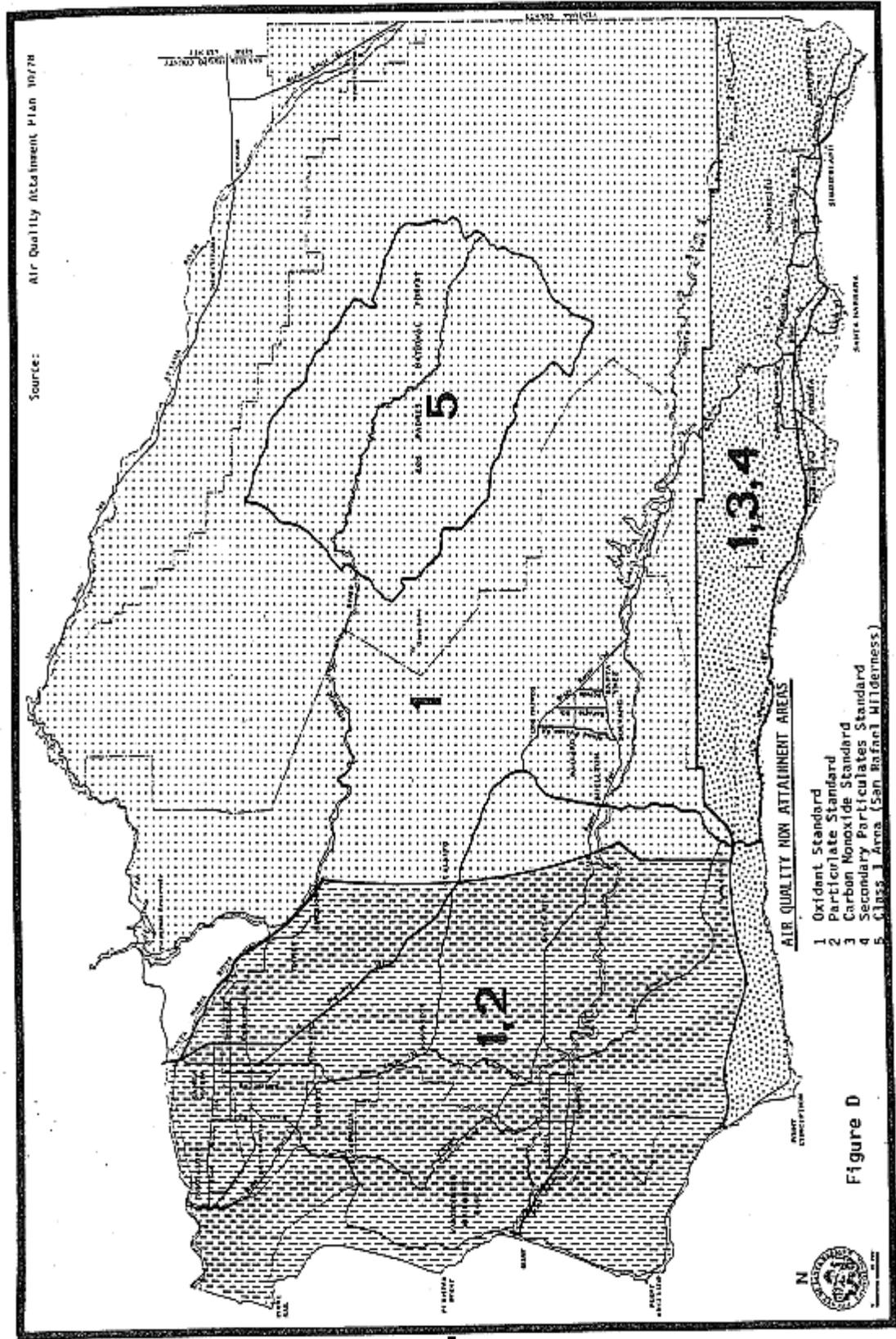
which transit routes will be feasible; the effectiveness of vanpooling; and, of course, the average trip lengths for automobile drivers. A compact urban pattern established by urban/rural boundaries will minimize the distances and be beneficial for air quality.

The Air Quality Attainment Plan and The Comprehensive Plan

Under requirements of the federal Clean Air Act Amendments of 1977, Santa Barbara County began a program to clean and protect its air resources. The objective of the program, known as the Air Quality Attainment Plan (AQAP), is to reduce pollutant emissions from various sources using a variety of methods. If this objective is not met, certain sanctions may be applied to local agencies by the Environmental Protection Agency. The most significant sanctions include the withholding of federal highway construction funds and federal wastewater treatment facility grants.

Following the adoption of the Clean Air Act Amendments, the California Resources Board designated portions of the county as non-attainment areas exceeding the National Ambient Air Quality Standards (NAAQS). All of the County was designated as non-attainment for oxidants while the South Coast was given non-attainment status for secondary total suspended particulates and carbon monoxide. The San Rafael wilderness area within the Los Padres National Forest was designated a Class 1 Area, meaning that its air quality must not be allowed to deteriorate. Figure D illustrates these non-attainment areas.

D Air Quality Attainment Areas



Four types of actions are available for reducing air pollution emissions in the AQAP:

- 1) Controls on stationary sources (e.g. factories, oil tanker loading terminals);
- 2) Controls on mobile sources (e.g. emission control devices on cars, inspection and maintenance programs);
- 3) Transportation controls (e.g. more buses and vanpools);
- 4) Land use controls (e.g. more mixed land uses, housing closer to shopping).

The AQAP land use controls are directed toward decreasing emissions by reducing use of the automobile. This effort also has beneficial impacts on energy and resource conservation (see Energy Element).

The Clean Air Act requires that local governments “have adopted by statute, regulation, ordinance, or other legally enforceable document, the necessary requirements and schedules and timetables for compliance and are committed to implement and enforce the appropriate elements of the [Air Quality Attainment] plan.”

The ARB has also required consistency between the Comprehensive Plan and the AQAP. ARB Resolution 79-50 states that the ARB “finds that to meet the Clean Air Act requirements for consistency of the [State Implementation Plan] and other planning programs, Santa Barbara County has committed to develop a well-defined process and schedule to achieve, monitor, and maintain consistency between regional growth forecasts, plans, and those aspects of local general plans which affect the emissions forecasts in the AQAP.”

Several issues in the Comprehensive Plan are addressed by the AQAP Land Use Measures. The respective issues in the Land Use Element are the designation of the urban/rural boundaries, the designation of residential densities, the application of planned unit development designations, the mixture of commercial and residential land uses, and the balance of jobs and housing. In the Circulation Element that issue of bikeway designations is addressed by the AQAP Land Use Measures.

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HOUSING

The Areawide Housing Elementⁱⁱ has identified problems associated with housing in Santa Barbara County. These problems include high demand for rental units, as indicated by low vacancy rates, spiraling costs of new and existing housing, and significant deterioration of structures located in the older developed areas of the county. The Areawide Housing Element found that overpayment according to federal and state standards is the greatest housing problem in Santa Barbara County. There is an insufficient supply of affordable housing for low-and moderate-income groups living in the South Coast. Overcrowding among lower-income renter households and large families is evident. However, units of adequate size to accommodate these larger households do exist and overcrowding is seen as a problem of the distribution of the housing stock. The Housing Element of the Comprehensive Plan confirms the findings of the Areawide Housing Element and examines specific measures to remedy the documented housing needs.

TRENDS AND LAND USE ISSUES ASSOCIATED WITH HOUSING

Along the South Coast the existing water moratoria in the Goleta, Montecito and Summerland County Water Districts have acted to channel some development pressure toward the cities of Santa Barbara and Carpinteria. In the City of Santa Barbara, limited available land may restrict further residential development. The extent and location of residential construction in Carpinteria will be heavily influenced by the availability of water and the application of coastal development policies established by the Coastal Act of 1976. All of Carpinteria Valley is included within the Coastal Zone.

In the North County, housing production will be closely related to future economic development, the phenomenon of decreasing household size, and migration of a portion of the South Coast work force in search of lower cost, single-family housing, and who are willing to accept increased commuting costs. There are also other factors which may inflate demand over expected levels in the areas of Lompoc, Santa Maria, and perhaps the Santa Ynez Valley. 1977 data gathered by the City of Santa Maria Community Development Department indicated that, in three new subdivisions, up to 30 percent of those purchasing homes were doing so for speculative purposes. Since employment opportunities are not being generated at the same rate as housing units, care must be taken to prevent a recurrence of the housing market depression which happened in the late 1960's in the Orcutt area.

Another part of the increased demand for housing evidently is the result of an increasing number of persons moving away from larger metropolitan Los Angeles to the more rural

ⁱⁱ Area Planning Council, April 1977

areas of the state. This trend of outmigration from metropolitan areas was recently cited as “one of the most noteworthy reversals in migratory patterns in the nation's history.”ⁱⁱⁱ It is also evident in other areas of California, particularly the Central Valley.

Future housing needs in the county will be significantly affected by such factors as the Vandenberg Space Shuttle and MX Missile Programs, construction of the LNG terminal at Point Conception, and federal outer continental shelf oil and gas lease sales. (See Table 4 in the following Land Use and Energy section.) The Local Agency Formation Commission (LAFCO), which rules on issues related to annexation, will influence the future location of housing through its designation of “spheres of influence”. This designation plays an important role in establishing and controlling the ultimate boundaries of urban areas. A number of factors suggest that planned unit developments, clustered housing units, manufactured housing, and other smaller size, higher density housing types will become increasingly important. These factors include increasing costs for land, labor, and materials, proximity to urban services, smaller household sizes and environmental concerns such as farmland and coastline preservation, air quality, and energy conservation. The degree to which higher density is accommodated by land use plans will become a major issue. Of course, higher densities do not automatically mean that more affordable housing will become available, since it could result in high densities, high-priced apartments or condominiums. However, higher densities may make it more feasible to produce low- to moderate-income housing.

Local governments owe a responsibility to their residents to protect the health, safety, and welfare of the community. There is little government can do directly about escalating home prices in an environment of resource constraints and a limited property tax base. However, other communities throughout the State are attempting to meet a similar challenge of providing a balanced community, in terms of home prices and the type of wage/salary employment available. Santa Clara County reviews plans for industrial expansion in regards to the housing demand created by the new employees expected to reside. Santa Barbara County, in the Goleta area, has determined, based on findings contained in specific Environmental Impact Reports that, in certain cases, new employment opportunities could adversely impact the local housing market. Attracting new households into a community where low vacancy rates exist contributes to higher prices due to fierce competition. Moreover, an expanding commercial/industrial base creates additional demand for often non-existent housing affordable to low wage paying job holders, such as the retail and service personnel associated with new commercial and industrial growth.

Among the innovative techniques used by communities to make housing affordable to persons of lower income is the use of Community Development Block Grant funds to

ⁱⁱⁱ Peter Morrison, Rand Corporation Demographer, speech at the annual meeting of the Association for the Advancement of Science, Denver, Colorado, 1977.

offset the costs of land, and public improvements to aid low-to moderate-income housing development. In Santa Barbara County, the City of Santa Maria has assisted housing development in this manner.

It is recognized that Federal and State housing subsidy programs, alone, are not sufficient by themselves to relieve the housing shortage experienced by persons of lower incomes. The County seeks the cooperation and assistance of the private housing developer in assuring that a variety of housing sizes, types, and prices is made available, because the private market is the most efficient producer of new homes. One method proposed in the Housing Element is the use of a “density bonus,” or an increase in allowable density when a developer agrees to reserve a certain percentage of units for low income people.

A study produced for the County's Housing Element revealed that existing apartments or mobile home parks converted into cooperative ownership can significantly lower the cost of housing to the consumer under certain conditions. Mobile home planned developments and modular homes are a means of encouraging private enterprise to provide affordable homes to lower income people. Private enterprise should look to efficiently designed, energy-conserving prefabricated housing in order to lower the costs of producing housing. The County explores the use of these and other strategies in the Comprehensive Plan Housing Element.

LAND USE AND ENERGY

The issues raised for land use planning in Santa Barbara County by the “energy crisis” can be divided into two categories - conventional energy and alternative energy. In the case of land use planning for conventional energy sources, the issues for the county revolve around a variety of proposals to construct large-scale facilities to produce, process, and distribute oil and gas resources. The most direct relationship between land use and conventional energy supply facilities entail impacts on employment, housing, transportation, safety, public services and revenues.

In the case of alternative energy, a different set of possibilities and considerations arise. Either in response to federal and state-mandated requirements to promote alternative energy sources, or as the result of a county-level commitment to go beyond these mandates, the promotion of alternative energy sources will require reassessment of existing policies and ordinances dealing with building codes, conditions for residential, commercial, and industrial plans, and certain onsite zoning restrictions.

LAND USE AND CONVENTIONAL ENERGY SOURCES

The production and distribution of oil and gas has long played an important role in the development of Santa Barbara. The development of these resources has traditionally occurred in three areas: onshore (mostly North County); coastal zone (onshore and offshore); and outer continental shelf (OCS, offshore federal).

The Conservation and Energy Chapter of the Conservation Element discussed onshore oil production, suggesting the factors which shape the level of production in the North County. In terms of land use, it was suggested that recent changes in the federal policy could produce a technical and economic environment conducive to expanded exploration and development of onshore oil fields. The major constraints on the expansion of production of onshore oil and gas fields will be air quality considerations. The status of the coastal zone, state tidelands, and OCS oil and gas development, and the issues attending the development of these resources, are reviewed most thoroughly in the context of the Local Coastal Plan (LCP). As pointed out in the energy section of the LCP, it is generally assumed that coastal zone onshore and state tidelands oil development has peaked and will continue to decline and that OCS development may be expanding in the near future. Increased production in the Santa Barbara Channel will result from a combination of the expansion of production from existing offshore facilities and proposed additional lease sales in federal waters.⁵

[NOTE: The remainder of this section on LAND USE AND CONVENTIONAL ENERGY SOURCES was deleted under case no. 91-GP-3, Board Resolution 91-536, 9/3/91.]⁶

ALTERNATE ENERGY AND LAND USE

As discussed in the Conservation and Energy Chapter of the Conservation Element, the problems associated with conventional energy supplies have prompted a substantial interest in pursuing a wide variety of alternative energy approaches and technologies. Many alternatives have been identified as viable energy sources for California: solar, wind, geothermal, and biomass conversion are frequently cited as alternative energy resources offering a considerable, largely untapped, potential for reducing dependence on conventional energy.

The rate at which this potential is utilized will depend on many factors - the relative economics of different energy sources, the availability of conventional sources, technological advances or constraints, the level of public commitment, to name a few. Local governments can do little to influence this general configuration of factors. Compared with conventional energy sources, however, the policies of local jurisdictions can play a major role in maximizing the potential of alternative energy. In a general sense, the most important role for local governments is to provide a framework conducive to maximizing the opportunities to reduce dependence on conventional energy sources and for accelerating the use of alternative sources. Land use planning offers an excellent format for creating such a framework.

Two general aspects of land use planning are particularly relevant to the energy issue: (1) the degree and type of density; and (2) building orientation and design.

1. The degree and type of density can have a significant influence on the overall energy efficiency of a community. Land use policies which encourage medium to high density development and the mixing of land use activities have the effect of reducing dependence on the automobiles, a major source of energy consumption. Higher density

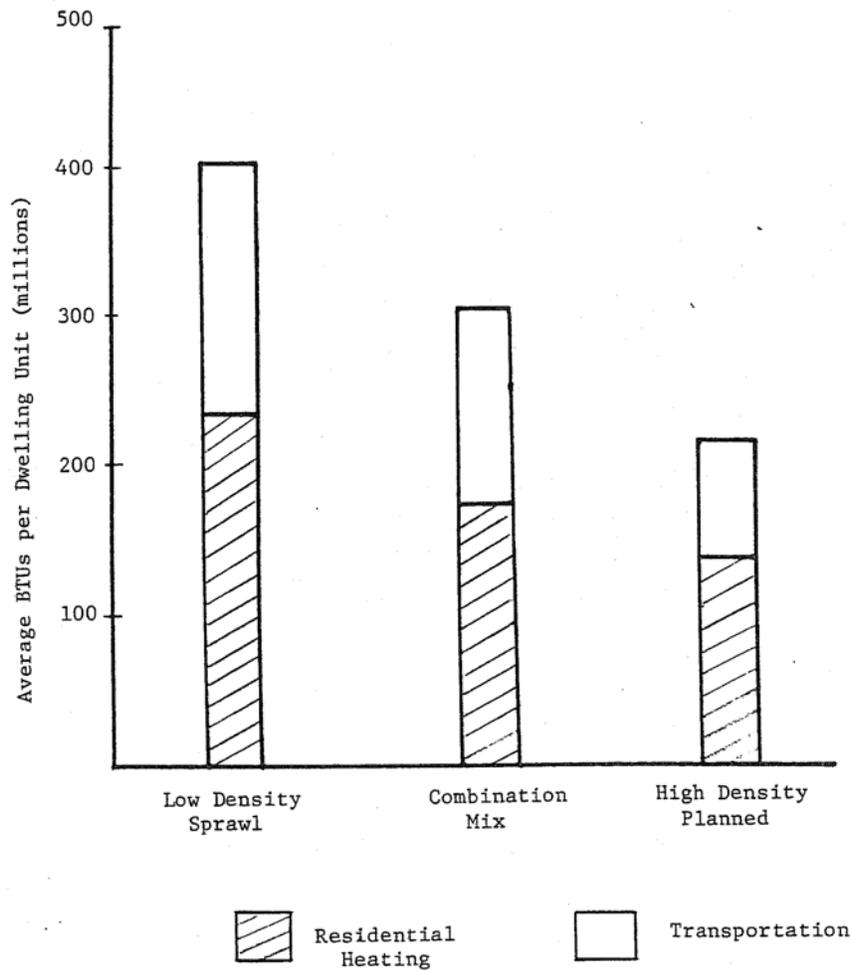
development patterns encourage alternative, more energy-efficient means of transportation such as mass transit and the use of bicycles. Because of the close relationship between automobile use and air quality, local jurisdictions are required to explore and implement tactics designed to promote alternatives to the automobiles. The Air Quality Attainment Plan (AQAP) addresses these issues. Whether motivated by air quality concerns or an attempt to reduce energy consumption, land use policies which promote urban infilling have the additional energy efficiency benefits of encouraging development emphasis on multiple dwelling and clustering units as opposed to single-family residences. Figure E demonstrates the general relationship between energy consumption and types of development.

2. Site and structure design offer perhaps the greatest opportunity for reducing dependence on conventional energy sources and encouraging the use of alternatives. Whether it is a single family home, a tract of houses, an apartment complex, a commercial office building, a government facility, or an industrial structure, the amount and kinds of energy requirements can be heavily influenced by on-site design and building practices.

Recently implemented state legislation seeks to influence the amounts and kinds of energy consumed in all new residential and non-residential buildings. Standards for residential construction include: wall, ceiling, and floor insulation to reduce heat loss from buildings; levels of thermal conductivity for doors and windows; prohibition on the use of electric resistance heat for swimming pools; the use of electric resistance heat for space and hot water heating only if it can be shown to be more cost effective than gas or solar; and provisions for the insulation of pipes, ducts, and heating equipment. In addition, the manufacturing, sale and use of large energy-consuming appliances (e.g., air conditioners, refrigerators, and heating equipment) will be increasingly regulated to ensure the availability and use of energy efficient consumer goods. Finally, recently adopted legislation (AB 3250 and AB 2321) will encourage the use of solar energy by setting guidelines to ensure the availability of solar "skyspace" for new buildings. Solar energy, be it a passive system (using the building itself to collect and store heat from the sun) or an active system (using specifically built collectors to capture and transfer solar, thermal or electric energy), can be maximized only if there are assurances of unobstructed access to the sun. Collectively, energy building and appliance standards and solar access legislation are expected to make a considerable contribution to the reduction in conventional energy consumption and the opportunity to utilize alternative energy sources.

E Annual Energy Consumption

FIGURE E
ANNUAL ENERGY CONSUMPTION



Source: The Costs of Sprawl (Real Estate Research Corp.)

As elsewhere in California, the County of Santa Barbara will play an important role in the interpretation and implementation of these standards. Moreover, if the county wishes to expand on the criteria and guidelines established by state law, a great deal more can be accomplished to reduce consumption and promote alternatives. It is

technically feasible at this time to provide adequate energy needs for homes and buildings with minimal or no reliance on conventional energy sources. The rise in the cost of conventional energy sources, increased interest and understanding of active and passive solar energy designs and technologies, and state and federal tax credits for the purchase of alternative energy systems have resulted in the availability of a wide range of alternative energy applications. If this potential is to be maximized, however, local governments will need to go beyond state standards and engage in the “fine tuning” necessary to identify and encourage those approaches and alternatives best suited for specific regions and for specific types of development. Examples of the variations in approaches and design most relevant to land use and alternative energy applications would include:

Passive solar energy systems: The ability to fully incorporate passive solar design will be influenced by onsite topography, vegetation, nearby structures and orientation. The incorporation of well-established energy efficient building principles can lead to a considerable reduction in the need for and consumption of natural gas and electricity for heating and cooling. Several existing houses in Santa Barbara County have demonstrated the effectiveness of passive solar energy design.

Passive versus active solar systems: A structure built to optimize the passive heating and cooling potential in a given location will minimize the size and space requirements for solar collectors used in supplementary active systems.

Location of collectors: Some types of collectors for space and hot water heating need to be located on roof-tops (houses, garages, carports, patio covers) while others can be mounted on vertical walls or on the ground.

Neighborhood solar systems: In some cases, particularly tract developments and mobile home parks, it may be preferable to provide hot water and space heat through a neighborhood solar system. Neighborhood systems would be particularly useful for those existing or new developments where the orientation and site constraints make it difficult to locate collectors on individual units. It has been estimated that a neighborhood solar system for 1,000 people might require a total collector surface area of three-fourths to one acre of land. This could be installed in one centralized location or at several smaller sites.

Wind Power Generators: The renewed interest in and increasing technical-economical viability of utilizing wind machines is certain to involve local land use decisions. Small-scale, onsite use of wind power generators (including rooftop mounted equipment) would primarily involve aesthetic concerns. Alternatively, surveyors of the wind potential in California have shown the viability of producing electricity with larger “wind farms”; the Point Conception-Point Arguello area has been identified as one potential site for a large wind farm project.

Biomass: Energy from biomass, the conversion of organic waste material to gaseous, liquid, or solid fuels, can take many forms. Agricultural wastes and urban wastes are two general subcategories. A 1977 feasibility study by Southern California Edison, for

example, examined the possibility of utilizing the energy from the Santa Barbara County solid waste disposal system. The implications for land use would be in the reduction of the need for large areas of land currently required at the transfer station and the Tajiguas landfill site.

Energy conservation, solar, wind, and biomass conversion are exemplary of alternative energy opportunities most likely to raise land use issues in Santa Barbara County. Given the commitment of federal and California State governments to promote alternative energy, and given the increasingly favorable economic and technological features of alternative energy applications, the question is not so much whether the land use issues will be experienced locally, but whether these issues are seen as an unwelcome regulation of land use planning or an opportunity to facilitate the use of alternative energy resources. The County adopted an Energy Conservation Element in 1981 which contains several recommendations for the implementation of energy conservation programs.

[NOTE: The text on this page (REFERENCES) was deleted under case no. 91-GP-3, Board Resolution 91-536, 9/3/91.]

4. [Deleted, case no. 91-GP-3, Board Resolution 91-536, 9/3/91.]⁷

RECREATION^{iv}

The Recreation Section of the Comprehensive Plan is a statement of policy concerning the county's responsibility for providing facilities to improve the quality of life.

The plan has been developed by using a system capable of being monitored and altered with maximum public participation. Because maximum public participation is necessary to assure a recreation system that is responsive to the needs of the user, a planning process was designed that would allow all of its parts to be altered as new information becomes available. Just as the Comprehensive Plan itself can be altered by the Board of Supervisors to meet future unidentified needs or as a result of additional information, so too can the decisions reflected in the Recreation Section of the Comprehensive Plan be changed. It is important, then, to remember that planning for parks and recreation is a continuing process.

In the development of the recommendations for the Recreational Section it was necessary to review the goals and objectives of the seven Comprehensive Plan Advisory Committees as they relate to the location of recreation facilities, the types of facilities, comments on the existing park system, ideas on implementation, relationship of recreation to open space, transportation and some recreation policy conclusions. However, critical to all decisions regarding what land should be recommended for inclusion in the park system and those facilities which should be placed on it was a philosophy which underlies the entire study. That is: "Recreation Units (park sites) should accommodate only those facilities and activities which do not impair the natural features of the landscape."

That philosophy demanded that a test be applied to any piece of ground designated for park use, and that decision making regarding facilities to be placed on that land should depend on their impact on the environment of that site. That philosophy has resulted in a recreation system which optimizes recreational experiences in harmony with environmental factors.

What this plan does:

Replaces the 1973 Open Space Parks and Recreation Plan.

Relates Park and Recreation Master Plan to the goals of the Comprehensive Plan.

Establishes a baseline level of park and recreation service to serve as a guide for the next five years.

^{iv} Prepared by the Santa Barbara County Park Department, November 16, 1978 -Revised April 15, 1980.

Provides an inventory of existing park and recreation facilities both private and public, which should be kept current.

Defines the need for recreation activities in terms of space and facilities in order to satisfy a measured demand for those activities.

Shows proposed park sites and opportunities for recreation activities as they relate to the natural ecosystem in varying degrees of suitability.

Establishes a new "park classification system" relating park sites to ERME environmental suitability.

Makes specific recommendations for the acquisition of additional sites and development of existing sites to meet indoor and outdoor recreation and needs identified, and identifies possible school park joint use opportunities.

Proposes areas which would be most suitable to accommodate the identified indoor and outdoor needs.

The plan identifies lands to meet present and future recreation needs for the residents of the unincorporated areas to 1985. These recommendations were based on investigation of the potential for using school facilities to meet some of the identified recreation needs. Specific recreation activities for existing and proposed sites were identified, but only where there is an adopted park master plan are the activities quantified.

What this plan does not do:

Provide "site-specific" design for proposed sites and existing sites which are not master planned. The process for master planning individual sites is based on a policy of the Park Commission which was adopted in 1975 and requires extensive public participation. These "site-specific" master plans will have to meet the goals identified in the Comprehensive Plan as finally adopted by the Board of Supervisors. The words "site specific", as used in this context, mean a plan which would show where and how many of the activities shown for a proposed site can actually be placed on the land.

No attempt was made to identify what recreation the non-park user would participate in if activity space was provided. Nor was user demand for minor activities such as model airplane flying, model sail boating, handball, or other low participation activities identified.

In order to assure that the acquisition of parkland acreage was environmentally suitable for proposed uses, adequate in size and location to serve the needs of the county residents, priorities were established by planning area and park type for the acquisition of parkland. Factors which were considered included urban pressure which may convert these sites to other uses and the local need for recreational facilities based on current and projected needs.

The Recreation Section provides for a diversity of recreational opportunities both active and passive, indoor and outdoor, within a reasonable travel time and distance for every county resident.

The utilization of other public lands for park and recreation purposes was considered wherever possible. The plan identifies some school facilities where joint use, development, and programs can help meet the identified recreation needs within the planning area. Additional sites may be identified later. In addition, county-owned lands which are not currently used for recreation purposes and which are suitable for such purposes were also identified. In addition, parklands in adjacent cities where joint use development and programs might best serve both the city and the county residents were noted.

Ordinance 3120 of the Santa Barbara County Code sets forth conditions to all subdivisions requiring dedication of land and/or payment of a fee for the purposes of providing park and recreation facilities. It is the intent of this Recreation Section that all County parks, open areas, joint use facilities, equestrian and hiking trails, off-road vehicle sites, both existing and proposed, which are shown on the final adopted Comprehensive Plan maps shall be eligible for these fees or land dedication requirements subject to adopted County policies concerning agricultural land uses.⁸ It is further the intent of this element that the benefits of Ordinance 3120 should apply to other public lands, not specified at this time, which may be used for park or recreational purposes in the future, provided that it is determined that it is in the greater public interest to do so.

According to the formula described below, it has been determined that 4.7 acres of park land are needed for every 1,000 persons. It should be noted that demand created by persons living outside of the County has been removed for the purposes of this equation.

$$\frac{\text{Measured projected need of County residents in acres}}{\text{Total population considered}} = \frac{1,320.29}{281,000} =$$
$$\frac{4.7 \text{ acres}}{1,000 \text{ persons}}$$

Some of the formulae for measuring demand for recreation activity were based on information currently in use by the State of California, the Comprehensive Plan as developed by Livingston and Associates, and other data identified by the County Park staff as being peculiar to Santa Barbara County.

The original formula using participation rate, turnover rate, participation days, park standard and design capacity will continue to be used by the Park Department in our program to determine the absolute recreation needs in the county; this may be adjusted from time to time. Another source of information relating to recreation demand was generated by the City of Santa Barbara in the development of the Park and Recreation

Master Plan. The Park Department staff has used this information to develop specific demands for such diverse outdoor sport activities as softball, football and soccer.

The Recreation Section provides that camping will only be provided at Cachuma Lake and Jalama Beach Park within the Santa Barbara County Park System. Expansion of facilities are possible at each site and a new master plan is being developed for Cachuma Lake. This development plan will, however, be restricted by the current amount of water available for operation of the lake and by the very real restriction on the number of lanes that are possible on Highway 154 which provides major access to the lake. Jalama Beach may be expanded by doubling its size without impacting significantly on the scenic road which is its prime access. No wilderness camping is projected within the County Park Department System, as those lands which are suitable for this activity are in the National Forest. The un-met need for "out-of-county users" for camping (over and above what is now provided at Cachuma Recreation Area and Jalama Beach Park) will have to be met by the state and federal government.

The number of trail miles for riding and hiking paths have not been quantified. Desire by the public for easy and close access to trails and bikeways requires many additional miles of trails and paths than can be justified by using normal projections based on participation rates. Also, the extent of significant landscape within a community such as Santa Barbara which the public wishes to visit will further increase the number of miles of trails and paths needed to satisfy the public demand to reach these sites. The proposed riding and hiking trail system has been developed by the users themselves in each urban area after extensive study. Development of the entire trail system, link by link, will have to be prioritized to commit diminishing resources to the development of these trails.

Beach use projections have been made for the total county population and are designated to be met within the South Coast areas as this is the only place where suitable beaches are to be found in the county. In some cases only access to the beach is being proposed. All of the recommendations regarding the use of coastal areas must be consistent with the Local Coastal Plan.

Off-road vehicle riding sites are primarily designated to meet the needs of noncompetitive and very limited competitive motorcycle use, youth mini-bike use, and 4-wheel vehicle track use.

Sites for scientific study and environmental monitoring have not been designated on the park maps because they are not proposed to be included as part of the Park Department's responsibility. Following is a list of exhibits which together with the Park, Recreation, and Trail Maps outline the Recreation Section of the Comprehensive Plan.

The exhibits are:

Table 5 -Proposed Parks and Joint Use Facilities

Table 6 -Recreation Demand Summary

Table 7 -Recreation Facility Standards

Table 8 -Recreation Demand Projections

Table 9 -Existing Facilities Inventories
Table 10 -Recreation Unit Type Definitions

5. Proposed Parks and Joint Use Facilities

Table 5

PROPOSED PARKS AND JOINT USE FACILITIES

Site No.	Acres	Name	Nature ¹ Walk, Picnic	Family Rec. ² Walking	Beach ⁴ Picnic Use	Group Use	Softball	Handball	Sec. ball	Tennis	Foot. Rec.	Indoor Rec. Athletics	Indoor Sec. Prog.	Swimming	Camp- ing	Trail Head	Equestrian	Undesignated Rec.
1.	20	Rincon-Trail Head	XX															
2.*		Deleted																
3.	11	Leon Point	XX		XX								XX					
4.	2	Greenwell Avenue		XX														
5.	1	Summerland Beach			XX													
6.	2.5	Mishling Expansior	XX		XX													
7.	2	Maxwells			XX													
8.	n/a	Hale Park	XX		XX													
9.	n/a	Cold Spring School			XX					XX								
10-33.09		Hollister	XX		XX					XX								
11.	40	Moro Mesa																
12.*		Deleted																
13.*		Deleted																
14.		Deleted																
15.	131	Deveraux	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			XX
16.	54	Haskell's Beach	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			XX
17.*		Deleted																
18.	8	Santa Ynez Park			XX					XX								
19.	23	Baseline																
20.	n/a	Los Olivos																Eques.Center

Footnotes:

- NatureWalks are "walks for the specific purpose of observing plants, birds or animals, and often including the collection of specimens (butterflies, rocks, seashells, etc.) (PARIS P.37)
- Walking includes any "walks where the primary purpose is fitness, which has not been included under hiking or mature walks, and which lasted thirty minutes or more". (PARIS P.37)
- Informal Recreation includes passive and active recreation activities not easily allocated to specific facilities but which require park space, such as children's games, frisbee throwing, strolling, etc.
- Beach Use includes a wide variety of recreation activities which can be employed at a sandy beach (such as swimming, surfing, picnicking, sunbathing, playing volleyball, etc.) and excluding use of motorized vehicles.
- Undesignated Recreation and other refers to minor activity such as passive recreation, flying, model sailboating, handball or other low participation or general activity identified. * Department proposal deleted by Planning Commission action.

v Resolution No. 98-408 (Case No. 98-GP-4) Amended October 27, 1998 (Deleted Cathedral Oaks)

vi Resolution No. 86-111 (Case No. 85-GP-27) Amended February 24, 1986 (Revised acreage of proposed "Hollister Park")

Table 5 (Con't)
 PROPOSED PARKS AND JOINT USE FACILITIES

Site No.	Acres	Name	Nature ¹ Walks	Family ² Picnic Use	Inf. ³ Group Picnic	Beach ⁴ ball	Soc- cer	Ten- nis	Soft- ball	Indoor Athletics	Indoor Rec. PROG.	Swim- ming Pools	Eques- trian Trail Hinds	Undestig- nated rec. & Other
21.	40	HCA-Expansion		XX						XX	XX	XX		
22.*		Deleted												
23.	40.5	Lompoc-Highway 1		XX						XX	XX	XX		
24.*		Deleted												
25.	n/a	Santa Maria High		XX								XX		
26.*		Deleted												
27.	n/a	Raggetti High		XX						XX	XX	XX		
28.*		Deleted												
29.	16	Tanglewood School			XX									
30.	n/a	Lefroy Pk.-Expansion		XX										
31.	n/a	Sisquoc School		XX										
32.	150	Jalana-Expansion											XX	
33.	n/a	Canalino School		XX								XX		
34.	n/a	Carpinteria High			XX									
35.	6	Grisham School/ Orcutt Jr. High	XX											Sportsfields
36.	10	Dunlap School	XX											Sportsfields
37.	10	Shaw School	XX											Sportsfields
38.	19.5	Lakeview School	XX											Sportsfields
39.	10	Patterson School	XX							XX	XX			Sportsfields
40.	10	Pine Grove School	XX											XX
41.		Rice Ranch Road	XX											XX
42.		Nightengale School	XX											Sportsfields
43.		Cabrille High School	XX											Sportsfields
44.		Chestnut School	XX											Sportsfields
45.		Proposed Park	XX											Sportsfields
46.		Buena Vista School	XX											Sportsfields
47.		Proposed Open Area	XX											Sportsfields
48.		Los Berros School	XX											Sportsfields

Table 5 (Con't)

100 c

EXISTING PARKS AND JOINT USE FACILITIES

Site No. & Acres	Name	Natural Males	Walking	Inf. Rec.	Family Picnic	Beach Use	Group Picnic	Softball	Handball	Soc. Center	Tennis	Football	Indoor Athletics	Indoor Rec. Prog.	Swimming Pools	Camping	Equestrian Trails	Unfinished	Other
E1	6	Arroyo Burro	XX	XX	XX	XX	XX												
E2	3.3	Buellton Parkway																	XX
E3	29	Goleta Beach																	
E4	26	Gundalup Dunes	XX																
E5	50	Hans C. Andersen																	
E6	1.5	Isle Vista Beach																	
E7	28	Jalama																	
E8	61	Ken Adan	XX																
E9	137	Lake Los Carneros	XX																
E10	4	LeRoy Park																	
E11	2	Lookout Park																	
E12	51	Los Alamos Park																	
E13	12	Manning Park																	
E14	4	Miguelito Park																	
E15	82	Mojoqui Falls Park																	
E16	36	Ocean Park																	
E17	16	Richardson Park																	
E18	3	Rincon Park																	
E19	19	Rocky Neck Park																	
E20	106	San Antonio Park																	
E21	21	Santa Rosa Park																	
E22	4.5	Santa Ynez Park																	
E23	1	Solvang Park																	
E24	11	Stow Grove Park																	
E25	20.5	Suey Park																	
E26	8	Summerland Park																	
E27	68	Toto Canyon Park																	
E28	2	Ventucopa Park																	
E29	100	Waller Park																	
E30	4.6	Sharon Place (Buellton Flagg's Hill)																	
E31	9,698	Cachuna Lake																	

6. Recreation Demand Summary

Table 6
 RECREATION DEMAND
 SUMMARY

	Carp.	Mont.	Santa Barbara	Goleta	Santa Ynez	Lompoc	Lompoc North	Orcutt	Santa Maria
<u>Nature Walks</u>	0ac	1.46ac	0ac	.88ac	2.41ac	7.10ac	0ac	5.51ac	8.22ac
<u>Walking for Pleasure</u>	8.18	5.04	3.28	24.64	8.42	16.64	3.17	10.55	13.51
<u>Informal Recreation</u>	0	.15	0	13.70	1.17	0	.96	0	0
<u>Family Picnicking</u>	0	0	7.24	24.62	33.88	10.34	7.80	0	23.09
<u>Group Picnicking</u>	0	0	13.92	17.90	0	22.28	0	0	16.46
<u>Beach Use</u>	9.85	10.36	0	19.89	13.20	31.60	8.00	18.00	36.96
<u>Playing Outdoor Sports</u>									
<u>Softball</u>	0	1.05	3.15	3.15	1.05	1.05	1.05	1.05	1.05
<u>Baseball</u>	0	0	0	0	0	1.35	0	0	0
<u>Soccer (Adult)</u>	0	0	0	6.82	3.41	0	0	0	3.41
<u>Soccer (Youth)</u>	0	0	3.41	13.64	3.41	3.41	6.81	6.82	10.23
<u>Flag Football</u>	2.67	0	0	8.01	2.67	5.34	0	0	5.34
<u>Little League</u>	0	0	0	0	1.04	1.04	2.08	2.08	0
<u>Basketball (Youth)</u>	0	0	1.11	1.85	.37	.74	.37	.37	1.11
<u>Tennis</u>	0	.24	0	1.44	.24	.24	.72	0	0
<u>Outdoor Theater</u>	1.0	0	0	2.55	1.00	1.17	1.00	0	0
<u>Indoor Recreation</u>									
<u>(Athletics)</u>	1.66	.94	0	7.02	1.82	3.21	1.10	0	3.95
<u>(Programs)</u>	.83	.47	0	0	.91	1.61	.55	0	2.17
<u>Swimming in Pools</u>									
<u>Competition</u>	0	0	1 pool	1 pool	0	0	0	1 pool	1 pool
<u>Instruction</u>	1.51	1.51	7.95	3.19	1.65	0	1.00	0	3.59
<u>Non-User Recreation Space</u>	7.55	4.25	39.75	31.90	8.25	14.60	5.00	11.25	17.95
<u>Total Acres</u>	33.25	25.47	78.81	181.20	84.90	183.10	39.57	55.63	147.04

7. Recreation Facility Standards

Table 7
 RECREATION FACILITY STANDARDS

Recreation Activity	Use Standard	Facility Area In Acres	Support Facility In Acres	Buffer Area In Acres	Total Area In Acres
Nature Walks	2.07 acres/10,000	2.07	None	.2	2.27
Walking for Pleasure	5.76 acres/10,000	5.76	None	.49	6.25
Informal Recreation	2.6 acres/10,000	2.60	.48	.78	3.86
Family Picnicking	26 tables/10,000	2.60	.20	.40	3.20
Group Picnicking	40 tables/10,000	4.00	1.00	3.00	8.00
Beach Use	1.06 acres/10,000	1.06	Variable-site specific	4.24	5.30
Playing Outdoor Sports					
Softball	1 field/7,500	.26	.64	.14	1.04
Baseball	1 field/37,500	.47	.64	.24	1.35
Soccer (Adult)	1 field/25,000	1.86	.64	.91	3.41
Soccer (Youth)	1 field/4,500	1.86	.64	.91	3.41
Football	1 field/20,000	1.32	.64	.72	2.67
Little League	1 field/4,000 (Youth)	.26	.64	.14	1.04
Basketball (Youth)	1 court/4,500 (Youth)	.14	.15	.08	.37
Tennis	1 court/3,500	.20	.03	.01	.24
Outdoor Theater	1 acre/2,500	1.0	N/A	N/A	1.0
Indoor Recreation					
Athletics Programs	5,000 sq ft/10,000	.12	.92	.06	1.10
Swimming in Pools	2,500 sq ft/10,000	.06	.46	.03	.55
Competition Instruction					
	1 pool/50,000	1.0	Determined by Facility Design	.50	2.0
	1 pool/20,000				

8. Recreation Demand Projections

Table 8

RECREATION DEMAND PROJECTIONS *
 CARPINTERIA (POPULATION 15,100)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	3.43	3.48	+0.05	0
Out of county	Rec. Element Pg. 66	0	0	0	0
Walking for Pleasure	6.25 acres/10,000	9.44	1.26	-8.18	8.18
Informal Recreation					
In-county	3.86 acres/10,000	5.83	6.07	+1.24	0
Out of county	Rec. Element Pg. 66	.20	1.24	+1.04	0
Family Picnicking					
In-county	3.20 acres/10,000	4.83	11.40	+6.57	0
Out of county	Rec. Element Pg. 66	4.80	6.57	+2.77	0
Group Picnicking	8.04 acres/10,000	12.14	15.00	+2.86	0
Beach Use					
In-county	8.00 acres/10,000	12.08	7.93	-4.05	4.05
Out of county	Rec. Element Pg 66	5.80	0	-5.80	5.80
Playing outdoor sports					
Softball	1.05 acres/7,500	2.10	2.10	0	0
Baseball	1.35 acres/37,500	0	1.35	0	0
Soccer (Adult)	3.41 acres/25,000	3.41	3.41	0	0
Soccer (Youth)	3.41 acres/4,500 Youth	3.41	6.82	0	0
Football	2.67 acres/20,000	2.67	0	-2.67	2.67
Little League	1.04 acres/4,000 Youth	1.04	1.04	0	0
Basketball (Youth)	.37 acres/4,500 Youth	.37	.37	0	0
Tennis	.24 acres/3,500	.96	3.36	+2.40	0
Outdoor Theatre	1.00 acres(min)/25,000	1.00	0	-1.00	1.00
Indoor Recreation					
Athletics Programs	1.10 acres/10,000	1.66	0	-1.66	1.66
Swimming Pools	.55 acres/10,000	.83	0	-.83	.83
Competition	1 pool/50,000	0	0	0	0
Instruction	2 acres/20,000	1.51	1.51	0	0
Nonuser Recreation Space	5.00 acres/10,000	7.55	0	-7.55	7.55

*See Notes on page 69

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 MONTECITO (POPULATION 8,500)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	1.93	.47	-1.46	1.46
Out of county	Rec. Element Pg. 66	0	0	0	0
Walking for Pleasure	6.25 acres/10,000	5.31	.27	-5.04	5.04
Informal Recreation					
In-county	3.86 acres/10,000	3.28	3.22	-.06	.06
Out of county	Rec. Element Pg. 66	.09	0	-.09	.09
Family Picnicking					
In-county	3.20 acres/10,000	2.72	8.40	+5.68	0
Out of county	Rec. Element Pg. 66	2.80	5.68	+2.88	0
Group Picnicking	8.04 acres/10,000	6.83	12.60	+5.77	0
Beach Use					
In-county	8.00 acres/10,000	6.80	0	-6.80	6.80
Out of county	Rec. Element Pg 66	3.56	0	-3.56	3.56
Playing outdoor sports					
Softball	1.05 acres/7,500	1.05	0	-1.05	1.05
Baseball	1.35 acres/37,500	0	0	0	0
Soccer (Adult)	3.41 acres/25,000	0	0	0	0
Soccer (Youth)	3.41 acres/4,500 Youth	0	0	0	0
Football	2.67 acres/20,000	0	0	0	0
Little League	1.04 acres/4,000 Youth	0	0	0	0
Basketball (Youth)	.37 acres/4,500 Youth	0	0	0	0
Tennis	.24 acres/3,500	.48	.24	-.24	.24
Outdoor Theatre	1.00 acres(min)/25,000	0	0	0	0
Indoor Recreation					
Athletics	1.10 acres/10,000	.94	0	-.94	.94
Programs	.55 acres/10,000	.47	0	-.47	.47
Swimming Pools					
Competition	1 pool/50,000	0	0	0	0
Instruction	2 acres/20,000	1.51	0	-1.51	1.51
Nonuser Recreation Space	5.00 acres/10,000	4.25	0	-4.25	4.25

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 SANTA BARBARA (POPULATION 79,500)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	18.05	31.83	+13.78	
Out of county	Rec. Element Pg. 66	.67	13.78	+13.11	0
Walking for Pleasure	6.25 acres/10,000	49.69	46.41	- 3.28	3.28
Informal Recreation					
In-county	3.86 acres/10,000	30.69	230.5	+199.81	
Out of county	Rec. Element Pg. 66	2.02	199.81	+197.79	0
Family Picnicking					
In-county	3.20 acres/10,000	25.44	42.20	+16.76	
Out of county	Rec. Element Pg. 66	24.00	16.76	-7.24	7.24
Group Picnicking	8.04 acres/10,000	63.92	50.00	-13.92	13.92
Beach Use					
In-county	8.00 acres/10,000	63.60	97.60	+34.00	0
Out of county	Rec. Element Pg 66	28.98	34.00	+5.02	0
Playing outdoor sports					
Softball	1.05 acres/7,500	11.55	8.40	-3.15	3.15
Baseball	1.35 acres/37,500	2.70	2.70	0	0
Soccer (Adult)	3.41 acres/25,000	10.23	10.23	0	0
Soccer (Youth)	3.41 acres/4,500 Youth	10.23	6.82	-3.41	3.41
Football	2.67 acres/20,000	10.68	10.68	0	0
Little League	1.04 acres/4,000 Youth	3.12	3.12	0	0
Basketball (Youth)	.37 acres/4,500 Youth	1.11	0	-1.11	1.11
Tennis	.24 acres/3,500	5.52	6.72	+1.20	0
Outdoor Theatre	1.00 acres(min)/25,000	3.18	3.18	0	0
Indoor Recreation					
Athletics	1.10 acres/10,000	8.75	8.75	0	0
Programs	.55 acres/10,000	2.19	2.19	0	0
Swimming Pools					
Competition	1 pool/50,000	2 pools	1 pool	1 pool	1 pool
Instruction	2 acres/20,000	7.95	0	-7.95	7.95
Nonuser Recreation Space	5.00 acres/10,000	39.75	0	-39.75	39.75

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 GOLETA (POPULATION 63,800)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	14.48	14.27	-.21	.21
Out of county	Rec. Element Pg. 66	.67	0	-.67	.67
Walking for Pleasure	6.25 acres/10,000	39.88	15.24	-24.64	24.64
Informal Recreation					
In-county	3.86 acres/10,000	24.63	11.58	-13.05	13.05
Out of county	Rec. Element Pg. 66	.65	0	-.65	.65
Family Picnicking					
In-county	3.20 acres/10,000	20.42	17.40	-3.02	3.02
Out of county	Rec. Element Pg. 66	21.60	0	+98	21.60
Group Picnicking	8.04 acres/10,000	51.30	33.40	-17.90	17.90
Beach Use					
In-county	8.00 acres/10,000	51.04	57.04	+6.04	
Out of county	Rec. Element Pg 66	25.93	6.04	-19.89	19.89
Playing outdoor sports					
Softball	1.05 acres/7,500	9.45	6.30	-3.15	3.15
Baseball	1.35 acres/37,500	2.70	2.70	0	0
Soccer (Adult)	3.41 acres/25,000	10.23	3.41	+6.82	6.82
Soccer (Youth)	3.41 acres/4,500 Youth	15.05	3.41	-13.64	13.64
Football	2.67 acres/20,000	8.01	0	-8.01	8.01
Little League	1.04 acres/4,000 Youth	5.20	5.20	0	0
Basketball (Youth)	.37 acres/4,500 Youth	1.85	0	-1.85	1.85
Tennis	.24 acres/3,500	4.32	2.88	-1.44	1.44
Outdoor Theatre	1.00 acres(min)/25,000	2.55	0	-2.55	2.55
Indoor Recreation					
Athletics	1.10 acres/10,000	7.02	0	-7.02	7.02
Programs	.55 acres/10,000	3.51	4.35	+.84	0
Swimming Pools					
Competition	1 pool/50,000	1 pool	0	1 pool	1 pool
Instruction	2 acres/20,000	3.19	0	-3.19	3.19
Nonuser Recreation Space	5.00 acres/10,000	31.90	0	31.90	31.90

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 SANTA YNEZ VALLEY (POPULATION 16,500)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	3.75	1.68	-2.07	2.07
Out of county	Rec. Element Pg. 66	.34	0	-.34	.34
Walking for Pleasure	6.25 acres/10,000	10.31	1.89	-8.42	8.42
Informal Recreation					
In-county	3.86 acres/10,000	6.37	10.00	+3.63	
Out of county	Rec. Element Pg. 66	4.80	3.63	-1.17	1.17
Family Picnicking					
In-county	3.20 acres/10,000	5.28	10.40	+4.12	
Out of county	Rec. Element Pg. 66	38.00	4.12	-33.88	33.88
Group Picnicking	8.04 acres/10,000	13.26	75.20	+61.94	0
Beach Use					
In-county	8.00 acres/10,000	13.20	0	-13.20	13.20
Out of county	Rec. Element Pg 66	0	0	0	0
Playing outdoor sports					
Softball	1.05 acres/7,500	2.10	1.05	-1.05	1.05
Baseball	1.35 acres/37,500	0	0	0	0
Soccer (Adult)	3.41 acres/25,000	3.41	0	-3.41	3.41
Soccer (Youth)	3.41 acres/4,500 Youth	6.82	3.41	-3.41	3.41
Football	2.67 acres/20,000	2.67	0	-2.67	2.67
Little League	1.04 acres/4,000 Youth	1.04	0	-1.04	1.04
Basketball (Youth)	.37 acres/4,500 Youth	.37	0	-.37	.37
Tennis	.24 acres/3,500	1.20	.96	-.24	.24
Outdoor Theatre	1.00 acres(min)/25,0001.	1.0	0	-1.00	1.00
Indoor Recreation					
Athletics	1.10 acres/10,000	1.82	0	-1.82	1.82
Programs	.55 acres/10,000	.91	0	-.91	.91
Swimming Pools					
Competition	1 pool/50,000	0	0	0	0
Instruction	2 acres/20,000	1.65	0	-1.65	1.65
Nonuser Recreation Space	5.00 acres/10,000	8.25	0	-8.25	8.25

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 LOMPOC (POPULATION 29,200)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	6.63	0	-6.63	6.63
Out of county	Rec. Element Pg. 66	.47	0	-.47	.47
Walking for Pleasure	6.25 acres/10,000	18.25	1.61	-16.64	16.64
Informal Recreation					
In-county	3.86 acres/10,000	11.27	35.1	+23.83	0
Out of county	Rec. Element Pg. 66	3.4	+23.83	+20.43	
Family Picnicking					
In-county	3.20 acres/10,000	9.34	15.2	+5.86	
Out of county	Rec. Element Pg. 66	16.20	5.86	-10.34	10.34
Group Picnicking	8.04 acres/10,000	23.48	1.20	-22.28	22.28
Beach Use					
In-county	8.00 acres/10,000	23.36	0	-23.36	23.36
Out of county	Rec. Element Pg 66	8.24	0	-8.24	8.24
Playing outdoor sports					
Softball	1.05 acres/7,500	3.15	2.10	-1.05	1.05
Baseball	1.35 acres/37,500	1.35	0	-1.35	1.35
Soccer (Adult)	3.41 acres/25,000	3.41	3.41	0	0
Soccer (Youth)	3.41 acres/4,500 Youth	13.64	10.23	-3.41	3.41
Football	2.67 acres/20,000	7.01	2.67	-5.34	5.34
Little League	1.04 acres/4,000 Youth	1.04	0	-1.04	1.04
Basketball (Youth)	.37 acres/4,500 Youth	1.48	.74	-.74	.74
Tennis	.24 acres/3,500	1.68	1.44	-.24	.24
Outdoor Theatre	1.00 acres(min)/25,000	1.17	0	-1.17	1.17
Indoor Recreation					
Athletics Programs	1.10 acres/10,000	3.21	0	-3.21	3.21
Swimming Pools	.55 acres/10,000	1.61	0	-1.61	1.61
Competition	1 pool/50,000	1 pool	1 pool	0	0
Instruction	2 acres/20,000	2.92	2.92	0	0
Nonuser Recreation Space	5.00 acres/10,000	14.60	0	-14.60	14.60

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 VANDENBERG VILLAGE-MISSION HILLS (POPULATION 10,000)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	2.27	3.35	+1.08	
Out of county	Rec. Element Pg. 66	.21	1.08	+0.87	
Walking for Pleasure	6.25 acres/10,000	6.25	2.08	-3.17	3.17
Informal Recreation					
In-county	3.86 acres/10,000	3.86	1.5	-2.36	
Out of county	Rec. Element Pg. 66	1.40	2.36	.96	.96
Family Picnicking					
In-county	3.20 acres/10,000	3.20	2.00	-1.20	1.20
Out of county	Rec. Element Pg. 66	6.60	0	-6.60	6.60
Group Picnicking	8.04 acres/10,000	8.04	8.40	+0.36	0
Beach Use					
In-county	8.00 acres/10,000	8.00	0	-8.00	8.00
Out of county	Rec. Element Pg 66	Allocated to Lompoc			
Playing outdoor sports					
Softball	1.05 acres/7,500	1.05	0	-1.05	1.05
Baseball	1.35 acres/37,500	0	0	0	0
Soccer (Adult)	3.41 acres/25,000	0	0	0	0
Soccer (Youth)	3.41 acres/4,500 Youth	6.81	0	-6.81	6.81
Football	2.67 acres/20,000	0	0	0	0
Little League	1.04 acres/4,000 Youth	2.08	0	-2.08	2.08
Basketball (Youth)	.37 acres/4,500 Youth	.37	0	-.37	.37
Tennis	.24 acres/3,500	.72	0	-.72	.72
Outdoor Theatre	1.00 acres(min)/25,000	1.0	0	-1.0	1.0
Indoor Recreation					
Athletics Programs	1.10 acres/10,000	1.10	0	-1.10	1.10
Swimming Pools Competition Instruction	.55 acres/10,000	.55	0	-.55	.55
Nonuser Recreation Space	1 pool/50,000 2 acres/20,000	0	0	0	0
Nonuser Recreation Space	5.00 acres/10,000	5.0	0	-5.0	5.0

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 ORCUTT (POPULATION 22,500)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	5.11	0	-5.11	5.11
Out of county	Rec. Element Pg. 66	.40	0	-.40	.40
Walking for Pleasure	6.25 acres/10,000	14.06	3.51	-10.55	10.55
Informal Recreation					
In-county	3.86 acres/10,000	8.69	24.	+15.31	0
Out of county	Rec. Element Pg. 66	3.3	15.31	+12.01	
Family Picnicking					
In-county	3.20 acres/10,000	11.	30.2	+19.2	0
Out of county	Rec. Element Pg. 66	14.4	19.2	+4.8	0
Group Picnicking	8.04 acres/10,000	18.09	71.6	+53.51	0
Beach Use					
In-county	8.00 acres/10,000	18.00	0	-18.00	18.00
Out of county	Rec. Element Pg 66	Allocated to Santa Maria			
Playing outdoor sports					
Softball	1.05 acres/7,500	3.15	2.10	-1.05	1.05
Baseball	1.35 acres/37,500	1.35	2.70	+1.35	0
Soccer (Adult)	3.41 acres/25,000	3.41	3.41	0	0
Soccer (Youth)	3.41 acres/4,500 Youth	10.23	3.41	-6.82	6.82
Football	2.67 acres/20,000	2.67	2.67	0	0
Little League	1.04 acres/4,000 Youth	2.08	0	-2.08	2.08
Basketball (Youth)	.37 acres/4,500 Youth	.74	.37	-.37	.37
Tennis	.24 acres/3,500	2.70	3.84	+1.14	0
Outdoor Theatre	1.00 acres(min)/25,000	1.00	1.00	0	0
Indoor Recreation					
Athletics Programs	1.10 acres/10,000	2.48	8.68	+6.20	0
Swimming Pools	.55 acres/10,000	1.24	1.24	0	0
Competition Instruction	1 pool/50,000	1 pool	0	-1 pool	1 pool
Nonuser Recreation Space	2 acres/20,000	2.5	2.5	0	0
	5.00 acres/10,000	11.25	0	-11.25	11.25

Table 8 (Con't)

RECREATION DEMAND PROJECTIONS
 SANTA MARIA (POPULATION 35,900)

Recreation Activity	Use & Area Standard	Projected Need (Acres)	Supply (Acres)	Deficiency or Surplus	Additional Area Required (Acres)
Nature Walks					
In-county	2.27 acres/10,000	8.14	0	-8.14	8.14
Out of county	Rec. Element Pg. 66	.08	0	-.08	.08
Walking for Pleasure	6.25 acres/10,000	22.44	7.93	-13.51	13.51
Informal Recreation					
In-county	3.86 acres/10,000	13.86	28.1	+14.24	0
Out of county	Rec. Element Pg. 66	5.5	14.24	+8.74	
Family Picnicking					
In-county	3.20 acres/10,000	11.49	12.0	+.51	
Out of county	Rec. Element Pg. 66	23.60	.51	-23.09	23.09
Group Picnicking	8.04 acres/10,000	28.86	12.40	-16.46	16.46
Beach Use					
In-county	8.00 acres/10,000	28.72	0	-28.72	28.72
Out of county	Rec. Element Pg 66	8.24	0	-8.24	8.24
Playing Outdoor Sports					
Softball	1.05 acres/7,500	5.25	4.20	-1.05	1.05
Baseball	1.35 acres/37,500	2.70	2.70	0	0
Soccer (Adult)	3.41 acres/25,000	3.41	0	-3.41	3.41
Soccer (Youth)	3.41 acres/4,500 Youth	20.46	10.23	-10.23	10.23
Football	2.67 acres/20,000	5.34	0	-5.34	5.34
Little League	1.04 acres/4,000 Youth	3.12	3.12	0	0
Basketball (Youth)	.37 acres/4,500 Youth	1.11	0	-1.11	1.11
Tennis	.24 acres/3,500	4.31	5.67	+1.45	0
Outdoor Theatre	1.00 acres(min)/25,000	1.44	3.00	+1.56	0
Indoor Recreation					
Athletics Programs	1.10 acres/10,000	3.95	0	-3.95	3.95
Swimming in Pools	.55 acres/10,000	2.17	0	-2.17	2.17
Competition Instruction	1 pool/50,000	1 pool	0	-1 pool	1 pool
Nonuser Recreation Space	2 acres/20,000	3.59	0	-3.59	3.59
	5.00 acres/10,000	17.95	0	-17.95	17.95

Footnotes to Table 8:

1. Playing outdoor sports: Use area is indicated for a complete field. No allocation has been made for partial fields. When a half or more of a field is required, full acreage is projected.
2. Use and area standard varies according to needs of each geographic area.
3. Recreation for the City of Guadalupe will be met at LeRoy Park.
4. Playing outdoor sports supply includes projections made for proposed joint use facilities.

9. Existing Facilities Inventories

Table 9

EXISTING FACILITIES INVENTORY

SOUTH COAST URBAN AREA

<u>Activities</u>	<u>Private Sector</u>	<u>School Dist.</u>	<u>City</u>	<u>County</u>	<u>State</u>	<u>Federal</u>
Extremely Light:						
Scientific Study	70 Ac	0	0	0	50Ac	
Very Light:						
1. Nature Walks	5mi	0	4.75mi	2.72mi	0	0
2. Walking for Pleasure	0	0	35.7mi	6.16mi	0	0
Light:						
3. Informal Recreation	12 ac	0	230.5Ac	34.39Ac	99.9Ac	0
Moderate:						
4. Picnicking	0	0	211 tab.	240 tab.	207 tab.	0
5. Beach Use	0	0	3.2mi	1.87mi	10.2mi	0
Heavy:						
6. Group Picnicking	10 tab.	0	250 tab.	265 tab.	3 areas	0
7. Playing O/D Sports	44.7Ac	76.03Ac	31.82Ac	3.64Ac	0	0
8. Swimming	0	3 pools	2 pools	0	0	0
9. Camping	0	0	6 sites	0	377 sites	0
10. ORV Riding	6Ac	0	0	0	0	28Ac
11. Other	6 golf 2 ranches	0	0	0	0	58.8mi

Table 9 (Con't)

E X I S T I N G F A C I L I T I E S I N V E N T O R Y

SANTA YNEZ URBAN AREA

<u>Activities</u>	<u>Private Sector</u>	<u>School Dist.</u>	<u>City</u>	<u>County</u>	<u>State</u>	<u>Federal</u>
Extremely Light:						
Scientific Study	0	0	0	0	0	0
Very Light:						
1. Nature Walks	0	0	0	.25mi	0	0
2. Walking for Pleasure	0	0	0	1.45mi	0	0
Light:						
3. Informal Recreation	.25Ac	0	0	10Ac	0	0
Moderate:						
4. Picnicking	32 tab.	0	0	52 tab.	0	12 acres
5. Beach Use	0	0	0	0	0	0
Heavy:						
6. Group Picnicking	10 tab.	0	0	376 tab.	0	0
7. Playing O/D Sports	0	0	2.2Ac	2.05Ac	0	0
8. Swimming	0	0	0	0	0	0
9. Camping	0	0	0	0	0	39 sites
10. ORV Riding	0	0	0	0	0	7.3 acres
11. Other	Guest Ranch	0	0	0	0	9.1 miles

Table 9 (Con't)

EXISTING FACILITIES INVENTORY

LOMPOC URBAN AREA

<u>Activities</u>	<u>Private Sector</u>	<u>School Dist.</u>	<u>City</u>	<u>County</u>	<u>State</u>	<u>Federal</u>
Extremely Light:						
Scientific Study	0	0	0	0	0	0
Very Light:						
1. Nature Walks	0	0	0	.5mi	0	0
2. Walking for Pleasure	0	0	1mi	2.44mi	.25	0
Light:						
3. Informal Recreation	0	0	35.1Ac	2.5Ac	2Ac	0
Moderate:						
4. Picnicking	0	0	65 tab.	36 tab	17 tab	0
5. Beach Use	0	0	0	0	0	0
Heavy:						
6. Group Picnicking	0	0	6 tab.	191 tab.	0	0
7. Playing O/D Sports	0	15.4Ac	5.6	2.4Ac	0	0
8. Swimming	0	0	1 pool	0	0	0
9. Camping	0	0	0	0	0	0
10. ORV Riding	0	0	0	0	0	0
11. Other	2 golf 1 rec. club	0	0	0	Museum Mission	0

E X I S T I N G F A C I L I T I E S I N V E N T O R Y

SANTA MARIA URBAN AREA

<u>Activities</u>	<u>Private Sector</u>	<u>School Dist.</u>	<u>City</u>	<u>County</u>	<u>State</u>	<u>Federal</u>
Extremely Light:						
Scientific Study	0	0	0	20 Ac.	0	0
Very Light:						
1. Nature Walks	0	0	0	0	0	0
2. Walking for Pleasure	0	0	6.1mi	3.4mi	0	0
Light:						
3. Informal Recreation	80 Ac.	0	28.1Ac	38.36Ac	0	0
Moderate:						
4. Picnicking	0	0	60 tab.	170 tab	0	1 area
5. Beach Use	0	0	0	.2mi	.9mi	0
Heavy:						
6. Group Picnicking	0	0	62 tab.	433 tab.	0	0
7. Playing O/D Sports	1 Ac.	26.86Ac	11.93Ac.	27.68Ac	0	0
8. Swimming	1 pool	0	1 pool	0	0	0
9. Camping	0	0	0	0	0	10 sites
10. ORV Riding	0	0	0	0	0	0
11. Other	2 golf courses	0	0	0	0	0

Table 9 (Con't)

EXISTING FACILITIES INVENTORY

OUTSIDE DESIGNATED URBAN AREAS*

<u>Activities</u>	<u>Private Sector</u>	<u>School Dist.</u>	<u>City</u>	<u>County</u>	<u>State</u>	<u>Federal</u>
Extremely Light:						
Scientific Study	400 Ac	0	0	0	0	1900Ac
Very Light:						
1. Nature Walks	0	0	0	0	0	0
2. Walking for Pleasure	0	0	0	7.8mi	0	0
Light:						
3. Informal Recreation	0	0	0	28Ac	0	0
Moderate:						
4. Picnicking	0	0	0	127 tab.	0	31 areas
5. Beach Use	0	0	0	.41mi	0	0
Heavy:						
6. Group Picnicking	0	0	0	20 tab.	0	0
7. Playing O/D Sports	0	0	2.4Ac	1Ac	0	0
8. Swimming	0	0	0	2 swim 1 wad.	0	0
9. Camping	0	0	0	526 sites	0	200 sites
10. ORV Riding	0	0	0	0	0	81.2 acres
11. Other	0	0	0	Pier 600 bt. spaces	0	0

* To be added to designated urban area totals.

10. Recreation Unit Type Definitions

Table 10

RECREATION UNIT TYPE DEFINITIONS

INTENSIVE USE RECREATION AREAS

PHYSICAL REQUIREMENTS: Physiographic features such as topography, soil type, drainage, etc., should be adaptable to special types of intensive recreation use and development. There are no specific size criteria.

LOCATION: Usually within or near major centers of urban population but may occur within such units as national parks and forests remote from population concentrations.

ACTIVITIES: Intensive day or weekend type such as picnicking, water sports, playing outdoor sports, off highway vehicle riding, camping, and other activities for many people.

DEVELOPMENTS: High degree of facility development which often requires heavy investment. They are usually managed exclusively for recreation purposes. Development may include a road network, parking areas, bathing beaches and marinas, bathhouses, artificial lakes, playfields, and sanitary and eating facilities.

MODERATE USE RECREATION AREAS

PHYSICAL REQUIREMENTS: May have varied topography, interesting flora, and fauna within a generally attractive natural or manmade setting adaptable to providing a wide range of opportunities.

LOCATION: Can be more remote than Intensive Use Areas, however, relatively accessible to centers of urban population and accommodate a major share of all outdoor recreation. Included are portions of public parks and forests, public and commercial camping sites, picnic grounds, trails, streams, lakes, coastal areas, and reservoirs.

ACTIVITIES: Extensive day, weekend, and vacation use types such as low density camping, picnicking, fishing, water sports, nature walks, and outdoor games.

DEVELOPMENTS: Generally less than Intensive Use Areas; includes, but not limited to, access roads, parking areas, picnic areas, campgrounds, bathing beaches, marinas, stream access, natural and/or artificial lakes.

NATURAL ENVIRONMENT AREAS

PHYSICAL REQUIREMENTS: Varied and interesting land forms, lakes, streams, flora, and fauna within attractive natural settings.

LOCATION: Usually more remote from population centers than Intensive and Moderate Use Areas and occur throughout the county and, on an acreage basis are the largest class in both public and private ownership.

ACTIVITIES: Extensive weekend and vacation types dependent on quality of the natural environment such as sightseeing, hiking, nature study, picnicking, camping, swimming, boating, canoeing, fishing, and mountaineering. The primary objective is to provide for traditional recreation experience in the out-of-doors commonly in conjunction with other resource uses. Users are encouraged to enjoy the resource “as is,” in natural environment.

DEVELOPMENTS: Access roads, trails, picnic and camp site facilities, and minimum sanitary facilities. There may be other compatible uses of the area such as watershed protection, water supply, grazing, lumbering and mining provided such activities are managed so as to retain the attractiveness of the natural setting.

SPECIAL USE

PHYSICAL REQUIREMENTS: Outstanding natural features associated with an outdoor environment that merit special attention and care in management to insure their preservation in their natural condition includes individual areas of remarkable natural wonder, high scenic splendor, or features of scientific importance. One or more such areas may be part of a larger administrative unit.

LOCATION: Any place where such features are found.

ACTIVITIES: Sight seeing, enjoyment, and study of the natural features. Kinds and intensity of use limited to the enjoyment and study of the natural attractions so as to preserve the quality of the natural features and maintain an appropriate setting. Maybe visited on a day, weekend, or vacation trip.

DEVELOPMENTS: Limited to minimum development required for public enjoyment, health, safety, and protection of the features. Wherever possible, access roads and facilities other than trails and sanitary facilities should be kept outside and in the immediate vicinity of the natural features. Visitors encouraged to walk to the feature or into the area when feasible. Improvements should harmonize with and not detract from the natural setting.

RECREATION OPEN SPACES

PHYSICAL REQUIREMENTS: Extensive or limited natural, and undeveloped areas. Essential characteristics are that the natural environment has not been disturbed by commercial utilization. The site may vary with different physical and biological conditions and may be determined in part by the characteristics of adjacent land. Size may vary in different parts of the county. These areas are inspirational, aesthetic, scientific, and cultural assets of great value.

LOCATION: Usually in or adjacent to population centers.

ACTIVITIES: Hiking, nature study, bicycling, and informal recreation.

DEVELOPMENTS: No development of public roads, permanent habitations, or recreation facilities except trails. Mechanized equipment allowed for maintenance, or needed to control fire, insects and disease. Commercial use of the area that may exist at the time of establishment should be discontinued as soon as practical.

HISTORICAL AND CULTURAL SITES

PHYSICAL REQUIREMENTS: These are sites associated with the history, tradition or cultural heritage of national, state or local interest and are of enough significance to merit preservation or restoration.

LOCATION: The location of the feature established at the site.

ACTIVITIES: Sight seeing, enjoyment, and study of the historic or cultural features. Kinds and intensity of concurrent use as determined by the size and suitability of the site.

DEVELOPMENTS: Management should be limited to activities that would effect such preservation and restoration as may be necessary to protect the features from deterioration and to interpret their significance to the public. Access to the area should be adequate but on-site development limited to prevent overuse. Development should not detract from the historic or cultural values of the site.

RECREATION SECTION MAPS:

Santa Barbara County Comprehensive Plan
Parks, Recreation and Trails (Non-motorized); PRT-1, 1" = 5500'

Santa Barbara County Comprehensive Plan
Parks, Recreation and Trails (Non-motorized); PRT-2
Carpinteria-Montecito-Summerland Area; 1" = 1000'

Santa Barbara County Comprehensive Plan
Parks, Recreation and Trails (Non-motorized); PRT-3
Goleta-Santa Barbara Area; 1" = 1000'

Santa Barbara County Comprehensive Plan
Parks, Recreation and Trails (Non-motorized) PRT-4
Santa Ynez Valley Area, 1" = 1000'

Santa Barbara County Comprehensive Plan
Parks, Recreation and Trails (Non-motorized): PRT-5
Lompoc Area; 1" = 1000'

Santa Barbara County Comprehensive Plan
Parks, Recreation and Trails (Non-motorized); PRT-6
Santa Maria Area; 1" = 1000'⁹

Orcutt Community Plan Parks, Recreation and Trails Map¹⁰

IV. GOALS AND POLICIES

REGIONAL

This plan is designed to encourage the qualities that make this County unique, by encouraging a balanced and diverse economy, promoting local self-sufficiency, by encouraging a balance in housing with jobs, stressing long-term productivity, living within our means in so far as availability of resources and services, providing moderate, orderly growth in harmony with our surroundings, and to provide for protection of the historical heritage which has enriched the lives of residents and visitors throughout the years.

In order to accomplish these objectives, this plan has four fundamental goals.

Environment: Environmental constraints on development^{vii 11 12} shall be respected. Economic and population growth shall proceed at a rate that can be sustained by available resources.

Urbanization: In order for the County to sustain a healthy economy in the urbanized areas and to allow for growth within its resources and within its ability to pay for necessary services, the County shall encourage infill, prevent scattered urban development, and encourage a balance between housing and jobs.

Agriculture: In the rural areas, cultivated agriculture shall be preserved and, where conditions allow, expansion and intensification should be supported. Lands with both prime and non-prime soils shall be reserved for agricultural uses.

Open Lands: Certain areas may be unsuited for agricultural uses due to poor or unstable soil conditions, steep slopes, flooding or lack of adequate water. These open lands have importance as grazing, watershed, wildlife habitat, mineral resources, recreation, and scenic qualities. These lands are usually so located that they are not necessary or desirable for urban uses. There is no basis for the proposition that all land, no matter where situated or whatever the need, must be planned for urban purposes if they cannot be put to some other profitable economic use.

^{vii} "Development" means any man-made change to improved or unimproved real property including but not limited to buildings or structures, mining, dredging, filling, grading, excavation, or drilling operations. Sand and gravel operations may be allowed in the same sense as flood control operations are allowed. Neither agricultural improvements nor oak tree removal are development within the meaning of this Element.

The following policies are necessary to implement these four goals:

LAND USE DEVELOPMENT POLICIES

1. The Land Use Element of the Comprehensive Plan shall be reviewed at least every five years to keep it up-to-date and responsive to changing issues and conditions. This review should take the form of a thorough needs assessment within each planning area.
2. The densities specified in the Land Use Plan are maximums and may be reduced if it is determined that such reduction is warranted by conditions specifically applicable to a site, such as topography, geologic or flood hazards, habitat areas, or steep slopes. However, density may be increased only under programs of the Housing Element and the Residential Agricultural Unit (RAU) program.¹³
3. No urban development shall be permitted beyond boundaries of land designated for urban uses except in neighborhoods in rural areas.
4. Prior to issuance of a development permit, the County shall make the finding, based on information provided by environmental documents, staff analysis, and the applicant, that adequate public or private services and resources (i.e., water, sewer, roads, etc.) are available to serve the proposed development. The applicant shall assume full responsibility for costs incurred in service extensions or improvements that are required as a result of the proposed project. Lack of available public or private services or resources shall be grounds for denial of the project or reduction in the density otherwise indicated in the land use plan. Affordable housing projects proposed pursuant to the Affordable Housing Overlay regulations, special needs housing projects or other affordable housing projects which include at least 50% of the total number of units for affordable housing or 30% of the total number of units affordable at the very low income level shall be presumed to be consistent with this policy if the project has, or is conditioned to obtain all necessary can and will serve letters at the time of final map recordation, or if no map, prior to issuance of land use permits.¹⁴
5. Within designated urban areas, new development other than that for agricultural purposes shall be serviced by the appropriate public sewer and water district or an existing mutual water company, if such service is available.
6. An adjustment from the minimum parcel size specified for lands designated on the Land Use Element maps as having a minimum parcel area of five acres or greater may be allowed for divisions of parcels in areas that were originally surveyed by Federal government survey, and which parcels subsequently are found not to consist of full sections or parts thereof due to surveying errors. The number of lots resulting from division of such parcels

may equal the number that could have been created if the parcels were full 640 acre sections or parts thereof. This policy shall not apply if a recorded survey of the applicant's property prior to the time the applicant acquired the property revealed that the parcel did not contain a full section or part thereof. The granting of any adjustment from the minimum parcel size shall be subject to the following finding: That allowing this adjustment shall not constitute a grant of special privileges inconsistent with limitations upon other properties in the vicinity of the proposed lot or lots and under identical Comprehensive Plan land use designation, and that circumstances justify granting a variance from the minimum lot area provisions of the applicable zoning ordinance.

7. Lot line adjustments involving legal, non-conforming parcels as to size may be found consistent with the Comprehensive Plan if:
 - a. No parcel involved in the lot line adjustment that is conforming as to size prior to the adjustment shall become non-conforming as to size as a result of the adjustment; and,

Except as provided herein, all parcels resulting from the Lot Line Adjustment shall meet the minimum parcel size requirement of the zone district in which the parcel is located. A Lot Line Adjustment may be approved that results in nonconforming (as to size) parcels provided that it complies with subsection a or b listed below:

- a) The Lot Line Adjustment satisfies all of the following requirements:
 - i. Four or fewer existing parcels are involved in the adjustment; and,
 - ii. The Lot Line Adjustment shall not result in increased subdivision potential for any affected parcel; and,
 - iii. The Lot Line Adjustment shall not result in a greater number of residential developable parcels than existed prior to the adjustment.
 - b) The parcels involved in the adjustment are within the boundaries of an Official Map for the Naples Townsite adopted by the County pursuant to Government Code Section 66499.50 et seq. and the subject of an approved development agreement that sets forth the standards of approval to be applied to Lot Line Adjustments of existing adjacent parcels within the boundaries of the Naples Townsite Official Map. This exception provision shall expire 5 years after its effective date September 12, 2000 unless otherwise extended.¹⁵
8. Proposed development of parcels, including changes of zone, subdivisions, and lot splits, which are divided by a Comprehensive Plan boundary line, i.e.

Urban, Inner-Rural, Rural, or Existing Developed Rural Neighborhood, may be found consistent with the Comprehensive Plan provided that the resulting density on one side of the boundary line complies with the designated density, notwithstanding that the resulting density on the remainder portion of the parcel, which shall not be further divided, exceeds the designated density.¹⁶

9. If a portion of an existing^{viii} legal parcel is designated on the Comprehensive Plan with the “Agricultural Industry Overlay” and the remainder of the parcel is not, and the area of that portion does not meet the minimum parcel size requirements of the base land use designation because it is seven (7) acres or less in size, a land division separating that portion may be found consistent with the Comprehensive Plan subject to all of the following limitations:
 - a. The entire portion designated with the Agricultural Industry Overlay is retained as a whole parcel and is not further subdivided;
 - b. Such portion is separated from the balance of the parcel by existing*: public roads or developed railroad rights-of-way (not including rights-of-way for spurs, turnouts, and other lines off the traveled line, etc.), or unusual and undisturbed geologic or natural topographic conditions (e.g. major watercourses, slopes 30% or greater, or major floodways), which create physical barriers and a separation of the parcel;
 - c. It is not possible to use such portion for agricultural production (i.e., the growing of crops and/or raising of animals) either by itself or with adjoining parcels and such portion has not been in agricultural production for the preceding five years;
 - d. The balance of the parent parcel meets the minimum parcel size requirements of the Land Use Element of the Comprehensive Plan;
 - e. No land use permits, other than those for commercial or industrial uses appurtenant to agricultural production, shall be issued on the parcel containing the overlay.
10. Impacts of oil, gas, and produced-water pipelines outside of industry facilities shall be minimized by requiring the use of available or planned common carrier and multiple-user pipelines to the maximum extent feasible. New pipeline construction shall be permitted only if the Planning Commission determines that the use of available or planned common carrier and multiple-user pipelines is not feasible or is not environmentally preferable to alternative

^{viii} Existing as of the date of the adoption of this policy (April 22, 1985)

proposals. New pipelines that are permitted shall be constructed, operated and maintained as common carrier or multiple-user pipelines unless the Planning Commission determines it is not feasible. New multiple-user pipelines shall provide equitable access to all shippers with physically compatible stock on a nondiscriminatory basis.

New pipelines shall be restricted to approved corridors that have undergone comprehensive environmental review unless the Planning Commission determines that such corridors are not available, safe, technically feasible, or the environmentally preferred route for the proposed pipeline. The required environmental review for proposed pipelines shall include analysis to determine what cumulative impacts might result in adding future pipelines to that corridor.

The design of new common carrier and multiple-user pipelines shall take into account the reasonable, foreseeable needs of other potential shippers. If other pipeline projects are expected to be located in the same corridor, the proposed project shall be required to coordinate concurrent or “shadow” construction with the other projects where practical.

Permits for new pipeline construction shall require engineering of pipe placement and burial within the corridor to minimize incremental widening of the consolidated corridor during subsequent pipeline projects, unless the proposed route is determined to be unacceptable for additional pipelines.^{17 18}

11. For the purpose of ensuring safe, orderly, and planned development of oil and gas resources, the Board of Supervisors designates the northwestern and midwestern portion of the county as the North County Consolidation Planning Area, or NCCPA (as defined under the section “Other Definitions” in this element) and subjects oil and gas development in this planning area to the following policies:
 - a. Due to estimated oil and gas reserves located offshore, the County has prepared a study entitled Siting Gas Processing Facilities: Screening & Siting Criteria.^{19 20} That study is incorporated herein by reference to guide a comprehensive analysis of alternative sites should the county receive an application for a Development Plan to construct or expand a facility in the NCCPA for treating or processing either inshore or offshore gas production. The criteria are designed to optimize public safety, environmental protection, and the benefits of consolidation.

The county has conducted a comparative assessment of available modes for shipping large volumes of crude oil which are produced from offshore fields, processed locally, and requiring transportation to refineries. The assessment concluded that, although pipelines exhibit potentially significant adverse impacts to the environment, they are measurably the environmentally preferred mode of transportation when compared to marine tanker and rail. Furthermore, major crude oil pipelines are in operation for

transporting crude oil from both northern and southern Santa Barbara County to refineries outside the county. Consequently, the county shall require that all crude oil produced from offshore reserves and landed in Santa Barbara County shall be shipped to onshore facilities via pipeline, and thence to refineries via overland pipeline, except as provided in Policy 12. Presently, this policy does not apply to facilities that serve only onshore fields however, it shall apply to facilities that serve both onshore and offshore fields as well as only offshore fields.²¹

12. Proposals for expansion, modification, or construction of new oil and gas processing facilities, oil storage facilities, or pipeline terminals, which receive oil from offshore fields exclusively or from both offshore and onshore fields, shall be conditioned to require transportation of oil by pipeline, to processing facilities and final refining destination, except as provided in this policy.

“Final Refining Destination” shall mean a refinery in California where final refining of the subject oil into products is accomplished. Exceptions: Oil shall be considered to reach its final refining destination if (a) the oil has been transported out of the State of California, and does not reenter before final refining; or (b) the oil has been transferred to truck or train after leaving the County by pipeline, and does not reenter the County by truck or train, and is not transferred to a marine vessel for further shipment to a port in California prior to final refining.

Crude oil received onshore from offshore production facilities may be transported by highway or rail if the Director determines that the oil is so highly viscous that pipeline transport is infeasible, taking into account available options such as modifications to existing pipelines, blending of NGLs, etc.

Any shipment of oil by highway or rail under this policy shall be limited to that fraction of the oil that cannot feasibly be transported by pipeline and shall not exceed the limits of permitted capacity for these transportation modes. The shipper or carrier shall mitigate to the maximum extent feasible any environmental impacts caused by use of the alternate transportation mode.

Temporary transport of oil by waterborne vessel may be authorized under an emergency permit if the Governor of the State of California declares a state of emergency pursuant to Public Resources Code Sec. 30262(a)(8) for an emergency that disrupts the pipeline transportation of oil produced offshore Santa Barbara County. In such a case, the oil transported by alternate mode shall be limited to that fraction which cannot feasibly be transported by pipeline. Transport by the alternate mode shall cease immediately when it becomes technically feasible to resume pipeline transport^{22 23}

13. Oil and gas facilities shall be dismantled and removed, their host sites cleaned of contamination and reclaimed to natural conditions, or conditions to accommodate reasonably foreseeable development, in an orderly and timely

manner that avoids long-term impacts to the health, safety, and welfare of the public and environment.

Applicability: Policy 13 shall apply to all existing and future onshore land uses that are, or at one time were, wholly or partially dedicated to the production, processing, storage, and transportation of oil or gas derived from offshore reservoirs. Policy 13 shall also apply to all oil refineries, regardless of the source of crude oil.

Implementing Procedures:

- (a) The County shall establish a process in its Coastal and Inland Zoning Codes for determining if, based on reasonable evidence, permitted land uses or independent business functions thereof have discontinued operations permanently. The County shall also establish a discretionary process to permit the removal, retention, or abandonment in-place of facilities, structures, and improvements associated with permitted land uses determined to be abandoned, and to reclaim host sites to natural conditions, or other conditions, in compliance with applicable laws and permits. This permit shall be independent of any development permits associated with future use of the land, but may be processed concurrently with development permits.
- (b) Permittees shall obtain all applicable permits to remove (or retain) facilities, structures, and other improvements, and reclaim the host site upon the intentional abandonment of operations of a permitted land use. Otherwise, the permittee shall obtain either County approval to defer abandonment or all applicable permits to remove facilities and reclaim host sites under the following circumstances:
 1. Any event designated in an existing County permit that would require consideration of abandonment; or
 2. The permitted land use has become idled.
- (c) Long-term salvage operations, recycling facilities, or junkyards shall not be considered ancillary to permitted land uses. Long-term salvage operations shall require appropriate permits to operate as legal uses. "Long-term," for purposes of this procedure, shall constitute a period of two or more years. Permittees who desire to operate long-term salvage or recycling operations at an oil/gas site shall first obtain the appropriate permits to do so, and such permits shall be issued independent of the oil/gas operation."²⁴

13. Voter Approval

- a. Any legislative approvals (e.g. zoning amendment, General Plan amendment, Local Coastal Plan amendment, Development Plan, or other legislative action) which would authorize or allow the development, construction, installation, or expansion of any onshore support facility for offshore oil and gas activity on the South of the County of Santa Barbara (from Point Arguello to the Ventura County border) shall not be final unless such authorization is approved, in the affirmative, by a majority of the votes cast by the voters of the County of Santa Barbara in a regular election. For the purpose of this measure, the term “onshore support facility” means any land use, installation, or activity proposed to effectuate or support the exploration, development, production, storage, processing, or other activities related to offshore energy resources.
- b. The voter approval requirement set forth in (a.) above shall not apply to onshore pipeline projects or to onshore support facilities that are located entirely within an existing approved consolidated oil and gas processing site at Las Flores Canyon (designated as of June 13, 1995 as APN 81-220-14, 81-230-19) or Gaviota (designated as of June 13, 1995 as APN 81-130-07, 81-130-52, 81-130-53).
- c. The terms, polices, and zoning amendments set forth herein shall expire at the end of twenty-five (25) years after the effective date of this ordinance unless extended by the Board of Supervisors or by another vote of the electorate.^{25 26}

PLANNED DEVELOPMENT POLICIES²⁷

All areas designated in the Comprehensive Plan for Planned Development shall be subject to the following policies:

1. The purpose of the Planned Development designation shall be to ensure coordinated, well-planned development of large areas designated for residential use within urban areas defined in the Land Use Element of the Comprehensive Plan. Areas designated for Planned Development may include parcels which are subject to topographic, geologic or other constraints such as steep slopes, unstable soils and flood hazards, or parcels with significant scenic or resource values. The intent is to provide for flexibility and innovative design of residential development in order to avoid development in hazardous areas, protect environmentally sensitive habitats and archaeological sites, preserve the maximum amount of open space, and provide other public benefits.
2. The entire area designated for Planned Development shall be planned as a unit. Preparation of a specific plan (Government Code Section 65450) may be

required when parcels comprising a site designated as PD are in separate ownerships.

3. Use of flexible design concepts, including clustering of units, mixture of dwelling types, etc., shall be required to accomplish as much as possible all of the following goals;
 - a. protection of the scenic qualities of the site;
 - b. protection of resources, i.e., habitat areas, archaeological sites, etc.
 - c. avoidance of siting of structures on hazardous areas;
 - d. provision of public open space and recreation;
 - e. preservation of existing healthy trees; and
 - f. provision of adequate urban services (e.g., water, sewer, streets).

4. Permitted uses shall include:
 - a. residential units, either attached or detached;
 - b. recreational facilities, including but not limited to tennis courts, swimming pools, playgrounds, and parks for the private use of the prospective residents and/or public; and
 - c. open space;and in developments of 200 residential units or greater, conditionally permitted uses may include:
 - d. commercial recreational facilities (private and public) that are compatible with the proposed residential units;
 - e. convenience establishments of a commercial and service nature such as a neighborhood store, provided:
 - 1) such convenience establishments are an integral part of the general plan of development for the Planned Development and provide services related to the needs of the prospective residents;
 - 2) such convenience establishments and their parking areas will not collectively occupy more than one (1) acre per two hundred (200) dwelling units;

- 3) such convenience establishments will be located, designed, and operated primarily to serve trade and service needs of persons residing in the Planned Development and not persons residing elsewhere;
 - 4) such convenience establishments will not by reason of their location, construction, manner or timing of operations, signs, lighting, parking arrangements, or other characteristics have adverse effects on residential uses within or adjoining the development, or create traffic congestion or hazards to vehicular or pedestrian traffic.
5. The County shall specify the maximum density of development permitted under the Planned Development designation at the time this designation is adopted for a particular parcel(s) unless already specified in the Land Use Element of the Comprehensive Plan. Determination of an appropriate density shall take into account all of the factors listed in Policy 3 and shall be compatible with the density and character of surrounding land uses.
6. The amount of public and common open space in a Planned Development shall be specified in the specific plan and/or development plan. The County shall determine the amount of public and common open space required, but in no case shall the amount of public and/or common open space be less than forty (40) percent of the gross area of the entire site.

Open space shall be defined as follows:

- a. Public open space shall include but not be limited to public parks and parking lots, access corridors such as bike paths, hiking or equestrian trails, usable natural areas, and vista points which are accessible to members of the general public. Public open space shall not include areas which are unusable for recreational purposes, e.g., private or public streets, and private parking lots. Environmentally sensitive habitat areas and archaeological sites may be included in public open space.
- b. Common open space shall include but not be limited to recreational areas and facilities for the use of the prospective residents of the project such as tennis courts, swimming pools, playgrounds, community gardens, landscaped areas for common use, or other open areas of the site needed for the protection of the habitat, archaeological, scenic, or other resources. Common open space shall not include driveways, parking lots, private patios and yards, other developed areas, or hard surfaced walkways.

HILLSIDE AND WATERSHED PROTECTION POLICIES

1. Plans for development shall minimize cut and fill operations. Plans requiring excessive cutting and filling may be denied if it is determined that the development could be carried out with less alteration of the natural terrain.
2. All developments shall be designed to fit the site topography, soils, geology, hydrology, and any other existing conditions and be oriented so that grading and other site preparation is kept to an absolute minimum. Natural features, landforms, and native vegetation, such as trees, shall be preserved to the maximum extent feasible. Areas of the site which are not suited to development because of known soil, geologic, flood, erosion or other hazards shall remain in open space.
3. For necessary grading operations on hillsides, the smallest practical area of land shall be exposed at any one time during development and the length of exposure shall be kept to the shortest practicable amount of time. The clearing of land should be avoided during the winter rainy season and all measures for removing sediments and stabilizing slopes should be in place before the beginning of the rainy season.
4. Sediment basins (including debris basins, desilting basins, or silt traps) shall be installed on the project site in conjunction with the initial grading operations and maintained through the development process to remove sediment from runoff waters. All sediment shall be retained on site unless removed to an appropriate dumping location.
5. Temporary vegetation, seeding, mulching, or other suitable stabilization method shall be used to protect soils subject to erosion that have been disturbed during grading or development. All cut and fill slopes shall be stabilized as rapidly as possible with planting of native grasses and shrubs, appropriate non-native plants, or with accepted landscaping practices.
6. Provisions shall be made to conduct surface water to storm drains or suitable watercourses to prevent erosion. Drainage devices shall be designed to accommodate increased runoff resulting from modified soil and surface conditions as a result of development. Water runoff shall be retained onsite whenever possible to facilitate groundwater recharge.
7. Degradation of the water quality of groundwater basins, nearby streams, or wetlands shall not result from development of the site. Pollutants, such as chemicals, fuels, lubricants, raw sewage, and other harmful waste, shall not be discharged into or alongside coastal streams or wetlands either during or after construction.
8. On any lands not Comprehensive Planned and zoned for agriculture, grading and "brushing" shall require a permit. Exceptions shall be grading of 50 cubic yards or

less and “brushing” within a radius of 100 yards of a residential structure for fire purposes.

9. Where agricultural development and/or agricultural improvements will involve the construction of service roads and the clearance of natural vegetation for orchard and vineyard development and/or improvements on slopes of 30 percent or greater, cover cropping or any other comparable means of soil protection, which may include alternative irrigation techniques, shall be utilized to minimize erosion until orchards and vineyards are mature enough to form a vegetative canopy over the exposed earth, or as recommended by the County Public Works Department.²⁸

STREAMS AND CREEKS POLICIES

1. All permitted construction and grading within stream corridors shall be carried out in such a manner as to minimize impacts from increased runoff, sedimentation, biochemical degradation, or thermal pollution.

FLOOD HAZARD AREA POLICIES

The National Flood Insurance Program (NFIP) of 1968 requires that jurisdictions who choose to make flood insurance available to their residents through Federal Emergency Management Agency (FEMA) maintain an ordinance which utilizes the FEMA Flood Insurance Rate Maps (FIRM) to determine zoning for existing and proposed structures to be insured. Insurability, construction restrictions, and insurance rates are determined by the zone in which the structure exists (or will be constructed). The County of Santa Barbara has included *County Code Chapter 15A-Floodplain Management* and *15B-Development Along Watercourses* to meet the requirements of the NFIP. A comprehensive list of flood goals, policies, and implementation measures is included in the *Seismic Safety and Safety Element* and should be referenced in conjunction with the flood hazard area policies from this section. The most current County flood hazard maps available shall be used by the County in the development review process. These maps include:

- FEMA Flood Insurance Rate Maps
- California Emergency Management Agency (CAL EMA) Flood Hazard and Dam Failure Inundation Maps
- U.S. Army Corps of Engineers Flood Hazard Maps
- California Department of Water Resources Flooding Awareness and Levee Flood Protection Zone Maps

The intent of the Flood Hazard Area policies is to avoid exposing ~~new~~ developments to flood hazards and reduce the need for future flood control protective works. This goal has the added benefit of reducing the need for and resulting alterations of to natural stream and wetland environments. The intent of these policies is best implemented by, in part, regulating development within the 100 year flood plain and other hazardous areas in the following manner:-

1. All development, including construction, excavation, and grading, except for flood control projects and non-structural agricultural uses, shall be prohibited in the floodway unless off-setting improvements in accordance with ~~HUD~~ federal regulations are provided. If the proposed development falls within the floodway fringe, development may be permitted, provided creek setback requirements are met and finished floor elevations are two feet above the projected 100-year flood elevation, and the other requirements regarding materials and utilities as specified in the Flood Plain Management Ordinance are in compliance.
2. Permitted development shall not cause or contribute to flood hazards or lead to expenditure of public funds for flood control works, i.e., dams, stream channelizations, etc.
3. All development shall be reviewed in accordance with the requirements of County Code Chapter 15A-Floodplain Management and 15B-Development Along Watercourses.
4. The County should revise and review the floodplain improvement projects identified in the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan on a regular basis for progress and necessary revisions.

HISTORICAL AND ARCHAEOLOGICAL SITES POLICIES

1. All available measures, including purchase, tax relief, purchase of development rights, etc., shall be explored to avoid development on significant historic, prehistoric, archaeological, and other classes of cultural sites.
2. When developments are proposed for parcels where archaeological or other cultural sites are located, project design shall be required which avoids impacts to such cultural sites if possible.
3. When sufficient planning flexibility does not permit avoiding construction on archaeological or other types of cultural sites, adequate mitigation shall be required. Mitigation shall be designed in accord with guidelines of the State Office of Historic Preservation and the State of California Native American Heritage Commission.
4. Off-road vehicle use, unauthorized collection of artifacts, and other activities other than development which could destroy or damage archaeological or cultural sites shall be prohibited.
5. Native Americans shall be consulted when development proposals are submitted which impact significant archaeological or cultural sites.

PARKS/RECREATION POLICIES

1. Bikeways shall be provided where appropriate for recreational and commuting use.
2. Opportunities for commercial and sport fishing should be preserved and improved where appropriate.
3. Future development of parks should emphasize meeting the needs of the local residents.
4. Opportunities for hiking and equestrian trails should be preserved, improved, and expanded wherever compatible with surrounding uses.
5. Schools and other public-owned lands should be utilized for joint use recreational activities whenever possible.

OTHER OPEN LANDS POLICIES (For Parcels designated Other Open Lands)

1. Preservation of open lands shall be encouraged under the Williamson Act.
2. Utilization of open lands shall be consistent with protection and long-term productivity of County watersheds.

3. Appropriate recreational uses will be of light intensity with minimal environmental degradation in open land areas.
4. The Conservation Elements and Seismic Safety-Safety Element shall specify other policies for the protection of open land.

VISUAL RESOURCE POLICIES

1. All commercial, industrial, and planned developments, shall be required to submit a landscaping plan to the County for approval.
2. In areas designated as rural on the land use plan maps, the height, scale, and design of structures shall be compatible with the character of the surrounding natural environment, except where technical requirements dictate otherwise. Structures shall be subordinate in appearance to natural landforms; shall be designed to follow the natural contours of the landscape; and shall be sited so as not to intrude into the skyline as seen from public viewing places.
3. In areas designated as urban on the land use plan maps and in designated rural neighborhoods, new structures shall be in conformance with the scale and character of the existing community. Clustered development, varied circulation patterns, and diverse housing types shall be encouraged.
4. Signs shall be of size, location, and appearance so as not to detract from scenic areas or views from public roads and other viewing points.
5. Utilities, including television, shall be placed underground in new developments in accordance with the rules and regulations of the California Public Utilities Commission, except where cost of undergrounding would be so high as to deny service.

PUBLIC FACILITIES^{ix}

1. a. The development of public facilities necessary to provide public services is appropriate within the defined Rural and Inner-Rural Areas.
- b. When a public agency proposes that a facility be located in a Rural or Inner-Rural Area, especially when it may create any parcel(s) smaller than the minimum parcel size for the Area and the applicable land use designation(s), conformity with the Comprehensive Plan shall be determined in consideration of the following factors:

^{ix} Outside "Urban" and "Existing Developed Rural Neighborhood" Areas

- i. Whether the public interest and necessity require the project, balancing potential inconsistencies with other elements and policies of the Comprehensive Plan; and
 - ii. Whether the project is planned and located in the manner that will be most compatible with the greatest public good and the least private injury; and
 - iii. Whether the property sought to be acquired is necessary for the project.
 - c. Regarding any development of public facilities which meets the preceding three criteria, the acquisition of real property for such public facilities is appropriate within the Rural and Inner-Rural Areas, and the acquisition of such real property shall be deemed to be in conformity with the Comprehensive Plan, regardless of the fact that parcels may result which are smaller than the minimum parcel size for the Area and the applicable land use designation(s).
2. In cases where a specific Community Facility or Overlay Designation is applicable, a site providing regional public services within a Rural or Inner-Rural Area shall be given one of the following Designations: "Institution/Government Facility"; "Public Utility" (e.g., a wastewater treatment plant site); "Cemetery"; "Special Area" (e.g., for recognition and preservation of a historic or archaeological site); or, "Waste Disposal Facility," Such designation shall be applied to a proposed site through amendment of the pertinent Land Use Element map, either concurrent with or following the acquisition of the site by the public agency and prior to any development pertaining to the facility.
3. Except in case of an emergency which threatens lives or the immediate safety of persons or property, environmental review for projects allowed under these Policies shall be conducted at the earliest feasible time, and should be completed prior to acquisition of any site for a public facility. The site selection process shall include criteria to avoid areas having significant environmental constraints (for example, prime agricultural soils, areas of high aesthetic value such as Scenic Highway Corridors, public service/resource limitations, geologic or hydrologic hazards, important biological resources, cultural resources), unless the public agency determines that the location of the facility or use on a specific site having such constraints is necessary to satisfy the findings required in California Code of Civil Procedure Section 1245.230 (or successor statute), or is necessary for the protection of the public health, safety, or welfare.
4. The creation of a parcel which is nonconforming as to size and/or use with the applicable land use designation(s) shall be avoided by a public agency, to the extent feasible, through the acquisition of, easements

and/or lease or other rights appropriate to the facility or use to be established.

5. On disposition of parcels which are nonconforming as to size and/or use, the public agency shall ensure through the disposal process that the parcel be brought, to the extent feasible, into substantial conformity in size and/or use with the land use designation(s) currently prevailing in the parcel's vicinity.

SOUTH COAST POLICIES

Growth Management Policies ²⁹

1. The Board of Supervisors and/or Planning Commission shall not approve new housing developments within the unincorporated South Coast Area which would utilize new extractions or increases in extractions of groundwater from any physically overdrafted groundwater basin, or which through such new or increased groundwater extractions would create a condition of physical overdraft in any groundwater basin. A condition of existing physical overdraft or project-induced physical overdraft shall be verified by the County Water Agency.

This policy shall not apply to new development:

- (1) supplied by water to which the development is legally entitled pursuant to litigation or an adjudication of water rights, whether the developer is an appropriator or overlying landowner; or
- (2) supplied by existing wells (or new wells which replace existing wells) with a recent historic use which would not be exceeded as result of the new development.

Implementing Action

This policy will apply to all projects of five or more dwelling units, and to any smaller projects for which the Division of Environmental Review of the Resource Management Department has made a finding of “significant unavoidable adverse impact” due to the project’s water demand from a currently overdrafted basin or creation of a condition of overdraft. “Recent historic use” shall mean the average annual groundwater extractions from the existing well over the five or more years immediately preceding the date of application for the new development. In determining this average, the County shall use proper discretion in excluding years of unusually high or low groundwater extractions.

2. The Board of Supervisors strongly encourages the governing Board of the various water purveyors within the unincorporated area of the County to take steps to increase their firm water supplies, including but not limited to placing water supply augmentation projects and/or funding measures on the ballot for decision by the voters.

Implementing Action

The Board of Supervisors shall request annual reports from each water purveyor within the unincorporated area of the County, which detail the measures accomplished or being considered by each purveyor to increase its firm deliverable water supplies.

3. The County shall assist existing Santa Barbara County employers in providing suitable mitigation of the adverse housing impacts associated with any expansion of said employers' operations within the unincorporated area of the County.

Implementing Action

The Department of Resource Management and the County Housing Authority shall work cooperatively to identify the most appropriate type of mitigation for a specific project. To this end, the County Housing Expediter shall coordinate private and public efforts to provide affordable housing for the County's private and public labor force. In addition, the Department of Resource Management shall "fast track" all applications for mixed-use (commercial/industrial/ governmental/and residential) developments proposed by, and for the primary use of, existing County employers.

4. The sections of the Petroleum Ordinance, Ordinance No. 661, and "Statement of Policy Relative to the Location of On-shore Facilities" (Statement) that address oil and gas processing facilities are hereby incorporated by reference in the land use element. The Statement does not apply, however, to the South Coast Consolidation Planning Area, which is defined in Policy 5 below.³⁰
5. The Board of Supervisors designates the unincorporated area from Point Arguello to the western boundary of the City of Santa Barbara, and from the ridge of the Santa Ynez Mountains to the three-mile-offshore limit line on the south and southwest as the South Coast Consolidation Planning Area (SCCPA). Within the SCCPA, the Board of Supervisors strongly encourages, to the maximum extent feasible, commingled processing of oil and gas production from offshore reservoirs and zones to minimize industrialization within this area and to minimize adverse environmental impacts associated with construction and operation of multiple, segregated processing facilities. Additionally,³¹ the Board of Supervisors requires consolidation of oil and gas processing sites.

Implementing Action

- A. Definition of new production.

Reference to the terms "new production" or "new oil and gas production" or any similar reference for the purpose of this policy shall mean:

1. The development of any oil and/or gas after the adoption of these policies which requires new discretionary local, state, or federal permits unless it is from an existing well or platform; or
2. The development of any oil and/or gas which, after the adoption of these policies, requires approval of a new platform, or a new subsea or onshore well completion.

If the operator contends that a Constitutionally-protected vested right exists within the context of existing permits to process new production at a facility which is not at a

County designated consolidated site, the operator may file a request for a determination of exemption to allow processing of that production at the nonconsolidated site.

B. Consolidation of processing facilities.

All efforts shall be made to consolidate oil and gas processing facilities. New oil and gas production from offshore reservoirs shall be processed at facilities approved for consolidation to the maximum extent technically and environmentally feasible. Commingled processing shall be required to avoid or reduce project and cumulative impacts --considering environmental, socioeconomic, safety, and land use concerns that otherwise would result from construction and/or operation of redundant processing units, redundant pipelines, and redundant ancillary facilities. Construction of new processing facilities at consolidated sites shall be considered only if the County determines that the new facilities would not be unnecessarily redundant, finding that one or more of the following conditions apply.

First, permitted processing capacity at the sites designated for consolidation is insufficient for a period of time that would render development of the proposed offshore reservoir(s) infeasible. Determining applicability of this condition shall include consideration of feasible delays in development of the offshore reservoir(s) to maximize use of currently permitted processing capacity at sites designated for consolidation. Determination of condition applicability also shall include consideration of expanding existing facilities in favor of constructing new facilities.

Second, the specific chemical characteristics and physical properties of oil or gas from a particular reservoir would render development of the resource technically infeasible unless specialized units can be built. Specialized units may include partial dehydration equipment if it is required to adapt a resource to the technical requirements of a processing facility.

Third, commingling the production in approved processing facilities at designated consolidated sites is determined to be environmentally unacceptable.

Approval of a collocated processing facility at a consolidated site shall be contingent upon shared use of existing ancillary facilities to the maximum extent feasible.

C. Consolidation of Processing Sites.

The oil and gas processing site at Las Flores Canyon (APN 81-220-14 and 81-220-19, as delineated on County zoning and parcel maps as of September 7, 2004) is designated as the consolidated site for processing oil and gas production from offshore reservoirs and zones. Any new oil and gas production from offshore reservoirs and zones that is processed within the South Coast Consolidation Planning Area shall be processed at this site.³²

D. Equitable, Nondiscriminatory Access to Consolidated Facilities and Sites.

Operators and owners of County-designated consolidated facilities and sites shall make their facilities and property available for commingled processing and consolidation of oil and gas facilities on an equitable and nondiscriminatory basis.

If existing processing capacity is insufficient to accommodate proposed production and necessary new facilities are not permissible pursuant to the County's consolidation policies, operators of consolidated facilities shall reduce throughput on a pro-rata basis to accommodate other developers. E. Review of Permits

The County shall review permits that are approved after August 12, 1985 for new or modified oil and gas facilities when throughput, averaged (arithmetic mean) over any twelve (12) consecutive months, does not exceed 3 percent of the facility's maximum permitted operating capacity. The review shall be conducted in a duly-noticed public hearing to determine if facility abandonment or facility modifications are appropriate.

F. Review of South Coast Consolidation Policies

The County shall periodically review the South Coast Consolidation policies in view of new or updated information, such as: revised production forecasts, revised air quality data, advancements in technology for reduction of air emissions, and results of impact monitoring programs. The results of the policy review shall be presented in a duly-noticed public hearing, and appropriate revisions in the policies shall be pursued as deemed necessary by the County.³³

6. The County shall request that all agencies (e.g. Caltrans, County Public Works, etc.) performing work within the Highway 101 corridor from the Ventura County line to the western most extent of the Goleta Community Plan submit projects for review and encourage these agencies to design projects to comply with the *Highway 101 Corridor Design Guidelines*, on file at the County of Santa Barbara Planning and Development.³⁴

V. AREA/COMMUNITY GOALS

Citizen participation plays a vital role in the planning process. Area residents and landowners are directly affected by the consequences of land use decisions. This community involvement not only finds support in established democratic principles, but encourages citizen concern for their surroundings and provides a vehicle for “first-hand” information to decision makers.

Traditionally, public participation in Santa Barbara County has been conveyed through established citizen committees. From the outset of the Comprehensive Plan program, the seven area General Plan Advisory Committees were the official channel for citizen input. Each committee prepared a detailed report on goals to be reflected in the Comprehensive Plan. The reports were organized to conform with the various subjects covered by the Plan.

In addition, the committees reviewed each element (Conservation, Open Space, Seismic Safety, and Safety, etc.) as they were being formulated, and worked with staff to develop the Comprehensive Plan maps on Circulation and Land Use.

For the most part, the reports on goals of each Advisory Committee were similar. They emphasized preservation and expansion of agriculture, containment of urban development within prescribed geographic limits, and protection and enhancement of the County's natural environment.

In this chapter, the Advisory Committees' recommendations have been arranged by subject matter and committee planning areas:

- Carpinteria (Toro Canyon)³⁵
- Summerland Area
- Montecito Area
- Santa Barbara Area (includes Mission Canyon and Las Positas)
- Goleta -Lompoc Area
- Santa Ynez Valley
- Santa Maria
- Orcutt Area
- Los Alamos Planning Area³⁶

Some of the desires of the Committees were general or long-range goals, others were very specific, to be incorporated into an implementation program. There were also goals that did not come within the scope of the Comprehensive Plan or were superseded by the Local Coastal Plan. However, most of the goals recommended by the Committees were reflected in either the Comprehensive Plan or the Coastal Plan.

CARPINTERIA ³⁷

Area/Community Goals for Carpinteria are superseded by the Toro Canyon Plan within the area covered by the Plan.³⁸

Population/Growth

The rate of growth for the Carpinteria area is recommended not to exceed 0.9% per year.

Growth outward from the city's core should be emphasized, to discourage leapfrog development.

Land Use

Development should complement the natural contours of land, utilizing, wherever possible, existing environmental conditions;

The agricultural economy and the semi-rural qualities of the area should be preserved.

Grading should be stringently regulated in steep slope areas of 30 percent or greater.

Buffer strips should be required to separate extreme differences in land use.

Preservation of open space need not be considered only from an agricultural standpoint (Williamson Act). The preservation of non-agricultural land in open space is a viable approach when it is determined that the preservation of non-agricultural land is consistent with the Comprehensive Plan, is a reasonable use of the land, and is in the public interest.

Agriculture

Every effort should be made to preserve fertile lands for agriculture.

Foothill Road and Casitas Pass Road should be the dividing line between the exclusive agricultural land use and mixed agricultural and other uses.

Existing agriculture should be preserved above Foothill Road and east and above Casitas Pass Road. Lands with prime soils located below Foothill should also remain in agriculture use.

Housing

New housing should be allocated so that all economic segments of the community are accommodated.³⁹

Parks/Recreation

Any further park development in this area should be low profile and of very light impact, i.e., daytime activity utilizing facilities that are geared to satisfying the needs of the local residents rather than attracting use by out-of-county residents.

Scenic open space should not be utilized for intensive recreation.

SUMMERLAND⁴⁰

In 1992 the County adopted a Community Plan for Summerland area (see the “Summerland Community Land Use Map” for the Planning Area boundaries). This Plan describes the community and the relevant issues it faces, including land use, agriculture, recreation, coastal access, circulation, habitats, public services and visual resources. The Community Plan establishes land use designations and zone districts and includes development standards to guide future development. In addition, the Community Plan contains a number of policies as well as actions which implement the goals and objectives of the Plan. Finally, in addition to the adoption of the Community Plan, the Board of Supervisors also adopted Board of Architectural Review Guidelines for Summerland.

In addition to the applicable Comprehensive Plan policies, the goals, objectives, policies and actions of the Summerland Community Plan also apply. Where there are other goals, objectives, policies and actions in the Comprehensive Plan which address the same issues as the Summerland Community Plan, those of the Summerland Community Plan shall be applied.

See the “Community Plans” section of this Element for the complete Summerland Community Plan.

MONTECITO

I. GROWTH AND SERVICE-RELATED RESOURCES

GOAL I.A. Maintain orderly growth consistent with available resources and the semi-rural character of the community.

Policy I.A.1. In order to pace development within long-term readily available resources and services (i.e., water, sewer, roads, schools), the County shall not permit the number of primary residential units to exceed an annual rate of one half of one percent of the permitted 1989 housing stock unless specifically exempted by ordinance. This rate shall represent the maximum allocated residential growth rate until such time that the County determines, through a periodic public review of the status of services and infrastructure in the Montecito Planning Area, that further growth can be accommodated by acceptable and reliable supplies and capacities without diminishing the quality of life in the community.

Policy I .A. 2. A temporary reduction in the annual one-half percent dwelling unit permit rate and corresponding reduction in number of permit allocations for the Montecito Planning Area may be enacted by the Board of Supervisors, if the short term availability of resources is jeopardized by the continued allocation of such permits.

Implementation Measure I.A.I. The County shall adopt and implement a growth management ordinance that regulates the number of additional new primary residential units permitted each year by the Resource Management Department. Such ordinance shall be periodically reviewed, as defined in the ordinance, to measure its effectiveness in achieving the balance sought by the growth objective of the community.

In 1992, the County adopted a Community Plan for the Montecito area (see the “Montecito Community Land Use Map” for planning area boundaries). The Montecito Community Plan describes the community and the relevant issues it faces and establishes land use designations and zone districts to guide future development. In addition, the Community Plan contains a number of policies and actions that serve to implement its goals and objectives.

In addition to applicable Comprehensive Plan policies, the goals, objectives, policies and actions of the Montecito Community Plan apply to activities within the Montecito Planning Area. Where there are other goals, objectives, policies and actions in the Comprehensive Plan that address the same issues as the Montecito Community Plan, those of the Montecito Community Plan shall be applied.

See the “Community Plans” section of this Element for the complete Montecito Community Plan.^{41 42 43}

SANTA BARBARA AREA⁴⁴

Population/Growth

The population level and rate of growth of the South Coast should not adversely alter the present quality of life and the environment.

Economic growth and prosperity should be achieved through growth in productivity generated by a stable population rather than being linked to population growth.

Land Use

Stream channels should be protected from encroachment and channelization, and aesthetic and conservation measures should be used to acquire green belts along major streams with public access.

Development should be restricted within such hazardous areas as flood plains, ocean bluffs, or within the 75-year retreat estimate, on filled land (unless supplemental building

code requirements are met), on active or potentially active landslide areas, on unstable slopes, in fire hazard areas, or adjacent to potentially active earthquake faults.

Land presently allocated for industrial use should be evaluated, and surplus lands should be planned for more appropriate uses. Laws protecting the historical features of the South Coast area should be strengthened and broadened in recognition of the role that the past plays in the present and future character of the area.

Within the Santa Barbara area, the foothills of the Santa Ynez range form the northern limit of urban development, and outward expansion of this boundary is undesirable.

Housing

Where appropriate, planned unit developments should be encouraged to provide for greater flexibility in the development of residential properties and to encourage the preservation of landscaped open spaces without increasing the overall population density.

Maintenance, improvement, and rehabilitation of existing housing and landscape should take precedence over wholesale demolition.

Parks/Recreation

Suitably balanced recreational activities meeting the needs of a diverse population should be provided. The County, cities, and school districts should cooperate so the supplementation rather than duplication of services is provided on the South Coast.

Hiking and equestrian trails should be preserved, improved and expanded.

Permanent County-owned camping facilities, operated on a non-profit basis for use by local organizations, should be established.

Use of off-road vehicles should be stringently regulated and confined to a few areas where the impact on the environment and on the human community will be minimal.

Transportation/Circulation

Regional transportation planning shall be coordinated with the land use planning and policies of the region.

Local regional transportation systems shall be designed to maintain and enhance the quality of life in the region.

Projects to increase the capacity of the region's freeway and arterial system through the provision of additional traffic lanes shall be considered only when the existing facility can no longer provide an acceptable level of service. An acceptable level of service

shall be defined as one that can accommodate peak hour traffic at somewhat less than free flow.

Highway 101 on the South Coast portion of the County shall be limited to four lanes, two in each direction, with the potential of an additional lane in each direction.

Highway 154 shall not be expanded to provide more than two through lanes.

Public transportation should be provided. The type and level of service shall be consistent with the needs of each community.

A system of bikeways and pedestrian facilities shall be developed to provide an alternative to the automobile.

Work and school schedule changes shall be encouraged to reduce peak period congestion.

Employers shall be encouraged to implement employee transpooling (car pooling and van pooling).

Environment

Air quality must be given prime consideration in land use planning.

The character and quality of the environment should be preserved and enhanced.

A program to achieve maximum fire protection consistent with the natural beauty of the mountain slopes should be developed.

Grading of hillside sites should be severely restricted.

Removal of major trees should be strictly limited.

Open space should be preserved primarily for its scenic and aesthetic values; its utilization for intensive recreational activities should be discouraged.

Noise level standards should be set and enforced.

Planned Development Sites ⁴⁵

Cieneguitas Creek Planned Development:

The following policies shall be applicable to the Planned Development Designation on the Cieneguitas Creek property:

- a. A maximum of 75 residential units may be developed on the site. All residential units shall be located outside of the following constraint areas: identified archaeological sites, riparian areas associated with Atascadero and Cieneguitas Creeks, Rincon formation areas in the southern and eastern portions of the site, and oak woodlands dispersed throughout the site.
- b. Development within buildable areas (i.e., outside of the constraint areas defined above) on the western portion of the site shall be clustered. To minimize visual impacts, buildings shall not exceed 25 feet in height and shall be finished in color tones which blend with the surrounding natural environment. Extensive landscaping shall also be used to mitigate visual impacts.
- c. Development within the older alluvium areas outside of the constraint areas on the eastern portion of the site shall be limited to single-family lots of one or more acres in size.
- d. Development on portions of the site that exceed 30% slopes which are located outside constraint areas should be limited to single-family lots of five or more acres in size.
- e. Development within the constraint areas defined above shall be limited to service systems such as interior streets, water, sewer, and other utilities necessary to serve the site. Such development shall be sited and designed to minimize adverse impacts on environmentally sensitive habitats, archaeological areas, and groundwater resources. Identified constraint areas shall be held in open space in perpetuity.
- f. At the time of project approval, the County shall make the finding that the proposed water supply is adequate to serve all potential development on the site (including single-family lots) without overdrafting affected groundwater basins.

46 47

GOLETA

In 1993 the County adopted a Community Plan for the Goleta area (see the “Goleta Community Plan Area Land Use Map” for the Planning Area boundaries). This Plan describes the community and the relevant issues it faces, including land use, agriculture, recreation, coastal access, circulation, habitats, public services and visual resources. The Community Plan establishes land use designations and zone districts and includes development standards to guide future development. In addition, the Community Plan contains a number of policies as well as actions which implement the goals and objectives of the Plan.

In addition to the applicable Comprehensive Plan polices, the goals, objectives, polices and action of the Goleta Community Plan also apply. Where there are other goals,

objectives, policies and action in the Comprehensive Plan which address the same issues as the Goleta Community Plan, those of the Goleta Community Plan shall be applied.

See the "Community Plans" Section of this Element for the complete Goleta Community Plan.⁴⁸

SANTA YNEZ VALLEY

Population Growth

Planning for the Valley should be geared to the concept of living within the resources available locally.

Agriculture

Agriculture should be preserved and protected as one of the primary economic bases of the Valley.

Land Use

Future residential development should not be located on prime food producing or pasture land, but close to existing public services. The beauty of the land should be preserved by limiting urban sprawl and creating buffer zones to maintain the individual character of each town.

Parcel sizes should progressively increase from urban centers to suburban belts, to ranches, to rural farming and grazing.

Density standards should be set to meet the needs of the communities.

Medium and heavy industrial uses are not considered compatible with the Valley's unique life style.

Tourism should be encouraged as a use consistent with preservation of open space.

Housing supply should not be allowed to overtax present available resources.

Open space should be used as settings for unique and historic areas. The rural view to the east of Mission Santa Ynez should be preserved in open space, and in agricultural use wherever possible.

LOMPOC AREA

Population Growth

The present character of the Lompoc area should be retained and enhanced.

Population should remain within available natural resources and should enhance present quality of life and environment.

The limits of the natural resources should be ascertained. Then an estimate should be made of the reasonable holding capacity and a planned pattern of growth be made that is compatible with available resources.

Land Use

The natural backdrop of the area should be preserved through strict controls on hillside development. Hillside grading over 30 percent on residential and commercial land should be severely restricted.

The unique character of the area should be protected and enhanced with particular emphasis on protection of agricultural lands, grazing lands, and natural amenities.

The river bottom should be managed as an open space, in the best interests of wildlife conservation, water conservation, and flood control.

Residential, commercial and industrial growth should be confined to urban areas.

Commercial and industrial development that complements and expands the existing agricultural industry of the area should be encouraged.

Urbanization should remain within the City of Lompoc and designated urban portions of the Vandenberg Village/Mission Hills/ Mesa Oaks areas.

Industrial development should be light intensity.

Forests, mountainous areas, agricultural lands and ranch lands should be preserved by revising the property tax structure to encourage these uses through a preserve status of tax incentive and by prohibiting subdivision and multiple-unit residential development.

Prime agricultural lands should be preserved for agricultural use only. Preservation of lesser grades of presently producing or potential agricultural land should be actively encouraged.

Scenic areas, such as ocean frontage, mountainous areas, streams, and lands immediately adjacent to these areas should be preserved by their being included in the County's public and private open space land programs.

Encouragement should be given to the preservation of significant archaeological resources and sites reflecting the County's Indian, Mexican, Spanish, and early California cultural historical heritage now in both public and private ownerships.

Provision should be made for the systematic re-establishment of lands that have been misused by destruction of natural habitats, inappropriate construction, erosion, grading, mining, or waste disposal.

Changes in natural or re-established topography, vegetation, biological communities should be minimized in an attempt to avoid the destruction of natural habitats.

Residential development should be prohibited in areas in proximity to airport flight and noise patterns or abutting major traffic ways. Such areas should be designated for uses that would not suffer adverse impacts.

Development, construction, and roads cut in steep areas should be limited to ensure safety and protection of the terrain, as well as environmental and scenic values.

Circulation

Develop a comprehensive countywide transportation system which will provide alternative forms of transportation for all residents and reduce dependence on the automobile.

Improvements to or alterations of existing roadways must minimize environmental and visual impact. The scenic enhancement of through-transit corridors in the Lompoc Valley should be encouraged.

A County Bikeway Plan should be implemented.

The Lompoc Airport should remain for general aviation only. No expansion for extensive scheduled commercial traffic should be planned for.

The use of rail transportation between Lompoc and other points should be considered for a future mode of transporting people.

Efficient public transportation between Lompoc and other central coast communities should be encouraged.

Parks/Recreation

Provide facilities for a maximum variety of recreational activities for all age levels within a reasonable distance of the place of residence, so separated and protected as to avoid conflicts between the different types of activities.

Locate recreational activities where adverse effects, such as increased auto traffic, noise, and increased litter would not conflict with surrounding areas.

Establish trails for horses and hiking so that they are compatible with surrounding uses.

Encourage wildlife sanctuaries.

Design future parks to be natural areas with minimal maintenance.

Develop an adequate day-use park for the Mission Hills area in the vicinity east of the present housing development.

Environment

Growth and employment must be consistent with the preservation and enhancement of resources and environmental quality.

Unique ecological areas should be identified and preserved.

All mineral resources extraction should be regulated to minimize adverse impacts rehabilitation and ultimate use plans should be required.

The County should plan for and encourage the maximum conservation of energy.

An adequate supply of quality water should be provided to meet agricultural and urban needs.

Pollution of streams, sloughs, drainage channels, underground water basins, estuaries, the ocean, and areas adjacent to such waters should be minimized.

The groundwater resources should be protected against prolonged overdrafting.

Adequate flood control measures should include provisions to recharge water basins with water runoff.

Wastewater recycling should be encouraged.

The County should plan for and encourage the maximum conservation of water.

Good air quality should be maintained as one of our greatest assets.

Excessive noise should be eliminated through the development of noise pollution standards.

Tularosa Road Area Planning Policy

All applications for Comprehensive Plan Amendments, Rezones, and Land Divisions within the Tularosa Road Study Area identified in 83-GP-8 shall be subject to the following policy:

1. Prior to approving any application for increased density, the County shall find that there is adequate water and sewage disposal for each proposed or potential parcel, that there is adequate legal and practical access to each proposed or potential parcel, and that development of residential and accessory structures on each lot will not result in increased fire hazard.⁴⁹

SANTA MARIA/ORCUTT AREA

Population Growth

Economic and population growth should proceed at a rate that can be sustained by available resources. The availability of these resources, especially water, should be continuously monitored and integrated with the growth.

Land Use

Leapfrog development should be discouraged.

Promotion and protection of agriculture as an industry

Parks/Recreation

Commercial parks including overnight facilities should be encouraged.

The County should develop its existing parks for day use to the fullest extent possible.

Circulation

Public transit should be planned and provided within the urban area.

Circulation for trucking should be reviewed to eliminate conflicts with urbanized areas, and areas should be planned for truck and bus turnarounds.

Environment

Reasonable environmental protection and open space preservation policies should be adopted.

Tepusquet Study Area Planning Policies

These policies apply to parcels within Tepusquet Canyon that are encompassed by the “Existing Rural Neighborhood” boundary line on the Countywide Land Use Element Map (COMP 1) except those parcels that are within agricultural preserve. (Refer to 82-GP-6).

All applications for Comprehensive Plan amendments, rezones, and land divisions for parcels within the Tepusquet Study Area shall be subject to the following policies.

1. A map, drawn by a registered Civil Engineer or licensed land surveyor, conforming to National Mapping Standards, and having a scale of not less than one inch equals two hundred feet, shall be filed at time of application that shows:
 - a. The proposed parcelization of the site, and
 - b. The topography of the site, with a contour interval of at least forty (40) feet. The use of existing topography (i.e., U.S. Geological Survey 7.5 minute quadrangle topo) would be acceptable in this case. However, a more frequent contour interval (e.g., five, ten or twenty feet) may be requested for various reasons, including a more precise depiction of a parcel's actual topographic variation, for the proper application of the following planning policies. If this is the case, contours shall be based upon either ground or aerial survey; interpolation; between existing forty foot contours would not be acceptable.
2. The size of lots shall be determined by the following criteria:
 - a. To qualify for a twenty acre minimum lot size; at least fifty percent of the gross area of each proposed lot 1 shall have a slope of less than thirty percent.^x
 - b. To qualify for a ten acre minimum lot size, the entire area of each proposed lot shall have a slope of less than thirty percent.
 - c. No lots less than forty acres in size shall be created that do not meet the criteria of a, or b, above.
 - d. No lots less than ten acres in size shall be created.

^x The area of the slope shall be determined using adjacent contours.

3. Prior to approving any application for increased density, the County shall make the following findings:
 - a. That there is adequate water for each proposed or potential lot;
 - b. That there is adequate sewage disposal capability for each proposed or potential lot;
 - c. That each proposed or potential lot has a suitable building site and adequate road access without necessitating alteration of natural land forms; and
 - d. That development of residential and accessory structures on each lot will not result in increased fire hazard.⁵⁰

51 52 53 54 55 56

ORCUTT

In 1997 the County adopted a Community Plan for the Orcutt area (see the “Orcutt Community Plan Area Land Use Map” for the Planning Area boundaries). This Plan describes the community and the relevant issues it faces including land use, agriculture, recreation, circulation, habitats, public services, visual resources and fiscal issues. The Community Plan establishes land use designations and zone districts and includes development standards to guide future development. In addition, the Community Plan contains a number of policies as well as actions which implement the goals and objectives of the Plan.

In addition to the applicable Comprehensive Plan policies, the goals, objectives, policies and actions of the Orcutt Community Plan also apply. Where there are other goals, objectives, policies, and actions in the Comprehensive Plan which address the same issues as the Orcutt Community Plan, those of the Orcutt Community Plan shall be applied.

See the “Community Plans” Section of this Element for the complete Orcutt Community Plan.⁵⁷

LOS ALAMOS PLANNING AREA:

In 1994, the County adopted a Community Plan for the Los Alamos area (see Los Alamos Community Plan Land Use Map). The Los Alamos Community Plan describes the community and the relevant issues it faces and establishes land use designations and zone districts to guide future development. In addition, the Community Plan contains a number of policies, actions, and development standards that serve to implement its goals and objectives.

In addition to applicable Comprehensive Plan policies, the goals, objectives, policies, actions, and development standards of the Los Alamos Community Plan apply to activities within the Los Alamos Planning Area. Where there are other goals, objectives, policies, actions, and development standards in the Comprehensive Plan that address the same issues as the Los Alamos Community Plan, those of the Los Alamos Community Plan shall be applied.

See the “Community Plans” section of this Element for the complete Los Alamos Community Plan.⁵⁸

LAND USE HOLDING CAPACITY

METHODOLOGY FOR CALCULATING DWELLING UNIT CAPACITY AND DISTRIBUTION

I. Tables 11a through 20a

The following tables indicate the total theoretical unit capacity which could be accommodated by the land use plans of the various planning areas. The calculations are based on aerial measurements of the mapped areas of the different land use designations shown on the land use maps for the planning area. The methodology used to perform these calculations is discussed below:

1. Calculations by land use density for each mapped area were grouped into their corresponding Urban, Inner-Rural, or Rural categories. Calculations for areas within Existing Developed Rural Neighborhoods are included within the Rural Category.
2. The number of Developed Units was determined by using aerial photographs, current and historical Assessor's parcel map pages, land uses maps, and data developed in preparation of the Land Use Element.
3. Figures showing Household Size for the different land use designations and planning areas were derived from 1970 and 1975 census information distributed by dwelling unit type when subject to comparisons of land use classifications. The series of estimates recognized housing supply and purchasing power consistent with that in evidence within Santa Barbara County during 1974 through 1976. Reference material regarding fertility, migration patterns, age, sex, and household composition can be made available on request. In addition, the number of households and household sizes were not adjusted in recognition of a critical housing shortage in evidence on or about April 1, 1976 (estimate). The multiple use of an existing structure, conversion of units not in previous use (guest houses, garages, etc.) to house population may have resulted in sizeable additions in the number of inhabitants within some planning areas located on the South Coast of Santa Barbara County.
4. Estimated population was calculated by multiplying the numbers of "Developed Units" by their respective Household Size multipliers.
5. Additional Potential Units were calculated by multiplying the area of vacant parcels by the density factor for the appropriate land use designation. No attempt was made to factor in any constraints on development. For the purposes of these tables, the density factor was based on the minimum parcel size allowed for a particular designation, e.g., the minimum parcel size for all lands designated as A-I, with or without a specified minimum parcel size, was five acres.

6. Theoretical Unit Capacities were determined by adding the number of Developed Units to their respective number of Additional Potential Units for each land use designation. This presents an estimate of the maximum unit holding capacity of the land use plans and gives some perspective to the potential growth possible for the various planning areas. Actual developed capacity will be somewhat less than the theoretical unit capacities since not all parcels will necessarily be developed to their highest permitted density due to environmental constraints.

METHODOLOGY FOR CALCULATING DEVELOPED AND UNDEVELOPED LAND

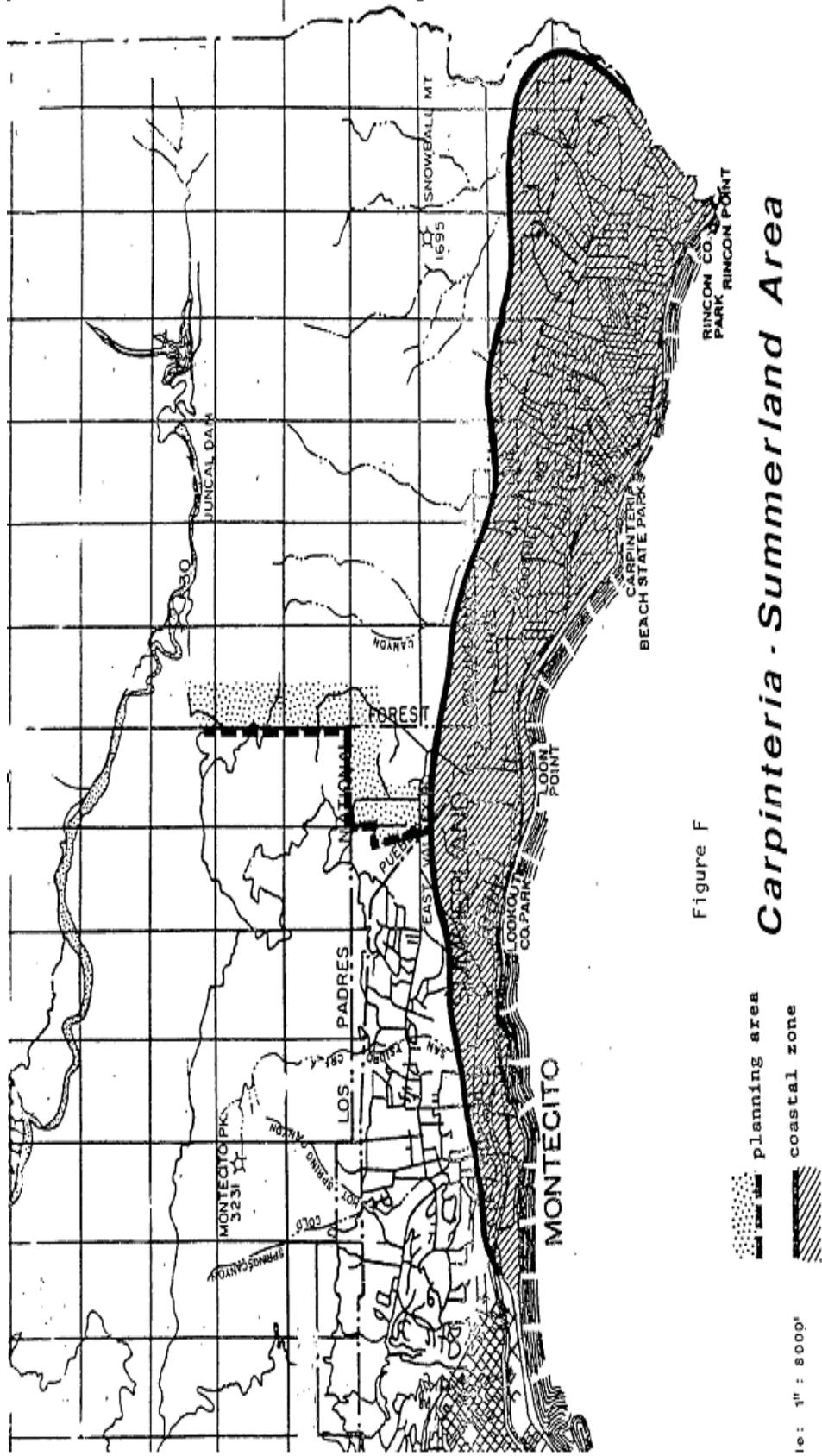
11. Tables 11b through 20b

These numbers show the amount of developed and undeveloped land for each of the land use designations and are divided according to whether they appear in the Urban, Inner-Rural, Rural, or Existing Developed Rural Neighborhood areas. The acreages for land use designations with potential for residential development were adjusted to exclude public and private schools public lands, religious institutions and lots larger in size than the minimum designated for residential use, but not large enough to be divided. For example a 1.8 acre lot with an existing house in a one or more acre per unit category was calculated as having the potential for only one unit.

HOLDING CAPACITY TABLES BY PLANNING AREA

CARPINTERIA AREA ⁵⁹

F Carpinteria-Summerland Planning Area



11.A Carpinteria-Summerland Planning Area – Dwelling Unit Capacity

TABLE 11a: CARPINTERIA-SUMMERLAND AREA RESIDENTIAL LAND USE DISTRIBUTION
 (Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretical Unit Capacity
URBAN AREA					
A-I	1	2.8	2	49	50
Ranchette	8	2.8	22	51	59
3+ acres/unit	37	2.8	103	40	77
1+ acres/unit	63	2.6	163	207	270
RURAL AREA					
MA	1	2.8	2	253	254
A-II/I	15	2.8	42	448	463
TOTAL	125		334	1048	1173

11.B Carpinteria-Summerland Planning Area – Land Use Capacity

Table 11b
 CARPINTERIA-SUMMERLAND AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LAND
 (Federal Lands, Incorporated Cities, and Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A-I	6.3	245					47.4	1620
A-II	239	4960						
MA	61	10120						
Recreation/Open Space	21						46.4	
RESIDENTIAL								
Ranchettes	40	255						
3+ acres/unit	112.9	120						
1+ acres/unit	63	207						
COMMUNITY FACILITIES								
Education	163.6							

Figure G [Deleted, case no. 92-GP-14, Board Resolution 92-516, 9/15/92.]

Table 12 [Deleted, case no. 92-GP-14, Board Resolution 92-516, 9/15/92.]⁶¹

SANTA BARBARA AREA H Santa Barbara Planning Area

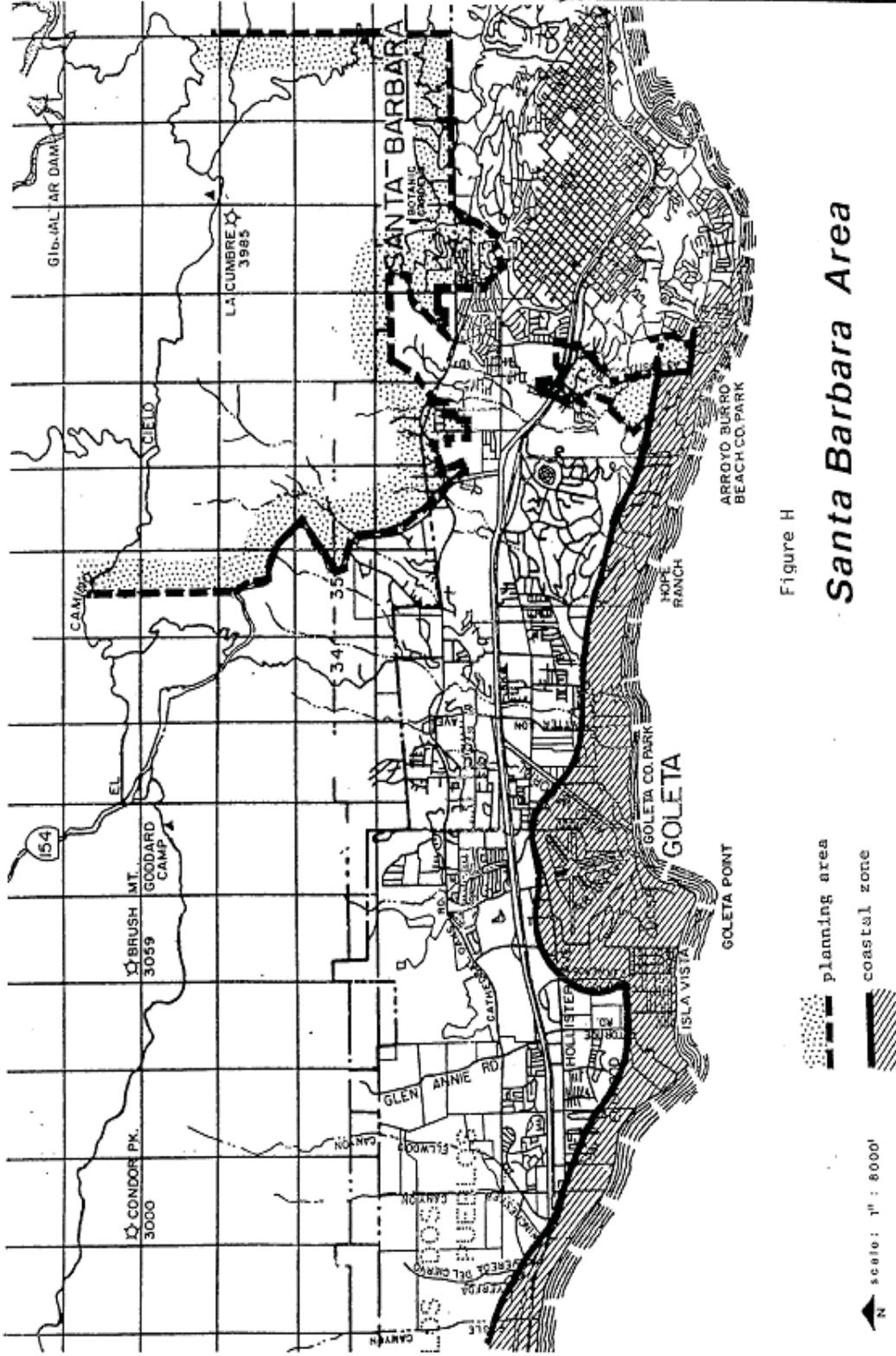


Figure H
Santa Barbara Area

13.A Santa Barbara Planning Area – Dwelling Unit Capacity

TABLE 13a : SANTA BARBARA AREA RESIDENTIAL LAND USE DISTRIBUTION
 (Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretica Unit Capacity
URBAN AREA					
Planned Development	0	2.8	0	75	75
A-I	60	2.8	168	132	192
Ranchette	39	2.8	109	48	87
1+ acres/unit	255	2.8	714	121	376
1.8 units/acre	221	2.6	574	18	239
3.3 units/acre	148	2.6	384	61	209
4.6 units/acre	1017	2.6	2644	781	1798
12.3 units/acre	123	2.0	246	0	123
RURAL AREA					
MA	3	2.8	8	124	127
A-II	3	2.8	8	71	74
TOTAL	1869		4855	1431	3300

13.B Santa Barbara Planning Area – Land Use Capacity

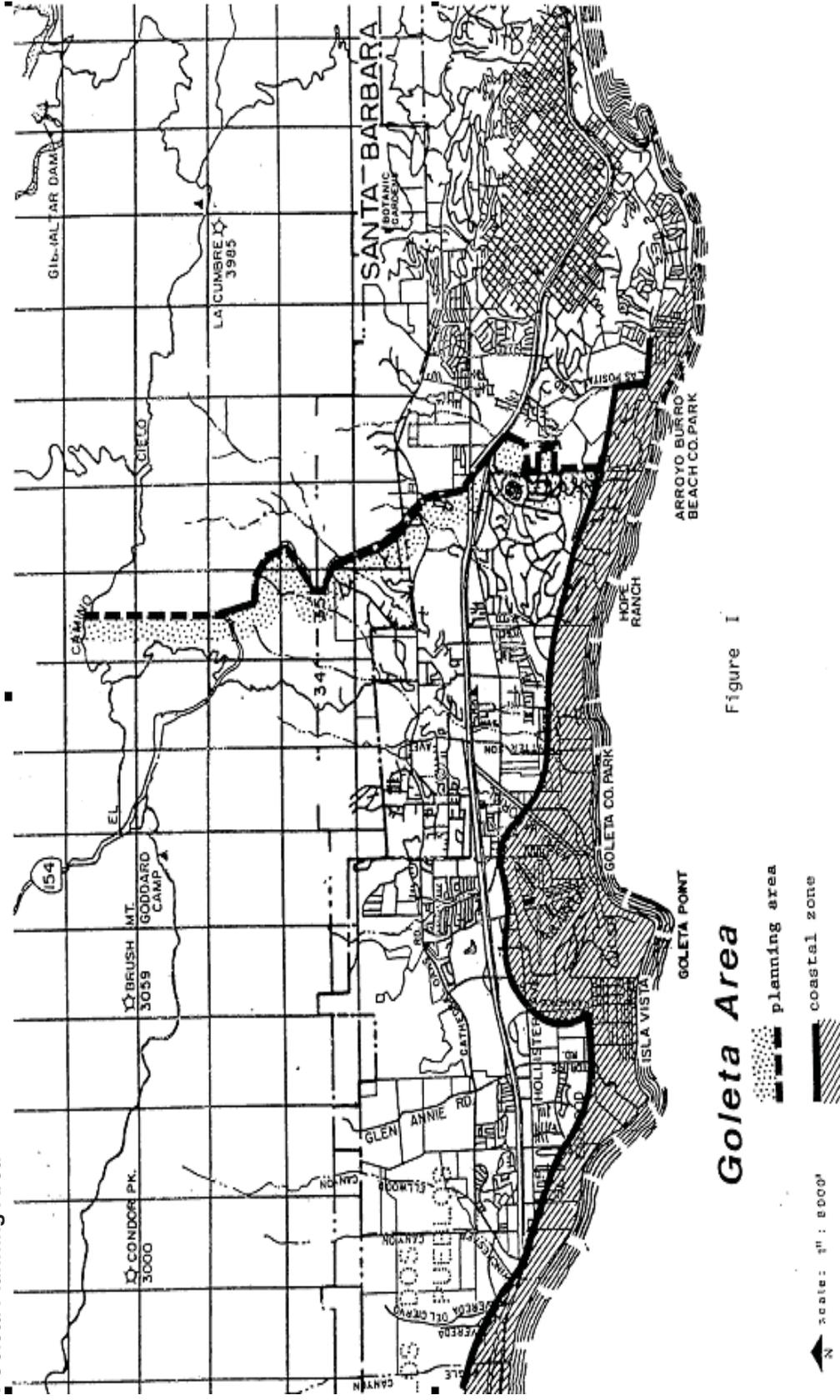
Table 13b

SANTA BARBARA AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LAND
 (Federal Lands, Incorporated Cities, and Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A-I	479	482.8						
A-II	135	2840						
MA	135	4952.5						
Recreation/ Open Space	171.9							
Other Open lands	63.4						2133.7	
RESIDENTIAL								
Planned Development		373.6						
Ranchettes	197.5	240						
1+ acres/unit	287.5	121						
1.8 units/acre	123.2	10						
3.3 units/acre	44.9	18.5						
4.6 units/acre	221.2	169.8						
12.3 units/acre	24.8							
COMMUNITY FACILITIES								
Education	19.3						18.4	
Government/Institution	0.7							
Public Utility	1.0							
COMMERCIAL								
Neighborhood Commercial	3.0							

GOLETA VALLEY AREA

I Goleta Planning Area



Goleta Area

Figure 1

14.A Goleta Planning Area – Dwelling Unit Capacity

TABLE 14a: GOLETA AREA RESIDENTIAL LAND USE DISTRIBUTION
 (Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretical Unit Capacity
URBAN AREA					
A-I	16	3.0	48	65	81
3+ acres/unit	22	3.0	66	9	31
1+ acres/unit	987	3.0	2961	1217	2204
1.8 units/acre	262	3.4	890	62	324
3.3 units/acre	2792	3.4	9492	562	3354
4.6 units/acre	6290	3.4	21386	477	6767
12.3 units/acre	3712	2.6	9651	5251	8963
20.0 units/acre	701	2.0	1402	913	1614
30.0 units/acre	2697	2.0	5394	0	2697
RURAL AREA					
MA	15	3.0	45	254	269
A-II/I/A	114	3.0	342	274	388
Ranchette	57	3.0	171	97	154
1+ acres/unit	153	3.0	459	153	306
1.8 units/acre	33	3.4	112	10	43
TOTAL	17851		52419	9344	27195

0234R

14.B Goleta Planning Area – Land Use Capacity

Table 14b

GOLETA AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LANDS
 (Federal Lands and Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A					13.5	20.0		
A-I	80.4	325					130.3	735
A-II					3510.1	5000		
MA					662.9	10160		
Recreation/ Open Space	687.2						7.5	
RESIDENTIAL								
Ranchette							285.2	485
3+ acres/unit	76.1	18						
1+ acres/unit	987.5	1217					153	153
1.8 units/acre	146	34.4					18.5	5.6
3.3 units/acre	846.1	170.3						
4.6 units/acre	1367.4	103.7						
12.3 units/acre	301.8	426.9						
20.0 units/acre	35.1	45.6						
30 units/acre	89.8							
COMMUNITY FACILITIES								
Education	247.8							
Government/ Institutional	339.2						1.8	
Public Utility	36.2							
Civic Center	9.8							
Cemetery	13.2							142.2

Table 14b (Con't)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
COMMERCIAL								
General Commercial	157.9							
Neighborhood Commercial	72.6	5					1	
Highway Commercial	15.5	6.3						
Office and Professional	38	78.4						
INDUSTRIAL								
Industrial Park	292.1	328.8						
Light Industry	23.3	2.0						
General Industry	44.8	16						

15.A Santa Ynez Valley Planning Area – Dwelling Unit Capacity

TABLE 15a: SANTA YNEZ VALLEY AREA RESIDENTIAL LAND USE DISTRIBUTION

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretica Unit Capacity
URBAN AREA					
A-I	28	2.7	75	49	77
3+ acres/unit	10	2.9	29	3	13
1+ acres/unit	840	2.9	2436	552	1362
1.8 units/acre	347	2.9	1006	437	784
3.3 units/acre	776	2.9	2250	941	1717
4.6 units/acre	1059	2.7	2859	344	1403
12.3 units/acre	73	2.1	153	120	193
20.0 units/acre	667	1.6	1067	1058	391
INNER-RURAL AREA					
A-I	7242	2.7	1954	1300	2024
RURAL AREA					
A-I/II	355	2.7	958	293	648
1+ acres/unit	18	2.9	52	27	45
TOTAL	4897		12839	5124	8657

0235R

15.B Santa Ynez Valley Planning Area – Land Use Capacity

Table 15b

SANTA YNEZ VALLEY AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LANDS
 (Federal Lands Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A-I	132	224	*	*	*	*	*	*
A-II Recreation/ Open Space	219		*	*	*	*	*	*
Other Open Lands		15.4						
RESIDENTIAL								
3+ acres/unit	31.3	9.0						
1+ acres/unit	810.1	552.4					20.7	27.7
1.8 units/acre	192.5	243.3						
3.3 units/acre	220.2	300.2						
4.6 units/acre	223.8	71.2						
12.3 units/acre	6.0	14.6						
20.0 units/acre	33.1	19.8						
COMMUNITY FACILITIES								
Education	81.9		45					
Government/Institution	138							
Public Utility	10							
Cemetery	14							

* Data not available.

Table 15b (Con't)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
COMMERCIAL								
General Commercial	158.5	137.2						
Neighborhood Commercial	24	1.5	4.0					
Highway Commercial	29.6	33.9					1	6.9
Office and Professional	7	10.2						
INDUSTRIAL								
Industrial Park		12						
Light Industry	10	6.5						
General Industry	35	113.1						

LOMPOC AREA
K Lompoc Planning Area

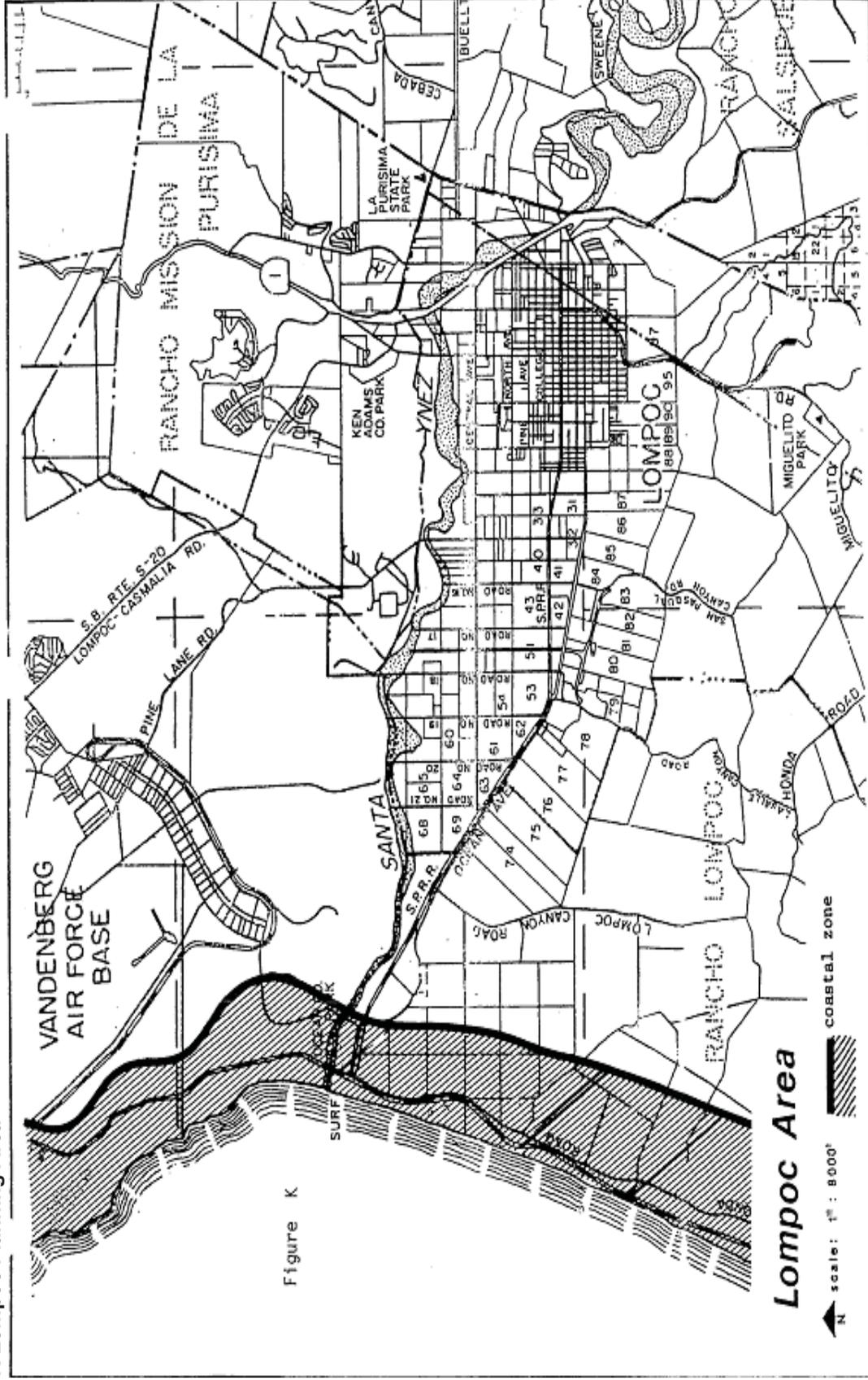


Figure K

16.A Lompoc Planning Area – Dwelling Unit Capacity

TABLE 16a: LOMPOC AREA RESIDENTIAL LAND USE DISTRIBUTION
 (Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretical Unit Capacity
URBAN AREA					
A-I	1	3.0	3	6	7
Ranchette	8	3.0	24	5	13
3+ acres/unit	5	3.0	15	8	13
1+ acres/unit	81	3.0	243	54	135
1.8 units/acre	288	3.2	921	775	1063
3.3 units/acre	144	3.4	489	20	164
4.6 units/acre	2677	3.4	9101	2586	5263
12.3 units/acre	401	2.0	802	207	608
20.0 units/acre	393	2.0	786	847	1240
RURAL AREA					
A-II	204	3.0	612	414	618
Ranchette	48	3.0	144	258	306
TOTAL	4250		13140	5180	9430

0236R

16.B Lompoc Planning Area – Land Use Capacity

Table 16b

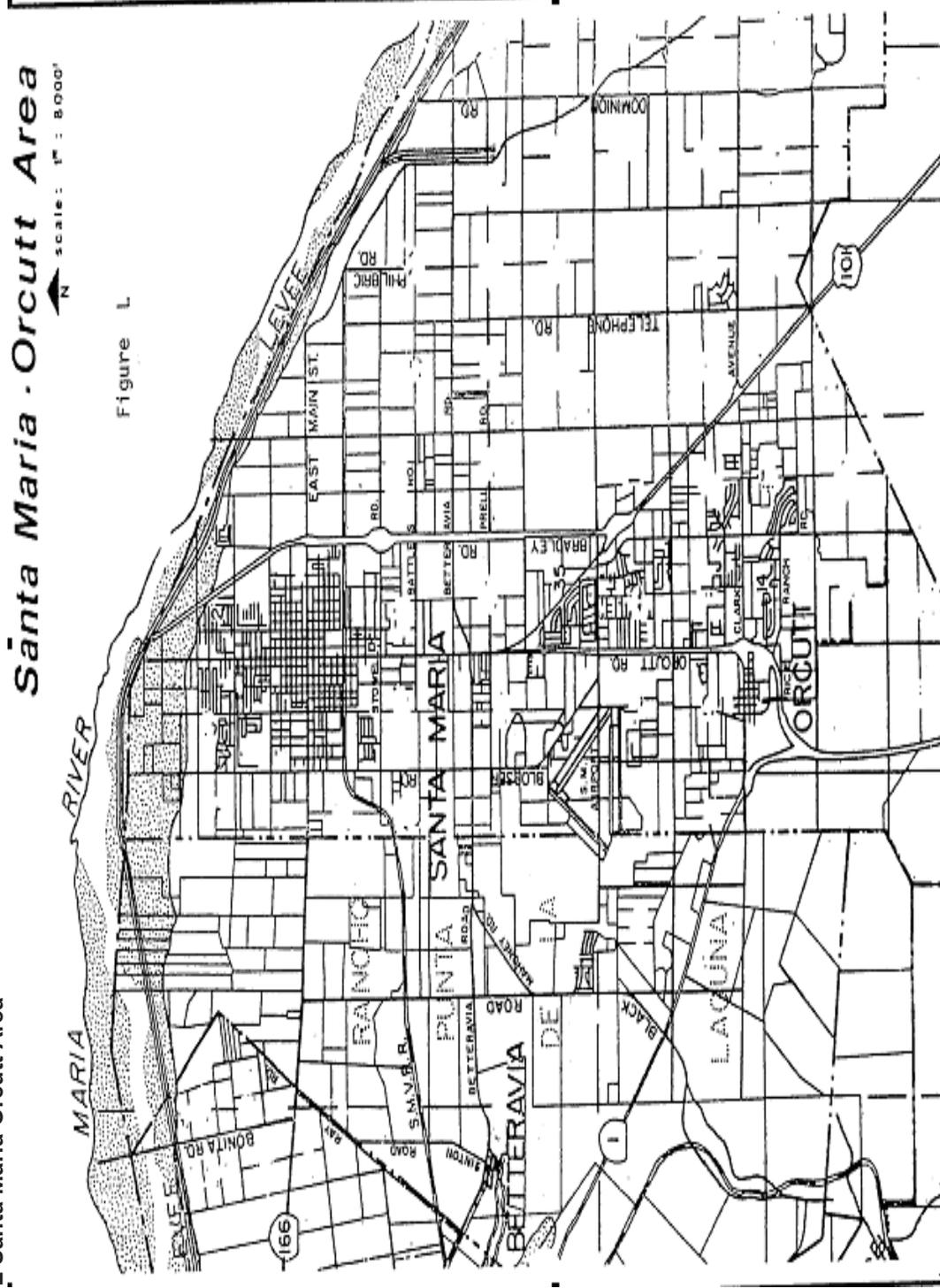
LOMPOC AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LAND
 (Federal Lands, Incorporated Cities and Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A-I	8.4	30					702.8	831.5
A-II					8010	16560		
Recreation/ Open Space	336.2				972.6			
RESIDENTIAL								
Ranchettes	40.6	28.7						
3+ acres/unit	13.5	26.4						
1+ acres/unit	79.6	56.2						
1.8 units/acre	159	436.6						
3.3 units/acre	43.7	6.2						
4.6 units/acre	592.5	551.8						
12.3 units/acre	32.6	16.9						
20.0 units/acre	11.9	50.1						
COMMUNITY FACILITIES								
Education	81.3							
Government/Institution	178.7						4	
Public Utility	1							
COMMERCIAL								
General Commercial	20.6	25.1						
Neighborhood Commercial	3.6	2.7						
Highway Commercial	15.8	69.2						
Office and Professional	1	1						

Table 16b (Con't)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
INDUSTRIAL								
Industrial Park	6	40.7						
General Industry	12.6	4.4						

SANTA MARIA/ORCUTT AREA
I. Santa Maria-Orcutt Area



17.A Santa Maria – Orcutt Planning Area – Dwelling Unit Capacity

TABLE 17a: SANTA MARIA - ORCUTT AREA RESIDENTIAL LAND USE DISTRIBUTION

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretical Unit Capacity
URBAN AREA					
A-I	6	3.1	18	40	46
Ranchette	48	3.1	148	53	101
1+ acres/unit	51	3.1	158	1036	1087
1.8 units/acre	251	3.3	828	394	645
3.3 units/acre	3466	3.5	12131	5770	9236
4.6 units/acre	2294	3.5	8029	623	2917
12.3 units/acre	1187	2.3	2730	1701	2888
20.0 units/acre	29	2.1	60	84	113
30.0 units/acre	39	2.1	81	1761	1800
INNER-RURAL AREA					
A-I	13	3.1	40	343	356
RURAL AREA					
A/A-II	247	3.3	815	876	1123
TOTAL	7631		25038	12681	20312

0237R

17.B Santa Maria - Orcutt Planning Area – Land Use Capacity

Table 17b

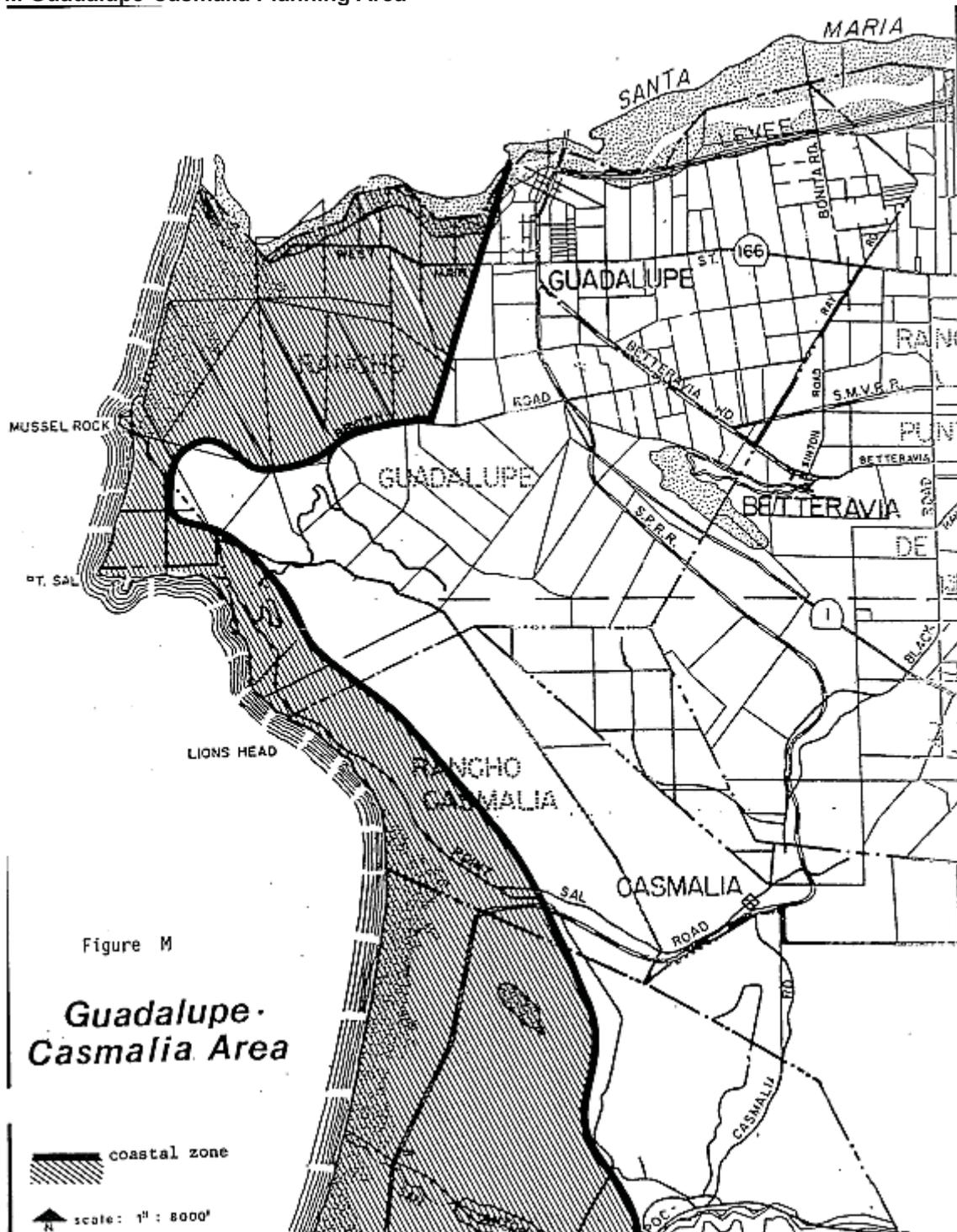
SANTA MARIA-ORCUTT AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LAND
 (Federal Lands and Incorporated Cities Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A					415	6520		
A-I	35.8	200	66.8	1715				
A-II					8275.2	8960		
Recreation/ Open Space	170.1						151.5	
RESIDENTIAL								
Ranchettes	243	265						
1+ acre/unit	51.7	1036						
1.8 units/acre	139.8	220.8						
3.3 units/acre	1050.3	1875.1						
4.6 units/acre	498.7	139.4						
12.3 units/acre	63.9	206.8						
20 units/acre	1.7	4.9						
30 units/acre	1.3	58.7						
COMMUNITY FACILITIES								
Education	158.3							
Cemetery	1.7							

Table 17b (Con't)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
COMMERCIAL								
General Commercial	16.4							
Neighborhood Commercial	32.7	32.2						
Service Commercial	45	132.6						
Highway Commercial	10	36.9					11.1	
Office and Professional	5.5	13.8						
INDUSTRIAL								
Industrial Park	19	167.4						
General Industry	66	456.3						

GUADALUPE-CASMALIA AREA
M Guadalupe-Casmalia Planning Area



18.A Guadalupe – Casmalia Planning Area – Dwelling Unit Capacity

TABLE 18a : GUADALUPE-CASMALIA AREA RESIDENTIAL LAND USE DISTRIBUTION
 (Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretical Unit Capacity
URBAN AREA					
A-I	0	3.0	0	3	3
3.3 units/acre	27	3.4	91	60	87
4.6 units/acre	44	3.4	150	50	94
RURAL AREA					
A-II	95	3.8	361	132	227
TOTAL	166		602	245	411

18.B Guadalupe – Casmalia Planning Area – Land Use Capacity

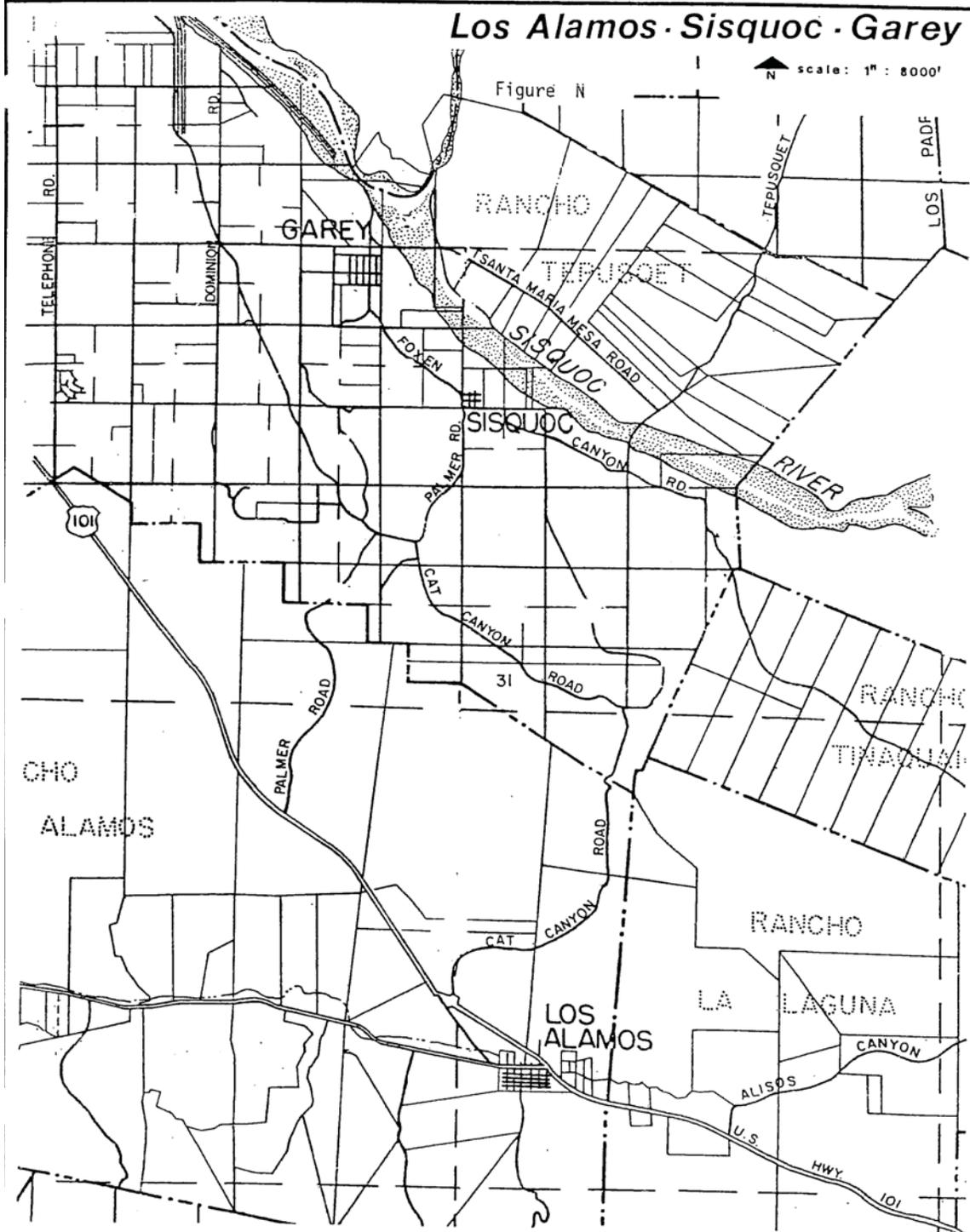
Table 18b

GUADALUPE-CASMALIA AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LAND
 (Federal Lands, Incorporated Cities and Coastal Zone Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A-I		14.9						
A-II	3833	5280						
RESIDENTIAL								
3.3 units/acre	8.4	18						
4.6 units/acre	9.5	11						
COMMUNITY FACILITIES								
Education	6.5	6			4.9			
COMMERCIAL								
General Commercial	0.3	2.4						
Highway Commercial		2.0						
INDUSTRIAL								
General Industry		14						

SISQUOC-GAREY AREA ⁶²

N Los Alamos-Sisquoc-Garey Planning Area



19.A Los Alamos-Garey-Sisquoc Planning Area – Dwelling Unit Capacity

TABLE 19a: LOS ALAMOS-GAREY-SISQUOC AREA RESIDENTIAL LAND USE DISTRIBUTION

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretical Unit Capacity
URBAN AREA					
Ranchettes	9	3.0	27	11	20
1+ Acres/Unit	11	3.0	33	24	35
1.8 Units/Acre	1	3.0	3	13	14
3.3 Units/Acre	8	3.0	24	123	131
4.6 Units/Acre	134	3.0	402	517	651
12.3 Units/Acre	98	2.4	235	166	264
RURAL AREA					
A-I/II	75	3.2	239	39	114
TOTAL	336		963	893	1229

0215

19.B Los Alamos-Garey-Sisquoc Planning Area – Land Use Capacity

Table 19b

LOS ALAMOS-GAREY-SISQUOC AREA ACREAGES OF
 DEVELOPED AND UNDEVELOPED LAND

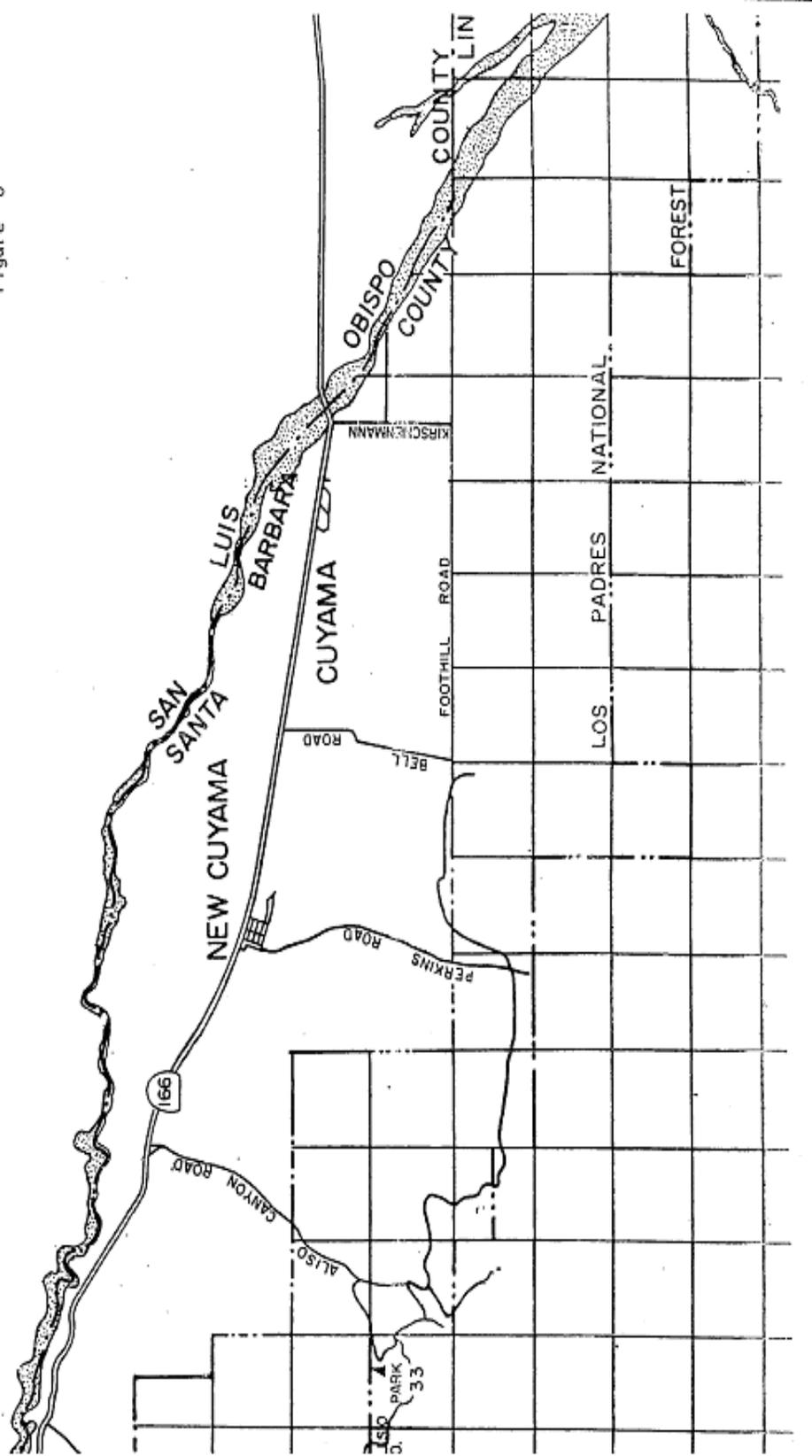
COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A-I							22.7	60
A-II					2854.3	1080		
Recreation/Open Space	55.1							
RESIDENTIAL								
Ranchette	49.9	55						
1+ acres/unit	11.1	24						
1.8 units/acre	.6	7.6						
3.3 units/acre	2.5	37.3						
4.6 units/acre	29.2	112.4						
12.3 units/acre	8	13.5						
COMMUNITY FACILITIES								
Education	23.3							
Government/Institution	6							
Cemetery	5							
COMMERCIAL								
General Commercial	19	19.1						
Neighborhood Commercial	0.3							
Highway Commercial	19	13.4						
INDUSTRIAL								
Industrial Park		14						
Light Industry	3.1							

CUYAMA VALLEY
O Cuyama Valley Planning Area

Cuyama Valley

↑ N scale: 1" = 8000'

Figure 0



20.A Cuyama Valley Planning Area – Dwelling Unit Capacity

TABLE 20a: CUYAMA VALLEY AREA RESIDENTIAL LAND USE DISTRIBUTION

COMPREHENSIVE PLAN CATEGORY	DWELLING UNITS AND POPULATION				
	Developed Units	Household Size	Estimated Population	Additional Potential Units	Theoretical Unit Capacity
URBAN AREA					
A-I	0	2.8	0	12	12
4.6 units/acre	347	3.0	1041	28	375
12.3 units/acre	17	2.2	37	536	553
RURAL AREA					
A-II	3	2.8	8	76	79
TOTAL	357		1086	652	1019

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20.B Cuyama Valley Planning Area – Land Use Capacity

Table 20b

CUYAMA VALLEY AREA ACREAGES OF DEVELOPED AND UNDEVELOPED LAND
 (Federal Lands Excluded)

COMPREHENSIVE PLAN CATEGORY	URBAN		INNER-RURAL		RURAL		NEIGHBORHOOD	
	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.	Dev.	Undev.
OPEN LANDS								
A-I		63.1						
A-II					59,554			
Recreation/ Open Space	15.5							
RESIDENTIAL								
4.6 units/acre	75.5	6.1						
12.3 units/acre	1.4	43.6						
COMMUNITY FACILITIES								
Education	62.7							
Government/Institution	4							
Public Utility	2.1							
COMMERCIAL								
General Commercial	3	11.3						
INDUSTRIAL								
Industrial Park	25	39.5						
Light Industry		5.8						

LAND USE DEFINITIONS

OPEN LAND USES

AGRICULTURE

The purpose of an agricultural designation is to preserve agricultural land for the cultivation of crops and the raising of animals. For the purposes of this Element, agriculture shall be defined as the production of food and fiber, the growing of plants, the raising and keeping of animals, aquaculture, the preparation for marketing of products in their natural form when grown on the premises, and the sale of products which are accessory and customarily incidental to the marketing of products in their natural form which have been grown on the premises. Lands eligible for this designation include, but are not limited to, lands with prime soils, prime agricultural land^{xi}, grazing land, land in existing agricultural use, land with agricultural potential, and lands under Williamson Act contracts.

Plant crops include food and fiber crops, orchards and vineyards, field crops, and crops grown in nurseries, and greenhouses. Animal raising includes raising and keeping of horses, grazing, and stock raising activities. In addition to such uses, agricultural lands may be utilized for a limited number of other uses, including related or incidental residential uses; and the preparation for marketing of products as allowed under the appropriate zoning districts. Public works, public service, public utility and oil drilling uses which are found to be compatible with agriculture may also be permitted.⁶⁵

Agricultural Commercial (AC) (40-320 or more acre minimum parcel size)

This category is for commercially farmed, privately owned land located within either Rural, Inner-Rural, Existing Developed Rural Neighborhoods or Urban Areas which meets the following criteria:

^{xi} Prime agricultural land (Cal. Government Code § 51201(c)) means:

1. All land which qualifies for rating as Class I or Class II in the Soil Conservation Service land use capability classifications.
2. Land which qualifies for rating 80 through 100 in the Storie Index Rating.
3. Land which supports livestock used for the production of food and fiber and which has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the U.S.D.A.
4. Land planted with fruit or nut bearing trees, vines, bushes or crops which have a nonbearing period of less than five years and which will normally return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than \$200 per acre.
5. Land which has returned from the production of unprocessed agricultural plant products

1. The land is subject to a Williamson Act Contract, including contracts that have been non-renewed or,
2. Parcels forty (40) acres or greater, whether or not currently being used for agricultural purposes, but otherwise eligible for Williamson Act Contract may be included if they meet requirements of Uniform Rule No.6.

This category includes compatible land uses and land uses that are necessary and a part of the agricultural operations. All types of crops and livestock are included. Both “prime” and “non-prime” soils (as defined in the Williamson Act and the County's Uniform Rule No.6) and irrigated and non-irrigated lands are included. Parcels which are smaller than forty (40) acres in size at the time of adoption of this Element may be eligible for the AC designation if they are “prime” or “super-prime” as defined by the County Uniform Rules and are eligible for agricultural preserve status.⁶⁶

Agriculture I (5 or more acres minimum parcel size)

This designation applies to acreages of prime and non-prime farm lands and agricultural uses which are located within Urban, Inner Rural, and Rural Neighborhood areas.

Agriculture II (40 or more acres minimum parcel size)

This designation applies to acreages of farm lands and agricultural uses located outside Urban, Inner Rural and Rural Neighborhood areas. General agriculture is permitted, including but not limited to livestock operations, grazing, and beef production as well as more intensive agricultural uses.

MA - Mountainous Areas

The purpose of this designation is to delineate land having an average slope in excess of 40 percent and isolated table land surrounded by slopes exceeding 40 percent. Such lands may include the steeper foothills of the County, as well as mountain lands within the Los Padres National Forest boundary. This land shall be kept free of intensive development to reserve it for such uses as watershed, scenic enjoyment, wildlife habitat, grazing, orchards, and vineyards.

Mountainous Area (MA-40) (40 acre minimum parcel size)

The purpose of this designation is to delineate land that has an average slope in excess of 40 percent as well as isolated table land and valleys surrounded by slopes exceeding 40 percent. Generally, fire hazard is extreme, and public road access and availability of public services to these lands is minimal. Such lands often border land having higher density uses on at least one side, and may include the steeper foothills of the County and mountain land within the Los Padres National Forest boundaries. These areas shall be kept free of intensive development to reserve them for such uses as watershed, scenic enjoyment, wildlife habitat, grazing, orchards and vineyards. In addition, certain

low-intensity residential uses at a density of not greater than one dwelling unit per 40 acres are permitted, provided they are consistent with applicable policies of the Comprehensive Plan.

Mountainous Area (MA-100) (100 - 320 acres minimum parcel size)

The purpose of this land use category is to designate more remote land that has an average slope in excess of 40 percent as well as isolated table land and valleys surrounded by slopes exceeding 40 percent. Generally, fire hazard is extreme, and public road access and availability of public services to these lands is minimal. Such lands usually are at higher elevations than lands designated MA-40, and often border lands having medium- to low-intensity residential and agricultural uses. Such lands include the steep mountain lands within the Los Padres National Forest boundaries. These areas shall be kept free of development to reserve them for such uses as watershed, scenic enjoyment, wildlife habitat, grazing, orchards, and vineyards. In addition, certain low-density residential uses at a density of not greater than one dwelling unit per 100 acres are permitted provided they are consistent with applicable policies of the Comprehensive Plan.⁶⁷

PARK AND RECREATION AREAS

Existing Public or Private Recreation and/or Open Space

The purpose of this designation is to provide opportunities for various forms of outdoor recreation, of a public or private nature, which require access to open spaces and natural settings for their realization. These open space recreational uses include, but are not limited to, the following: public parks containing facilities for picnicking, camping, riding, hiking, walking, biking, on a day or longer use basis; flood control easements providing access to and along stream channels and other drainage areas; and golf courses. Structures or other facilities shall be limited to those required to support the recreational activities. These may include parking areas, corrals and stabling areas, picnic and camping areas, trails, water and sanitary facilities, safety and first aid stations, ranger stations, and limited concession facilities. Other recreational structures and facilities of a more intensive nature, such as swimming and tennis clubs, may be permitted. More intense commercial recreational development shall be limited to areas classified as commercial. For example, fairgrounds, amusement parks, and large indoor recreational complexes shall be classified as commercial uses.

Proposed Public or Private Park/Recreational Facility Overlay

This designation identifies by an overlay those lands suitable for future inclusions within the recreational designation defined above. These lands include the following: lands selected by the County Park Department from those sites designated as having the highest suitability for recreational use; areas designated by advisory committees; shoreline areas designated within the County coastal zone; and additional access along creeks and drainage ways.

OTHER OPEN LANDS (100-320 acres minimum parcel size)

These areas are lands subject to environmental constraints on development, have no agricultural potential or have outstanding resource value. These include some lands shown on the ERME Factors maps of the Environmental Resources Management Element. One residence per 100 acres is permitted in this category. Within the coastal zone, the Other Open Lands designation has been reserved for specific areas that have extensive or outstanding natural resource values. Some examples include the Carpinteria Slough, Devereaux Dunes, Guadalupe Dunes, and Point Sal.

RESIDENTIAL LAND USES

Density is the primary parameter within which residential land uses are defined. Density is used to describe the number of dwelling units permitted on an acre of land or, in later translation into zoning, the number of dwelling units permitted on a lot of a given size. Within Urban areas, residential uses permitted may include child day care, fraternities, sororities, dormitories, boarding and lodging houses, in addition to single- and multiple-family dwelling units. Special care homes may be permitted with a conditional use permit as specified in the County Zoning Ordinance. The following two designations merit special attention.

Residential Ranchette (5 - 20 acres minimum parcel size)

The designation, Residential Ranchette, is intended for use within Urban, Existing Developed Rural Neighborhoods, Inner-Rural and coastal zone areas. These are areas adjacent to the more intensive urban uses. While the use of such parcels is residential, the intent of the designation is to preserve the character of an area and to minimize the services required by smaller lot development. The Residential Ranchette designation permits all forms of cultivated agriculture, grazing, and related activities which would be allowed under an Agriculture I designation (e.g., intensive commercial animal husbandry would not be permitted).⁶⁸

Residential Designations/Densities⁶⁹

Residential Ranchette:	One unit/5 acres to one unit/20 acres
Residential:	One unit per 3 or more acres
	One unit per 2 or more acres
	(Goleta Community Planning Area only) ⁷⁰
	1.0 unit per acre
	1.8 units per acre
	3.3 “ “ “
	4.6 “ “ “
	6.0 “ “ “(Goleta Community Planning Area only) ⁷¹
	8.0 “ “ “
	12.3 “ “ “
	20.0 “ “ “
	30.0 “ “ “

Land Use Designation⁷²

Density

Planned Development

As specified for individual areas (e.g., “30 dwelling units”, or “maximum Density 3.3 Units per Acre”)

NOTE: There exist limited cases where the strict application of certain of these maximum residential densities to an individual property zoned in an otherwise compatible R-I (Single Family Residential) district would preclude a reasonable division of the property as otherwise permitted by such zoning. Therefore, it is hereby explicitly stated that the following residential densities and R-I zone districts are consistent at the parcel level:

Maximum Residential Density	Consistent R-1 Zone District
1.8 Units per Acre	20-R-1
3.3 “ “ “	15-R-1
3.3 “ “ “	12-R-1
3.3 “ “ “	10-R-1
4.6 “ “ “	8-R-1
4.6 “ “ “	7-R-1

In any case where a parcel is subject to any of these specific combinations of maximum residential density and R-I zoning, a land division which meets the minimum net lot area requirements of the zoning may be deemed consistent with the applicable density by the Planning Commission and/or Board of Supervisors, notwithstanding the fact that a strict mathematic application of such density to the original parcel would not permit the land division; provided, however, that only one additional lot may be permitted over the number otherwise allowed by a strict mathematic application of the maximum residential density to the original parcel.

Semi-Rural Residential

The purpose of this designation is to provide for residential development that will preserve the semi-rural character of the Montecito Planning Area and portions of the Toro Canyon Plan area⁷³ and the adjacent Cima Del Mundo property⁷⁴. The Semi-Rural Residential designation is characterized by narrow winding roads; predominantly low density residential development; limited commercial, resort/visitor-serving uses and infrastructure development; a lack of sidewalks and traffic lights; and a diversity of housing, architecture, landscaping and property sizes. The intent is to allow only development which will minimize additional depletion of constrained resources, services, and infrastructure.^{75 76}

The density factor shown below describes the maximum number of primary dwelling units that may be permitted if the County determines that resources, services, and infrastructure are adequate to support ultimate buildout.^{77 78}

⁷⁹ DESIGNATION	DENSITY (units/acre)	MINIMUM PARCEL SIZE
SRR-0.1	0.1	10 acre
SRR-0.2	0.2	5 acre
SRR-0.33	0.33	3 acre
SRR-0.5	0.5	2 acre
SRR-1.0	1.0	1 acre
SRR-1.8	1.8	20,000 sq. ft.
SRR-3.3	3.3	15,000 sq. ft.
SRR-4.6	4.6	7,000 sq. ft.
SRR-12.3	12.3	7,000 sq. ft.

Planned Development

The Planned Development designation is intended for large areas within urban boundaries which are appropriate for residential development but need to be planned as a unit because of site constraints such as topographic, geologic or flood hazards or because of significant resource values including archaeological sites or environmentally sensitive habitats. The purpose of the PD designation is to avoid piecemeal development of such areas by requiring coordinated, long -range planning. The PD designation also allows for the flexibility needed in the siting, design, and mix of housing types to provide for safe and attractive development that meets the needs of the community, while protecting resources and providing other public benefits (e.g., avoidance of development in hazardous areas, adequate provision of public services, preservation of open space).⁸⁰

COMMUNITY FACILITIES⁸¹

Educational Facilities (Public or Private) - Include all existing schools from elementary through college level.

Institution/Government is for all major public and quasi-public land uses not included in the categories already defined, such as military installations, state office buildings, county hospitals.

Public Utility - An area designated for the facilities and service of a public utility or public service entity. Screening, landscaping, and other design requirements may be prescribed by the Zoning Ordinance to ensure compatibility with surrounding land uses.

Civic Center - An area designated for public and quasi-public buildings and services, which may include libraries, public auditoriums, post offices, fire and emergency services, and other public uses.

Cemetery - This category shows existing and proposed cemeteries and lands currently designated for their expansion.

INDUSTRIAL

Coastal-Related Industry

The intent of this designation is to recognize that, although certain industrial uses are directly dependent on coastal-dependent development or uses, they themselves do not strictly qualify as coastal-dependent uses. Examples include those industrial and energy facilities which support coastal-dependent uses such as offshore oil platforms, but do not require a site on or adjacent to the sea to be able to function at all. Determination of what types of uses qualify as coastal-related industry rather than coastal dependent industry must be made case-by-case since several project specific or geographic-specific variables may influence such determination.⁸²

Industrial Park

This category is not limited to a specific list of uses. It is any industrial use which is housed in well-designed buildings set in attractively landscaped grounds. This is industry in a park-like atmosphere. The uses permitted under and consistent with the Industrial Park symbol may include commercial, as specified in the Santa Barbara County Zoning Ordinance.

Light Industry

Includes industrial plants and warehouses without nuisance features but not necessarily in an industrial park.

General Industry

All industrial uses.

COMMERCIAL

General Commercial (C) - This designation has been used to denote areas suitable for many types of commercial activities. Central business district areas, district centers, service commercial, neighborhood centers, and design commercial are all contained under this designation. Permitted uses in the General Commercial designation range from convenience activities, which serve such day-to-day needs as food, drugs, gasoline, and other incidentals, to wholesale facilities which support agricultural, construction, and transportation activities.

Neighborhood Commercial (N) - Neighborhood Commercial is located within the neighborhood and serves such day-to-day needs of residents in the immediate area as food, drugs, gasoline, and other incidentals. They usually require 5,000-10,000 people, or from 1,700-3,300 dwelling units in the neighborhood for support.

Service Commercial (S) - This designation is used to denote areas suitable for a limited range of commercial activities of a service commercial nature, including wholesale

business facilities, agriculture, construction, transportation and other service facilities, commercial distribution businesses, and warehouse and storage facilities. Ancillary offices and retail sales serving any of the above described uses are permitted on-site when subordinate to the principal service commercial activity.⁸³

Highway Commercial (H) - When shown in small centers long highways and freeways, this designation permits only those uses which serve the highway traveler such as hotels, motels, restaurants, garages, and service stations. Additionally, overnight recreation-vehicle facilities may be permitted subject to a conditional use permit.

Resort/Visitor Serving Commercial (V) - The intent of this designation is to cater to the needs of visitors to recreational areas. Visitor serving commercial uses will normally be found adjacent to important recreational resource areas, at special points of interest, or in special neighborhoods or communities. The intensity of the commercial development shall be subordinate to the character of the recreational setting. Uses shall include, but not be limited to, the following: resort hotels, motels, restaurants, country clubs, guest ranches, riding stables, and beach clubs. Uses, buildings, and structures customarily incidental and accessory to such recreational facilities, including commercial uses and services, are also permitted. Uses not permitted under this designation include other retail services, unrelated office and professional services, highway related services for transients normally found at major highway interchanges or highway exits.

Office and Professional (P) - This category was developed to specifically relate to the PI, Professional Institutional Zone, of the County Zoning Ordinance. Permitted uses are offices, hospitals, schools, churches, etc., as specified in the Santa Barbara County Zoning Ordinance.

OVERLAY DESIGNATIONS

The purpose of the overlay designation is to indicate locations where the presence of hazards or special resources place constraints on development. These overlay designations carry performance standards which are included in the land use plan text.

Environmentally Sensitive Habitat Areas This designation applies to sensitive ecological communities or significant natural habitats.

Scenic/Buffer Areas Scenic areas are so designated because of the picturesque view or landscape afforded by their natural setting. Buffers are areas that are utilized to mitigate the effects of changes in appearance resulting between land areas being put to different uses. Along streams and creeks, they are shown within the floodway areas as a designated width of land adjacent to the stream which is necessary to protect biological productivity, water quality, and hydrological characteristics of the stream. A buffer strip is measured horizontally from the banks or higher water mark of the stream landward.

Stream: watercourses, including major and minor streams, drainage ways and small lakes, ponds and marshy areas through which streams pass. (Coastal wetlands are not included.)

Major Stream: a stream with a drainage area in excess of 500 acres.

Minor Stream: a stream with a drainage area less than 500 acres.

Riparian Vegetation: vegetation normally found along the banks and beds of streams, creeks, and rivers.

Stream Corridor: a stream and its minimum prescribed buffer strip.

Airport Clear and Approach Zones - Airport Clear Zones and Airport Approach Zones are located adjacent to the ends of airport runways, and are subject to particular hazards which necessitate special land use restrictions to promote the public safety and preserve navigable airspace. For the purpose of the Land Use Element, the Airport Clear and Approach Zones for any given runway are a continuous horizontal plane surface adjacent to the end of the runway, having the geometric form of an isosceles trapezoid extending outward from the runway end and bisected by an extension of the runway centerline. These Zones are displayed in outline form on the Land Use Element maps for all runways of the County's airports. The specific dimensions of these Zones shall be consistent with the Santa Barbara County Airport Land Use Plan (ALUP), and shall be specified in the applicable County Zoning Ordinance.

Airport Clear Zones are located immediately adjacent to the ends of airport runways. These Zones experience greater noise and safety hazards than Airport Approach Zones, and therefore are subject to more restrictive land use limitations. These limitations generally shall be consistent with the ALUP although different limitations may be specified if such different limitations are determined by a two-thirds majority of the Board of Supervisors to be consistent with § 21670 of the California Public Utilities Code, and shall be specified in the applicable County Zoning Ordinance.

Airport Approach Zones are extensions of the Airport Clear Zones, and are subject to lesser noise and safety hazards than are Airport Clear Zones. Accordingly, land use limitations within the Approach Zones are less restrictive than within Clear Zones. Such limitations generally shall be consistent with the ALUP although different limitations may be specified if such different limitations are determined by a two-thirds majority of the Board of Supervisors to be consistent with § 21670 of the California Public Utilities Code, and shall be specified in the applicable County Zoning Ordinance.⁸⁴

85 86

Affordable Housing Overlay – The purpose of the Affordable Housing Overlay is to promote the development and provision of affordable housing in the County. Qualified parcels are designated with two densities, the base density when a developer proposes

a standard project and a higher residential density when a developer complies with affordable AHO criteria. To utilize the higher density, a developer must provide one of the following: at least 30% of all units are provided to very low income households, or at least 50% of all units are provided to a mix of affordable income households consistent with the Affordable Housing Overlay Allocation Table in the Housing Element Implementation Guidelines. Such projects are subject to various additional incentive and performance standards, as specified in the applicable zoning ordinance and the Housing Guidelines.”⁸⁷

OVERLAY SYMBOLS

Proposed Public or Private Educational Facilities - Includes all proposed schools from elementary through college level.

Mineral Resource Area - An area of known deposit of metallic and non-metallic resources and mineral fuel. Extraction is permitted in these areas with the required permits and environmental safeguards.

Spa - An area containing a mineral spring designated for recreational use where the central focus of such use is the mineral water.

Special Area Symbol (S) Designates areas of unique geological, archaeological or historical significance.

OVERLAY SYMBOLS FOR RURAL AREAS ONLY

Mineral Resource Industry - An area for the processing, with or without extraction, of natural resources excluding petroleum products, but including diatomaceous earth, cinnabar, sand and gravel and other natural resources.

Agricultural Industry - The purpose of this overlay designation is, notwithstanding other provisions of this Plan, to provide for agriculturally related commercial and industrial uses in Rural Areas where appropriate. Development Plans and Conditional Use Permits shall be required pursuant to applicable zoning ordinances.

1. The request for the designation must be accompanied by a Development Plan and Conditional Use Permit, information outlining the reasons why it is necessary to put this overlay in the Rural Area, and must satisfy the following criteria:
 - a. The use must be directly related to agriculture.
 - b. Special circumstances require that the project be located within the Rural Area.
 - c. The placement of the designation will provide particular and specific benefits which will advance the purposes and policies of this Plan.

- d. The proposed site is currently designated as “A-II” (Agriculture II) and is located within the Rural Area.
- e. The use is not otherwise permitted under the agricultural land use designations of the Land Use Element and Zoning Ordinances.
- f. The project site should not include prime soils, or environmentally sensitive areas where development would result in significant adverse impacts.
- g. The overlay shall not be applied where it would have a significant adverse impact on adjacent residential areas.
- h. The placement of the designation will not represent a significant cumulative loss of agricultural land in the planning area.

The criteria set forth in Number 1 above, do not have to be met with respect to uses on lands designated with the “Agricultural Industry Overlay” prior to the date of the adoption of this Plan.

- 2. The following uses may be allowed with a Conditional Use Permit and Development Plan as required pursuant to applicable zoning Ordinances: processing, packaging, treatment, and/or sale of agricultural commodities; transportation facilities required to support agriculture; and fertilizer manufacturing.⁸⁸

Waste Disposal Facility - An area for the disposal of waste materials.

Petroleum Resource Industry - An area for the processing with or without extraction of petroleum products.

BOUNDARY LINES

Urban Area - An area shown on the land use map within which is permitted the development of residential, commercial, and industrial activity, and their related uses, buildings and structures, including schools, parks, utilities, etc. Mineral extraction (including oil) and related uses are permitted in urban areas outside the coastal zone. Open spaces and recreational activities and related uses are permitted and encouraged throughout the Urban area. Agriculture is permitted and encouraged in the Urban area when it is surrounded by urban uses. When adjacent to a Rural area, agriculture shall be in the Rural area.

The Coastal Zone in Santa Barbara County spans 110 miles of coastline and includes approximately 184 square miles. In addition, the offshore islands of Santa Cruz and Santa Rosa are entirely within coastal jurisdiction. While the coastal zone boundary line generally extends inland only 1000 yards, the Santa Barbara coastal zone extends further inland in several areas because of important habitat, recreational, and

agricultural resources. These areas include the lands surrounding Guadalupe Dunes and Point Conception, and most of Carpinteria Valley. The Coastal Plan (both text and maps) are separate documents from the Santa Barbara County Comprehensive Plan.

Inner-Rural Area - An area shown on the land use map within which development is limited to rural uses such as agriculture and its accessory uses, mineral extraction (including oil) and its accessory uses, recreation (public or private), ranchette development, agricultural parcels, and uses of a public or quasi-public nature. These areas shall be adjacent to designated Urban Areas. The minimum permitted lot size shall be five acres, with the sole exception of any parcel(s) to be owned and used solely by a public agency, consistent with the "Public Facilities" Policies of this Element. Residential development denser than one unit per five acres, commercial, industrial, and other intensive urban uses shall be reserved for Urban Areas and excluded from areas designated Inner-Rural. Agricultural and open space preserves and related uses are to be encouraged. Recreational activities in these areas should be compatible with ranchette and agricultural uses. Existing smaller lot neighborhood developments are permitted within the Inner-Rural area only in designated locations.

Rural Area: An area shown on the land use map within which development is limited to agriculture and related uses, mineral (including oil) extraction and related uses and activities, recreation (public or private), low density residential and related uses and uses of a public or quasi-public nature. The minimum lot size permitted within this area is 40 acres, with the sole exception of any parcel(s) to be owned and used solely by a public agency, consistent with the "Public Facilities" Policies of this Element. Existing smaller lot neighborhood developments are permitted within the Rural Area only in designated locations.

Existing Developed Rural Neighborhood - A neighborhood area that has developed historically with lots smaller than those found in the surrounding Rural or Inner Rural lands. The purpose of the neighborhood boundary is to keep pockets of rural residential development from expanding onto adjacent agricultural lands. Within the Rural Neighborhood boundary, infilling of parcels at densities specified on the land use plan maps is permitted. NOTE: Areas shown on the County Comprehensive Plan Map (COMP-I, 111. = 8000') as existing neighborhoods in rural areas shall retain existing zoning.

OTHER

STRIPED AREA - (AREAS WHICH PERMIT TWO OR MORE LAND USES)

Areas shown on the land use maps in alternative striped patterns designating two or more land uses may be used for any one or all of these designated uses. But if an area is alternatively striped for park, recreation, or other open space use, a portion of the site should be used for said designated open space use.

OTHER DEFINITIONS

Urbanization or Urban Development shall mean:

- a) Any type of commercial or industrial use, excepting only those limited uses which may be permitted within the Rural and Inner-Rural Areas under the Coastal Dependent Industry designation, the "Overlay Symbols" of Mineral Resource Area or Spa, any of the "Overlay Symbols for Rural Areas Only" (Mineral Resource Industry, Agricultural Industry, Waste Disposal Facility, Petroleum Resource Industry), and/or the Conditional Use Permit provisions of the applicable County Zoning Ordinance (which explicitly require a finding of consistency with the Comprehensive Plan);
- b) Residential development at a density higher than 0.2 unit per gross acre (one unit per five gross acres);
- c) The creation by land division or lot line adjustment of any parcel(s) smaller than five acres in gross area. However, the creation of smaller parcel(s) within the Rural and Inner-Rural Areas shall not be defined as "urbanization" or "urban development" when such parcel(s) are for a public use, consistent with the "Public Facilities" Policies of this Element.

Dwelling Unit – A building or portion thereof designed, occupied, or intended for occupancy as a home, residence, or sleeping place either permanently or temporarily by one or more families and one kitchen provided within the unit. Units within boarding or lodging houses, dormitories and hotels shall not be defined as dwelling units.⁸⁹

Agricultural Improvement - Agricultural activities or structures on agriculturally designated land which are not subject to building, grading, or brush-clearing permits. These activities and structures may be subject to special agricultural building, agricultural grading, or special agricultural brush-clearing permits.⁹⁰

Agricultural Development - Any agricultural building, structure, practice, or operation that a) requires a building, grading, or brush clearing permit on land designated for agriculture; b) is located on land which has had no history of cultivation; and/or c) is on land not designated for agriculture. A permit solely for plumbing or electricity shall not constitute a standard building permit.⁹¹

92 93

Open and Grazing - Open land generally refers to those areas which are at the present time unsuited for intensive agricultural uses due to poor or unstable soil conditions, steep slopes, subject to flooding, or where there is an absence of an adequate water supply.⁹⁴

Shadow Construction - Pipeline construction, involving two or more separate pipeline projects in the same corridor, is coordinated at closely-timed intervals so that site rehabilitation is required only once.⁹⁵

Public Facilities - Buildings, structures, and uses by government agencies to provide public services. In the Rural and Inner-Rural Areas, appropriate public facilities are specifically limited to include:

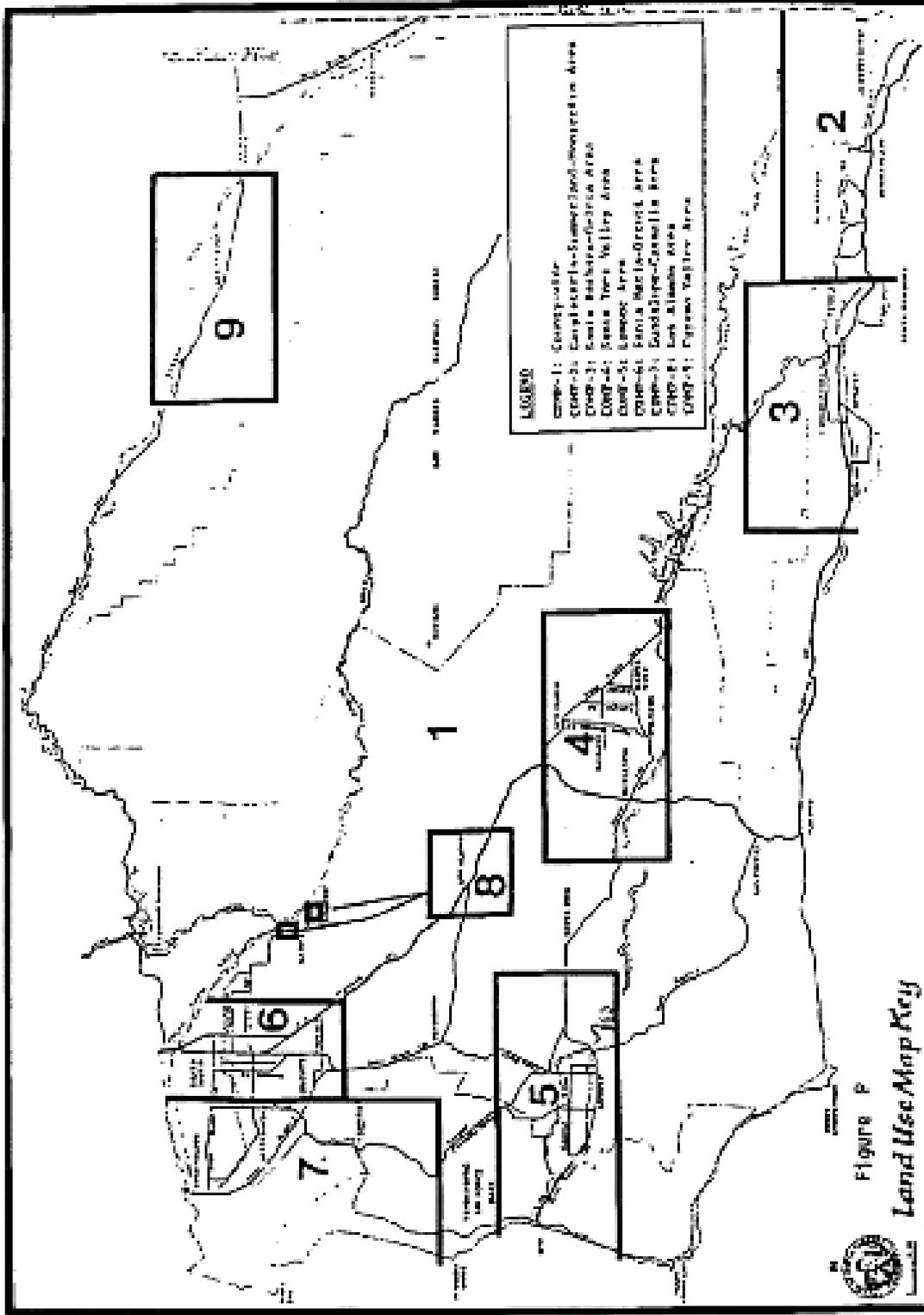
- 1.) Flood control rights-of-way, debris basins, and settling ponds;
- 2.) Subsurface, surface, and air transportation rights-of-way;
- 3.) Sites for emergency services, government-owned and operated utilities, communications, solid waste and/or wastewater disposal, parks, open spaces, beaches, air quality monitoring stations, survey control points, erosion prevention and control, vehicular inspection, honor farms, housing for public employees (e.g., rangers, caretakers, emergency response personnel), animal control shelters, reservoirs, pump stations, water wells and/or storage tanks, electrical substations. (87-GP-5)

NORTH COUNTY CONSOLIDATION PLANNING AREA (NCCPA) – A planning area for oil and gas development in the western portion of Santa Barbara County, defined by the following boundaries: the Santa Barbara County – San Luis Obispo County boundary to the north, the three-mile offshore limit line to the west, the Santa Ynez Mountain ridge line to the south, and to the east, U.S. 101 north to CA 154, east along CA 154 to CA 176, north along CA 176 until it turns in a general northwesterly direction, east to the Los Padres National Forest boundary just south of Lookout Mountain, north along the National forest boundary to the County Line. Maps of this oil and gas consolidation planning area are provided in the siting study incorporated into this element under Land Use Development Policy #11.⁹⁶

CONSISTENCY

Agricultural zoning – is consistent with all general plan land use designations, except that land subject to an Agricultural Preserve Contract shall, pursuant to the Criteria for Agricultural Preserves, be designated on the General Plan for an agricultural land use, as well as zoned for agriculture.⁹⁷

P Land Use Map Key



LAND USE ELEMENT MAPS⁹⁹

The maps for the Land Use Element consist of the following:

Santa Barbara County Comprehensive Plan
Land Use Element
COMP-1 (1" = 8000')

Santa Barbara County Comprehensive Plan
Land Use Element
Carpinteria Area
COMP-2-(1" = 1000')

Santa Barbara County Comprehensive Plan
Land Use Element
Cuyama Valley Area
COMP-2 (1" = 2000')

Santa Barbara County Comprehensive Plan
Land Use Element
Santa Barbara Area¹⁰⁰
COMP-3 (1" = 1000')

Santa Barbara County Comprehensive Plan
Land Use Element
Santa Ynez Valley Area
COMP-4 (1" = 1000')

Santa Barbara County Comprehensive Plan
Land Use Element
Lompoc Area
COMP-5 (1" = 1000')
Land Use Element Maps (continued)

Santa Barbara County Comprehensive Plan
Land Use Element
Santa Maria-Orcutt Area
COMP-6 (1" = 1000')

Santa Barbara County Comprehensive Plan
Land Use Element
Guadalupe-Casmalia Area
COMP-7 (1" = 2000')

Santa Barbara County Comprehensive Plan
Land Use Element

Garey Sisquoc Land Use Map¹⁰¹
COMP-8 (1" = 600')
Goleta Community Plan
Land Use Overlay, Southern and Northern Section – Inland Area¹⁰²

Goleta Community Plan
Land Use, Environmentally Sensitive Habitat and Riparian Corridor Overlay,
Southern Section and Northern Section – Inland Area¹⁰³

Summerland Community Plan
Land Use Designations
(1" = 300')

Summerland Community Plan
Land Use Overlay (Land Use and Zoning)
(1" = 300')

Montecito Community Plan
Land Use Designations
(1" = 500')

Montecito Community Plan
Land Use Overlay
(1" = 500')

Montecito Community Plan
Environmentally Sensitive Habitat Overlay (Land Use and Zoning)
(1" = 500')

Los Alamos Community Plan
Land Use Designation Map¹⁰⁴

Toro Canyon Plan
Land Use Designations Map

Toro Canyon Plan
Land Use Overlay Designations Map

Toro Canyon Plan
Environmentally Sensitive Habitats, Land Use Overlay Map¹⁰⁵

Appendix

Participating County Staff

R.D. Johnson, County Administrative Officer
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Ray Coudray, Development Division, Geology
James M. Stubchaer, Flood Control Engineer
Michael H. Pahos, Director, Park Department
Leland R. Steward, Director of Transportation
Charles Lawrance, County Water Agency

Other Information Sources

U.S. Forest Service
Vandenberg Air Force Base
Santa Barbara County-Cities Area Planning Council
Santa Barbara County Transportation Study (SCOTS)
Santa Barbara County Fire Department
City of Carpinteria
City of Guadalupe
City of Lompoc
City of Santa Barbara
City of Santa Maria
University of California, Berkeley
University of California, Santa Barbara
Pacific Gas and Electric Company
Southern California Edison Company
Southern California Gas Company

The Energy and Land Use Chapter of this document was prepared by Donald K. Schultz, Ph.D., with financial assistance from the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, under provisions of the Federal Coastal Zone Management Act of 1972.

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Karen Thompson
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Community Plans

Beginning in 1992, areawide updates to the 1980 Land Use and Circulation Elements were accomplished through the adoption of Community Plans. These Plans typically consist of separately bound text and maps, along with appropriate amendments to the text and maps contained and referenced herein.

Summerland Community Plan - Board of Supervisors Resolutions 92-238 (Land Use), April 27, 1992; and 92-308 (Circulation), May 19, 1992.

Montecito Community' Plan - Board of Supervisors Resolutions 92-516 (Land Use) and 92-514 (Circulation), September 15, 1992.

Orcutt Community Plan – Board of Supervisors Resolutions 96-GP-001 (Land Use), 96-GP-016 (Noise), 96-GP-017 (Circulation), 96-GP-018 (Bikeways) and 96-GP-019 (Parks, Rec. and Trails) (Dates of Adoption – July 22, 1997).¹⁰⁶

Goleta Community Plan – Board of Supervisors Resolutions 92-GP-024 (Land Use), 92-GP-026 (Circulation), and 93-GP-002 (Noise) (Date of Adoption July 7, 1993)¹⁰⁷

Los Alamos Community Plan¹⁰⁸

Toro Canyon Community Plan – Board of Supervisors Resolutions 00-GP-004 (Land Use), 04GPA-00000-00004 (Circulation) (Date of Adoption February 25, 2002)¹⁰⁹

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Energy Conservation Design Manual for New Residential and Nonresidential Buildings.

California Energy Commission, May 1978, National Gas Supply and Demand, 1978-1995.

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California Public Utilities Commission, July 1978, Final Environmental Impact Report for the Point Conception LNG Terminal Project.

Department of the Air Force, January 1978, Final Environmental Impact Statement, Vandenberg Space Shuttle.

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Department of Housing and Urban Development, 1978, A Survey of Passive Solar Buildings.

Department of the Interior, 1978, Draft Environmental Statement, OCS ,Sale #48.

Employment Development Department, May 1978, Annual Planning Information, 1978-1979.

General Research Corporation, April 1977, An Evaluation of the Housing Market for DCSB Students.

Index

Includes the major topics of the nine Comprehensive Plan Elements

Subject	Element
Agricultural Resources	Conservation
Airport Hazard and Noise Impact	Open Space
Airport Noise	Noise
Airports	Circulation
Air Quality	Major Issues
Archaeological Sites	Conservation
Bikeways	Circulation
Biology (see Ecological Systems)	
Circulation Definitions	Circulation
Circulation Recommendations	Circulation
Compressible and Collapsible Soils	Seismic Safety/Safety
Conclusions and Recommendations	
Agricultural Resources	Conservation
Archaeological Sites	Conservation
Ecological Systems	Conservation
Fire Hazard	Seismic Safety/Safety
Flood Control	Seismic Safety/Safety
Geologic and Seismic Hazards	Seismic Safety/Safety
Historic Sites	Conservation
Noise	Noise
Mineral Resources	Conservation
Water Resources	Conservation
Ecological Systems	Conservation
Energy and Conservation	Conservation
Energy and Land Use	Major Issues (Land Use)
Environmental Factors	Environmental resources Management
Equestrian/Hiking Trails	Circulation
Erosion Seismic Safety/Safety	
Expansive Soils	Seismic Safety/Safety
Fire Hazard	Seismic Safety/Safety
Flood Control	Seismic Safety/Safety
Geologic and Seismic Hazards	Seismic Safety/Safety
General Geography and Geology	Seismic Safety/Safety
Goals and Policies	
County-wide	
Planning Areas	
High Groundwater	Seismic Safety/Safety
Historic Sites	Conservation
Landslides and Slope Stability	Seismic Safety/Safety

Land Use and Environmental Data System	Conservation
Land Use Definitions	Land Use
Land Use Designation Acreages	Land Use
Liquefaction	Seismic Safety/Safety
Major Conservation Issues	Conservation
Mineral Resources	Conservation

CITATIONS

- ¹ [Resolution No. 80-566](#) (Case No. 77-GP-11) Adopted December 22, 1980 (Adopted new General Plan, called a Comprehensive Plan; and including a Land Use Element, A Circulation Element, an Environmental Resources Management Element, and a Recreation Element)
- ² [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Amended to include Agricultural Element Adoption)
- ³ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Incorporated Agricultural Element)
- ⁴ [Resolution No. 81-100](#) (Case No. 77-GP-11) Amended March 9th 1981 (Adopted Text of the Air Quality Supplement to Land Use Element)
- ⁵ [Resolution No. 91-536](#) (Case No. 91-GP-3) Amended September 3rd, 1991 (Amended Land Use and Conventional Energy Sources Paragraph 3)
- ⁶ [Resolution No. 91-536](#) (Case No. 91-GP-3) Amended September 3rd, 1991 (Deleted Remainder of Land Use and Conventional Energy Sources)
- ⁷ [Resolution No. 91-536](#) (Case No. 91-GP-3) Amended September 3rd, 1991 (References and Table 4 “Socioeconomic Impacts of Selected Projects” Deleted)
- ⁸ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Amended sentence)
- ⁹ [Resolution No. 97-314](#) (Case No. 96-GP-019) Amended July 22, 1997 (Deleted “Orcutt Area” from PRT-6 Map and renamed “Santa Barbara Comprehensive Plan Parks, Recreation and Trails Santa Maria Area (PRT-6)”)
- ¹⁰ [Resolution No. 97-314](#) (Case No. 96-GP-019) Amended July 22, 1997 (Adopt by reference map titled “Orcutt Community Plan Parks, Recreation and Trails” map dated July 22, 1997)
- ¹¹ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Amended Development to add “improvements are”)
- ¹² [Resolution No. 03-120](#) (Case No. 00-GPA-6) Amended April 15, 2003 (Amended footnote to add the words “neither”, “nor oak tree Removal,” removed the word “not”)
- ¹³ [Resolution No. 99-267 & 99-269](#) (Case No. 98-GP-012) Amended July 6th, 1999 (Amended Residential Agricultural Unit Program (RAU))
- ¹⁴ [Resolution No. 93-624](#) (Case No. 93-GP-010) Amended November 23, 1993 (Amended Land use Development Policy #4)
- ¹⁵ [Resolution No.: 00-317](#) (Case No.: 00-GP-002) Amended September 12th, 2000 (Deleted old subsection 7.b and added a new subsection)

- ¹⁶ [Resolution No. 82-622](#) (Case No. 82-GP-31) Amended December 21, 1982 (Added Land Use Development Policies 6, 7a, 7b, 8)
- ¹⁷ [Resolution No. 86-399](#) (Case No. 86-GP-18) Amended July 21st, 1986 (Added Goals and Policies: Section 10)
- ¹⁸ [Resolution No. 86-399](#) (Case No. 81-GP-3) Amended Sept 3, 1991 (Amended Contents within Siting Gas Processing Facilities: Screening & Siting Criteria Study)
- ¹⁹ [Resolution No. 90-316](#) (Case No 89-GP-009) Amended May 22, 1990 (Added Section 11.A)
- ²⁰ [Resolution No. 91-536](#) (Case No. 81-GP-3), Amended September 3, 1991 (Amended contents within Siting Gas Processing Facilities: Screening and Siting Criteria Study)
- ²¹ [Resolution No. 04-303](#) (Case No. 04GPA-00000-00015) Amended October 26th 2004 (Revised preamble preceding Policy 12)
- ²² [Resolution No. 91-536](#) (Case No. 91-GP-03) Amended September 3rd, 1991 (Added Policy 12, 12a-12e, Implementing Action and Preceding Paragraph to Policy 12)
- ²³ [Resolution No. 04-303](#) (Case No. 04GPA-00000-00015) Amended October 26, 2004 (Amended Policy 12 and Deleted subsections 12.a-12.e and the Implementing Action)
- ²⁴ [Resolution No. 04-301](#) (Case No. 04GPA-00000-00007) Amended October 26th 2004 (Added Policy 13 Oil and Gas Facilities)
- ²⁵ [Resolution No. 96-341](#) (Case No. 96-GP-013) Amended August 20th, 1996 (Added Policy 13, Measure A96 voter approval initiative)
- ²⁶ [Resolution No. 96-342](#) (Case No. 96-GP-013) Amended August 20th, 1996 (Added Policy 13, Measure A96 voter approval initiative)
- ²⁷ [Resolution No. 82-387](#) (Case No. 82-GP-7) Amended July 19th, 1982 (Added Planned Development Policies Section)
- ²⁸ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September, 3rd 1991 (Amended Hillside and Watershed Protection Policy #9 to include “and/or improvements” and “and/or agricultural improvements”)
- ²⁹ [Resolution No. 81-559](#) (Case No. 81-GP-21) Amended December 14, 1981 (Added Growth Management Policies 1, 2, and 3)
- ³⁰ [Resolution No. 87-600](#) (Case no 87-GP-001) Amended December, 7th 1987 (Added subsection 4)
- ³¹ [Resolution No. 87-600](#) (Case No 87-GP-001) Amended December, 7th 1987 (Added subsection 5 & Implementing Action)
- ³² [Resolution No. 06-085](#) (Case No. 04GPA-00000-00017) Amended March 21st, 2006 (Amended South Coast Policy 5 Implementing Action C)
- ³³ [Resolution No. 87-600](#) (87-GP-1) Amended December 7th, 1987 (Amended Subsection 5 to 5.F)

- ³⁴ [Resolution No. 99-269](#) (Case No.: 99-GP-001) Amended July 6th, 1999 (Added South Coast Policy 6)
- ³⁵ [Toro Canyon Resolution 02-063](#) (Case No. 00-GP-004) Amended February 25, 2002 (Add Geographic Location Toro Canyon)
- ³⁶ [Resolution No. 94-100](#) (Case No. 92-GP-021, 93-GP-016), Amended February 8, 1994 (Added new “Los Alamos Planning Area”)
- ³⁷ [Resolution No. 92-238](#) (Case No. 92-GP-7) Amended April 27th, 1992 (Summerland Reference Deleted in Heading and Population/Growth subsection)
- ³⁸ [Resolution 02-063](#) (00-GP-4) Amended February 25th, 2002 (Superseded by the Toro Canyon Plan within the area covered by the Plan)
- ³⁹ [Resolution No. 93-624](#) (Case No. 93-GP-010) Amended November 23rd, 1993 (Amend Carpinteria Housing Section)
- ⁴⁰ [Resolution No. 92-238](#) (Case No. 92-GP-7) Amended April 27, 1992 (Adopted Summerland Community Plan)
- ⁴¹ [Resolution No. 91-121](#) & [91-122](#) (Case No. 90-GP-13) Amended March 5th, 1991 (Amended the Area/Community Goals Section: “Montecito.”)
- ⁴² [Resolution No. 92-515](#) (Case No. 92-GP-014) Amended September 15th 1992 (Amended Last 3 Paragraphs of “Montecito” section)
- ⁴³ [Resolution No. 92-516](#) (Case No. 92-GP-014) Amended September 15th 1992 (Deleted Preamble, Goals, and Implementation Measures and added text)
- ⁴⁴ [Resolution 91-697](#) (Case No. 91-GP-005) Amended December 3rd, 1991 (#b Regional Transportation Plan (Draft) section deleted)
- ⁴⁵ [Resolution 81-559](#) (Case No. 81-GP-26) Amended December 14th, 1981 (Added Planned Development Sites – Cieneguitas Creek and Environmental Section Above)
- ⁴⁶ [Resolution 81-559](#) (Case No. 81-GP-26) Amended December 14th, 1981 (Added in Goleta Valley Population Growth Language)
- ⁴⁷ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th, 1993 (Deleted Goleta Valley Section)
- ⁴⁸ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th 1993 (Adopted new Goleta Community Plan)
- ⁴⁹ [Resolution 83-518](#) (Case No. 83-GP-8) Amended December 19th 1983 (Added Tularosa Road Area Planning Policy)
- ⁵⁰ [Resolution 82-387](#) (Case No. 82-GP-6) Amended July 19th, 1982 (Added Tepusquet Study Area Planning Policies)

- ⁵¹ [Resolution No. 82-622](#) (Case No. 82-GP-12) Amended December 21st, 1982 (Added Original Planned Development Sites – Rice Ranch Site)
- ⁵² [Resolution No. 93-254](#) (Case No. 92-GP-022) Amended April 27th, 1993 (Amended Development Standard D)
- ⁵³ [Resolution No. 93-255](#) (Case No. 90-GP-005 & 92-GP-022) Amended April 27th, 1993 (Amended Development Standard D)
- ⁵⁴ [Resolution No. 94-310](#) (Case No. 93-GP-005) Amended June 14th, 1994 (Added Special Area Development Standards Section E, its subsequent subsections, the following paragraph, and the 1 & 2 footnotes)
- ⁵⁵ [Resolution No. 97-320](#) (Case No 96-GP-001) Amended July 22nd, 1997 (Deleted Rice Ranch Special Area & Development Standards)
- ⁵⁶ [Resolution No. 93-255](#) (Case No. 90-GP-005 & 92-GP-022) Amended April 27th, 1993 (Eliminated Figure E-1)
- ⁵⁷ [Resolution No. 97-314](#) (Case No. 96-GP-001) Amended July 22nd, 1997 (Adopted Orcutt Community Plan)
- ⁵⁸ [Resolution 94-96](#) (Case No. 92-GP-21) Amended February 8th, 1994 (Adopted Los Alamos Planning Area)
- ⁵⁹ [Resolution No. 92-238](#) (Case No. 92-GP-7) Amended April 27th, 1992 (Amend Carpinteria-Summerland references by deleting Summerland reference)
- ⁶⁰ [Resolution No. 02-063](#) (Case No. 00-GP-004) Amended February 25th, 2002 (Amended Tables 11a and 11b to reflect adoption of Toro Canyon Plan adoption)
- ⁶¹ [Resolution 92-515](#) (Case No. 92-GP-014) Amended September 15th, 1992 (Deleted Figure G, Table 12a & 12b)
- ⁶² [Resolution No. 94-96](#) (Case No. 92-GP-21) Amended February 4th, 1994 (Amended to Delete Los Alamos from Sisquoc-Garey Area)
- ⁶³ [Resolution No. 94-100](#) (Case No. 92-GP-021, 93-GP-016), Amended February 8, 1994 (Amend “Land Use Holding Capacity” to delete parcels within the Los Alamos Planning Area from Tables 19a and 19b)
- ⁶⁴ [Resolution 94-96](#) (Case No. 92-GP-21) Amended February 4, 1994 (Amends Table 19a and 19b by deleting parcels within the Los Alamos Planning Area)
- ⁶⁵ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd 1991 (Revised Agriculture definition in both paragraphs)
- ⁶⁶ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Added Agricultural Commercial (AC) Definition)

- ⁶⁷ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Amended Mountainous Areas, Mountainous Areas [MA40], and Mountainous Area [100-320 acres minimum parcel size] Definitions)
- ⁶⁸ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Amended Residential Ranchette 5-20 acres minimum parcel size definition)
- ⁶⁹ [Resolution No. 82-95](#) (Case No. 81-GP-19 and 81-GP-20) Amended March 8th, 1982 (Added Initial Residential Designations and Densities)
- ⁷⁰ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th 1993 (Added Goleta Specific Residential Designations/Densities)
- ⁷¹ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th 1993(Added Goleta Specific Residential Designations/Densities)
- ⁷² [Resolution No. 82-387](#) (Case No. 82-GP-7) Amended July 19th, 1982 (Added Planned Development land use designation)
- ⁷³ [Resolution No. 02-063](#) (Case No. 00-GP-004) Amended February 25th, 2002 (Toro Canyon inclusion)
- ⁷⁴ [Resolution No. 98-478](#) & [98-480](#) (Case No. 98-GP-023) Amended December 1st, 1998 (Added Cima del Mundo Property)
- ⁷⁵ [Resolution No. 91-122](#) (Case No. 90-GP-15) Amended March 5th, 1991 (Added Semi-Rural Residential Definition)
- ⁷⁶ [Resolution No. 92-516](#) (Case No. 92-GP-014) Amended September 15th, 1992 (Amended and deleted sections of Semi-Rural Residential Definition)
- ⁷⁷ [Resolution No. 91-122](#) (Case No. 90-GP-15) Amended March 5th, 1991 (Adopted Semi-Rural Residential Categories)
- ⁷⁸ [Resolution No. 92-516](#) (Case No. 92-GP-014) Amended September 15th, 1992 (Amended and Deleted sections of Semi-Rural Definition)
- ⁷⁹ [Resolution No. 92-516](#) & [92-515](#) (Case No. 92-GP-014) Amended September 15th, 1992 (Deleted old Semi-Rural Residential Categories and added new categories)
- ⁸⁰ [Resolution No. 82-387](#) (Case No. 82-GP-7) Amended July 19th, 1982 (Added Planned Development Definition)
- ⁸¹ [Resolution No. 82-95](#) (Case No. 81-GP-19 & 81-GP-20) Amended March 8th, 1982 (Added Educational Facilities, Institution/Government, and Public Utility Definitions)
- ⁸² [Resolution No. 91-536](#) (Case No. 90-GP-010) Amended September 3rd, 1991 (Definition deletes and replaces "Coastal Dependent Industry")
- ⁸³ [Resolution No. 82-622](#) (Case No. 82-GP-26) Amended December 21, 1982 (Added Service Commercial Definition)

- ⁸⁴ [Resolution No. 86-111](#) (Case No. 85-GP-8) Amended February 24, 1986 (Added Airport Clear and Approach Zones, Airport Clear Zone, and Airport Approach Zone Definitions)
- ⁸⁵ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th, 1993 (Added Affordable Housing Goleta Definition)
- ⁸⁶ [Resolution No. 93-624](#) (Case No. 93-GP-010) Amended November 23, 1993 (Deleted Affordable Housing Goleta Definition)
- ⁸⁷ [Resolution No. 93-624](#) (Case No. 93-GP-010) Amended November 23, 1993 (Added Affordable Housing Overlay Definition)
- ⁸⁸ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Added and amended Agricultural Industry Definition and included Agricultural Industry Overlay stipulation)
- ⁸⁹ [Resolution No. 82-95](#) (Case No. 81-GP-20) Amended March 8th 1982 (Added Definition of Dwelling Unit)
- ⁹⁰ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Added Agricultural Improvement Definition)
- ⁹¹ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Added Agricultural Development Definition)
- ⁹² [Resolution No. 80-566](#) (Case No. 77-GP-11) Amended December 22, 1980 (Added Agriculture Definition)
- ⁹³ [Resolution No. 91-536](#) (Case No. 81-GP-3) Amended September 3rd, 1991 (Deleted Agriculture Definition)
- ⁹⁴ [Resolution No. 80-566](#) (Case No. 77-GP-11) Amended December 22, 1980 (Added Open and Grazing Definition)
- ⁹⁵ [Resolution No. 86-399](#) (Case No. 86-GP-18) Amended July 21st, 1986 (Added Definition of Shadow Construction)
- ⁹⁶ [Resolution No. 90-316](#) (Case Nos. 89-GP-011, 90-GP-004, 89-GP-009) (Added North County Consolidation Planning Area Definition)
- ⁹⁷ [Resolution No. 80-566](#) (Case No. 77-GP-11) Amended December 22, 1980 (Added Agricultural Zoning Definition)
- ⁹⁸ [Resolution No. 02-063](#) (Case No. 00-GP-004) Amended February 25, 2002 (Toro Canyon Plan in Legend)
- ⁹⁹ [Resolution No. 80-566](#) (Case No. 77-GP-11) Amended December 22nd, 1980 (Adopted the following maps: Comp-1, Comp-2 (Carpinteria-Montecito-Summerland Area), Comp-3, Comp-4, Comp-5, Comp-6, Comp-7, Comp-8, Comp-9)
- ¹⁰⁰ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th, 1993 (Amended by deleting “Goleta-“ from Goleta-Santa Barbara Area)

¹⁰¹ [Resolution No. 94-100](#) (Case No. 92-GP-021, 93-GP-016), Amended February 8, 1994 (Amend Los Alamos Area Land Use Map (COMP-8) by deleting the Los Alamos Planning Area and renaming map the Garey Sisquoc Land Use Map (Comp-8))

¹⁰² [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th, 1993 (Adopt by reference the map titled “Goleta Community Plan, Land Use Overlay”)

¹⁰³ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th, 1993 (Adopt by reference the map titled “Goleta Community Plan, Land Use Environmentally Sensitive Habitat and Riparian Corridor Overlay”)

¹⁰⁴ [Resolution No. 94-100](#) (Case No. 92-GP-021, 93-GP-016), Amended February 8, 1994 (Adopt by reference the map titled “Los Alamos Community Plan Land Use Designation Map”)

¹⁰⁵ [Resolution No. 02-063](#) (Case No. 00-GP-004) Amended February 25, 2002 (Toro Canyon Adoption Area: Include New Map, New Overlay Designations, Environmentally Sensitive Habitats Map)

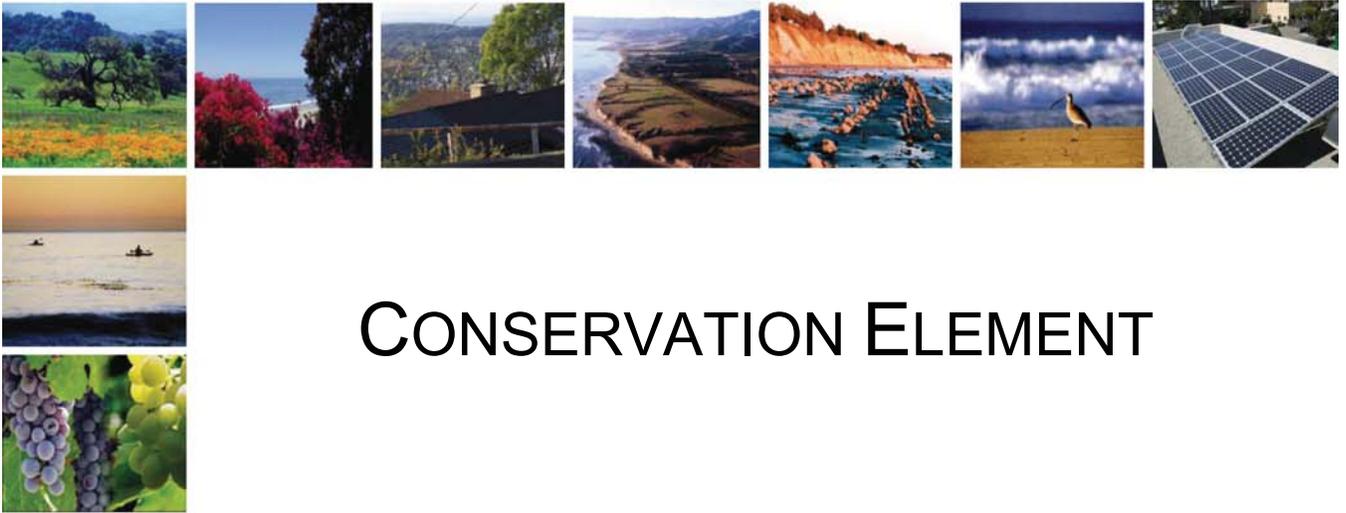
¹⁰⁶ [Resolution No. 97-314](#) (Case No. 96-GP-001) Amended July 22nd, 1997 (Added Orcutt Community Plan Reference)

¹⁰⁷ [Resolution No. 93-401](#) (Case No. 92-GP-024) Amended July 20th, 1993 (Added Goleta Community Plan Reference)

¹⁰⁸ [Resolution No. 94-100](#) (Case No. 92-GP-021, 93-GP-016), Amended February 8, 1994 (Incorporate by reference the Los Alamos Community Plan into the “Community Plans” section of the Land Use Element)

¹⁰⁹ [Resolution No. 02-063](#) (Case No. 00-GP-004) Amended February 25th, 2002 (Added Reference of Toro Canyon Community Plan adoption)

Exhibit C
To
Attachment C



CONSERVATION ELEMENT

ADOPTED 1979

REPUBLICATED MAY 2009

SANTA BARBARA COUNTY
COMPREHENSIVE GENERAL PLAN



County of Santa Barbara
Planning and Development
123 E. Anapamu Street
Santa Barbara, CA 93101

The electronic version of the Santa Barbara County Comprehensive Plan can be found at: <http://longrange.sbcountyplanning.org>

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Goleta Valley

Santa Ynez Valley

Lompoc

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The "Conservation and Energy" chapter of this report was prepared with financial assistance from the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, under the provisions of the Federal Coastal Zone Management Act of 1972.

TABLE OF CONTENTS

INTRODUCTION	7
STUDY PURPOSE AND ORGANIZATION	7
PREPARATION OF THE CONSERVATION ELEMENT.....	8
LAND USE AND ENVIRONMENTAL DATA SYSTEM.....	9
Study Areas.....	9
Computer Mapping	13
MAJOR CONSERVATION ISSUES	16
Water Resources	16
Ecological Systems	17
Mineral Resources	18
Agricultural Resources	19
Historic Sites and Archaeological Sites	19
AN INTERIM IMPLEMENTATION MEASURE.....	20
WATER RESOURCES	22
OVERVIEW OF WATER QUALITY	22
Surface Water Supplies.....	22
Groundwater Supplies.....	22
Groundwater Recharge	24
PROTECTION OF WATER RESOURCES.....	25
PRESENT WATER SUPPLIES AND FUTURE WATER DEMANDS.....	41
Local Water Conditions	41
Future Water Demands	60
ALTERNATE SOURCES OF SUPPLEMENTAL WATER SUPPLY	64
WASTEWATER.....	69
CONCLUSIONS AND RECOMMENDATIONS.....	74
ECOLOGICAL SYSTEMS	75
INTRODUCTION	75
PRESERVATION OF BIOLOGICAL DIVERSITY: THEORY AND RULES.....	75
Preserving Natural Systems	76
Some Considerations Governing Classification of Areas	78
METHODS OF MAPPING AND EVALUATING ECOLOGICAL UNITS	80
Categories	84
Biological Values.....	84
Tolerance to Use	85
Intensity of Use.....	86
Buffer Zones	111
Sources and Accuracy of Mapped Information	112
SPECIES AND ECOLOGICAL COMMUNITIES OF PARTICULAR VALUE	112
Birds.....	112
Reptiles	115
Mammals	115
Plants	115
Ecological Communities of Greatest Interest	117
Prime Examples of Common Ecological Communities.....	120
MAPPED AREAS AND COMMUNITIES	122
Coastal Strand and Marine Habitats.....	122
40-49. Chaparral and Scrub Habitats: Preserves and Study Areas.....	130
Grassland	131
Woodland and Savanna	133
Forest Habitats	135

Riparian Forests and Woodlands	139
76. Trees Serving as Traditional Roosting Sites (5-2-2).....	139
80. Freshwater Marsh (5-2-2)	140
Aquatic Freshwater Communities.....	140
TWO GEOGRAPHIC AREAS OF PARTICULAR ECOLOGICAL INTEREST	147
Channel Islands.....	147
Vandenberg Air Force Base.....	151
CONCLUSIONS AND RECOMMENDATIONS.....	153
MINERAL RESOURCES	158
INTRODUCTION	158
LOCATIONS OF KNOWN RESOURCES.....	158
PRODUCTION AND RESERVES	161
ENVIRONMENTAL IMPACTS.....	165
FUTURE NEEDS AND POTENTIAL DEFICITS.....	167
CONCLUSIONS AND RECOMMENDATIONS.....	169
AGRICULTURAL RESOURCES	171
INTRODUCTION	171
MAJOR CROPS AND HISTORICAL TRENDS.....	171
Cattle and Calves	171
Horses	174
Vegetable Crops.....	174
Field Crops.....	174
Fruit and Nut Crops	174
Cut Flowers and Nursery Products	175
1977 Agricultural Production	175
AGRICULTURAL LAND USE	175
AGRICULTURAL SUITABILITY	178
Soils	178
Environmental Impacts	182
Agricultural Suitability Models	186
PRESERVATION OF AGRICULTURE	203
CONCLUSIONS AND RECOMMENDATIONS.....	207
HISTORIC SITES.....	211
INTRODUCTION	211
MAJOR HISTORICAL RESOURCES.....	211
INVENTORY OF HISTORIC SITES	213
PRESERVATION PROGRAMS	224
CONCLUSIONS AND RECOMMENDATIONS.....	226
ARCHAEOLOGICAL SITES.....	228
INTRODUCTION	228
Early Archaeology in California.....	228
Special Characteristics of Santa Barbara County Archaeology	228
Early Archaeology in Santa Barbara County	229
Status of the Archaeological Resources of Santa Barbara County	229
Professional Assessment of the Importance of Archaeological Sites	230
CLASSIFICATION OF SITE DENSITY AREAS	230
DESCRIPTION OF DENSITY AREAS.....	231
THREATS TO ARCHAEOLOGICAL RESOURCES	234
Site Destruction: General.....	234
Direct Threats to Sites.....	234
Indirect Threats to Sites	235

CONCLUSIONS AND RECOMMENDATIONS.....	235
CONSERVATION AND ENERGY.....	239
PRODUCTION.....	239
EXTRACTION.....	240
PROCESSING.....	240
MARKETING.....	240
CONSUMPTION.....	242
RECOMMENDATIONS.....	243
BIBLIOGRAPHIES.....	250
APPENDICES.....	261
APPENDIX A: AGRICULTURAL SUITABILITY COUNTY-WIDE, MODEL STEPS FOR COMPUTER PROGRAMMING.....	261
APPENDIX B: SUITABILITY FOR AGRICULTURAL EXPANSION IN STUDY AREAS, MODEL STEPS FOR COMPUTER PROGRAMMING.....	266
APPENDIX C: PAYMENT CAPACITIES FOR VARIOUS CROPS PER HYDROLOGIC BASIN.....	270
APPENDIX D: PERSONS CONSULTED BY THE ENVIRONMENTAL BIOLOGISTS.....	281
CITATIONS.....	283

MAPS

STUDY AREAS, SANTA BARBARA COUNTY.....	11
PROTECTION OF LOCAL WATER RESOURCES.....	29
SANTA BARBARA COUNTY.....	30
SOUTH COAST AREA - EAST.....	32
SOUTH COAST AREA - WEST.....	34
SANTA YNEZ VALLEY AREA.....	36
LOMPOC AREA.....	38
SANTA MARIA-ORCUTT AREA.....	40
GENERALIZED GROUNDWATER BASINS, SANTA BARBARA COUNTY.....	42
MAJOR EXISTING AND POTENTIAL WATER SUPPLY FACILITIES, SANTA BARBARA COUNTY.....	43
WASTEWATER TREATMENT FACILITIES.....	70
ENVIRONMENTAL BIOLOGY.....	87
VALUE CLASSIFICATION-SANTA BARBARA COUNTY.....	88
TOLERANCE-INTENSITY CLASSIFICATION-SANTA BARBARA COUNTY.....	90
VALUE CLASSIFICATION-SOUTH COAST AREA - EAST.....	92
TOLERANCE-INTENSITY CLASSIFICATION-SOUTH COAST AREA - EAST.....	94
VALUE CLASSIFICATION-SOUTH COAST AREA - WEST.....	96
TOLERANCE-INTENSITY CLASSIFICATION-SOUTH COAST AREA - WEST.....	98
VALUE CLASSIFICATION-SANTA YNEZ VALLEY AREA.....	100
TOLERANCE-INTENSITY CLASSIFICATION-SANTA YNEZ VALLEY AREA.....	102
VALUE CLASSIFICATION-LOMPOC AREA.....	104
TOLERANCE-INTENSITY CLASSIFICATION-LOMPOC AREA.....	106
VALUE CLASSIFICATION-SANTA MARIA-ORCUTT AREA.....	108
TOLERANCE INTENSITY CLASSIFICATION-SANTA MARIA-ORCUTT AREA.....	110
MINERAL RESOURCES, SANTA BARBARA COUNTY.....	160
SOILS: AGRICULTURAL CAPABILITY, SANTA BARBARA COUNTY.....	181
AGRICULTURAL SUITABILITY FOR MAJOR CROPS, SANTA BARBARA COUNTY.....	189
SUITABILITY FOR EXPANSION OF AGRICULTURE.....	193
SOUTH COAST AREA - EAST.....	194

SOUTH COAST AREA - WEST	196
SANTA YNEZ VALLEY AREA.....	198
LOMPOC AREA.....	200
SANTA MARIA-ORCUTT AREA.....	202
AGRICULTURAL PRESERVES, SANTA BARBARA COUNTY.....	206
HISTORIC SITES.....	217
SOUTH COAST AREA- EAST.....	217
SOUTH COAST AREA - WEST.....	219
HISTORIC SITES, SANTA BARBARA COUNTY.....	220

Introduction ¹

STUDY PURPOSE AND ORGANIZATION

Santa Barbara County's natural and cultural resources are the subject of the Conservation Element. This element is required by State Planning Law as part of the Comprehensive Plan, "for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, and rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources" (Government Code, Section 65302 (d)).

There are six technical studies presented in this report: Water Resources, Ecological Systems, Mineral Resources, Agricultural Resources, Historic Sites, and Archaeological Sites. These studies, along with the geologic, fire and flood studies of the Seismic Safety and Safety Element, are used in the preparation of the Open Space Element, the Land Use Element, and the Circulation Element. In the Open Space Element and the Land Use Element, factors identified as constraints on agriculture, recreational opportunities and urban development are used to help delineate open space and urban land uses.

Several subjects that could have been discussed in the Conservation Element are covered in other studies and Comprehensive Plan elements. Erosion, shoreline regression, fire hazards and flood control are included in the Seismic Safety and Safety Element because they relate to geologic problems and public safety. Air pollution and its impact on air resources in Santa Barbara County, and clean air attainment are subjects of studies being prepared by the County under provisions of the federal Clean Air Act. It is anticipated that the Air Quality Maintenance Plan (AQMP) and the Air Attainment Program (AAP) will be used as the basis for an Air Quality Element. While an Air Quality Element is not a mandatory part of the Comprehensive Plan, State Planning Law (Government Code, Section 65303 (k)) provides that additional elements may be prepared on subjects which concern the physical development of the County. The air quality implementation strategies developed for the AQMP and AAP will be related to the Land Use and Circulation Elements, and will be incorporated where necessary into the Comprehensive Plan Implementation Program.

Onshore oil and gas development is discussed in the Mineral Resources chapter of the Conservation Element, while offshore production is studied by the state Office of Planning and Research in its report, Offshore Oil and Gas Development: Southern California.² A primary finding of the state report is that California has little control over outer continental shelf (OCS) development. Although OCS development plans may include onshore facilities, such facilities can be built offshore in federal waters. As the report further notes, "The course of offshore development will determine the onshore impacts California must bear, but the state and local governments of California can only comment on leasing and development plans and hope their concerns will be reflected in the decisions of federal officials. California may gain some control over OCS oil and gas

development through the consistency provisions of the Coastal Zone Management Act as amended, but the effectiveness and scope of these provisions is uncertain” (p, 17). As a solution to this problem, the state report recommends that Congress pass legislation requiring the Secretary of the Interior to accept the recommendations of an affected state’s governor on proposed OCS action, unless the Secretary determines they are not consistent with national security or the overriding national interest. It is not clear how this recommendation would answer the concerns of an affected local government.

Other energy-related studies include the following: The Local Coastal Program is evaluating locations for potential energy facilities; the Pipeline Feasibility Study is investigating the possibility of transporting oil by pipeline, thus eliminating the need for more onshore processing plants and marine terminals; the Liquefied Natural Gas (LNG) Siting Task Force is analyzing the impacts of the proposed LNG port and regassification facility near Point Conception. As information becomes available from these studies, it will be related to the Comprehensive Plan. A chapter on conservation and energy is included in this report.

PREPARATION OF THE CONSERVATION ELEMENT

An interdisciplinary team worked closely together on the technical studies included in this report. In most instances, existing source material was utilized, but some previously unavailable material, principally new maps, also was incorporated into the Conservation Element. Up-to-date agricultural land use maps were provided by the County Farm Advisor and his staff and the University of California, Santa Barbara, Geography Department’s Remote Sensing Unit. The U.S. Soil Conservation Service supplied field maps from the most recent soil survey of the South Coast area. Over 100 historic sites were mapped for the first time by the Santa Barbara Historical Society. Other material not previously published will be cited in the individual chapters in which it is discussed.

Certain chapters of the Conservation Element were written by the individuals responsible for the technical studies, while other chapters are based on analyses of data from a variety of sources, and were written by Livingston and Associates. Throughout the study, the County and the cities, and many state and federal agencies provided valuable assistance. The responsibility for each of the chapters is listed below.

Water Resources	County Planning Department, from County Water Agency reports; Bookman-Edmonston, Inc.
Ecological Systems	Dr. Joseph Connell, Robert Engel, Dr. J. R. Haller, Dr. Richard Howmiller, and Dr. William Murdock, environmental biologists at the University of California, Santa Barbara
Mineral Resources	Livingston and Associates
Agricultural Resources	Livingston and Associates
Historical Sites	Livingston and Associates
Archaeological Resources	Peggy Ehmann, Stephen Horne, Mike Perez, and Jeff Quilter, archaeologists at the Department of Anthropology, University California, Santa Barbara, under the direction of Dr. Michael Glassow
Conservation and Energy	County Planning Department

LAND USE AND ENVIRONMENTAL DATA SYSTEM

The land use and environmental data system designed for the Comprehensive Plan combines several methods for data collection, storage, retrieval, and analysis. First, all land use and environmental information was mapped on County-wide and study area reproducible base maps. In the interests of efficiency and accuracy, certain data then were coded and stored in a computer. The computer based data system permits large amounts of data to be handled more effectively and efficiently than using other information systems, and provides a degree of precision appropriate for land use planning. However, certain rural areas of the County do not require refined computer analysis because manual techniques utilizing overlays and other methods of interpreting environmental information are just as effective. For this reason, a data system that would permit progressively refined studies of land use and natural resources was designed.

Study Areas

To resolve the problems of data collection and analysis presented by the size and diversity of land use and environmental data in the County, three types of study areas were defined. In large areas of the County under federal ownership and on the Channel Islands, less precise information is needed for comprehensive planning (except for recreation potential) than in other portions of the County. So, Los Padres National Forest, Vandenberg Air Force Base, and the four Channel Islands were excluded from the computerized data base. However, information on agriculture, ecological systems, mineral resources, and water resources was analyzed for these areas and, in almost all

cases, is shown on manually prepared maps published in this report.

In the remaining portion of the County, two scales of analysis were employed. County-wide, the objective was to analyze regional resources and environmental constraints in order to be able to identify and rank opportunities for urban development, agricultural expansion, and recreational activities. Areas to be preserved because of environmental hazards, ecological communities, or scenic value also were evaluated. The boundaries of the County-wide study area for computer analysis are indicated on the Santa Barbara County Study Areas map. All County-wide data are mapped at a scale of 1 inch equals 8,000 feet, although published maps, of course, have been reduced in scale. Wherever urban development pressure is likely to be significant between now and 1990, a more refined level of analysis was undertaken. Four study areas, the South Coast, Santa Ynez Valley, Lompoc, and Santa Maria-Orcutt, were selected to encompass the lands where urbanization is likely to occur and where detailed analyses of agriculture, open space, scenic value, and recreational opportunities would be in order. Together, these areas include 589 square miles, 40 per cent of the County-wide study area. The boundaries of the study areas are indicated on the Study Areas map.

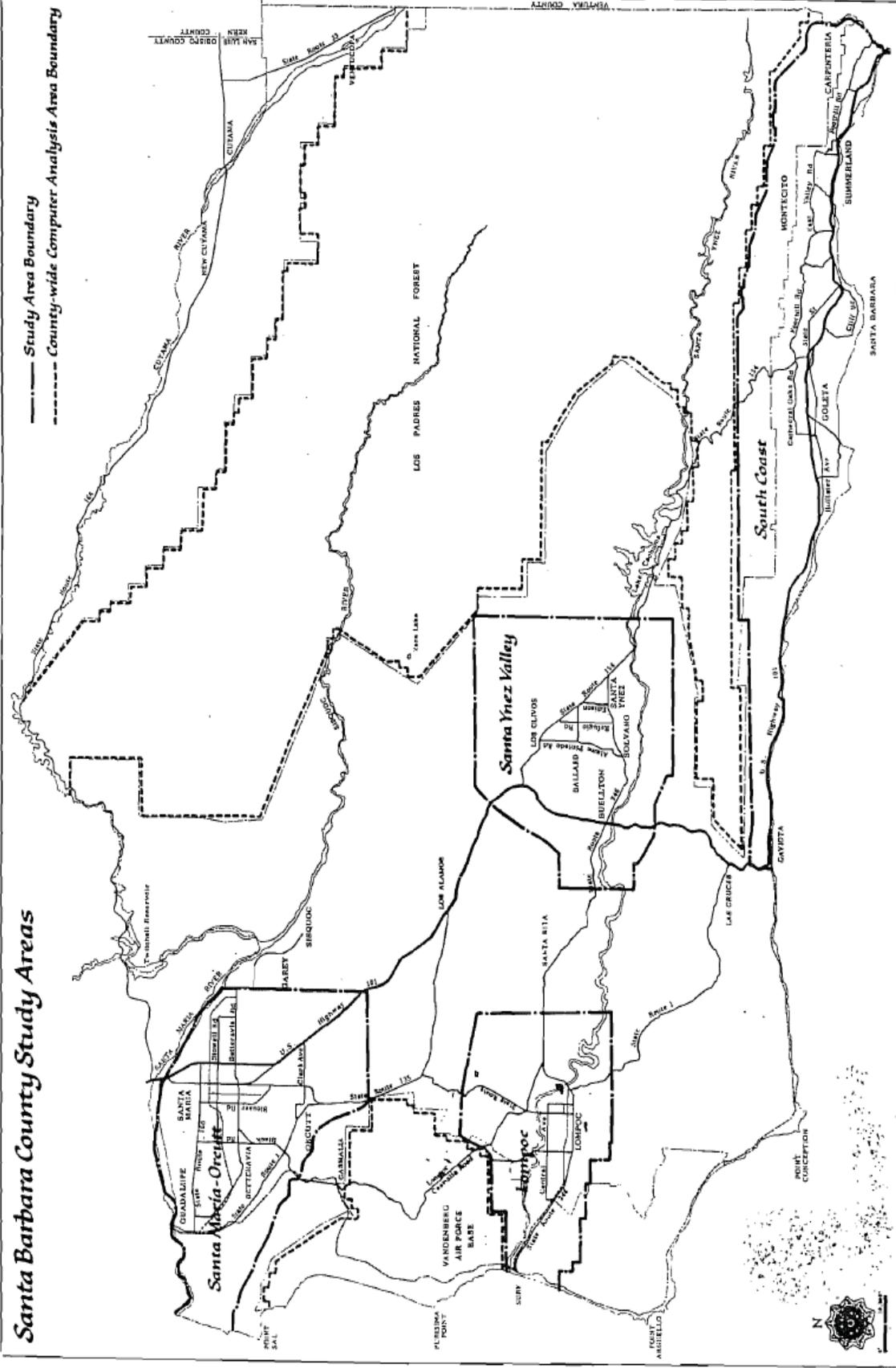
Other areas in the County also may have limited urban development potential, and these lands have been analyzed at the County-wide scale. However, it is unlikely that these areas will be developed extensively at urban densities by 1990. Certain outlying areas of the County with possible development potential, such as the Los Alamos area and the Cuyama Valley, will be examined carefully to determine not only their suitability for urban development but also the adverse impacts that development might create.

Not all of the land within the study areas actually has urban development potential. Two of the most obvious reasons are steep slopes and large public ownerships. To make the computer analysis more efficient and to keep the cost of the data bank at a reasonable level, the boundaries of areas for computer analysis were set to include a total of only 311 square miles of land with possible urban development potential. Four criteria were used to determine which areas to eliminate from detailed computerized data mapping and analysis.

- Areas with over 30 per cent average slope, which are too steep to be developable.
- Vandenberg Air Force Base.
- Los Padres National Forest.
- Areas exhibiting special environmental characteristics making them extremely difficult or infeasible to develop.

STUDY AREAS, SANTA BARBARA COUNTY

Santa Barbara County Study Areas



Because data were mapped at a scale of 1 inch equals 2,000 feet for the entire study area, and not just for the computer analysis area, data are available for the areas that were excluded, and therefore can be utilized as needed. Application of the criteria to delimit the computer analysis areas is described below in order to clarify how the boundaries were set.

South Coast--A large portion of the South Coast lies within the boundaries of the National Forest, and this line generally was used as the boundary for the computer analysis area from the Ventura County line to a point 2.4 miles west of Las Varas Canyon. However, portions of Toro Canyon and other areas within the National Forest with slopes averaging less than 30 per cent also were included in the computer analysis area.

Santa Ynez Valley--The most significant criterion applied to this study area was the exclusion of all lands averaging over 30 per cent slope. In addition, the Foxen Canyon area was omitted because half the Canyon lies outside the study area boundary. An area east of Los Olivos proposed for subdivision was included at the request of the County staff.

Lompoc--A large segment of the western portion of the Lompoc area within Vandenberg Air Force Base was excluded from the computer analysis area. In addition, the Federal Correctional Institution adjacent to the Air Force Base was omitted. Other portions of the Lompoc study area were eliminated because of excessive slope or, in the case of the southeastern section, because it lies within the flood plain of the Santa Ynez River.

Santa Maria-Orcutt--Here, the computer analysis area is almost as large as the study area because few lands were omitted. Areas of coastal and inland sand dunes were assumed unsuitable for urban development along with an oil field area south of Orcutt. Other portions of the study area averaging over 30 per cent slope or lying between the Southern Pacific Railroad tracks and steep lands were excluded.

Table 1 provides a summary of the acreage in the study areas and in the computer analysis areas.

TABLE 1. SANTA BARBARA COUNTY STUDY AREAS (Acres)

	<u>Study Area</u>	<u>Area for Computer Analysis</u>
South Coast	123,400	58,500
Santa Ynez Valley	94,000	44,500
Lompoc	64,300	27,800
Santa Maria-Orcutt	95,700	68,500
Total	377,400	199,300

Computer Mapping

Computer mapping techniques provide many benefits in a comprehensive planning study. Most important is the ability of the computer to analyze large amounts of data quickly and to produce maps at desired scales using legible graphic symbols. Using computer processing, it also is quite easy to test the efficacy of alternate solutions to a given problem and to compare the results graphically. The uniformity of scale and consistency of graphics format simplify analysis and interpretation of computer maps.

The key to a computer data system is a procedure permitting the computer to identify the spatial location of environmental data. The most practical approach is to employ an x-y grid coordinate system for reference purposes. Every location on a map then has a specific set of identifying coordinates, and information obtained from one map can be compared easily with information found on another map. These coordinates, in turn, are referenced to California State Plane Coordinates, so that the data system prepared in this study is compatible with other data systems.

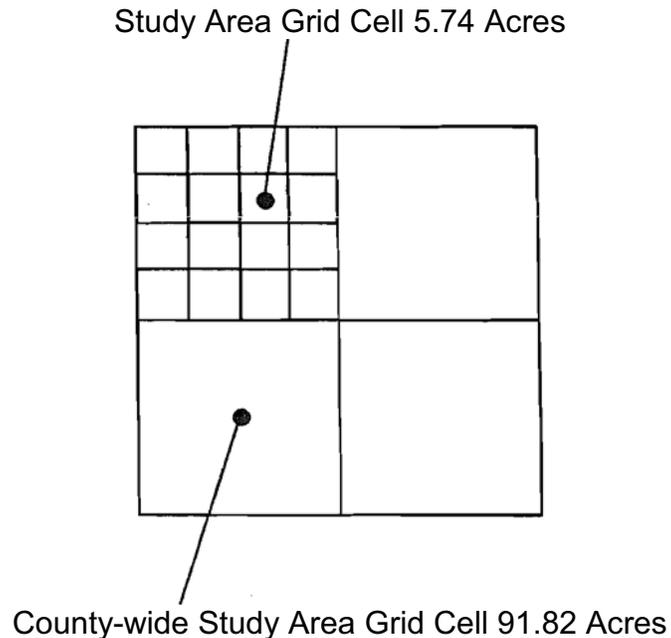
Once the coordinate system has been established, a common spatial unit must be defined for computer analysis and data mapping. Use of a standard grid cell size facilitates creation of the data bank and display of information in a consistent format. Because the data cell size affects not only the spatial accuracy of the analysis but also the cost of the system, these two factors must be balanced in relation to the objectives for which the data system is being designed.

For County-wide data mapping, a grid cell size of 2,000 by 2,000 feet (91.82 acres) was chosen. On gridded base maps at the County-wide scale (1 inch equals 8,000 feet), these grid cells are one quarter inch square. The computer-generated maps also utilize a one quarter inch graphic symbol to represent the information found in each grid cell. Consequently, manually prepared maps and computer maps are at the same scale and can be compared readily.

For computer analysis in the study areas, the grid cell is 500 feet by 500 feet (5.74 acres) and is represented on gridded base maps at a scale of 1 inch equals 2,000 feet by a one quarter inch square. Study area computer maps also are produced at the same scale as the manually prepared study area data maps. A County-wide grid cell at the scale of the study area maps contains 16 study area data cells. The relationship between these two grid cells is shown in the diagram.

Over 10,000 grid cells were used for County-wide analysis, and 35,000 cells for analysis in the study areas.

COMPARISON OF GRID CELL SIZES UTILIZED IN MAPPING ENVIRONMENTAL DATA



Scale: 1 inch = 2,000 feet

The data variables to be included in the computer data bank were selected after assessing what information would be required for the computer analyses. The computer-based data system is not intended to be all-inclusive, but, instead, is designed to respond to the needs of comprehensive planning. As such, the data bank is not an end in itself, but a tool to be used to identify and rank environmental constraints on land use and to indicate the relative suitability of areas within the County for various uses. Where manual techniques are more appropriate for analysis of data, it was not necessary to include that information in the computer data bank. With these principles in mind, 14 data variables were selected for the County-wide computer data file, and 17 data variables for the study area data files. To summarize this computer-based land use and environmental data system, the categories of information are listed in Table 2.

Pertinent land use and environmental data not included in the computer data bank were mapped manually on County-wide and study area base maps. This information was utilized in the analysis process along with the computer maps. In preparing the Conservation Element, major existing and proposed water supply facilities, mineral resources, County-wide agricultural land use and agricultural preserves, historic sites, and archaeological sites were mapped manually.

MAJOR CONSERVATION ISSUES

In preparing the Comprehensive Plan, a number of major conservation issues will have to be addressed. The following section is intended to highlight the major conservation issues facing the County and to provide a perspective on the technical studies presented in the remainder of this report.

Water Resources

State Planning Law (Government Code Section 65302 (d)) requires that the section referring to water resources in the Conservation Element be prepared “in coordination with any county-wide water agency and with all district and city water agencies which have developed, served, controlled or conserved water for any purpose for the county or city for which the plan is prepared.” On June 24, 1975, the Santa Barbara County Board of Supervisors, acting as the Water Agency Directors, adopted a Program of Action for Water Resources Planning. The program is designed to “determine the reasonable future water needs of all local facilities currently developed or feasible for development to fulfill such needs, and the requirement, if any, for importation of state project water.”³ The program is divided into two phases. Phase I involves reconnaissance level studies of the County groundwater basins, present and future water needs, conjunctive use of surface water and groundwater supplies, dam construction, weather modification, wastewater reclamation, desalinization of seawater, State Project water importation, and a preliminary water rights investigation. In addition to these studies, there is to be an environmental analysis of the various water supply alternatives. Phase II, feasibility level, is designed to examine the implementation potential of the alternatives studied in Phase I.

TABLE 2. LAND USE AND ENVIRONMENTAL DATA FOR COMPUTER ANALYSIS

County-wide Data

Groundshaking
Tsunamis, seiches
Slope stability and landslides
Compressible or collapsible soils
High groundwater
Liquefaction
Flood hazard
Protection of local water resources
Water supply, by hydrographic unit
Environmental biology
Soils: agricultural capability
Per cent of cell: 0-10 per cent slope
Per cent of cell: 11-20 per cent slope
Per cent of cell: 21-30 per cent slope

Study Area Data

Groundshaking
Tsunamis, seiches
Slope stability and landslides
Compressible or collapsible soils
Soil creep
Expansive soils
High groundwater
Liquefaction
Flood hazard
Protection of local water resources
Municipal and industrial water distribution
Environmental biology
Soil series
Land use
Slope
Elevation
Topography-orientation

The Water Resources chapter of the Conservation Element is a synopsis of the latest data available at the time of this writing in the above County Water Agency reports. Additional information is provided concerning the protection of the County's water resources. Finally, wastewater production figures are tabulated from the Water Agency report, Present and Future Water Needs of Santa Barbara County, and sewage treatment plant capacities are described.

Ecological Systems

Here, the critical issue facing the County is to determine the relative importance of ecological preservation compared with competing or conflicting goals and objectives. The environmental biologists state that natural systems should be preserved for at least five very compelling reasons. First, they cite the obvious direct benefits that are obtained from ecosystems (food production, watershed protection, etc.), and then they indicate how agricultural productivity depends, in part, on biological diversity. Ecosystems also are storehouses of genetic information and viable outdoor laboratories. Finally, outdoor recreational benefits, which always have been important, will become increasingly valuable with further growth and urbanization of California.

Because the environmental biologists have earmarked less than 30 per cent of the County for preservation (about 275,000 acres) it should be possible to accommodate the goal of biological preservation along with other development goals, except perhaps in areas subject to extreme pressure for urbanization. In several instances, the recommendations of the environmental biologists are in conflict either with current use or with development proposals. Fishing and collecting in coastal areas, development of More Mesa (the habitat of the White-tailed Kite), and overgrazing in the Santa Ynez

Valley are three examples that are analyzed in detail, along with other actual or potential conflicts, in the Ecological Systems chapter. Only within the context of the Comprehensive Plan can these competing values be balanced and alternatives assessed. The classification system and the priorities assigned by the environmental biologists will make the analysis of trade-offs easier. However, the lines that eventually will be drawn to delineate land use will be based not only on the need to preserve ecological communities but also on human, social, and economic needs.

To accomplish preservation of ecological communities, new implementation techniques will be required. Unfortunately, rare and endangered plants do not enjoy the same protection under the law as rare and endangered animals. Nonetheless, ecological preserves can be set up under existing State law (Government Code, Sections 51050-51065), and the County will be able to enter into 20 year open space easement agreements with the owners of lands designated as ecological preserves, once the appropriate ordinances have been adopted instituting such a program. The properties then will be eligible for tax treatment similar to lands in agricultural preserves. In certain areas of ecological importance, especially near urban areas, alternative or supplemental implementation measures may be necessary. The basic issue that must be resolved first is the relative importance of preserving biological diversity compared with other land use needs.

Mineral Resources

A critical issue raised in the mineral resources study stems from the environmental impacts of existing and proposed operations. The benefits of new or continued operations in certain areas may not outweigh the damage directly and indirectly attributable to mineral extraction. Often, however, mitigation measures can be utilized to control adverse impacts. Consequently, it is recommended that mineral resource activities be permitted in the County only if adverse impacts would not result, if flooding and erosion problems would not be increased, and if adopted federal and state air and water quality standards would not be violated.

Under requirements of the Surface Mining and Reclamation Act of 1975, the County must “adopt ordinances establishing procedures for the review and approval of reclamation plans and issuance of permits to conduct surface mining operations.” Within one year after the State Geologists map areas of mineral deposits, the County must establish resource management policies for incorporation into the Comprehensive Plan. Elsewhere in California, reclamation and ultimate site reuse strategies have proved beneficial, providing opportunities for solid waste disposal as well as for park or recreation facilities.

Future needs and potential deficits of rock, sand, and gravel will become an important issue if growth occurs in certain portions of the County. However, a reasonably exact estimate of the County’s future mineral needs and potential deficits cannot be made until the Comprehensive Plan has been completed and growth and development policies have been adopted. At that time, the County should sponsor a study, in

cooperation with the California Division of Mines and Geology, to determine future needs and potential deficits of rock, sand, and gravel and other mineral resources. A similar study in Orange County has been useful in land use planning and in prescribing and administering development regulations.

Agricultural Resources

The County's agricultural preserve program has been extremely successful in bringing 90 per cent of the eligible agricultural acreage under Williamson Act agreements, thereby retaining these lands in agricultural use for the foreseeable future. Contrary to the experience in other California counties, even some farmers whose lands lie adjacent to urban development have participated in the preserve program, demonstrating that they believe in the future of the County's agricultural economy. Today, over 500,000 acres have been placed voluntarily in agricultural preserves. In certain instances, however, small holdings, especially orchards, may not be eligible to participate in the program because of the minimum acreage requirements. Consequently, the County is urged to consider reducing the acreage requirements to encourage owners of such properties to place their lands under Williamson Act agreements. The need to preserve existing agriculture and to protect areas suitable for agricultural expansion has to be appraised in light of other pertinent environmental factors and the County's social and economic needs.

Historic Sites and Archaeological Sites

Before programs for the preservation of historic sites and archaeological sites can be formulated, the County must decide how important preserving these resources is in relation to other goals and objectives. If the County believes that a strong preservation program should receive its support, then it can build on the legislation passed in 1966 establishing the Advisory Landmark Committee. The record of the County's historic preservation program is not strong, and a far more aggressive policy will be necessary if significant numbers of sites are to be preserved. The history of archaeological preservation is even spottier. Except through the environmental impact assessment process, little has been done to assess threats to archaeological sites, let alone to undertake actions to preserve or, at last resort, to salvage the sites. In the Conservation Element, archaeologists urge the County to view the remaining sites as the non-living equivalent of rare and endangered species. The same policy also might be applied to the County's outstanding historic sites.

The major role that the County can play in a preservation program is that of a guardian. The County can designate landmarks and impose restrictive conditions to ensure preservation and enhancement of valuable historic sites. Although the County also has the authority to purchase historic buildings and properties, the most likely means of historic preservation probably is not through public ownership. Usually public funds are limited, and other needs often are, or seem to be, more pressing. Instead, the County should encourage the Advisory Landmark Committee and other interested parties to explore alternative means of preservation. To allow sufficient time for this process, the

owner of a designated historic property might be required to wait as long as one year before a decision is made on a development proposal for his site. In this way, the Advisory Landmark Committee would have a chance to recruit and screen prospective purchasers and to determine if one would comply with the preservation program. Archaeologists also have pointed out that at least two years between the submission of a development proposal and actual construction is necessary for adequate planning, excavation, and analysis of archaeological sites that are threatened.

Early County action to preserve historic sites and archaeological resources would benefit everyone concerned. Costly delays prior to construction or even during construction would be avoided if adequate steps based on the County's preservation program had been taken early in the development process.

A new source of federal funds to assist local governments implement historic preservation programs might be utilized by the County to expand present efforts. Under the federal Housing and Community Development Act of 1974, counties and cities can use community development block grants for acquisition of sites for historic preservation, and for comprehensive planning that includes surveys of structures and sites of historic and architectural value.

AN INTERIM IMPLEMENTATION MEASURE

In May 1974, the County adopted Ordinance 2576 which creates a Special Problems Committee composed of representatives of various County Departments. The Committee is empowered to prohibit development or to impose special conditions on construction in hazardous areas shown on a "Special Problem Areas" map. Currently, lands subject to flooding and drainage problems in Ballard, Los Alamos, Los Olivos, and Santa Ynez are indicated on the map.

As an interim implementation measure, it is recommended that areas identified as having geologic, seismic and flood problems in the Seismic Safety and Safety Element and areas identified as having water resources protection and drainage problems in the Conservation Element be added to the "Special Problem Areas" map, and thus become subject to Committee review. By taking this step immediately, even though the Implementation Program later may propose alternative and/or supplementary regulations, it will be possible to prevent development of hazardous areas and to ameliorate hazards incidental to development.

The specific areas that should be indicated on the "Special Problem Areas" map are indicated in a summary fashion below. These factors are discussed in detail in the appropriate chapters of the Seismic Safety and Safety Element and the Conservation Element.

Geologic and Seismic Problems

- Active, potentially active, and historically active faults and a fifty foot zone on either

side of the trace of the fault.

- Areas designated in Categories IV and V of the Geologic Problems Index.

Protection of Local Water Resources

- Stream channels recharging groundwater.
- Areas tributary to present major surface water supplies.
- Areas tributary to proposed future major surface water supplies.

Flood Hazard

- Stream channels and floodway areas.
- 100 year flood plain.
- Local drainage problem areas.

NOTE: This chapter's text and maps *regarding groundwater* are superseded in their entirety by the text and maps of the Groundwater Resources Section, adopted May 24, 1994.

Water Resources ^{4 5}

OVERVIEW OF WATER QUALITY

The State of California fulfills its responsibility for protection of the quality of water resources through the State Water Resources Control Board and a number of Regional Water Quality Control Boards. Santa Barbara County is within the area covered by the Central Coastal Regional Board. These agencies have two principal roles in the management of water quality. (1) The regional boards establish requirements prescribing the quality of point sources of waste discharge including discharges of municipal wastes, individual industrial waste discharges, and solid waste disposal sites. These waste discharge requirements establish the minimum acceptable quality of the wastes, as measured by those water quality parameters that are of significance for the particular receiving waters to which the wastes are discharged. (2) The State Board, in cooperation with the regional boards, is charged with the responsibility for formulating overall water quality management programs. To accomplish this task, the Board contracted for the preparation of basin water quality management plans for each of the basins in the State. The management plan for the Central Coastal Area was adopted in April 1975. This basin plan contains a recommended program for management of the quality of the water resources in the County, as well as encourages the use of reclaimed water.

Control of non-point sources of pollution (e.g., sedimentation, pesticides, animal wastes, salinity) are the subject of a water quality management plan to be completed by the State Water Resources Control- Board in December 1978.

Surface Water Supplies - The surface water supplies developed by the reservoirs on the Santa Ynez River generally are of satisfactory mineral quality containing somewhat in excess of 500 milligrams per litre of total dissolved solids. Some taste and odor problems result from polysulfides contained in the influent seepage into Tecolote Tunnel, but means of alleviating this problem are being investigated. Otherwise, conventional treatment is sufficient to produce acceptable water for domestic purposes. Such treatment is provided by Goleta County Water District and the City of Santa Barbara, and is under consideration by the Montecito, Summerland, and Carpinteria County Water Districts. No significant present degradation of surface water supplies due to waste discharges occurs, and the regulatory powers of the Regional Board are adequate to prevent such degradation from point source discharges.

Groundwater Supplies - The principal concern with quality of groundwaters is their mineral content. Part of the mineral content of the groundwaters occurs naturally. Surface runoff, which eventually contributes to the recharge of groundwater, dissolves minerals from the soil and rock with which it comes in contact and thereby acquires

some mineral content. Some additional mineralization may occur by solution of minerals, both from the aquifer materials and from the materials lying between the surface of the ground and the water table, after the surface waters have percolated. Some increase in mineralization also occurs from point sources of waste discharge (municipal waste waters, industrial wastes, etc.). To the extent that the mineral content of these wastes is greater than that of the underlying groundwater, the groundwater salinity will be increased. For example, municipal waste waters typically contain total dissolved solids concentrations that exceed those of the source water by 300 milligrams per litre or more. Therefore, pumpage of groundwater for municipal purposes, and subsequent return of the effluent to the groundwater basin, results in some increase in salinity of the underlying groundwater.

Other point sources of waste discharge include solid waste disposal sites and industrial wastes, particularly those from mineral extraction activities and oil production activities. Such discharges must conform with standards established by the Regional Water Quality Control Board. The specific requirements for a particular industrial activity and the constraint which such requirements might place on either the development or continued existence of such an activity would have to be evaluated on a case-by-case basis.

Point source waste discharges have not been major contributors to groundwater salinity increases in the past. In the South Coast area, the major point source waste discharges are those of effluent originating from the municipal waste collection and treatment systems. These municipal wastes currently are discharged to the ocean and consequently are not returned to groundwaters. In the northern portion of the County, municipal wastes are, in many cases, returned to groundwater. However, the amounts of municipal wastes and other point source discharges historically have been small in relation to total water use, which is primarily agricultural. Provided that present South Coast waste disposal practices continue, point source waste discharges will not contribute significantly to groundwater salinity. However, should there be any major expansion of point source discharges, such as large-scale use of highly mineralized reclaimed municipal waste water for groundwater replenishment, significant increased mineralization of the underlying groundwater could result.

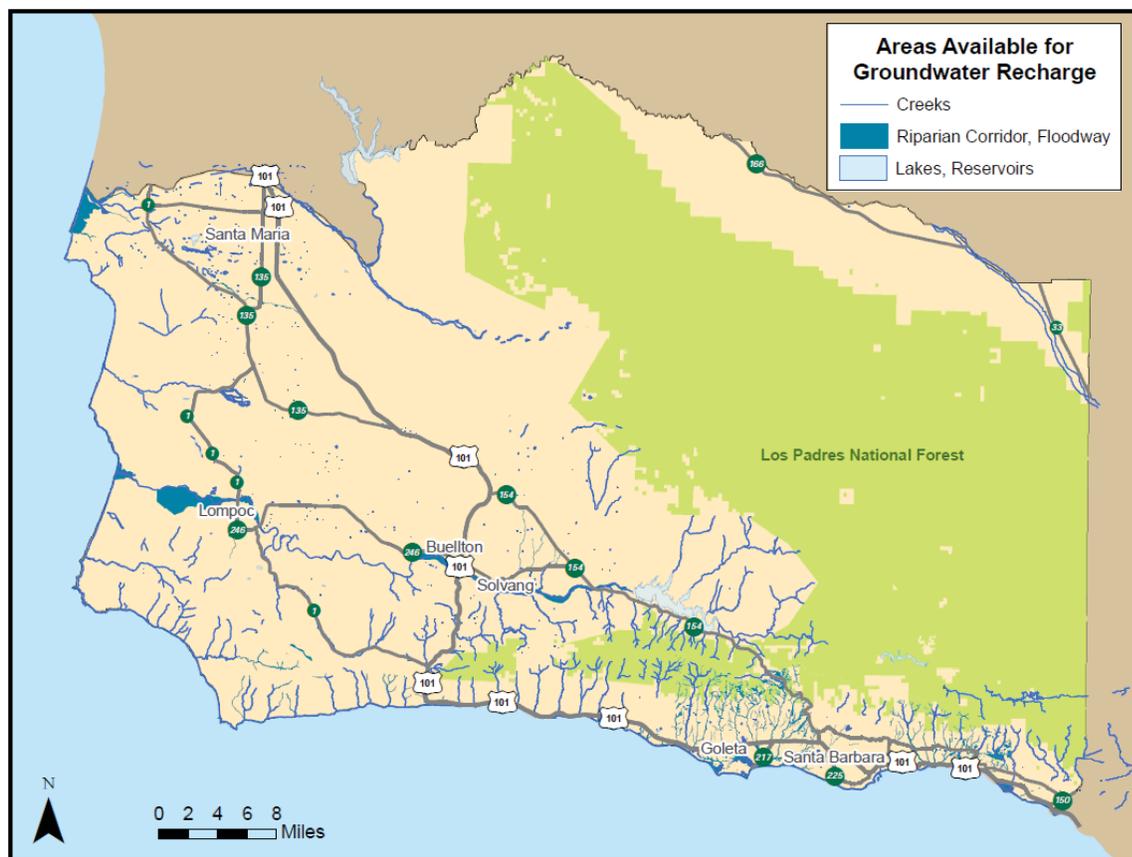
The major contribution to increased salinity of groundwaters comes from diffuse sources of wastes, especially from the percolation below the root zone of that portion of the water applied to plant growth, either to irrigated agriculture or to landscaped areas, which exceeds the amount consumptively used (evaporated and transpired) by the plants. The other major diffuse contribution of waste to groundwaters is from septic tanks in areas that do not have a sewerage system for the collection, treatment, and disposal of domestic wastes. When water is applied for irrigation, including irrigation of landscaping in urban areas, a substantial portion of the applied water is removed by evaporation and transpiration. As a result, the salts originally contained in the applied water are concentrated in the remaining unconsumed portion. To these salts are added any additional salt contributions from fertilizers, soil amendments, and the like, as well as possibly some additional salt dissolved from the soil. If the irrigated lands overlie

groundwater without an intervening clay layer, then the relatively highly mineralized irrigation return water can reach the groundwater body. Irrigation of lands overlying unconfined groundwater probably has contributed to increases in groundwater salinity in the past and is likely to continue to contribute to such salinity increases in the future. The magnitude of this problem and possible solutions are covered in the basin water quality management plan prepared for the State Water Resources Control Board.

Although localized problems may have occurred in the past, it is not believed that the use of septic tanks has contributed significantly to historical groundwater degradation on a basin-wide basis. The extent of any future basin-wide problems resulting from septic tanks will depend on the density of development. No studies are known to have been made of the maximum density of development that should be tolerated with septic tanks used as the means of domestic waste disposal. At present, the use of septic tanks is evaluated on a case-by-case basis by the County Public Works and Health Departments.

If groundwater levels are drawn below sea level in aquifers in hydraulic continuity with the ocean, saline water ultimately will intrude into the aquifer. In the South Coast area, a series of faults lying between the ocean and the groundwater bodies restricts the passage of water and provides some protection against salt water intrusion. However, sufficient data are not available to establish that such protection is fully effective, particularly in situations where groundwater levels are maintained substantially below sea level for long periods of time. In the Lompoc Plain, no known barrier to intrusion of seawater exists, and, accordingly, such intrusion conceivably could occur if groundwater levels were maintained below sea level. In the Santa Maria Valley, continued lowering of water levels near the coast could result in future seawater contamination of the groundwater basin.⁶

Groundwater Recharge- Pursuant to Government Code § 65302(d)(3) the County is required to provide a map which details rivers, creeks, riparian corridors, and other land areas which, “may accommodate floodwater for purposes of groundwater recharge and stormwater management”. The required map has been provided below and delineates County mapped creeks, rivers, ponds, lakes/reservoirs, riparian corridors, and floodways which can serve as opportunities for groundwater recharge.



It should be recognized that current County policies and development review procedures rarely allow direct drainage to creeks, rivers, and other natural water courses. Instead, County policies require new development to detain stormwater on the project site (for storm events up to 100-year floods) by utilizing detention basins, bio-swales, or other similar mechanisms. This requirement is intended to reduce flooding hazards, protect water quality from sedimentation and chemical runoff, and also allows for superior groundwater recharge instead of increased outflows to the ocean.

PROTECTION OF WATER RESOURCES

Developments in areas tributary to major surface water supplies or overlying or tributary to groundwater should be compatible with the protection of these water resources. Accordingly, lands in the County were categorized with respect to their relationship to such water sources.

Category 1, Stream Channels Recharging Groundwater - Areas were categorized as stream channels if review of U.S. Geological Survey quadrangle sheets indicated that the area drained by such streams would be significant and if the stream channel was located over unconsolidated materials, thereby permitting recharge to usable underlying groundwater bodies. Reaches of stream channels that overlie consolidated rock or confined groundwater were not classified in the category. Additionally, portions of some stream channels which have been lined to reduce flood hazard, with the effect of

preventing recharge from the stream to the underlying groundwater body, were not classified in Category 1.

In many cases, usage other than light recreational activities could endanger the percolation capacity of such areas. Any use should be subject to controls which would prevent damage to the recharge capability, obviate liability problems, and eliminate possible hazards.

Category 2, Areas Tributary to Present Major Surface Water Supplies - Facilities providing significant surface water supplies that were considered in defining Category 2 include Gibraltar, Jameson, and Cachuma reservoirs along with several small reservoirs located north of Goleta and Santa Barbara on the coastal side of the Santa Ynez Mountains. Twitchell Reservoir was excluded from Category 2 because its primary purpose is to provide groundwater recharge.

In this category, activities should not be permitted that would significantly degrade the quality of the surface water supplies or increase silt production. Accordingly, the amount of development should be limited, and controls should be imposed on development to prevent deleterious effects. Light recreational activities should cause few problems, provided that sanitary pollution from such usage is prevented and erosion is not increased. Intensive recreational usage could be somewhat more of a problem because of the potentially greater sanitary pollution load resulting from more people using the area.

In the case of agricultural use and intensive recreation, the salinity of return flows, the possible presence of nutrients (nitrates and phosphates) which could stimulate algal growth in reservoirs, and the erosion potential must be evaluated. Irrigated lands also contribute such trace constituents as pesticides, but this is not a major problem in the County. Waste loads resulting from excessive numbers of livestock tributary to surface water supplies likewise should be considered. For example, construction of a feedlot above Cachuma Reservoir obviously could create problems. The effects of agricultural uses are a question of degree. Some agriculture above surface water supplies can be tolerated, but if the amount of agricultural development becomes excessive, the problems may become too severe to be tolerated.

In urban areas, sanitary and industrial wastes and surface runoff are the principal sources of pollution. Land grading in connection with development may increase erosion and silt production. Obviously, the greater the total amount of urban development, the greater the potential for problems.

The question of usage of lands tributary to surface water supplies primarily involves the extent of development which should be permitted. It would be difficult to place a specific upper limit on the amount of development which might be acceptable. However, most of the lands in the County that are tributary to surface water supplies have limited development potential due to other factors.

Category 3, Areas Tributary to Proposed Future Major Surface Water Supplies - The only two proposed surface water supplies classified in this category were Salsipuedes and Round Corral reservoirs. The Lompoc Project was not placed in this category, because federal funding of this project is unlikely. The comments on Category 2 also apply to this category.

Category 4, Areas Overlying Unconfined Groundwater - Clay layers overlying groundwater bodies were delineated from information in U.S. Geological Survey publications and other reports, including reports prepared by various consultants, and from discussions with the County Farm Advisor. Because the available data are somewhat limited, and in some cases conflicting, the definition of the boundaries of Category 4 lands must be considered as very rough at best.

Any irrigation of Category 4 lands, whether they be in agricultural or urban use, generally will tend to increase the salinity of underlying groundwaters. In addition, urban development increases the amount of overlying impervious surface, thereby reducing replenishment of the groundwater from precipitation. All other things being equal, it would be preferable that development take place on lands other than those in Category 4. However, all other things seldom are equal, and from many other standpoints these may be very desirable lands for development. Consequently, although classification in Category 4 involves some constraint on development, the degree of such constraint is not major.

Point sources of groundwater pollution pose more serious problems. For example, a site for the disposal of decomposable organic solid wastes within a Category 4 area should not be permitted if the decomposition of such wastes threatens groundwater quality. Industrial activities involving land disposal of unacceptable waste materials also should not be permitted in Category 4 areas. The Regional Water Quality Control Board's regulation of waste discharges should solve these problems.

Category 5, Areas Tributary to Groundwater - Category 5 was defined using U.S. Geological Survey data to delineate consolidated materials, and maps showing topography to determine areas that are tributary to groundwater bodies. These areas are comprised mainly of mountainous lands surrounding valley floors, as well as rock outcrop areas within the valley floors themselves. The area tributary to Twitchell Reservoir was classified in this category because the primary purpose of the reservoir is to recharge groundwater through use of the Santa Maria and Cuyama River channels.

The comments on Category 2 and 4 also apply to Category 5, except that the problems created by sanitary wastes, although warranting consideration, are not as critical with respect to groundwater as they are to surface waters. The process of percolation through the soil and through the materials that make up the aquifer are quite effective in the removal of sanitary pollution.

Category 6, Areas Not Tributary to Water Resources - Areas in this category include the coastal mountain ranges from which runoff flows directly to the ocean without passing

over significant groundwater bodies, and areas underlain by extensive clay layers which prevent recharge to the main groundwater body of water applied at the surface. One of the largest of these confining layers occurs on the valley floor west of Lompoc, and confined water areas also exist in the Goleta and Carpinteria basins. In such confined groundwater areas, precipitation or application of water to the surface of the land in excess of consumptive use requirements cannot return to the main groundwater basin and will either run off or will form perched water tables. The boundaries of these Category 6 areas should be considered as approximate because of the limited extent of available data.

The County-wide and study area maps of protection of local water resources show the general distribution of these categories. Larger scale maps may be seen in the office of the County Planning Department.

Area Analysis of Protection of Local Water Resources

Category 2, encompassing the areas tributary to present surface water supplies, consists only of the headwaters area of the Santa Ynez River above Bradbury Dam.

Category 3, lands tributary to proposed surface water supplies, includes the major portion of the Sisquoc River watershed tributary to the site of the proposed Round Corral Dam, currently being studied by the U.S. Bureau of Reclamation. Category 3 also includes the portion of the Santa Ynez Mountains tributary to the proposed Salsipuedes Dam on Salsipuedes Creek, which is under study as a possible source of water supply for the Lompoc Area.

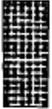
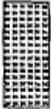
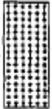
Category 4, lands overlying unconfined groundwater, comprises the major portion of the valley floors in the Cuyama Valley, Santa Maria Nalley, San Antonio Valley, Lompoc Plain, Santa Ynez Valley, and South Coast, as well as the upland areas of low relief adjoining the Santa Maria Valley, San Antonio Valley, Lompoc Plain, and Santa Ynez Valley.

The major portion of the mountainous area of the County which is not tributary to existing or proposed major surface water supplies is tributary to groundwater and, therefore, is shown in Category 5.

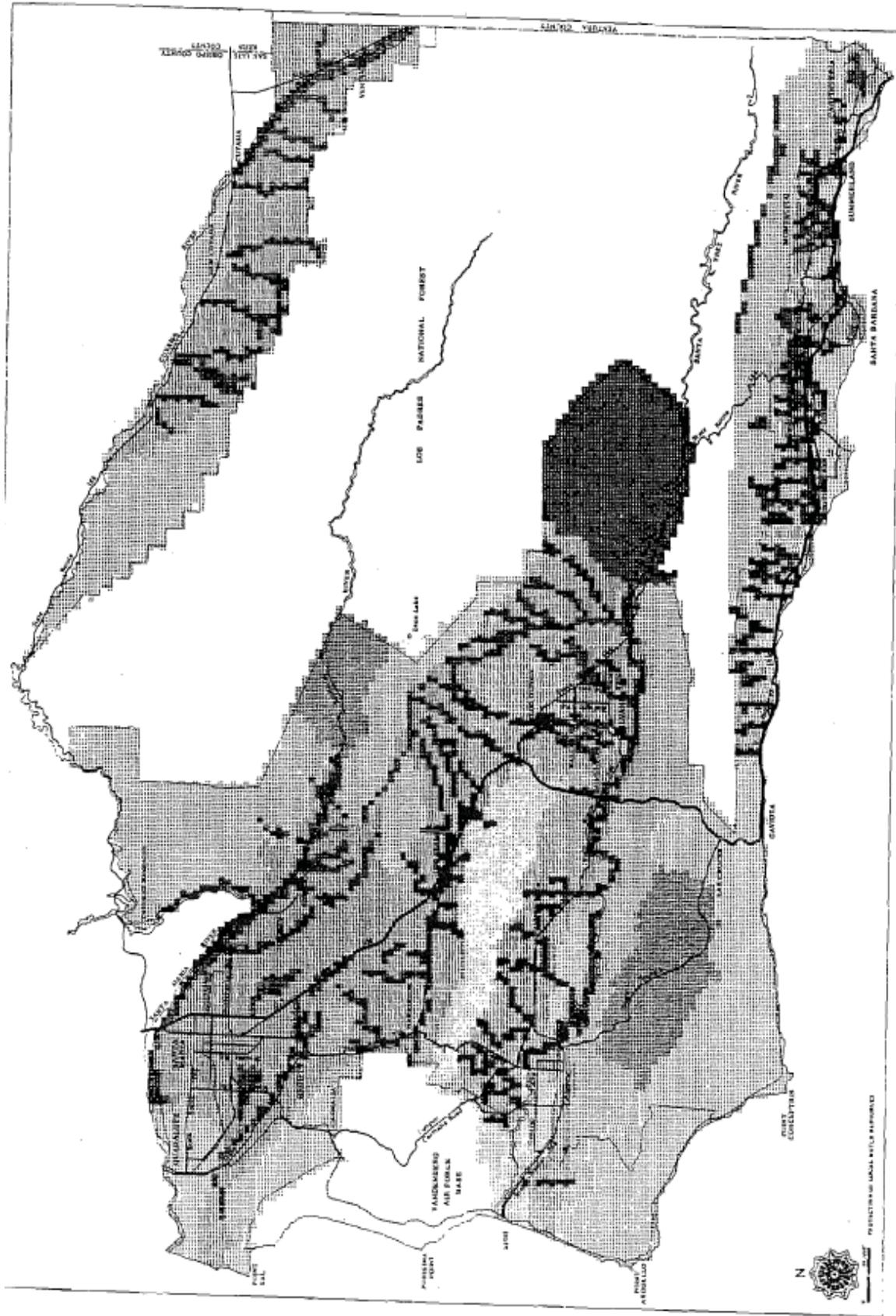
Category 6, lands not tributary to significant surface or groundwater resources, includes some mountainous and hilly areas immediately adjacent to the coast, particularly the southern slope of the Santa Ynez Mountains west of Gaviota. Other Category 6 areas are those overlying confined groundwater, including the western portion of the Santa Maria Valley, the western portion of the Lompoc Plain, and some areas on the South Coast lying near the shoreline.

PROTECTION OF LOCAL WATER RESOURCES

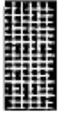
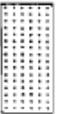
*Santa Barbara County
Protection of Local Water Resources*

	Category 1: Stream Channel Recharging Groundwater
	Category 2: Area Tributary to Present Major Surface Water Supplies
	Category 3: Area Tributary to Proposed Future Major Surface Water Supplies
	Category 4: Area Overlying Unconfined Groundwater
	Category 5: Area Tributary to Groundwater
	Category 6: Area Not Tributary to Water Resources

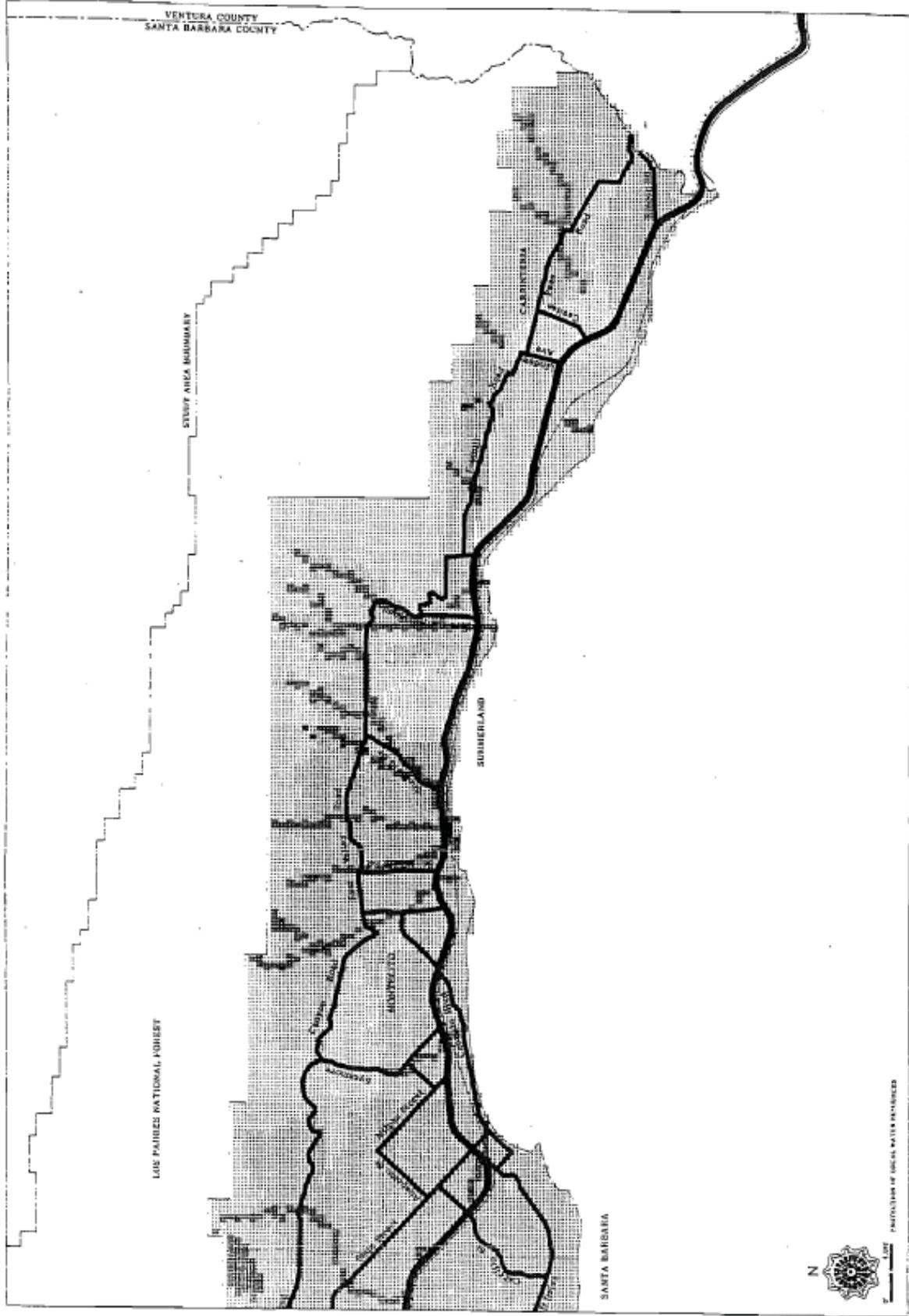
SANTA BARBARA COUNTY



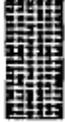
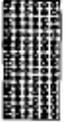
South Coast Study Area ~ East Protection of Local Water Resources

	Category 1: Stream Channel Recharging Groundwater
	Category 2: Area Tributary to Present Major Surface Water Supplies
	Category 4: Area Overlying Unconfined Groundwater
	Category 5: Area Tributary to Groundwater
	Category 6: Area Not Tributary to Water Resources

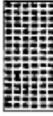
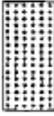
SOUTH COAST AREA - EAST



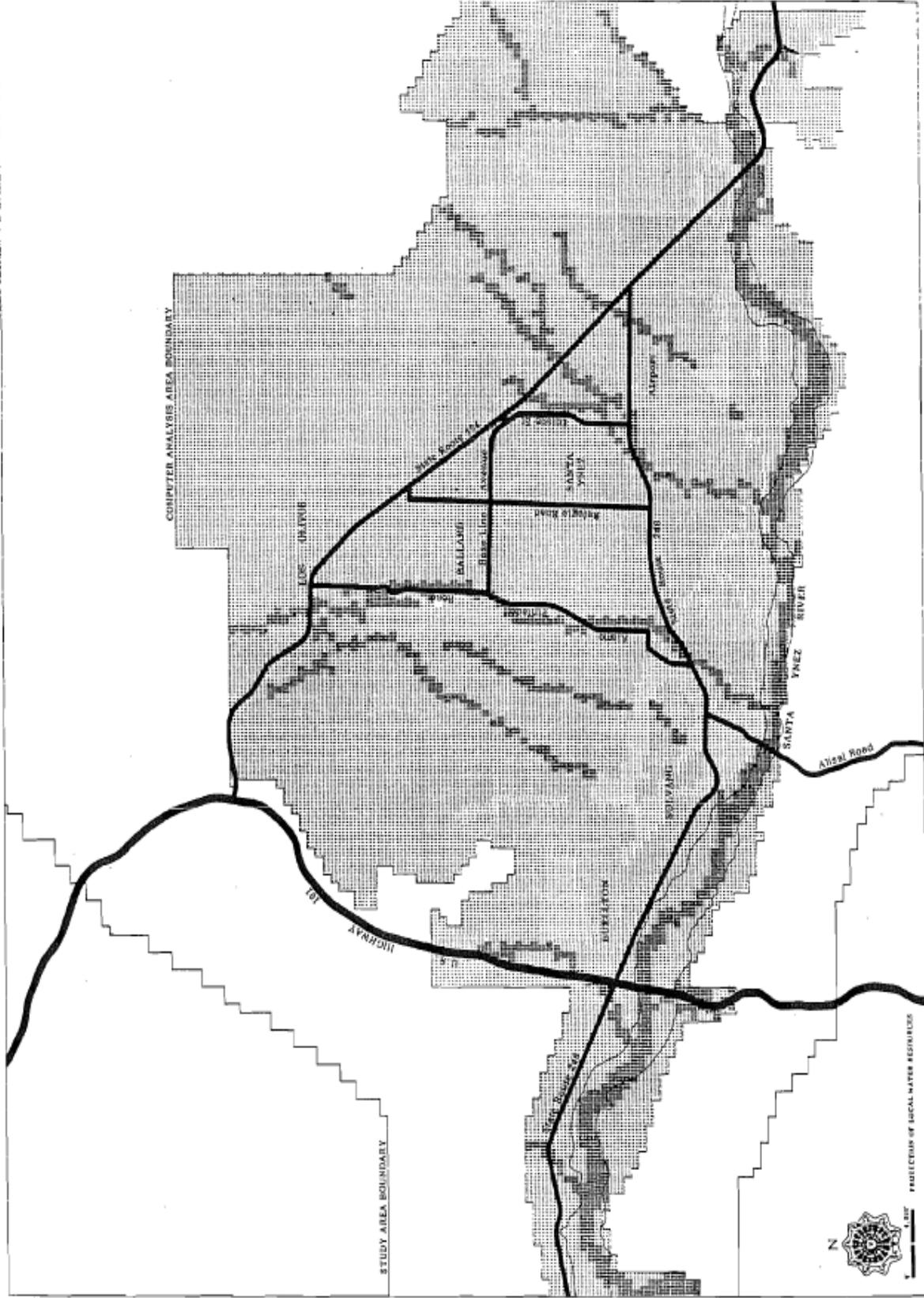
South Coast Study Area ~ West Protection of Local Water Resources

	Category 1: Stream Channel Recharging Groundwater
	Category 2: Area Tributary to Present Major Surface Water Supplies
	Category 4: Area Overlying Unconfined Groundwater
	Category 5: Area Tributary to Groundwater
	Category 6: Area Not Tributary to Water Resources

Santa Ynez Valley Study Area Protection of Local Water Resources

	Category 1: Stream Channel Recharging Groundwater
	Category 4: Area Overlying Unconfined Groundwater
	Category 5: Area Tributary to Groundwater

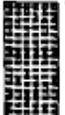
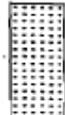
SANTA YNEZ VALLEY AREA



Lompoc Study Area Protection of Local Water Resources

	Category 1: Stream Channel Recharging Groundwater
	Category 4: Area Overlying Unconfined Groundwater
	Category 5: Area Tributary to Groundwater
	Category 6: Area Not Tributary to Water Resources

Santa María-Orcutt Study Area Protection of Local Water Resources

	Category 1: Stream Channel Recharging Groundwater
	Category 4: Area Overlying Unconfined Groundwater
	Category 5: Area Tributary to Groundwater
	Category 6: Area Not Tributary to Water Resources

PRESENT WATER SUPPLIES AND FUTURE WATER DEMANDS

The following sections of this chapter summarize and extract information from the Santa Barbara County Water Agency (SBCWA) reports prepared pursuant to the Agency's Program of Action for Water Resources Planning. These extensive documents were written in cooperation with the various water purveyors within the County, the Public Utilities Commission, the County Health Department, city planning agencies and public works departments, and the County Planning Department. The reader is referred to the Water Agency reports for detailed discussion of the complex water issues, study assumptions, and data sources. A list of the reports is provided in the Bibliography of this Conservation Element. As further information or updated figures become available, it will be included as addenda to the element.

Local Water Conditions⁷

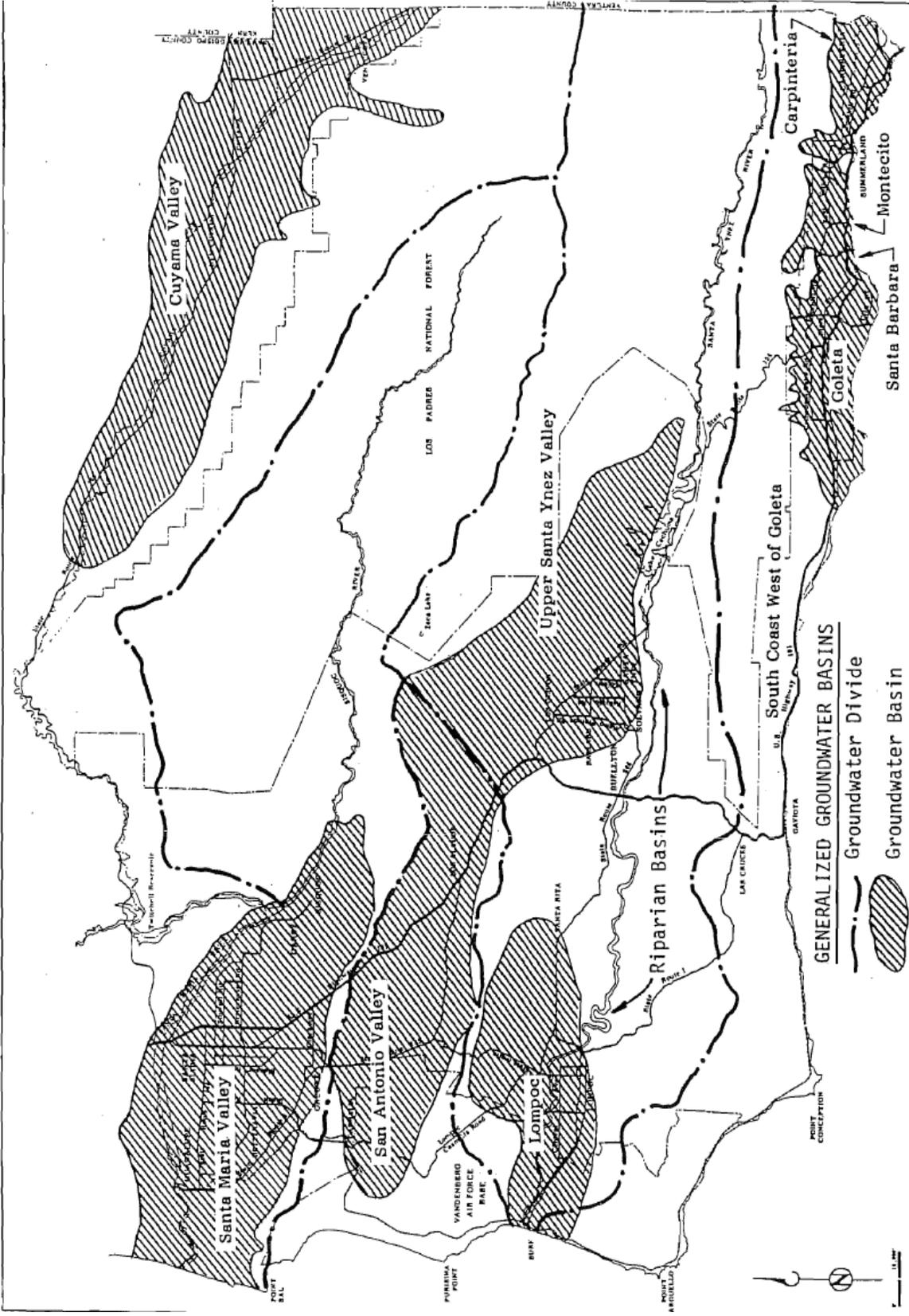
Santa Barbara County's water resources consist of groundwater and surface water supplies. The groundwater basins shown on the following map are the major source of water in the County, providing over 85 percent of the total applied water County-wide. Regardless of future decisions on supplemental water, groundwater will remain the major water source. In general, the available supply of groundwater is termed the "safe yield" of the basin. Safe yield is defined as follows:

-Safe yield for extractions means that a particular quantity of water may safely be extracted from the basin annually without causing a long-range decrease in the amount of water in storage, provided that the current arrangement of water use does not change significantly and cause less applied water to return to the basin by deep percolation than is currently the case.

-Safe yield for consumptive use, or for net extractions, means that the amount stated can be completely removed from the groundwater basin without causing a long-range loss of groundwater storage.

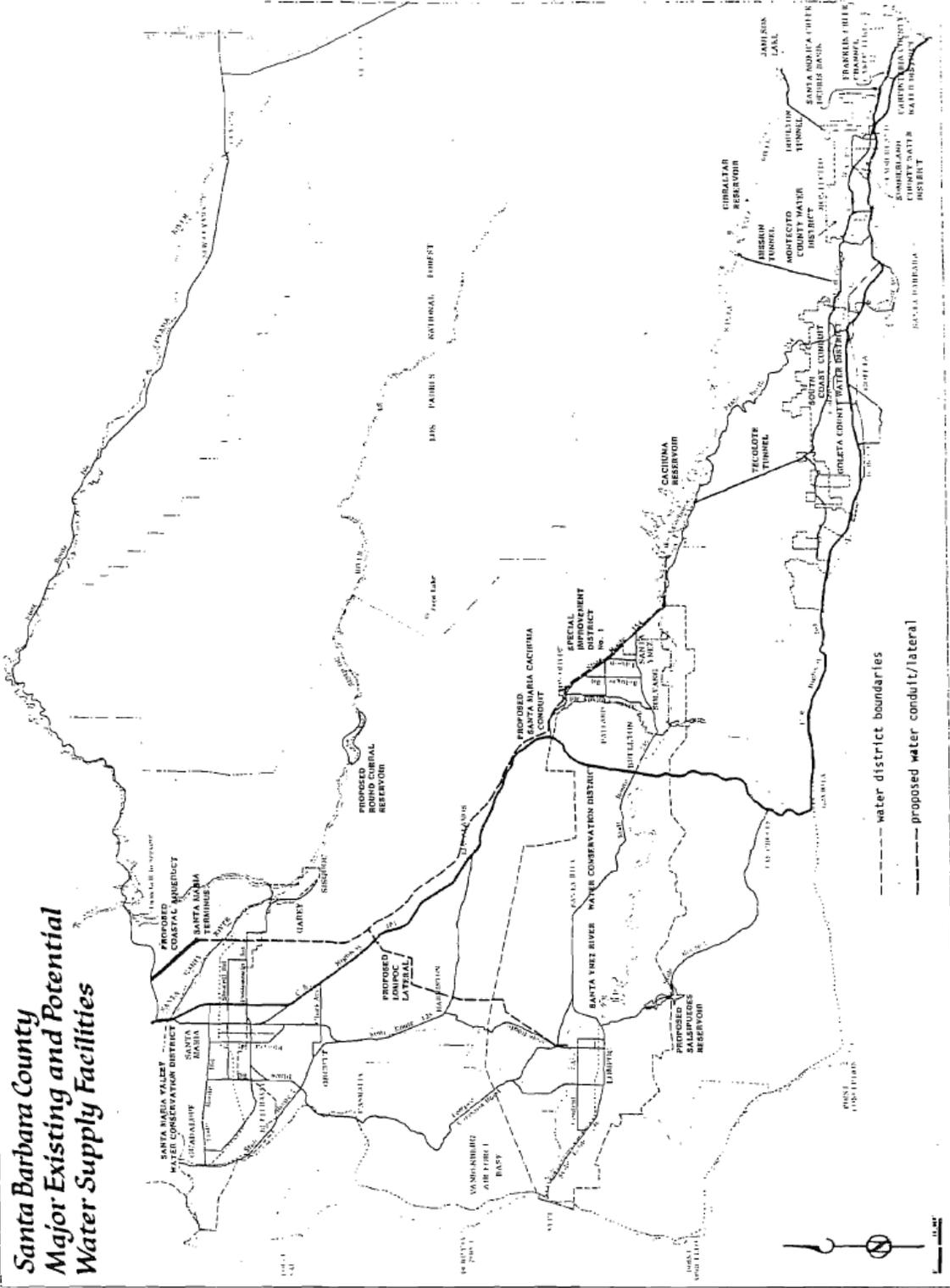
The safe yield is subject to change when there are changes in cultural conditions such as the amount of agricultural acreage, type of sewage disposal and extent of impervious surface area. Consideration must also be given to potential adverse environmental effects including subsidence and seawater intrusion.

GENERALIZED GROUNDWATER BASINS, SANTA BARBARA COUNTY



MAJOR EXISTING AND POTENTIAL WATER SUPPLY FACILITIES, SANTA BARBARA COUNTY

*Santa Barbara County
Major Existing and Potential
Water Supply Facilities*



Groundwater quality trends are difficult to interpret because of the numerous variables and uncertainties in the data. The long-range quality effects are usually very gradual and unpredictable. As a result, the SBCWA groundwater report examines water quality in relation to present conditions, with some possibilities given for the future.

The County's surface water supplies consist of Cachuma, Gibraltar, and Jameson reservoirs along the Santa Ynez River. Twitchell Reservoir is used for replenishment of groundwater in the Santa Maria Valley and is considered as an adjunct of the groundwater supply. Reclaimed wastewater irrigates a small amount of agricultural land and is counted as surface water supply.

Members of the Cachuma Project and the firm yield of the project to each member are shown in Table 1. The firm yield represents the amount of water that each member can rely upon as its projected Cachuma supply.

Yields from Gibraltar Reservoir have been estimated by Don Owen and Associates (1976) at 7.400 acre feet per year (AFY) for current conditions. 7.000 AFY in 1980.5.400 AFY in 1990 and 4.200 AFY for year 2000. Included in these figures is an average 500 AFY infiltration in Mission Tunnel.

Jameson Lake yields were estimated by Brown and Caldwell consultants (1977) at 1.490 AFY, 1.440 AFY, and 1.390 AFY for 1980, 1990, and the year 2000 respectively." This includes infiltration from Doulton Tunnel and runoff from Fox Creek.

Summary tables showing water use and supply conditions are reproduced from the Water Agency reports at the end of this section.

TABLE 1

CACHUMA PROJECT ALLOCATIONS OF
 ENTITLEMENT AND SURPLUS WATER
 AMONG THE MEMBER UNITS OF
 SANTA BARBARA COUNTY WATER AGENCY

Member Unit	1975-80 (4)	1980-85 (5)	1985-90 (6)	1990-95 (7)
City of Santa Barbara				
E-0, AFY	6,800	7,900	9,100	10,300
E-0, Percent	(30.769)	(30.739)	(31.271)	(32.188)
Surplus, AFY	1,754	646	[407]	[1,352]
Total Firm Yield, AFY	8,554	8,546	8,693	8,948
Goleta CWD				
E-0, AFY	7,400	8,800	10,200	11,600
E-0, Percent	(33.484)	(34.241)	(35.052)	(36.250)
Surplus, AFY	1,909	719	[456]	[1,523]
Total Firm Yield, AFY	9,309	9,519	9,744	10,077
Summerland CWD				
E-0, AFY	300	400	400	400
E-0, Percent	(1.357)	(1.556)	(1.375)	(1.250)
Surplus, AFY	77	33	[18]	[52]
Total Firm Yield, AFY	377	433	382	348
Montecito CWD				
E-0, AFY	1,900	2,400	2,800	2,900
E-0, Percent	(8.597)	(9.339)	(9.622)	(9.063)
Surplus, AFY	490	196	[125]	[381]
Total Firm Yield, AFY	2,390	2,596	2,675	2,519
Carpinteria CWD				
E-0, AFY	2,400	2,900	3,300	3,500
E-0, Percent	(10.860)	(11.284)	(11.340)	(10.938)
Surplus, AFY	619	237	[147]	[459]
Total Firm Yield, AFY	3,019	3,137	3,153	3,041
Santa Ynez RWCD				
E-0, AFY	3,300	3,300	3,300	3,300
E-0, Percent	(14.932)	(12.840)	(11.340)	(10.313)
Surplus, AFY	851	270	[147]	[433]
Total Firm Yield, AFY	4,151	3,570	3,153	2,867
Santa Barbara CWA, AFY				
Total E-0	22,100	25,700	29,100	32,000
Safe Yield	27,800	27,800	27,800	27,800
Available Surplus	5,700	2,100	[1,300]	[4,200]

Notes

- The numbers in parentheses below the years shown as the column headings represent period numbers for the Cachuma contract. Period one began in 1960-65. These last four periods are shown for they relate to current and projected Cachuma supplies as discussed in this report.
- "E-0" stands for "Entitlement-Obligation."
- The numbers in parentheses shown for each member unit represent their entitlement-obligation percentage. This percentage is applied to the total "available surplus" shown at the bottom of the table to arrive at the surplus figures shown for each area for each period.
- Numbers shown in brackets represent negative numbers.
- The "total firm yield" represents what the member units can depend upon receiving.

Carpinteria-Summerland Area: The Carpinteria groundwater basin is one of several south coast basins situated along a narrow alluvial plain between the Santa Ynez mountains and the Pacific Ocean. The basin proper underlies approximately 7,600 acres. The safe yield for extractions has been estimated at 4,500 acre feet per year (AFY). A consultant study⁸ indicated demand on the basin amounting to approximately 1,800 AFY for private water pumpage, and 2,000 AFY for the Carpinteria County Water District, totaling 3,800 AFY.

The groundwater quality is considered generally acceptable, although it has been slowly deteriorating. Salt accumulation in the basin totaled 4,670 tons/year (1975 conditions), and is projected to reach 5,180 tons/ year from existing sources by the year 2000. Seawater intrusion does not appear to be a problem in the deeper aquifers, but may be present in the shallow coastal aquifers.

The Carpinteria County Water District (CCWD) includes 9,205 acres, serving 11,650 people (1975 Special Census). In addition to groundwater use, the CCWD imports water from the Cachuma Project. The current total firm yield allocated to the district is 3,019 AFY.

The Summerland County Water District comprises 757 acres and is estimated by the Water Agency to have served 1,100 people in 1976. Because there is no groundwater supply in this area, Cachuma Project water is Summerland's only supply. The total firm yield for the current period is 377 AFY. An increase in irrigated agriculture, primarily lemons, caused the district's total water demand to be greater than its supply, resulting in a water hookup moratorium on October 16, 1974.

Montecito Area: The Montecito groundwater basin underlies approximately 4,300 acres. The current safe yield for extractions is estimated to be 1,200 AFY. Demands on the basin for 1975 conditions included 100 AFY of Montecito County Water District pumpage and 300 AFY private pumpage.

Groundwater quality is considered to be acceptable for domestic usage throughout the basin. Due to a lack of data, no trends can be seen. However, an increase in groundwater demand would probably lead to some degradation in quality. Salt accumulation totaled 2,560 tons/year (1975 conditions), and is projected to increase to 2,800 tons/year in the year 2000. The Rincon Thrust Fault appears to be an effective barrier to seawater intrusion.

The Montecito County Water District encompasses 8,359 acres and includes 9,711 people (1975 Special Census). The district received an average annual delivery from Jameson Lake and Doulton Tunnel of 2,194 acre feet for the 1970-75 period. The Cachuma Project supplied Montecito with an average of 2,264 acre feet during the Cachuma water years 1970-71 through 1975-76. The Montecito County Water District has been under a water hookup moratorium and allocation program since January 18, 1973 and May 1973, respectively.

Santa Barbara Area: The Santa Barbara groundwater basin underlies a predominantly urbanized area of 3,400 acres. The safe yield for extractions is estimated at 2,500 AFY. Surface supplies available to the City of Santa Barbara include Cachuma Project entitlement, diversions from Gibraltar Reservoir (including infiltration from Mission Tunnel), contractual deliveries of Jameson Lake water by the Montecito County Water District of about 300 AFY, and minor amounts of water from Cold Springs Tunnel, totaling 16,250 acre feet for 1975-76. Groundwater pumpage by the City was approximately 510 acre feet during the 1975-76 Cachuma year, with private pumpage from the basin currently estimated at 200 AFY.

Water quality trends show a condition of accelerating degradation. These trends may slow or be reversed due to Water Agency projections which indicate lessened groundwater pumpage and rising water levels. Under 1975 conditions, net salt-accumulation within the basin amounted to 5,14P tons/year, projected to decrease to 2,600 tons/year by the year 2000. As with the Montecito and Carpinteria groundwater basins, the Rincon Thrust Fault appears to act as an effective barrier to seawater intrusion.

The City of Santa Barbara Water Resources Department serves 68,500 people (1975 Special Census) within an area of 11,330 acres which includes the City (excluding the Hope Avenue neighborhood), Mission Canyon, and small "island" sections of Goleta and Montecito.

Goleta Valley Area: The Goleta groundwater basin underlies approximately 11,000 acres. Safe yield for extractions is estimated by the Water Agency to average 4,000 AFY.

Mineral concentrations vary significantly among the sub-basins of the Goleta Basin. The water quality data indicate that most of the Goleta groundwater is acceptable for domestic use. Projected future groundwater demands imply an increase in groundwater pumpage which could mean an acceleration in water quality degradation. Net salt accumulation for 1975 was 7,570 tons/year, and is projected to improve to 6,450 tons/year. Seawater intrusion was suspected in the Goleta Slough area; however, observation wells exhibited high concentrations of sulfate, a mineral not normally found in significant quantities in seawater. It is therefore believed that these concentrations are due to the presence of native saline waters in the basal Santa Barbara formation.

The Goleta County Water District (GCWD) is the largest south coast water district, covering 33,000 acres. The population served is estimated to be 74,100.⁹ The district relies mostly on Cachuma Project water as its source of supply. During the water year 1975-76 the GCWD did not pump from its wells. Deliveries from Cachuma that year amounted to 16,382 acre feet. In the prior year, however, groundwater pumpage amounted to 3,250 acre feet. Private well production for the 1975-76 year was 1,953 acre feet (including 1,470 acre feet pumpage by the La Cumbre Mutual Water Company). A water hookup moratorium has been in effect for this district since December 1972.

The La Cumbre Mutual Water Company serves the Hope Ranch area within the Goleta County Water District, and buys water wholesale from the GCWD. In addition, La Cumbre maintains four of its own wells to augment production capacity. 1975-76 water use was 1,770 acre feet (1,470 acre feet pumpage plus 300 acre feet deliveries from the GCWD).

South Coast West of Goleta:

The Ellwood to Gaviota area covers approximately 105 square miles of the southern coastal part of Santa Barbara County. Groundwater occurs in the consolidated rocks and in the alluvial filled stream valleys. The USGS has estimated that the average annual recharge to this area is approximately 6,000 AFY which was proposed as an upper limit on the safe yield for this area. Until a more detailed geohydrologic investigation of the Ellwood-Gaviota area is conducted, this figure is accepted as the best available estimate of groundwater safe yield. Agricultural water demand for this area is estimated by the Water Agency to be 1,720 AFY, of which 750 AFY are served by the Goleta County Water District. Because of the relatively small amount of municipal and industrial land use, water use for these categories has not been calculated.

The Gaviota to Point Conception area covers about 36 square miles. The safe yield of this area is tentatively estimated by the Water Agency to be approximately 2,000 AFY, based on a comparison with the Ellwood-Gaviota area. Current water demands in the Gaviota-Point Conception area are estimated to be 150 AFY from the Hollister Ranch.

Santa Ynez Valley Area: The Santa Ynez Uplands groundwater basin is an area of unconsolidated deposits covering about 88,000 acres north of the Santa Ynez River. The Water Agency estimates the present safe yield for extractions of this area at 11,000 acre feet. The net pumpage for municipal, industrial and agricultural demands under 1975 conditions was 12,550 acre feet, plus natural water losses (e.g., base flow out of system and phreatophyte¹⁰ consumptive use) of 1,000 acre feet.

Consistent groundwater quality data in the Santa Ynez Uplands are not available to determine the overall conditions or quality trends in the basin. However, well samples do indicate that the groundwater is of relatively high quality. There is a net salt accumulation of 2,780 tons/year (1975 conditions), projected to drop to 2,500 tons/year in the year 2000 due to reduced imports from lake Cachuma.

The Santa Ynez Valley is served by the Santa Ynez River Water Conservation District, Improvement District Number 1 (SYRWCD, I.D. #1); Solvang Municipal Improvement District (SMID); Cachuma Community Services District; and many small mutual water companies and private wells.

SYRWCD, I.D. #1 encompasses approximately 10,000 acres in a triangular area delineated by Solvang, Santa Ynez, and los Olivos. SMID is a separate service district which lies entirely within I.D. #1. Its area includes 1,380 acres comprising the town of Solvang and extending south to Alisal Ranch and Golf Course. The 1975 Special

Census indicated that 6,530 persons lived within I.D. #1 boundaries, with 2,440 of these residing in Solvang.

Both I.D. #1 and SMID operate wells and augment groundwater with Cachuma Project water. In the 1975-76 Cachuma Water Year, I.D. #1 received 4,219 acre feet from Cachuma, selling 226 acre feet of this to SMID. Total groundwater produced for I.D. #1 and SMID was 2,060 acre feet, for a total surface and groundwater production of 6,279 acre feet. Private wells are numerous in this area and are used primarily for agricultural irrigation. Within the I.D. #1 boundaries, private pumpage amounts to approximately 4,500 AFY. Total private pumpage of water for domestic purposes is estimated to be 150 AFY.¹¹

The Cachuma Community Services District includes the 840 acre area surrounding Lake Cachuma. The County of Santa Barbara provides water and sewer service to approximately 200 permanent residents and 20 park rangers. Water from lake Cachuma is the only source of supply, amounting to 142 acre feet in 1975.

The Buellton Community Services District (BCSD) encompasses 558 acres in and around the town of Buellton. The 1976 population was estimated by the BCSD to be 2,000 persons. Groundwater provides the only source of water to this area through two district wells. Annual water production averages 420 acre feet. One of these wells has high total dissolved solids and excess iron and manganese content. The State Department of Health has required that this water be treated. The BCSD is currently seeking funding for the project.

The State Department of Health has set a limit of 650 connections to the BCSD until the treatment plant is completed and a new well is drilled. A new well was begun but had to be abandoned until more funding becomes available. As of 1977, there were 527 connections to the BCSD. The district provides no water for agricultural irrigation. Private agricultural pumpage is estimated by the Water Agency in 1975 to total approximately 8,600 AFY. Additional domestic private pumpage is estimated at 10 AFY.

The Santa Ynez River riparian basins form a narrow strip along the Santa Ynez River from Bradbury Dam west 33 miles to a narrow area at the edge of the Lompoc Plain. In 1975, about 10,000 acres of irrigated truck, field, pasture, deciduous, ornamental, and vineyard crops were supported by the riparian basins. Additionally, there is some pumpage from the river deposits for the industrial uses in Solvang and Buellton areas as noted above, and for private homes and farms along the river. The safe yield for the riparian basins is a direct function of demand on the basins, rather than being a maximum fixed yield as determined by net natural recharge and imports.

This is because the basins are replenished essentially by releases from Cachuma Reservoir to satisfy prior water rights (unless Cachuma is spilling).¹²

Lompoc Area: There are four groundwater basins that are inter-connected hydraulically in the Lompoc area: Lompoc Plain (lying below and south of the Santa Ynez River as it

crosses the valley floor), Lompoc Uplands (within which both Vandenberg Village and Mission Hills are located), Lompoc Terrace (hilly area bordering the southwest part of the Lompoc Plain), and the Santa Rita Valley (upstream of the Lompoc Narrows on a tributary to the Santa Ynez River).¹³

Current (1975-76) long-term recharge to the Lompoc Plain subarea is estimated to be about 13,900 AFY. Discharge from these areas is attributable to consumptive use¹⁴ by municipal and industrial users, agricultural users, phreatophytes, and outflow to the ocean. Total discharge from the Lompoc Plain area is estimated at 16~400 AFY under mid-1970's conditions, so that discharge exceeds recharge by 2,500 AFY.

In the Uplands subarea, discharge is attributable to consumptive use by Vandenberg Village, the Village Country Club and Mission Hills areas, estimated to be about 1,850 AFY. Average recharge to this area is estimated at 2,000 AFY, implying that recharge exceeds discharge over this area by 150 AFY. In the Santa Rita Valley, however, the consumptive use is about 1,600 AFY, almost entirely agricultural, with recharge being 650 AFY. Therefore, the local overdraft in the Santa Rita portion of the Upland basin is about 950 AFY; or, taking the Upland area as a whole, the overdraft totals 800 AFY.

Discharge from the Lompoc Terrace is about 150 AFY to Vandenberg Air Force Base, with average recharge estimated at 400 AFY.

According to the County Water Agency (1977), the total long-term mean recharge to the Lompoc area is about 17,000 AFY. The 1975-76 conditions estimated discharge from the same area is about 20,000 AFY. The Lompoc area is therefore estimated to be in a state of overdraft at about 3,000 AFY in terms of consumptive use.¹⁵

The mineral quality of water in the Lompoc Plain is generally poor and a trend exists toward further mineralization. This is primarily due to agricultural irrigation, with a secondary contribution from municipal wastewater effluent in the riverbed. Water quality in the Lompoc Upland and Terrace is somewhat better and appears to be stable. Salt accumulation amounts to 7,550 tons/year, projected to increase to 9,170 tons/year.

No known barrier to seawater intrusion exists in the Lompoc area. The County Water Agency advises that, if projections of future groundwater depletion are reasonably correct, "planning should begin in the relatively near future for measures to protect the basin against potential long-range seawater intrusion."¹⁶

Water service in the Lompoc area is provided by the following agencies and firms: The City of Lompoc Water Division supplies water to 22,557 persons within a service area of 3,200 acres; the Federal' Correctional Institution (FCI) Utilities Department serves 1,682 persons; in the Vandenberg Village area, service is provided by the Park Water Company to an estimated population of 6,500; and in the Mission Hills area, the Mission Hills Water Company produces and distributes water to an estimated 3,000 persons (1975 Special Census).

Vandenberg Air Force Base (VAFB) covers an area of 98,400 acres and has 10,048 permanent residents. The Base produces its water supply from three separate groundwater basins: The Lompoc Plain, Lompoc Terrace, and San Antonio Groundwater Basin, totaling 4,146 acre feet in 1975. VAFB sells an average 675 AFY to the FCI.

The City of Guadalupe, included here within the Lompoc Area because it is in the Fourth Supervisorial District with Lompoc, provides service to approximately 3250 persons (based on State Department of Finance figures, 1975) in the incorporated city area of 465 acres. Water is pumped from wells in the confined Guadalupe subarea of the Santa Maria Groundwater basin. Production amounted to 850 acre feet in 1975. Water quality is marginal.

Santa Maria-Orcutt Area: This area is coterminous with the Fifth Supervisorial District and includes the City of Santa Maria and the unincorporated communities of Los Alamos, Casmalia, Orcutt, Sisquoc, Garey, Cuyama and New Cuyama. The groundwater basins are the principal source of water for these areas.

The San Antonio Valley groundwater basin underlies 66,000 acres located between, and in hydraulic continuity with, the Lompoc Uplands basin to the south and the Santa Maria groundwater basin to the north. The basin is separated from the coastal environment by about 7 miles of consolidated non-water-bearing rocks, and thus is not subject to the dangers of seawater intrusion. Total recharge to the basin amounts to 8,500 AFY for present conditions, while total discharge amounts to 11,500 AFY. Safe yield for extractions is estimated at 9,200 AFY. The basin thus has an overdraft for consumptive use of about 3,000 AFY.

Vandenberg Air Force Base began extractions from the west end of the basin in 1963, and averaged 1,500 AFY until 1976, when they pumped out 2,440 acre feet. Other municipal and industrial pumpage amounts to 386 AFY, with the Los Alamos Community Services District distributing 150 AFY to a population of about 570, and Union Oil Company providing 156 AFY to Casmalia, serving a population of about 200. Net pumpage for agricultural irrigation is estimated at 7,600 acre feet, and phreatophyte consumption and natural outflow totals 1,100 acre feet.

Water quality analyses by the U.S. Geological Survey indicate that San Antonio Valley basin groundwater is of better quality than in most areas of the County. Quality levels have remained fairly constant over time and are expected to remain so in the future. Under present conditions, net salt accumulation within the basin is estimated at 470 tons/year. With projected increases in VAFB groundwater exportation, there will be a net salt removal of 975 tons/ year by the year 2000.

The Santa Maria groundwater basin¹⁷ underlies approximately 77,000 acres in northern Santa Barbara County and 30,000 acres in southern San Luis Obispo County. Total average annual recharge to the basin is about 85,000 AFY. Removal of groundwater for 1975 conditions amounts to 6,000 AFY for subsurface outflow to the ocean, 85,000 AFY

for agricultural irrigation, and 13,250 AFY for municipal and industrial use. These figures exclude about 7,000 AFY return to the basin from effluent percolation and reclamation for irrigation of pasture crops. The sum of net pumpage suggests total disposal of about 105,000 AFY. The difference between estimated net recharge of 85,000 AFY and disposal of 105,000 AFY indicates an overdraft for consumptive use of 20,000 AFY under current conditions. The corresponding current overdraft for extracts is estimated at 28,000 AFY. While the current overdraft is significant, the Water Agency does not see this as alarming in view of the substantial amount of freshwater in storage above sea level, estimated at 2 million acre feet.

Water quality conditions vary within the Santa Maria Valley, generally deteriorating from east to west, laterally from the Santa Maria River. The use and reuse of groundwater, coupled with the introduction of additives resulting from both municipal and agricultural use, and evaporation of much of the applied water, result in increasingly mineralization of the groundwater. Shallower wells would probably be affected more than the deeper wells. The net salt accumulation (1975 conditions) is estimated at about 48,500 tons/year, with projected accumulation in the year 2000 of about 56,600 tons/year.

The City of Santa Maria Water Division provides service to most of the incorporated area of 9,710 acres. The public airport and unincorporated community of Orcutt are served by the Southern California Water Company. The City water system extends past the City limits to provide service to a mobile home park on West Main Street and to Stubbs Lane, Prescott Lane, and Goodwin Road. The Water Division estimates the current population of its service area to be 34,750 (1975 Special Census recorded 33,645).

Groundwater from the Santa Maria basin provides all of the needs of the City. Twitchell Reservoir supplies an estimated 21,200 AFY for recharge to the basin. The City produced 8,033 acre feet in 1976. Private pumpage for agricultural irrigation in the Santa Barbara County portion of the basin was estimated by the Water Agency to be 94,420 acre feet in 1975. Private pumpage for industry amounted to an estimated 1,700 for oil industry, 2,350 AFY for Western Refrigeration Company, 1,050 AFY for Sinton and Brown Company, 1,350 AFY for Union Sugar, and 1,000 AFY for livestock, totaling 7,450 AFY. Private pumpage for domestic use comes from small water companies that serve mobile home parks or a small group of houses. Among the companies near the City limits are Trailerancho Park; St. Marie Park, Inc.; Rosemary Farms; and Foster Road Mutual Water Company, totaling approximately 100 AFY.

In the Orcutt Area, water is supplied by the California Cities Water Company to a population of 18,500 (1975, Water Agency estimate) within an area of about 7,000 acres, including Tanglewood. Total 1975 water production was 3,849 acre feet. Private well production for agricultural purposes is minimal in this area. The 120 acre Rancho Maria Golf Course requires about 260 acre feet annually. Private pumpage for domestic purposes is used by the Rolling Hills Water Association, a small, mutual water company with 40 connections. Production figures were not available.

Water service for the Lake Marie area is provided by the Lake Marie Water Company. The total water service area is about 2 square miles, with a population of about 506 persons (1975 Special Census). Water production amounted to 316 acre feet in 1976.

The Sisquoc area comprises the southeasterly portion of the Santa Maria groundwater basin. This agricultural area has two small towns, Sisquoc and Garey. Garey is served by individual wells. For the town of Sisquoc, water is supplied by the Southern California Water Company to approximately 200 people (1975) within an area of 100 acres. Water production has been 21 AFY since 1972.

The Cuyama Valley groundwater basin underlies about 255 square miles within four counties. One hundred twenty-seven square miles are in Santa Barbara County, 4.1 square miles in San Luis Obispo County, 2 square miles in Kern County, and about 85 square miles in Ventura County. The safe yield for extractions is estimated to be 10,600 AFY. Under 1975 conditions, the overdraft for extraction amounted to about 50,000 AFY, with the corresponding overdraft for consumptive use at about 37,000 AFY.

Water quality is generally deteriorating, although quality varies from one area to another due to the great extent of the basin and concentrations of pumping in certain areas. Salt accumulation amounts to 12,000 tons/year, projected to decrease due to reduced irrigated agricultural acreage.

In the town of Cuyama, water is supplied by the Cuyama Mutual Water Company. Due to water quality problems, the County Health Department has required that bottled water be supplied by the company to its customers. In New Cuyama, the State Department of Health has imposed a moratorium on service connections until quality problems are solved.

Other Areas: These areas include small communities which are not served by large companies or water districts. Examples include Lake Cachuma Recreational Area, Cachuma Village, Rosario Tract Water Company, Santa Ynez River area above Lake Cachuma, and Zaca Lake. The Water Agency estimates that total water use for these areas is about 780 APY (1975 conditions).

Table 2
 SUMMARY OF SUPPLIES AND DEMANDS FOR SANTA BARBARA COUNTY IN 1975 (CURRENT) ^{6/}
 (in acre-feet)

Area or Basin	Available Supplies		Total ^{3/} Available Supply	Estimated ^{4/} Demand	Supply ^{5/} -Demand	Remarks
	Surface ^{1/} Water	Ground ^{2/} Water				
Carpinteria Basin	3,020	4,500	7,520	7,800	- 280	The actual surface water deliveries to CCWD in 1975 were greater than their firm yield due to available surplus. Recent (3/78) reports by Geo-technical Consultants indicate demands via private pumpage may be 500 AF less than assumed here. Summerland shows a surplus despite their existing moratorium due to the current young age of some agricultural crops that are expected to consume the "surplus" when full-grown.
Summerland Area	380	-	380	200	+ 180	
Montecito Basin	3,620	1,200	4,820	4,400	+ 420	Montecito shows a surplus, but facilities do not exist with which to extract the water. Also, currently claimed water rights limit allowable extractions. Recent studies have also indicated that the safe yield may be less than that shown here.
Santa Barbara Basin	16,250	2,500	18,750	16,050	+ 2,700	Santa Barbara greatly benefits from its Gibraltar system.
Goleta Basin	9,310	4,200	13,510	17,600	- 4,090	The actual surface deliveries to CCWD in 1975 were greater than the volume shown, due to the availability of surplus water. Additional NRS water was taken in advance to fulfill the demand.
Kilwood to Gaviota Area	-	<6,000	<6,000	1,720	+ 4,280	Goleta-West Conduit water delivered to this area are included as part of the total supply and demand on the Goleta Basin not the Kilwood-Gaviota area.
Gaviota to Point Conception Area	-	2,000±	2,000±	150	+ 1,850	
Santa Ynez Up-lands Basin	3,950	11,000	14,950	16,550	- 1,600	
Santa Ynez Riparian Basins: (Cachuma to Pomoc Narrows + Salsipuedes)	200	25,350	25,550	25,550	-	Cachuma water was supplied to SMIO. It is assumed throughout this report that supplies in the Santa Ynez Riparian Basins will equal demands. This is a result of the live stream criteria as modified by the New Release Schedule, which allows an accumulation of downstream release credits.
Santa Ynez Riparian Basins: (upstream of Cachuma)	-	780	780	780	-	

Area of Basin	Available Supplies		Total ^{2/} Available Supply	Estimated ^{4/} Demand	Supply ^{5/} - Demand	Remarks
	Surface ^{1/} Water	Ground ^{2/} Water				
Lompoc Area (Uplands, Terrace, Plain and Santa Rita Uplands)	(280)	23,400	23,400	28,120	- 4,720	
San Antonio Vly Basin	-	9,200	9,200	13,050	- 3,850	
Santa Maria Basin	(2,100)	110,100	110,100	138,050	-27,950	This represents the total demand on the basin both in SB and SLO Counties. The SB County portion of the demand is 114,550 AFY (23,500 AFY in SLO County).
Cuyama Basin	-	10,600	10,600	68,450	- 57,850	This represents the total demand on the basin both in SB and SLO Counties. The SB County portion of the demand is 31,975 AFY (36,475 AFY in SLO County).
TOTAL	36,730	210,830	247,560	338,470	-90,910	The SLO Co. demands are reflected in those totals.

Footnotes for Table 2:

- 1/ Surface water supplies represent total firm yields from the Cachuma Project for Period 4 and estimated yields for Gibraltar and Jameson. They do not represent actual 1975 deliveries. The values shown in ()s represent wastewater used to meet local agricultural demand. This volume has been included in the assessment of the GMB safe yield as well as part of the total demand. Surface supply includes Cachuma Project entitlement-obligations with allocated surplus (or shortage), Gibraltar Project used conjunctively with Santa Barbara's Cachuma surplus and groundwater, and Jameson Lake operated on a safe yield basis. Operation of Gibraltar, with diversions in excess of that allowable by the Gin Chow Decree may actually reduce the Cachuma firm yield somewhat (not reflected herein).
- 2/ In most cases the current safe yield for the groundwater basins as shown here are for extractions and were calculated assuming overdrafting to meet the demands.
- 3/ Total Available Supply is the sum of the surface water supplies and the groundwater basins safe yields for extractions.
- 4/ Estimated Demand represents both agricultural and M&I demands by public and private purveyors.
- 5/ Supply minus Demand is the result of the two previous columns. Positive numbers indicate surpluses, while negative numbers indicate deficits.
- 6/ Table does not show any water resource development not currently underway.

TABLE 3
 SUMMARY OF URBAN AND AGRICULTURAL WATER USE (1975)

A. URBAN CONDITIONS		
<u>Locality</u>	<u>Population</u>	<u>Water Use (AFY)*</u>
South Coast Region	169,233	34,700
Santa Ynez Valley Region	10,428	3,200
Lompoc Region	43,793	10,500
San Antonio Valley Region	1,025	400
Santa Maria Valley Region	56,138	20,100
Cuyama Valley Region	1,030	400
Total Santa Barbara County	281,647	69,300
B. AGRICULTURAL CONDITIONS		
<u>Locality</u>	<u>Irrig. Acres</u>	<u>Water Use (AFY)</u>
South Coast Region	11,045	13,250
Santa Ynez Valley Region	8,528	31,000
Lompoc Region	15,234	29,000
San Antonio Valley Region	4,715	10,000
Santa Maria Valley Region	38,983	94,000
Cuyama Valley Region	6,534	32,000
Total Santa Barbara County	85,039	210,000
		<u>Total Water Use (AFY)</u>
		279,300

Source: Santa Barbara County Water Agency
 * All water use numbers have been rounded.

TABLE 4

SUMMARY HYDROGEOLOGIC PROPERTIES

Groundwater Basin	Area (acres)	Annual Rainfall (inches)	Storage Capacity Total (x1000) Useable ^{a/}	Avg. Specific Yield (%)	Well Production Yield (gpm)	Well Production Specific Capacity (gpm/ft)	Safe Yield for Extractions (acre-feet)
Carpinteria	7,600	15.8	700	12	200-1,200	2.0-12	4,500
Montecito	4,300	17.8	120	7	200	1.0-2.0	1,200
Santa Barbara	3,400	17.8	184	11	200-800	7.0	2,500
Goleta	11,000	18.6	260	10	200-1,000	7.5	4,200
Ellwood to Gaviota	67,200	19.7	-	-	25	1.0	6,000
Gaviota to Pt. Conception	23,000	18.0	-	-	25	1.0	2,000
Santa Ynez Uplands	88,000	16.0	10,000	8	500-1,600	1-20	11,000
Santa Ynez River Riparian Basins	12,100	14-18	92	20	500-1,800	10-500	-
Lompoc	44,000	14.2	300	12	200-2,000	10-140	23,400
San Antonio	66,000	15.0	2,100	10	500-1,000	6-19	9,200
Santa Maria	107,000	13.4	10,000	14	500-3,000	10-300	110,100
Cuyama	163,200	6-12	10,000	15	500-4,000	10-300	10,600

a/ Estimated from Santa Barbara County isohyetal map prepared by the County Flood Control Department.

b/ Useable storage capacity is herein defined as the maximum amount of groundwater that may be extracted from a basin in support of a conjunctive use program without producing irreversible negative impacts. In most cases, useable capacity refers to the quantity of water in storage above sea level or alternatively, the maximum historical groundwater depletion below a full basin condition.

TABLE 5
 SUMMARY OF GROUNDWATER QUALITY
 Average Quality Range (mg/l)

Groundwater Basin	Total Dissolved Solids (TDS)	Total Hardness ^a (TH)	Sulfate (SO ₄)	Chloride (CL)	Nitrate (NO ₃)
Carpinteria	500 - 1,200	300 - 700	50 - 400	40 - 200	0 - 100
Montecito	700 - 1,000	170 - 470	110 - 240	40 - 160	na
Santa Barbara	550 - 800	300 - 600	100 - 300	30 - 130	na
Goleta	650 - 1,000	170 - 600	200 - 350	40 - 300	0 - 20
Ellwood to Gaviota	600 - 2,000	50 - 800	100 - 700	30 - 200	1 - 3.5
Gaviota to Pt. Conception	na ^b	na	na	na	na
Santa Ynez Uplands	470 - 700	280 - 550	20 - 230	30 - 150	1 - 20
Santa Ynez River Riparian Basins	600 - 1,000	400 - 550	250 - 1,000	20 - 280	0 - 20
Lompoc	500 - 2,000	250 - 1,000	100 - 750	100 - 300	1 - 40
San Antonio	400 - 900	200 - 700	10 - 300	80 - 200	0 - 30
Santa Maria	500 - 3,000	400 - 1,000	250 - 1,000	50 - 150	na
Cuyama	500 - 2,100	370 - 1,300	140 - 1,200	na	5 - 60
State Department of Health (Recommended/upper limit)	500/1,000	-	250/500	250/500	10/10

^a Concentrations greater than 100 mg/l are considered "hard." Concentrations less than 100 mg/l are considered "soft."

^b na: not available

TABLE 6

SUMMARY OF PROJECTED GROUNDWATER BASIN CONDITIONS

Groundwater Basin	Seawater Intrusion Potential		Water Level Decline (ft/yr) a/			Overdraft (AFY for extractions) b/						
	1975	1980	1990	2000	1975	1980	1990	2000				
Carpinteria	low	low	low	mod.	-	.8	1.7	2.1	-	940	1,940	2,400
Montecito	low	low	low	mod.	-	.7	2.1	3.0	-	370	1,225	1,675
Santa Barbara	low	low	low	low	-	-	-	-	-	-	-	-
Goleta	low	low	low	low	-	4.0	7.4	10.0	-	4,730	9,480	13,390
Ellwood to Gavitoa	-	-	-	-	-	-	-	-	-	-	1,840	5,200
Gavitoa to Pt. Conception	-	-	-	-	-	-	-	-	-	1,200	2,000	4,050
Santa Ynez Uplands	-	-	-	-	0.7	1.0	4.5	3.1	1,600	6,470	5,240	5,280
Santa Ynez River Riparian Basins	-	-	-	-	-	-	-	-	-	-	-	-
Lompoc	low	low	mod.	high	0.7	0.8	1.0	1.0	4,720	4,940	6,960	7,550
San Antonio	-	-	-	-	1.6	3.7	2.8	2.8	850	8,280	6,300	6,330
Santa Maria	low	low	mod.	high	1.0	1.6	1.6	1.9	32,550	38,300	38,540	39,420
Cuyama	-	-	-	-	8.0	7.7	4.5	1.2	57,850	55,220	32,040	8,860

a/ Determined using average specific yield assuming water levels decline at a uniform rate throughout the groundwater basin. Average annual groundwater depletion rate calculated from net water supply deficit figures in Water Needs Versus Water Availability in Santa Barbara County, SBCWA, November 1977.

b/ The indicated overdraft is calculated under the assumption that future demands are met from existing sources of supply and therefore does not include inputs from potential supplemental sources.

The future demands are based upon moderate urban and ag expansion assuming no water supply restrictions after 1980.

Future Water Demands

Table 7 summarizes County Water Agency projections of water resources for each decade to year 2000. These estimates were generally based on County Planning Department population projections,¹⁸ per capita water consumption values, and water duties, and have been reconciled with information supplied by the local water purveyors and city planning agencies. The November 1975 Special Census of Santa Barbara County was used as a reference point for all population data.

In order to show potential water supply conditions, it was assumed that no supplemental supplies (e.g., conjunctive use, wastewater reclamation, water importation) would be obtained. However, allowance was made for the effects of moderate municipal and industrial consumer conservation of water. Table 8 indicates the range of potential water savings. The low figures on this table represent minimum acceptance of conservation efforts by consumers; the higher figures represent anticipated maximum acceptance.

Estimates of agricultural water use; which represents the greatest water demand in the County, were based on power consumption for groundwater pumping and by crop acreages compared with appropriate water use factors. Future agricultural water demand was calculated using two methods: by examining the conventional agricultural considerations including water availability, soil type, climate, slope, drainage, cropping practices, potentially developable acreage, and economics; and by means of a linear programming model (explained in Present and Future Water Needs). The Water Agency utilized values between these two theoretical agricultural water use levels.

With respect to total water supply and total water demand for Santa Barbara County, including demands for San Luis Obispo County areas within the Santa Maria Valley and Cuyama Valley, the Water Agency notes the following:

<u>Item</u>	<u>1975</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
<u>Total Water Demand, AFY</u>				
w/Cuyama Basin	338,480	258,660	346,470	336,490
w/o Cuyama Basin	270,030	292,840	303,835	317,030
<u>Total Water Supply, AFY</u>				
w/Cuyama Basin	247,560	248,670	246,540	247,270
w/o Cuyama Basin	236,960	238,070	235,940	236,670
<u>Total Deficit, AFY</u>				
w/Cuyama Valley	99,920	109,990	99,930	89,220
w/o Cuyama Valley	33,070	54,770	67,895	80,360

TABLE 7
 CURRENT AND PROJECTED STATUS OF WATER AVAILABILITY

Volume of Water Remaining or Deficit
 Based Upon Applied Water Demands and
 Groundwater Basin Safe Yield for Extractions
 (Values are in acre feet per year)*

<u>Area or Basin</u>	<u>1975</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
Carpinteria	(280)	(940)	(1,940)	(2,400)
Summerland	180	40	(190)	(310)
Montecito	420	(370)	(1,220)	(1,670)
Santa Barbara	2,700	3,650	1,350	350
Goleta)	(4,090)	(4,730)	(9,480)	(13,390)
Ellwood to Gaviota)**	<u>4,280</u>	<u>2,800</u>	<u>(1,840)</u>	<u>(5,200)</u>
Subtotal, South Coast	3,210	450	(13,320)	(22,620)
Gaviota to Point Conception Area	1,850	(1,200)	(2,000)	(4,050)
Santa Ynez Uplands	(1,600)	(6,470)	(5,240)	(5,280)
Santa Ynez Riparian Basins (Inc. Sals.)***	0	0	0	0
Lompoc Area	(4,720)	(4,940)	(6,980)	(7,550)
San Antonio Valley	(3,850)	(8,280)	(6,300)	(6,330)
Santa Maria Basin	<u>(27,950)</u>	<u>(34,300)</u>	<u>(34,040)</u>	<u>(34,520)</u>
Subtotal, w/o Cuyama Basin	(33,060)	(54,740)	(67,880)	(80,350)
Cuyama Basin****	<u>(57,850)</u>	<u>(55,220)</u>	<u>(32,040)</u>	<u>(8,860)</u>
Total, Santa Barbara County	(90,910)	(109,960)	(99,920)	(89,210)
ROUND OFF	(90,900)	(110,000)	(99,900)	(89,200)

Source: SBCWA, Water Needs Versus Water Availability, November 29, 1977.

Notes to Table 7:

- * Deficits are shown in parentheses. All numbers are approximate, and most if not all numbers should be rounded. 1975 values are historical. The numbers do not reflect possible adjustments that might result from potential water rights disputes. (Deficits shown for 1975 do not reflect actual surface deliveries that year for Cachuma Project members.)

- ** Goleta Basin and Ellwood to Gaviota should be considered jointly, as some of the water demand in Ellwood to Gaviota is being satisfied by export of water from Goleta Basin area. Also, the Cachuma supply values to Goleta Basin do not allow for water available for purchase by Goleta CWD from other Member Units, as has occurred normally in past years.

- *** Santa Ynez Riparian Basins (alluvial gravel basins, Bradbury Dam to Lompoc Narrows) are recharged by releases and spills from Cachuma Reservoir and local tributary inflows. In general, releases from Cachuma must maintain adequate riparian basin recharge, and thus, there is no surplus or deficit in these basins.

- **** Cuyama Basin groundwater is essentially the sole source of supply for Cuyama Valley. Due to continuing depletions and increasing pumping costs, the projections are for an eventual decline in irrigated agriculture in this area. No major water resources developments are yet planned for Cuyama Valley.

TABLE 8
 PERCENTAGE OF TOTAL WATER SAVINGS BY AREA

<u>Area</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
Carpinteria	15-25%	15-26%	17-28%
Montecito	9-24%	10-26%	13-28%
Summerland	11-26%	12-29%	10-29%
City of Santa Barbara	13-30%	13-31%	14-34%
Goleta	9-24%	13-27%	15-29%
Santa Ynez Valley	12-25%	13-27%	14-28%
Lompoc	12-28%	14-29%	15-30%
Los Alamos	12-27%	14-31%	15-34%
City of Santa Maria	16-30%	17-31%	18-33%
Orcutt	12-33%	14-36%	16-39%
Lake Marie	11-22%	12-23%	14-29%
Guadalupe	13-27%	16-30%	16-30%
Sisquoc	11-24%	11-24%	11-24%
Cuyama	<u>9-23%</u>	<u>9-23%</u>	<u>9-23%</u>
Average	12-26%	13-28%	14-30%

Source: SBCWA, Present and Future Water Needs, January 13, 1978.

ALTERNATE SOURCES OF SUPPLEMENTAL WATER SUPPLY ¹⁹

The Water Agency has investigated a number of alternatives for water resources development in its Program of Action for Water Resources Planning. The alternatives, which are described in the Water Agency reports with regard to cost, flexibility, reliability, potential environmental impacts, water quality effects, and general project financing feasibility, include:

1. importation of State Project water via San Luis Obispo County (Coastal Aqueduct);
2. importation of State Project water via Ventura County (to South Coast area);
3. increased conservation of surface water by construction of new dams, reservoirs and spreading grounds;
4. desalination of seawater, oil field brines, wastewater or agricultural tailwater;
5. reclamation and reuse of wastewater;
6. weather modification through cloud seeding;
7. conjunctive use of surface and groundwater supplies;
8. watershed management;
9. construction of infiltration tunnels within the Santa Ynez Mountains;
10. mining of groundwater; and
11. increased consumer conservation.

The yields and water costs of these alternatives are tabulated for each major area of the County in Tables 9-12. These are preliminary figures and subject to further study by the Water Agency. Only projects which would yield "new" water (i.e., water not previously counted as existing available supply) are considered. These regional water supply alternatives could be combined in a number of ways to meet future County-wide supplemental water needs.

TABLE 10: SANTA YNEZ VALLEY ALTERNATIVES

<u>Alternative</u>	<u>Yield (AFY)</u>	<u>Cost (\$/AF)</u>
Weather Modification	4,700	9
Conservation	650	2
Conjunctive Use (NRS)	300	11
Cachuma Enlargement	4,000	510
State Water (Coastal Branch)	2,600	498
State Water (Ventura Route)	2,600	366
Conjunctive Use (Integrated)	4,300	920
Watershed Management	240	≤ 385

See Note "C", page 60

Source: SBCWA, Adequacy and Economics, March 13, 1978.

TABLE 11: LOMPOC-SAN ANTONIO AREA ALTERNATIVES

<u>Alternative</u>	<u>Yield (AFY)</u>	<u>Cost (\$/AF)</u>
Weather Modification	5,000	9
Conservation	1,140	2
Spreading Grounds	2,000	5
Salsipuedes Project	6,500	301
State Water Project (Coastal Branch)	9,100	486
State Water (Ventura Route)	9,100	366
Cachuma Enlargement	6,000	510
Wastewater Reclamation	2,200	215
Desalination (wastewater)	2,000	320
Desalination of Oil Brines	1,700	625
Watershed Management	800	<u>385</u>

See Note "C", page 60

Source: SBCWA, Adequacy and Economics, March 13, 1978.

TABLE 12: SANTA MARIA-ORCUTT AREA ALTERNATIVES

<u>Alternative</u>	<u>Yield (AFY)</u>	<u>Cost (\$/AF)</u>
Twitchell Management	1,500	~0
Increased Conservation	3,310	2
Weather Modification	13,000	9
Spreading Grounds	3,500	32
State Water	10,000	306
Round Corral Dam	6,700	762
Watershed Management	4,650	≤ 385
Desalination of Agricultural Tailwater	2,400	625
Desalination of Oil Brines	2,400	820

See Note "C", page 60

Source: SBCWA, Adequacy and Economics, March 13, 1978

Draft Table 13 is obsolete. Individual alternatives as shown in Tables 9-12 may be combined in a number of different ways depending upon future levels of demand. See Jones and Stokes Environmental and Water Resources Reconnaissance Report (January 1979) or the Water Agency's Adequacy and Economics Report, March 13, 1978, for illustrative combination alternatives.

WASTEWATER

Table 14, from the Area Planning Council's Draft Areawide Land Use Element for Santa Barbara County (January 1978), lists present flows and current design capacities of wastewater treatment facilities in the County. Most areas have more than 30% capacity remaining. However, in order to comply with water quality objectives, some districts may have to upgrade their treatment capacities. In some cases, this may require using some of the remaining capacity. For example, the Goleta Sanitary District has been ordered by the Regional Water Quality Control Board to upgrade their facility from primary to secondary treatment. The Goleta County Sanitary District is currently appealing this order. The 14 mgd figure is based on primary treatment rating. Upgrading the plant to secondary treatment would reduce the capacity to 7.6 mgd.

The State Water Resources Control Board has established a priority funding list of projects to clean up California waters. Ten communities in Santa Barbara County are listed for sewage treatment projects totaling nearly \$55 million. The priority list does not guarantee State funding, but enables the sanitary and water districts to compete for limited available funds. The projects include the following:

1. Carpinteria Sanitary District, \$2 million to improve sewage treatment and disposal system, starting in 1979-80.
2. Summerland Sanitary District, \$530,000 to improve sewage treatment and disposal system, starting in 1978-79.
3. Montecito Water District, \$3 million for wastewater reclamation projects, starting after 1983; Montecito Sanitary District, \$1 million to increase sewage treatment plant capacity.
4. City of Santa Barbara, \$2.5 million, with \$1.8 million for the wastewater reclamation project now completed, and \$650,000 for renovation or replacement of the airport sewer system.
5. Goleta Water District, \$17.7 million beginning in 1978-80 for project to use wastewater for landscaping and agricultural irrigation. Goleta Sanitary District, \$15.7 million for upgrading its wastewater treatment to secondary processing.
6. Santa Ynez Community Services District, \$2.2 million to continue work on sewage collection system and an interceptor to the Solvang Municipal Improvement District (SMID). \$1.1 million for SMID to complete interceptor and treatment plant expansion project.
7. Buellton Community Services District, \$670,000 for correcting treatment system deficiencies.
8. Lompoc, \$2.2 million to continue its interceptor project to eliminate wet weather discharges.
9. Mission Hills, \$2.5 million for interceptor, starting during 1980-81.
10. Santa Maria, \$5.65 million to increase disposal system capacity, a project already in process.

WASTEWATER TREATMENT FACILITIES

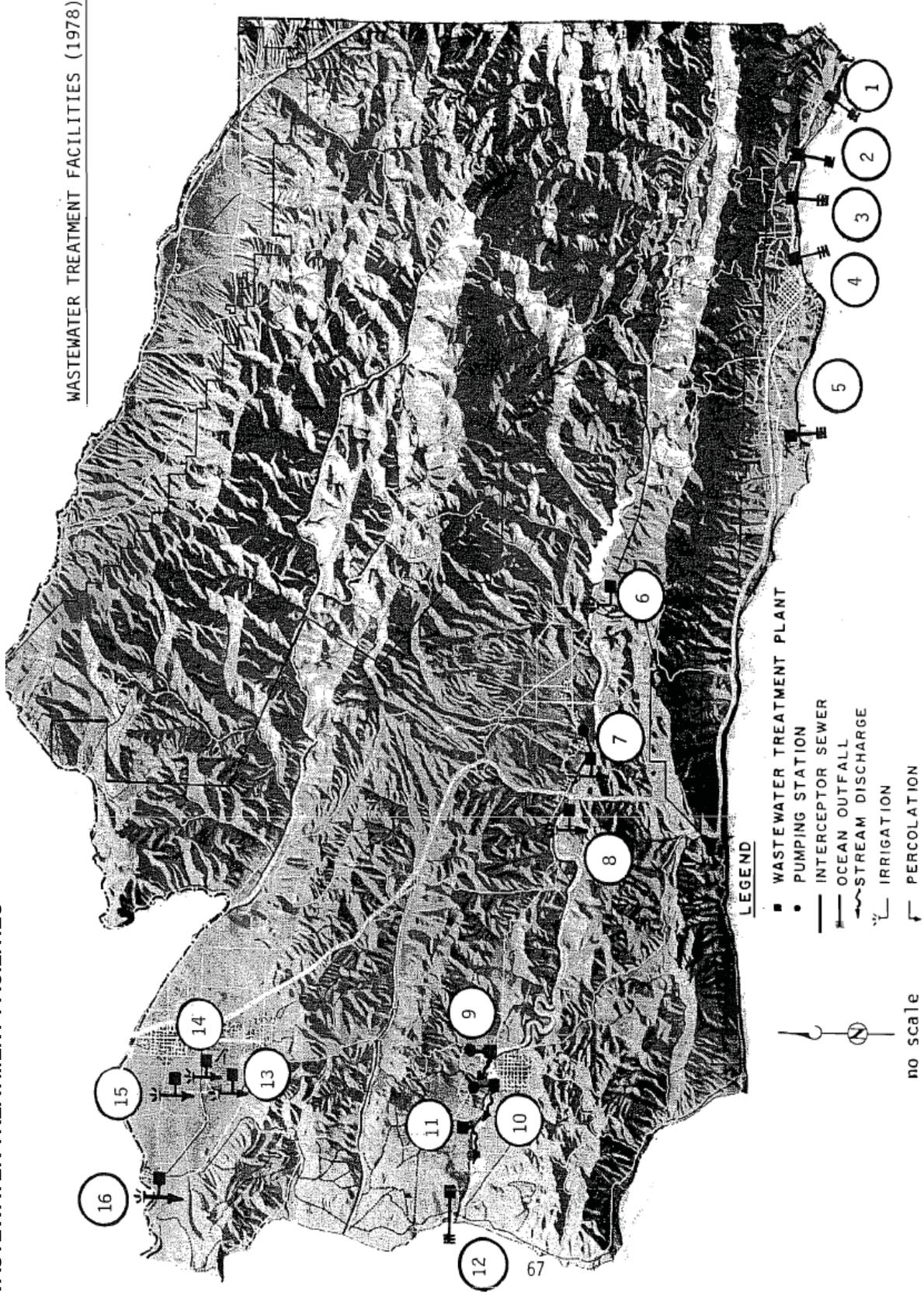


TABLE 14
 WASTEWATER FLOW AND SEWERAGE CAPACITIES

Area or Jurisdiction	Design Capacity Flow (mgd)	Current Wastewater Flow (mgd)	Estimated Remaining Capacity Percent	Estimated Total Population Capacity of System*
(1) Carpinteria Sanitary District ^a	2.0	1.1	33.0%	17,500
(2) Summerland Sanitary District ^a	.15	.115	23.0%	318
(3) Montecito Sanitary District ^a	.75	.7	7.0%	8,896
(4) Santa Barbara City Water ^c Treatment Plant	11.0 New Plant	At Capacity	-----	104,000 New Plant
(5) Goleta Sanitary District ^a including Isla Vista Sanitary District, UCSB, and Santa Barbara Airport	8.0	6.23	22.0%	136,570
(6) Cachuma County Sanitary District ^{b, f}	.22	.04	82.0%	N.A.
(7) Solvang Municipal Improvement District ⁱ	.80 (ADWF)**	.38	52.0%	N.A.
(8) Buellton County Sanitary District ⁱ	.3	.21	70.0%	4,500 ^h
(9) Mission Hills ^f	N.A.	.19	N.A.	N.A.

* Some figures may not take into account the number of persons serviced by private septic tanks or other private sewage services.

** ADWF--Average Dry Weather Flow

WASTEWATER FLOW AND SEWERAGE CAPACITIES (continued)

Area or Jurisdiction	Design Capacity Flow (mgd)	Current Wastewater Flow (mgd)	Estimated Remaining Capacity Percent	Estimated Total Population Capacity of System*
(10) City of Lompoc ^{e,f} including Vandenberg Village	5.0	2.5	56.0%	69,860 ^h
(11) Federal Correction Institution	.3	.17	43.0%	2,350
(12) VAFB (Main) ^{b,e,f}	3.0	1.2	60.0%	30,000
VAFB (South) ^{b,e,f}	.11	.04	63.0%	1,900
(13) Laguna County Sanitary District	2.4 (ADWF)	1.52	37.0%	31,000
(14) Santa Maria Airport Water ^{b,d,f} Treatment Plant	.75	.37	51.0%	N.A.
(15) Santa Maria City Water ^{b,f,g} Treatment Plant	5.5	5.0	.5/2.8 (in 1981)	N.A.
(16) Guadalupe Water Treatment Plant ^{b,f,**}	.5	.5	0%	N.A.

* Some figures may not take into account the number of persons serviced by private septic tanks or other private sewage services.

** On April 14, 1978, the state Regional Water Quality Control Board, Central Coast, issued a cease and desist order (#78-03) because the Guadalupe Water Treatment Plant was violating adopted waste discharge requirements. As a result, additional discharges to the sewer system of this area have been prohibited.

Notes to Table 14:

- a. Service System Capacity Studies Preliminary Data, prepared by the Joint County of Santa Barbara--City of Carpinteria Local Coastal Program Staff, November 1, 1977, pp. 27 (Carpinteria), 19 (Summerland), 14 (Montecito), 7 (Goleta).
- b. Water Quality Control Plan Report Central Coastal Basin Part II, State Water Resources Control Board, April, 1975, pp. 16-103 (Federal Corrections Institution and VAFB), 16-115 (Solvang), 16-114 (Buellton), 16-115 (Cachuma), 16-90 (City of Santa Maria), 16-91 (Santa Maria Airport and Laguna), 16-88 (Guadalupe).
- c. City of Santa Barbara, 1977, as cited in Effects of Rezoning the City of Santa Barbara: Draft Economic and Social Report, prepared by Hennison, Durham, and Richardon, Ecosciences Division, Santa Barbara, California, June 15, 1977, pp. 2-92, 2-93.
- d. Santa Barbara County Department of Public Works, 1975, and letter of 5/17/78.
- e. Lompoc Department of Public Works, 1975.
- f. Figures for current wastewater flow (Lompoc through Guadalupe) are from the individual service districts as compiled by the Santa Barbara County Water Agency.
- g. City of Santa Maria, Department of Public Works, May 10, 1978.
- h. This estimate was calculated by dividing the existing population by the percent amount of sewage capacity being expended. Because of the limited accuracy of this method, it was employed only where specific figures for total population capacity could not be found.
- i. Personal conversation, January, 1978. Central Coastal Basin, California, Regional Water Quality Control Board, San Luis Obispo, California.

CONCLUSIONS AND RECOMMENDATIONS

The complex issues of water supply alternatives and distribution should be evaluated within the authority and expertise of the Santa Barbara County Water Agency and its Board of Directors. Obviously, the land use recommendations of the Comprehensive Plan will affect future water demand and must be taken into consideration in any supplemental water supply decision. The final determination rests with the voters of Santa Barbara County, and ultimately with the Board of Supervisors. The Conservation Element will be updated as necessary to reflect current water resources conditions.

The County's and the cities decisions on land use and development projects should be based on the following water resources policies:

- The County and the cities should support the Regional Water Quality Control Board in its establishment of discharge requirements for point source waste discharges, in order to protect surface and groundwater supplies.
- Use of streams from which groundwater recharge takes place should be regulated to ensure that the recharge capability of the channels is not impaired.
- Land use and development upstream from surface reservoirs should be regulated and monitored by the County Department of Public Works and the County Planning Department in order to minimize the production of water polluting wastes.
- The County should initiate a study of land development in areas relying on septic tanks to assess the impact of alternate densities on water quality.
- On the basis of the adopted Water Quality Control Plan for the Central Coastal Region, the County and the cities should review their policies for protection of local water resources to determine what changes may be necessary.

Ecological Systems

INTRODUCTION

In developing recommendations on the environmental biology of Santa Barbara County for the Conservation Element, we have done two different things. First, we have described the ecological communities as they exist, and while there may be minor questions of the exact location of some species, this part of the process is straightforward. Second, we have made decisions that lead to recommendations on how each piece of land should be used in the future. This step clearly required us to make judgments, and these reflect our personal knowledge and biases. It is important, therefore, that we state what our biases are and how we made the judgments.

As biologists and ecologists we are convinced that a major effort should be made to preserve as much biological diversity as possible, and our reasons for this conviction are presented in the next section. In particular, Santa Barbara County is a unique ecological oasis along a coast that is rapidly becoming a megalopolis. Happily, Santa Barbara County is well endowed with a diversity of ecological communities; for example, it contains at least small patches of half of the plant communities found in California (Munz, 1970). Furthermore, its peculiar history and the environmental awareness of its citizens make it far more likely than other areas to succeed in preserving this large range of communities. In our judgment, therefore, the ecological goal for the County is simple: we hope that wise planning can ensure that in 50 or 100 years the natural (and semi-natural) environments of the County will look much as they do today.

The major process affecting that goal is land use. Lee M. Talbot, of the National Council on Environmental Quality, noted (Haskins, 1974) that, in spite of the great concern over pollution, as far as preserving diversity is concerned, pollution "is about the least important aspect of environment" - because it is often reversible. But changing land use, he noted, can eradicate habitats and exterminate species. Pollution also is a great simplifier, but its effects are hard to control. By contrast, the effects of land use are usually obvious, and therefore we can more easily make wise decisions.

In the remainder of this chapter we present our reasons for preserving diversity in Santa Barbara County and some simple general rules for choosing natural communities to protect. We then explain how we mapped each type of community, and how we used the available information about the community (its rareness, usefulness for scientific study, the degree to which it is endangered, and so on) to reach a recommendation on its future use. These recommendations are summarized on the Environmental Biology maps.

PRESERVATION OF BIOLOGICAL DIVERSITY: THEORY AND RULES

We present here (1) the reasons why natural and semi-natural biological communities should be preserved; (2) the basic ecological considerations that determined how we chose particular areas for protection; and (3) a set of simple rules that guided the way

we mapped our chosen sites.

Preserving Natural Systems

We present below some reasons for preserving species, a need that is recognized already by the State in its laws on rare and endangered species, and on conservation and open space planning. But first we must stress a fundamental point: to preserve species in nature we need to preserve whole biological communities and the environment in which they live, that is we need to preserve ecosystems. For example, raptorial birds need small mammals or small birds as food, and they in turn need a variety of seeds and insects, and they in turn require a variety of plant species. The birds may need one kind of habitat to nest in and another to feed in and these may need to be close together, while the insects have different things they eat at different times of their lives. Furthermore, it is extremely unlikely that we can preserve solely the web of species that directly supports the bird and its prey species. Since we usually cannot predict the consequences of major changes in a community, we usually have to preserve it as it comes - with perhaps some management. So, the preservation of biological diversity becomes the preservation of ecosystems.

Why should we make the effort to preserve the species that now exist? After all, millions of species have become extinct through geological time and in our own history we have accounted for thousands. In the last 3 centuries we have driven extinct about 100 bird species and over 50 species of mammals (perhaps as many as 80). Furthermore, the rate of extinction is accelerating alarmingly: 25 of the 47 species of wildlife lost in the U. S. in the past 270 years became extinct in the last 50 years. In spite of all this, we seem to be surviving pretty well; it seems as if we didn't need the Dodo anyway. Couldn't we do just as well without the Condor, Bald Eagle, and numerous other species that live in natural communities? The answer undoubtedly is that we certainly could survive pretty well without some of them, but it is not clear what the minimum number is that constitutes a viable biosphere, or which species they are; and, more difficult, it is not clear which species are now or might someday be useful, or which species are a necessary part of an ecosystem that contains species that someday might be useful. Each species gone is an option foreclosed, and it is impossible for us to tell which options the human race might someday want to take up. Thus, the conservative procedure is to preserve as many different types of ecosystems as we can, in each case preserving at least the minimum number of areas that is necessary for the community to maintain itself indefinitely. Since we know so little about the factors that are important in determining the long-term survival of ecosystems, we have to make generous estimates of the minimum needed.

Estuaries on the California coast provide an example of rare ecosystems that probably are dangerously close to the minimum. These are few and far apart, and, except for a very few, they are small. Yet, they are extremely important in supporting a large number of bird species, many of which migrate along the coast. Furthermore, the organisms in the estuaries cast their young into the ocean and "seed" other estuaries, so that estuaries depend upon other estuaries for recruitment. As estuaries become fewer and

smaller, we run the risk of losing not only bird species but resident estuarine species also.

There are at least five reasons for preserving natural communities and as much genetic diversity as possible. First, many natural ecosystems are of obvious direct benefit. For example, forests on hills and along stream and river courses protect the soil from erosion; trap rain, and slow its runoff rate, thus facilitating recharge of groundwater basins. Forests lower wind speed and water movement, thus slowing erosion on adjacent agricultural lands. Trees and other vegetation in agricultural areas serve the same purpose. Forests (and other dense vegetation) also cause the local climate to be wetter, and their removal in semi-arid areas, such as the northern shore of the Mediterranean (whose climate is like Santa Barbara's), has caused deserts to be created in formerly agricultural areas. Many natural systems also directly provide food, game, fisheries, and wildlife. Estuaries are extremely important as "nurseries" for many species of fish and for the prey species that the fish depend on. Perhaps as much as 30 per cent of the world fish catch is dependent in some way on estuarine waters, and this percentage is at least twice as high in the United States. Inshore ocean communities themselves are the world's major source of fish protein. The significance of these ecosystems is enhanced because the seashore, and estuaries in particular, are precisely the regions that have the fastest growing populations and that attract industry. Thus, estuaries not only are exceptionally useful natural areas to man, they also are under the greatest pressure from development and are "sinks" for man's pollutants.

Second, unmanaged communities serve a number of indirect functions through which they aid crop systems, the two obvious functions being pollination and the maintenance of a store of natural enemies for pest control. More than half of our crops are pollinated by insects - a service we generally get free. It is true that for some crops we could, and sometimes do, transport honey bees to the fields to help pollination. But this cannot be done with all crops, it is an extra cost, and it would be dangerous to depend completely on our ability to maintain this substitute in the indefinite future. The problem of providing substitutes for natural enemies that move back and forth between crops and wild vegetation is even more complicated and fraught with difficulties, as the history of pesticides has illustrated.

Third, natural communities are a storehouse of genetic information. Each species is a unique experiment which we can never repeat once the species becomes extinct. It is impossible to predict where and for what reason we might want to go to the storehouse - for new crops for food or fiber, for natural enemies, to purify an organic molecule so that we can make its analogue, and so on.

Fourth, we need natural systems as outdoor ecological laboratories. How is it that natural systems are self-maintaining and relatively stable? What determines where species occur and which species occur together? How do predators operate in nature, and can we get ideas from natural systems to use in crop systems? These are just some of the questions we need to ask of natural systems.

Finally, but just as important, a large fraction of our population derives enjoyment from light, non-destructive, recreational use of natural and semi-natural areas, and this is particularly true in Santa Barbara County. Furthermore, as we become more affluent, we can expect this kind of use to grow. This is illustrated by the fact that recently the number of visits paid to National Parks has been increasing at 10 per cent per year (doubling every 7 years) while the U.S. population has been increasing at only 1 per cent (doubling only every 70 years). Thus, areas we set aside now must be large enough and numerous enough to survive the increased use that inevitably will be made of them in the near future.

Some Considerations Governing Classification of Areas

Although natural communities are generally self-maintained and, therefore, in a sense come “free”, it is not true that any randomly chosen part of an ecosystem will survive. To ensure the survival of a given type of ecosystem we have to be concerned with several sorts of problems, discussed below.

Extinction of Populations - The likelihood that a population will go extinct from “chance” events increases as the population gets smaller. Thus, there is a minimum population size below which a species very probably will become extinct. Species with very low birth rates, like the California Condor, are particularly vulnerable because they take a long time to recover from adverse conditions. Small areas that support smaller populations can maintain fewer species than larger equivalent areas. This is illustrated by the fact that fewer species of birds are found on the smaller Channel Islands than on the larger ones and also that the local extinction rate over the past 50 years has been greater on the smaller islands (Diamond, 1969). Small areas support only small populations which can become extinct by accident during occasional storms, fires, etc. Furthermore, some species naturally are rare, for example large animals or those specialized to certain habitats or kinds of foods, and these are usually the first to go extinct on islands.

A nature preserve is destined to become an island in a sea of habitats modified by man. It will lose species as does any other island; and the smaller it is, the faster will it lose them.

Recolonization - Although some populations may go extinct locally, all species have dispersal stages; and, provided other areas in the region contain the species, the local population can be reconstituted by colonists from nearby populations. The evidence from islands again is instructive. The further away islands are from the mainland, the fewer species they have (other factors, such as island size, being equal). For example, one small island isolated during the building of the Panama Canal has lost about one species of bird per year for the past 50 years.

Clearly, then, we must try to ensure, first, that we preserve several examples of each ecosystem so that the inevitable attrition of species in each area can be balanced by recolonization, and second, that the areas are close enough together to allow some

individuals to migrate between areas.

Simplification - All ecosystems are “open” systems in that they receive materials from other areas. No matter how isolated an area is or how careful we are, we will have some effect on it. The history of environmental problems is replete with examples of ecosystems being damaged by seemingly unrelated activities in distant ecosystems. The effects of air pollution in Los Angeles on surrounding agriculture and forests, the movement of pesticides about the earth, the effects of irrigation, the effects of removing upstream groundcover, and the effects of applying fertilizers on water quality elsewhere are among the more notable examples.

We need to be concerned about the cumulative effect of a variety of pollutants on natural ecosystems because all types of pollutants, especially herbicides, radiation, and air pollution, have a uniform effect on communities; they simplify them by selectively killing species that are “non-weedy” and have poor dispersal powers (Woodwell, 1970). Thus, inevitably we will gradually and inadvertently simplify the communities around us, thereby reducing their ability to maintain themselves. The “openness” of ecosystems requires that we surround preserved ecosystems with buffer zones where heavily polluting or disrupting activities are prohibited, and that we also make the areas large enough to withstand inevitable accidental effects from elsewhere in the County. Furthermore, because various harmful materials may penetrate the preserve from outside, and because harmful activities may occur at the edge of the preserve, an optimum shape for a preserve will minimize the length of the edge in relation to total area; so a circular preserve is preferable to a long narrow preserve.

Future Use - Because people’s use of natural areas grows more rapidly than does population, we must plan for much heavier use than occurs now. A doubling or tripling of the amount of use in the next decade is not unlikely. Therefore, we need to be generous in our estimates of areas that should be set aside for light recreation.

Some Simple Guiding Rules - Based on these considerations, we have prescribed some rules for designating natural preserves and other lightly used areas to minimize deleterious environmental effects occurring both naturally and through man’s activities. These rules governing the size, shape, and number of such areas, seem to us only common sense (see Wilson and Willis, 1974). However, the rules provide no magic formula for choosing areas of the right size, shape, or number. Clearly, the minimum size needed to preserve a Condor population is much larger than that needed to protect some lizard species. We cannot calculate the appropriate size for all species or ecosystems, nor do we know precisely how close similar preserves ought to be to ensure recolonization. We have relied on our general knowledge of the natural history of the County’s flora and fauna in making these decisions; and, of course, in many instances we simply have had to accept what few ecosystems of a given type are available.

Briefly, the rules are these.

- Individual preserves must be made as large as possible to minimize the

extinction rate of particularly vulnerable species having low birth rates, such as birds and mammals.

- To minimize the amount of edge in relation to area, preserves should be kept as round in shape as possible.
- Preserves should be clustered as near each other as possible so that if a species goes extinct in one, the chances of recolonization from a neighboring preserve are maximized.
- Where possible, preserves should be surrounded by buffer zones in which only light recreation activities are permitted.

METHODS OF MAPPING AND EVALUATING ECOLOGICAL UNITS

Suppose one looks at the Environmental Biology maps (on file in the County Planning Department) and wants to find out what environmental value a particular place has, what use it can tolerate, and why. The map of the County has been divided into "ecological units". Each unit represents an area supporting a single type of natural ecological community of plants and animals such as coastal sagebrush, native grassland, live oak woodland, marine rocky intertidal zone, etc.

Within the mapped area of each ecological unit is a set of four code numbers representing (1) the particular category of natural community, (2) the ecological value of that community, (3) the use which it can tolerate, and (4) the intensity of that use which it can tolerate. The list of categories, values, uses, and intensities are given in Table 1. For example, the salt marsh at the mouth of the Santa Ynez River at Surf is designated as 34-1-2-2. The first number (34) indicates that it is a salt marsh, the second (1) indicates that its ecological value is an unusual and delicate habitat with several endangered species and consequently of scientific value. The third and fourth digits (2-2) indicate that it can tolerate recreation of a very light intensity, such as photography or bird watching.

TABLE 1. CLASSIFICATION SYSTEM FOR ENVIRONMENTAL BIOLOGY

1. Categories, County-wide Maps
 1. Exposed and protected coastal rocks
 2. Sandy beaches and coastal dunes
 3. Sloughs, closed bays, pilings. and coastal salt marshes
 4. Chaparral and scrub habitats
 5. Grassland
 6. Woodland and savanna
 7. Forest habitats
 8. Riparian forests and riparian woodlands
 9. Swampy habitats and aquatic habitats
 10. Introduced trees and shrubs
 11. Non-irrigated crops
 12. Irrigated row crops

- 13. Orchard or vineyard
- 14. Urban

2. Categories, Study Area Maps

A. Coastal strand and marine habitats

- 10. Exposed rocks. bluff tops
- 11. Exposed rocks. supratidal splash zone
- 12. Exposed rocks, intertidal
- 13. Exposed rocks. subtidal
- 14. Protected rocks, bluff tops
- 15. Protected rocks, supratidal splash zone
- 16. Protected rocks. intertidal
- 17. Protected rocks, subtidal
- 18. Pilings, wharves, and breakwaters
- 19. Coastal dunes
- 20. Sandy beaches. supratidal splash zone
- 21. Sandy beaches. intertidal
- 22. Sandy beaches. subtidal

- 30. Dunes in sloughs or closed bays
- 31. Sloughs and closed bays. supratidal
- 32. Sloughs and closed bays. intertidal
- 33. Sloughs and closed bays. subtidal
- 34. Sloughs and closed bays. from the supratidal marsh to the subtidal

B. Chaparral and scrub habitats

- 40. Coastal Sage ("soft" chaparral)
- 41. Great Basin Sage
- 42. Alkali Sink
- 43. Chamise Chaparral
- 44. Mixed Chaparral
- 45. Deciduous Oak Chaparral
- 46. Serpentine Chaparral associations
- 47. Semi-desert Chaparral
- 48. Montane Chaparral
- 49. Channel Islands Chaparral

C. Grassland

- 50. Native grasslands (usually remnants)
- 51. Introduced grasses
- 52. High altitude grassland - Portrero

- D. Woodland and savanna
 - 60. Central Oak woodland
 - 61. Southern Oak woodland
 - 62. Pinyon Juniper woodland
 - 63. Channel Islands woodlands
 - 64. Foothill woodland

- E. Forest habitats
 - 65. Canyon Oak-Bigcone Spruce
 - 66. Coast Live Oak
 - 67. Interior Cypress
 - 68. Torrey Pine forest
 - 69. Mixed Evergreen
 - 70. Coastal Pine
 - 71. Douglas Fir
 - 72. Mixed Conifer
 - 73. Jeffrey Pine
 - 74. Coulter Pine forest or woodland

- F. Riparian forests and riparian woodlands
 - 75. Lowland riparian woodland

- G. Urban, cultivated, and exotics (introduced trees and shrubs)
 - 76. Introduced trees and shrubs
 - 77. Urban and/or cultivated

- H. "Swampy" habitats
 - 80. Fresh-water marsh

- I. Aquatic habitats
 - 90. Streams, small intermittent
 - 91. Streams, large intermittent
 - 92. Streams, permanent
 - 93. Standing waters, eutrophic
 - 94. Standing waters, mesotrophic
 - 95. Standing waters, vernal pools (coastal valley)

- J. Miscellaneous
 - 98. Fossil deposits

99. Prehistoric and archaeological sites

3. Value Classification (in order of importance)

1. Unusual or delicate habitats, endangered species , and scientific study area
2. Unusual or delicate habitats and endangered species
3. Endangered species and scientific study area
4. Endangered species
5. Unusual or delicate habitat and scientific study area
6. Unusual or delicate habitats
7. Scientific study area
8. None of the above

4. Tolerance to Other Uses (in order of importance)

1. Only regulated scientific study
2. Recreation alone
3. Managed production of commercial biological resources alone
4. Managed production and recreation
5. Agriculture alone
6. Agriculture and managed production
7. Agriculture, managed production, and recreation
8. Urban development
9. Urban development and recreation

5. Intensity of use

1. Only regulated scientific study
2. Very light (observation of animals and plants, sketching, photography, etc.)
3. Light (hiking, backpack camping, line fishing, bicycling, education programs without collecting, low density informal picnicking without tables or cooking facilities)
4. Moderate (spear fishing, hunting, picnicking with tables and fire pits, informal ball games without permanent fixtures, horseback riding, low density, easy access camping with water and sanitary facilities but no electrical outlets and less than 5 sites/acre, light geologic or biologic specimen collecting by amateurs)
5. Heavy (trail bikes, dune buggies, high density group picnic areas with shelters, fire pits and tables, high density auto access camping areas with electricity, water, sanitary facilities and 6 to 20 sites/acre, recreation uses with permanent facilities)

In the following sections, we explain how we arrived at the mapping and coding system, how we decided to map what we did and how we arrived at value, tolerance, and intensity levels for mapped areas, habitats, and communities.

Categories

Because one of the best ways that a biologist can classify geographic areas is on the basis of their vegetation, we have decided to use plant communities as the major map category. Of the 29 California plant communities Munz (1971) describes, more than half can be found in Santa Barbara County. For purposes of accuracy and to maintain the potential for adequate description, we have subdivided these 15 communities into a somewhat larger, more descriptive, and more complete list.

Since the distribution of animal species usually conforms with the distribution of the particular plant communities in which they live, maps of animal and plant communities often coincide. The White-tailed Kite, for example, prefers as prey California Meadow Mice, which inhabit grassland. Where we wished to call attention to the kites, therefore, we mapped two areas of grassland, one with kites and one without.

Rare or endangered species also were mapped on the basis of plant communities. Certain birds (Black and Clapper Rails) are restricted to salt marshes, for example, and it is extremely unlikely that one could find them anywhere else. Similarly, certain plants (e.g. Cirsium rhotophilum) are restricted to coastal dune habitats. However, other rare or endangered species such as the California Condor, are not restricted to a single plant community. To map these species, we determined the area of the organism's most intensive use, or likely distribution.

When the animal species' distribution does not conform exactly with mapped plant communities these plant communities were sub-divided. Then different parts of the same plant community received different "values", "tolerances", and "intensities" (see below). Similarly, we sometimes sub-divided plant communities and gave the different parts different values for other reasons, such as the presence of a stream in one section.

Biological Values

Values such as "rare and endangered species" and "unusual or delicate habitats" provided the biological criteria for assigning tolerance and intensity levels. Of prime importance here was the degree to which species or communities are rare in Santa Barbara County.

In general; biologists place highest environmental priorities on areas, regardless of apparent scenic value, approximately in their natural condition, undisturbed by European man. Even though no pure examples can be found in the County, numerous areas exist where this disturbance has been light, or where there is little or no

disturbance at present, as in portions of Vandenberg Air Base and the Channel Islands. Undisturbed areas not only support “natural” biotas but, at the same time, may serve as “refuges” for organisms that are uncommon or rare elsewhere. Thus, Bald Eagles, which formerly nested in several places along the South Coast, now only winter in the extreme eastern, undisturbed portion of Lake Cachuma.

We also are extremely concerned about preserving some examples of all of the biotic communities found in the County. Where communities, like mixed coniferous woodland, are very rare and thus represent a very small portion of the County, most localities were mapped. However, for abundantly represented communities, such as chaparral, only prime examples or remote, undisturbed patches were recommended for preservation. It should be obvious, however, that we cannot be certain that our mapping is all-inclusive, especially in instances where the exact location of a community is unknown.

Several communities are quite rare in the County, but this does not necessarily connote rareness throughout the State. Perhaps our rarest community, the Douglas Fir forest (we have only one extremely tiny stand), actually is one of the most abundant coniferous trees in the Pacific Northwest. Similarly, mixed coniferous forest, mixed evergreen woodland, Great Basin sagebrush, and interior cypress forest, all rare communities in the County, are moderately abundant and widely distributed in the northern part of the State. On the other hand, Bishop Pine forest (a representative of closed cone pine forest), coastal salt marsh, coastal dune, and vernal pools are all uncommon or rare, regardless of where one looks.

We have approached this “relative rareness” problem with the belief that Santa Barbara County should be regarded as a discrete entity. If a community is common in other parts of the State but uncommon in the County, then we have regarded it as an “unusual habitat”. This approach will maximize and maintain the biotic diversity of the County. In a few instances, locations were mapped for less well defined biological reasons. The lower reaches of Happy Canyon, for example, are of extreme scenic value (a subjective feeling), because of an abundant spring wildflower display.

Tolerance to Use

The statement that some biotic communities are more tolerant of disturbance than are others may seem obvious; yet historically the treatment received by natural communities in national, state, and regional parks and preserves indicates that many people do not understand this fact. Mixed chaparral is extremely tolerant to disturbance. This community can and should be completely burned, yet will recover in a relatively short time. Moderately heavy hiking does not harm it extensively, and very thick chaparral is essentially impenetrable. On the other hand, certain plant communities are so sensitive to disturbance that they have almost completely disappeared. Native grassland, for example, is almost non-existent in the State because grazing, heavy traffic, and competition with introduced grasses essentially have eliminated it. The coastal strand and dune community is another example of an extremely delicate community. Highly specialized organisms live in this unstable, “oozing” substrate. Traffic damages

vegetation, thus accelerating sand movement and making seed germination an uncommon event. Without roots in the sand, mammals cannot maintain their burrows.

Intensity of Use

Stating whether a community was tolerant or intolerant to a particular use does not convey enough information because a community tolerance varies with the specific type and intensity of use. A Douglas Fir forest, for example, normally should be moderately tolerant of traffic. The tiny Purisima Hills stand, however, is on a rather steep slope; and traffic would promote erosion, thus further threatening the trees.

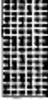
Recreation can be conducted at varying degrees of intensity. Wildlife watching, photography, and hiking can be done almost anywhere without damaging the community. At the opposite extreme, off-road recreation vehicles (ORV's) create erosion, mar the landscape, grind plants, frighten animals, and annihilate the natural environment. In an area heavily used by ORV's, few species survive.

ENVIRONMENTAL BIOLOGY

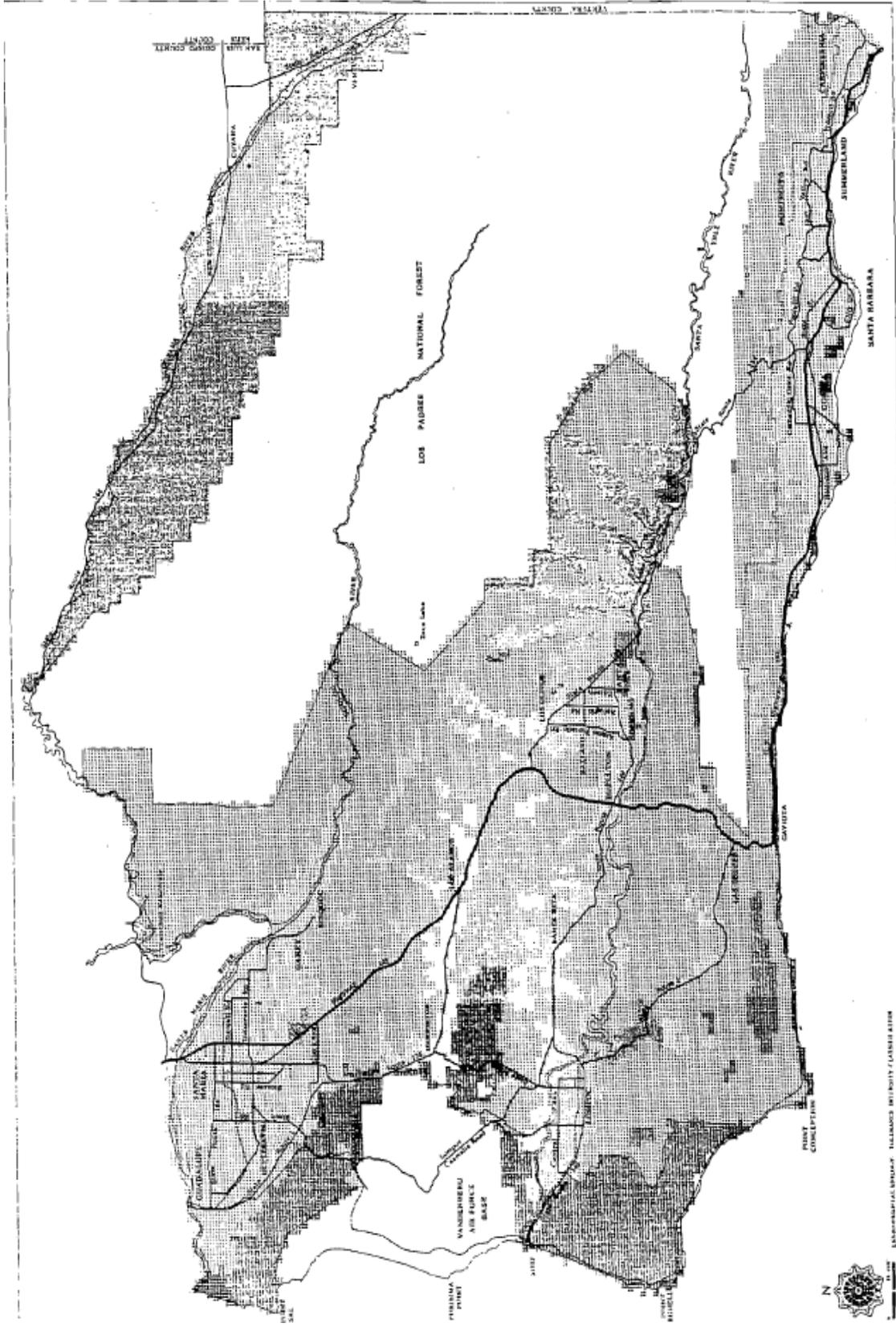
*Santa Barbara County
Environmental Biology:
Value Classification*

	Unusual or Delicate Habitat, Endangered Species, and Scientific Study Area (1)
	Unusual or Delicate Habitat and Endangered Species (2)
	Endangered Species and Scientific Study Area (3)
	Endangered Species (4)
	Unusual or Delicate Habitat and Scientific Study Area (5)
	Unusual or Delicate Habitat (6)
	Scientific Study Area (7)

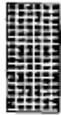
Santa Barbara County Environmental Biology: Tolerance-Intensity Classification

	Tolerant Only to Regulated Scientific Study (1-1)
	Tolerant Only to Very Light Intensity Recreation (2-2)
	Tolerant Only to Light Intensity Recreation (2-3)
	Tolerant Only to Moderate Intensity Recreation (2-4)
	Tolerant Only to Heavy Intensity Recreation (2-5)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Moderate Intensity Recreation (7-4)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Heavy Intensity Recreation (7-5)

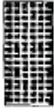
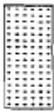
TOLERANCE-INTENSITY CLASSIFICATION-SANTA BARBARA COUNTY



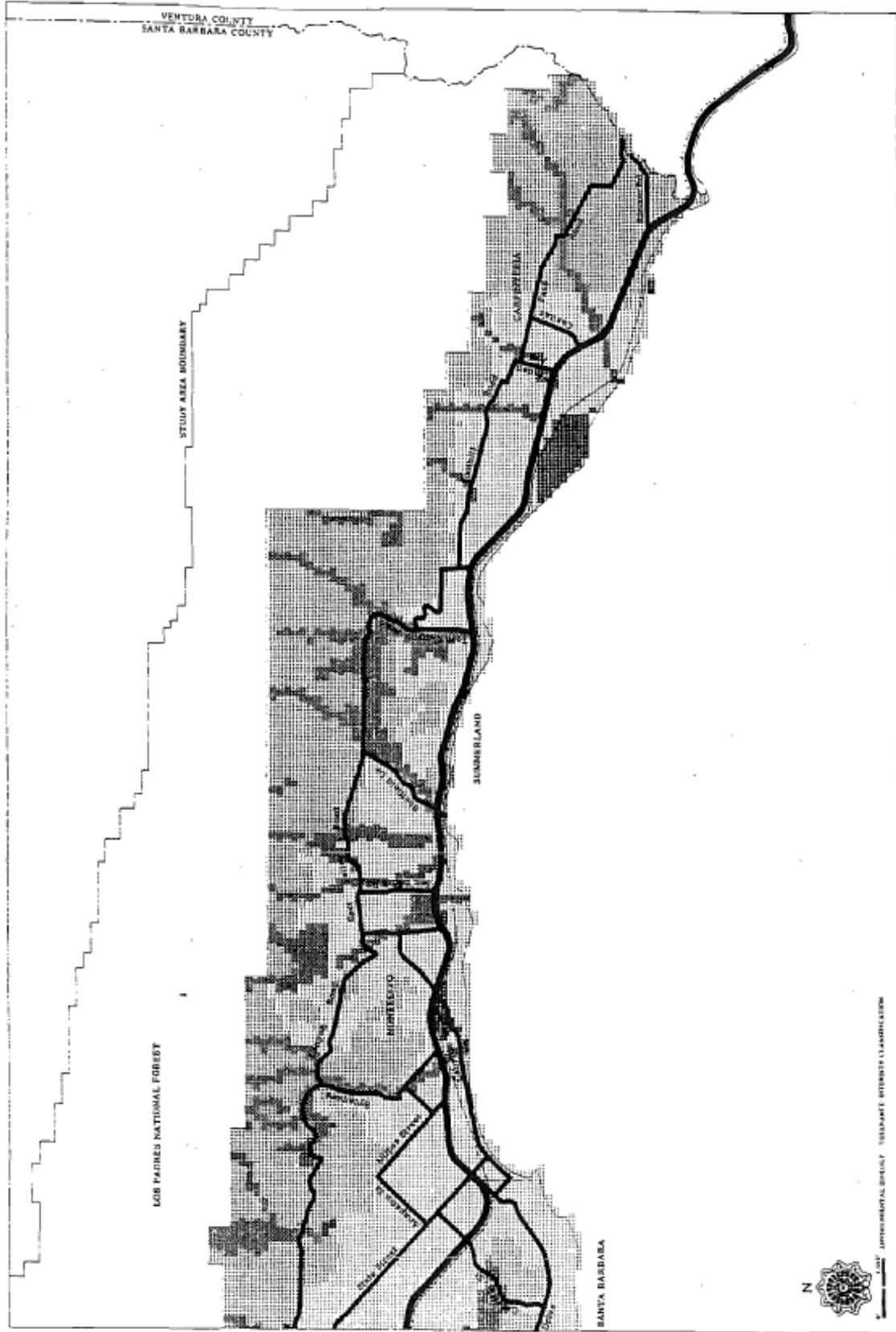
South Coast Study Area ~ East Environmental Biology: Value Classification

	Unusual or Delicate Habitat, Endangered Species, and Scientific Study Area (1)
	Unusual or Delicate Habitat and Scientific Study Area (5)
	Unusual or Delicate Habitat (6)
	Scientific Study Area (7)

South Coast Study Area ~ East Environmental Biology: Tolerance-Intensity Classification

	Tolerant Only to Regulated Scientific Study (1-1)
	Tolerant Only to Very Light Intensity Recreation (2-2)
	Tolerant Only to Light Intensity Recreation (2-3)
	Tolerant Only to Moderate Intensity Recreation (2-4)
	Tolerant Only to Heavy Intensity Recreation (2-5)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Moderate Intensity Recreation (7-4)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Heavy Intensity Recreation (7-5)

TOLERANCE-INTENSITY CLASSIFICATION-SOUTH COAST AREA - EAST



South Coast Study Area ~ West Environmental Biology: Value Classification

	Unusual or Delicate Habitat, Endangered Species, and Scientific Study Area (1)
	Unusual or Delicate Habitat and Scientific Study Area (5)
	Unusual or Delicate Habitat (6)
	Scientific Study Area (7)

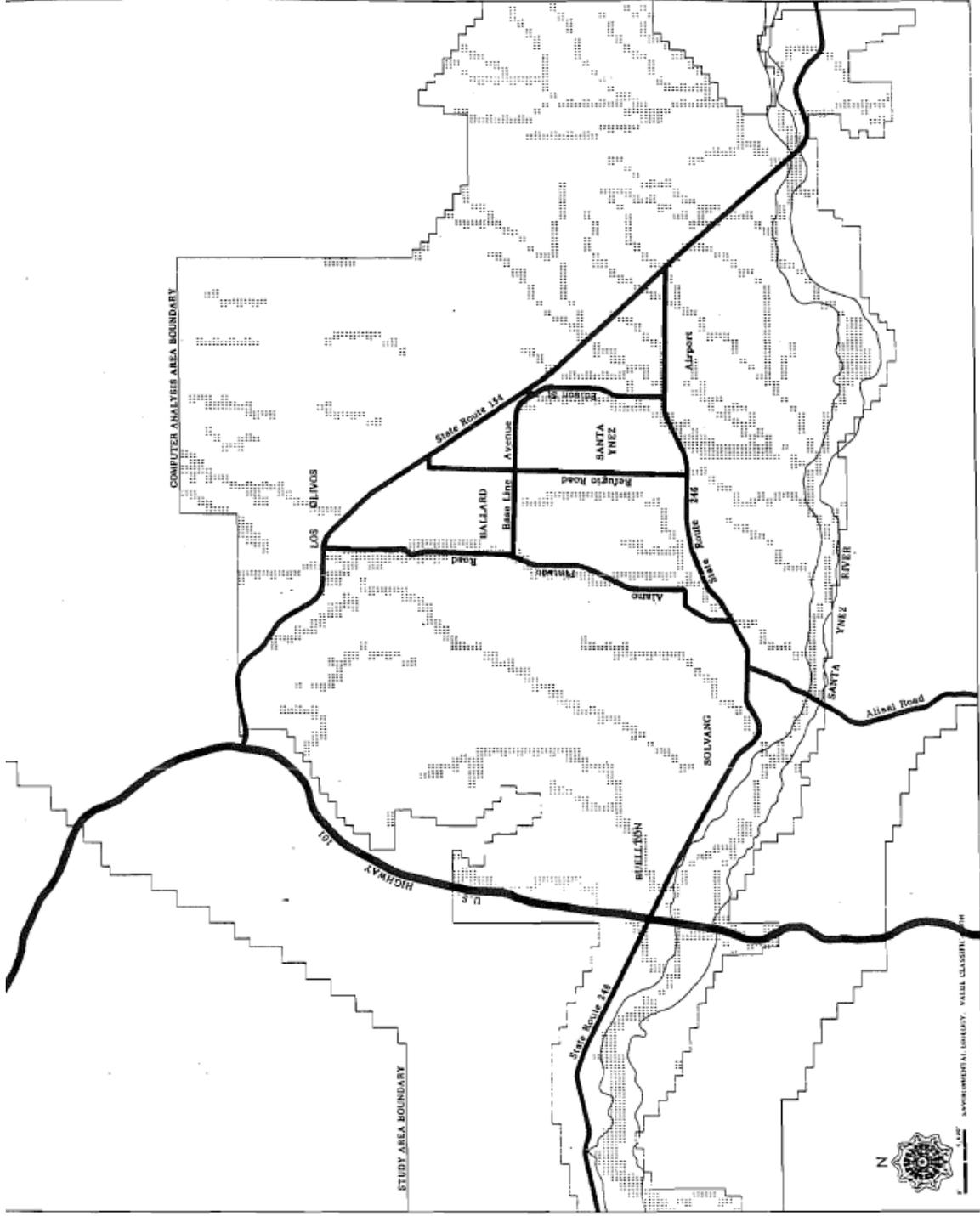
South Coast Study Area ~ West Environmental Biology: Tolerance-Intensity Classification

	Tolerant Only to Regulated Scientific Study (1-1)
	Tolerant Only to Very Light Intensity Recreation (2-2)
	Tolerant Only to Light Intensity Recreation (2-3)
	Tolerant Only to Moderate Intensity Recreation (2-4)
	Tolerant Only to Heavy Intensity Recreation (2-5)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Moderate Intensity Recreation (7-4)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Heavy Intensity Recreation (7-5)

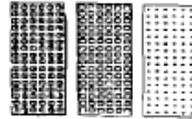
*Santa Ynez Valley Study Area
Environmental Biology:
Value Classification*

	Unusual or Delicate Habitat (6)
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VALUE CLASSIFICATION-SANTA YNEZ VALLEY AREA



Santa Ynez Valley Study Area Environmental Biology: Tolerance-Intensity Classification

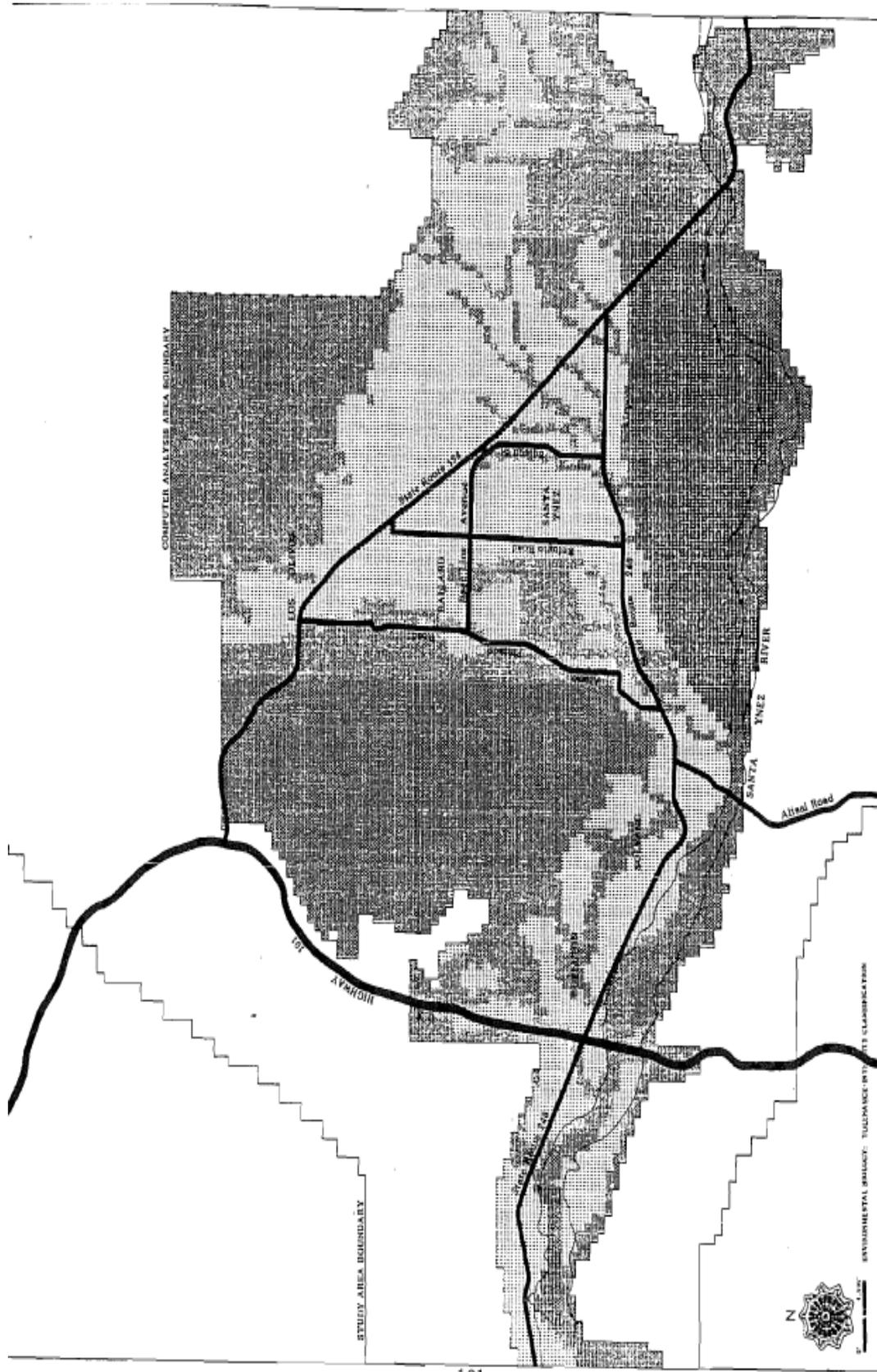


Tolerant Only to Very Light Intensity Recreation (2-2)

Tolerant Only to Light Intensity Recreation (2-3)

Tolerant to Agriculture, Managed Production of Commercial
Biological Resources, or Moderate Intensity Recreation (7-4)

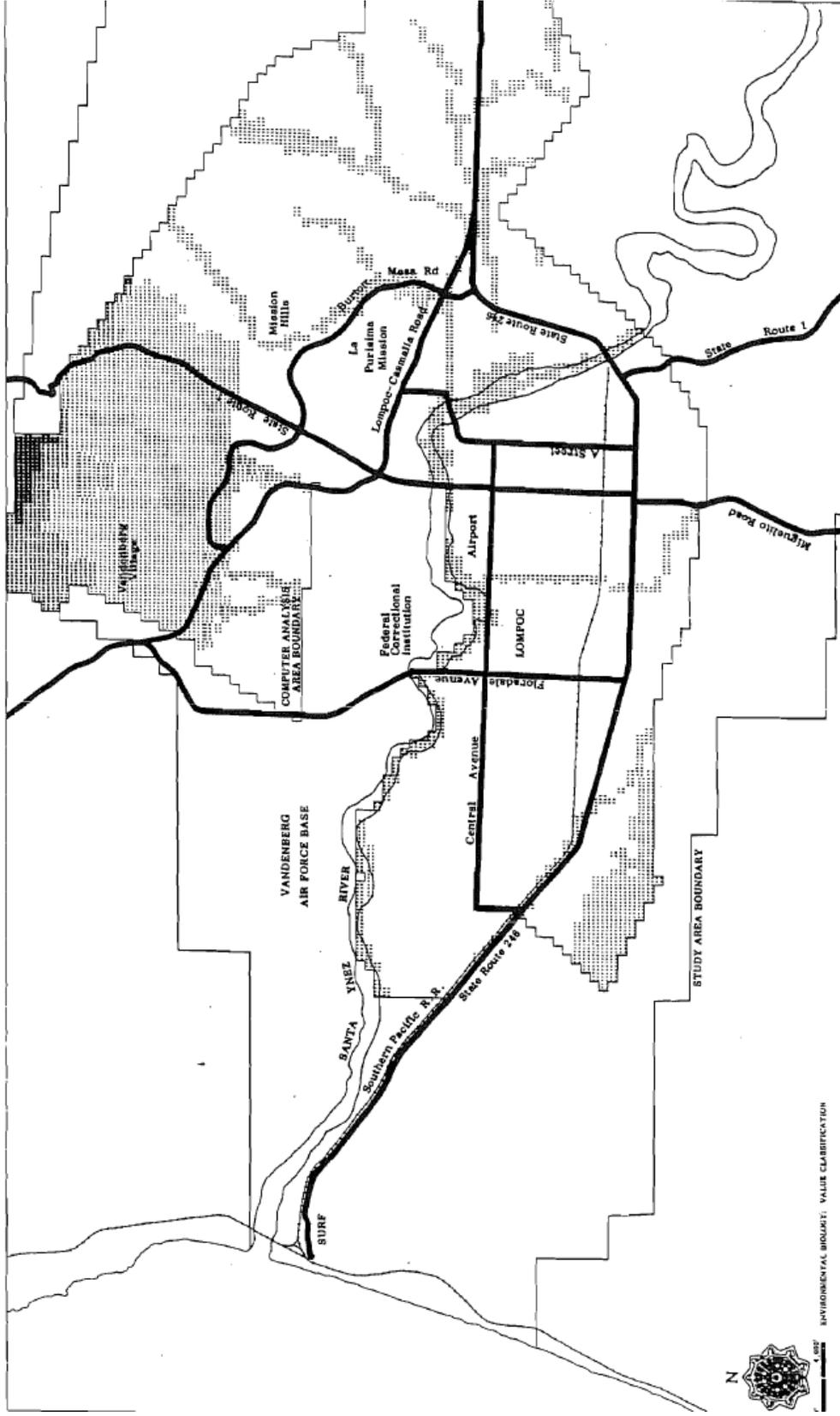
TOLERANCE-INTENSITY CLASSIFICATION-SANTA YNEZ VALLEY AREA



Lompoc Study Area Environmental Biology: Value Classification

	Unusual or Delicate Habitat and Endangered Species (2)
	Endangered Species (4)
	Unusual or Delicate Habitat and Scientific Study Area (5)
	Unusual or Delicate Habitat (6)
	Scientific Study Area (7)

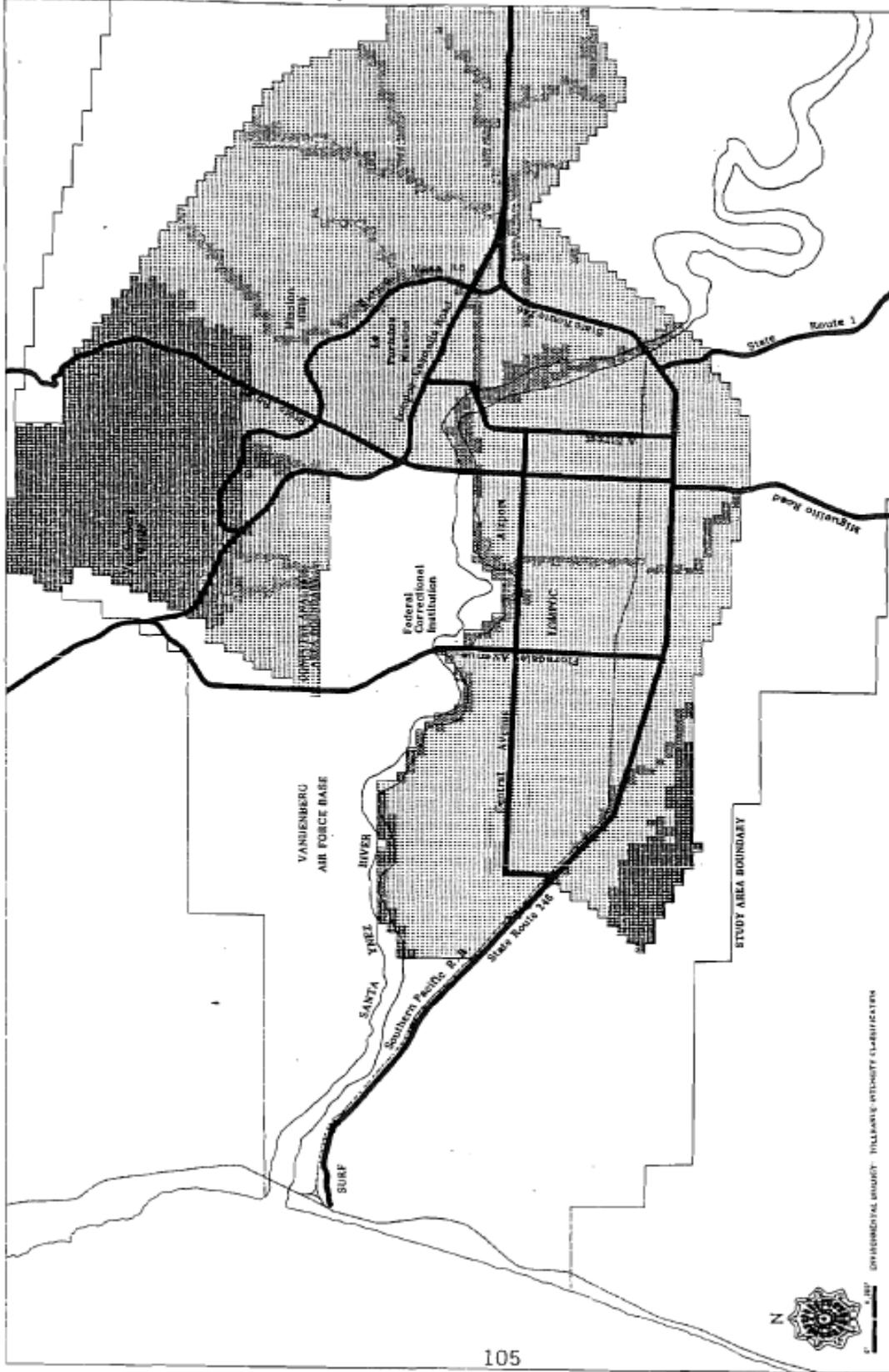
VALUE CLASSIFICATION-LOMPOC AREA



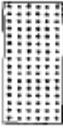
Lompoc Study Area Environmental Biology: Tolerance-Intensity Classification

	Tolerant Only to Very Light Intensity Recreation (2-2)
	Tolerant Only to Light Intensity Recreation (2-3)
	Tolerant Only to Moderate Intensity Recreation (2-4)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Moderate Intensity Recreation (7-4)

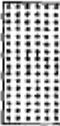
TOLERANCE-INTENSITY CLASSIFICATION-LOMPOC AREA



Santa Maria-Orcutt Study Area Environmental Biology: Value Classification

	Unusual or Delicate Habitat and Endangered Species (2)
	Endangered Species (4)
	Unusual or Delicate Habitat (6)

Santa Maria-Orcutt Study Area Environmental Biology: Tolerance-Intensity Classification

	Tolerant Only to Very Light Intensity Recreation (2-2)
	Tolerant Only to Light Intensity Recreation (2-3)
	Tolerant Only to Moderate Intensity Recreation (2-4)
	Tolerant Only to Heavy Intensity Recreation (2-5)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Moderate Intensity Recreation (7-4)
	Tolerant to Agriculture, Managed Production of Commercial Biological Resources, or Heavy Intensity Recreation (7-5)

The intensity concept adds information to the tolerance scheme. Although intensities were used only to describe recreation activities, they can also be applied to other kinds of activities. For example, commercial exploitation of a resource can be governed by intensity; a party of sport fishermen does not deplete an area to the extent that a fishing fleet does. Similarly, intensities can be applied to agricultural uses. Grazing is less environmentally destructive than is irrigated agriculture.

We have not treated in any detail areas that are now used for urban and agricultural purposes because these generally are not of much biological interest. Activities in these areas, of course, can affect the rest of the County; examples are smog from automobiles harming vegetation, and pesticides or feedlot runoff affecting natural communities elsewhere. While it is clear that some of these activities have more severe effects than others (for example irrigated truck crops probably have more external effects than does light grazing), we nevertheless do not feel competent to make recommendations on the particular use to which agricultural and urban areas should be put. On the maps, therefore, all such areas are designated as tolerant of "agriculture, managed production, and recreation" (7), and "heavy intensity use" (5). Each area mapped for such use includes the area presently used plus some additional area for expansion. We do not mean to imply by this that such uses necessarily should expand to fill the mapped areas; we simply tried to indicate where, on the basis of topography and biotic communities, such uses could expand without destroying interesting ecological areas.

Exceptions to this procedure occur when mapped ecological units, designated as tolerating only light or moderate recreation use, overlap areas presently being used for various kinds of farming. Certain ecological communities occur only on flat or gently sloping lands, and such lands frequently are used for commercial agricultural production. The future survival of these communities obviously is threatened by such intensive use. Therefore, we have drawn our maps to call attention to such conflicts of interest. To rescue such communities as the Central Oak Woodland, Native Grassland, and Lowland Riparian Woodland (categories 60, 50, and 75), suitable examples of these habitats must be set aside to permit recovery of the natural community by careful ecological management. Unless such actions are taken, these ecological communities are doomed to extinction.

Buffer Zones

In setting aside an area to preserve its natural ecological community or a rare species, it is important to establish a zone of reduced use surrounding the preserve, because all communities affect others adjacent to them. To protect streams in areas being logged, the federal Bureau of Land Management currently has a policy of leaving a 100 foot strip on either side of a stream that is used for fishing (Sadler, 1970). Likewise, the federal Water Pollution Control Administration (1970) recommends buffer strips 75 feet wide on either side as the minimum width to protect streams. Clearly, such protection enhances the area downstream as well as the area within the buffer strips. These widths initially were designated with the impact of logging in mind, but they also are

appropriate where agriculture and urban development are likely to affect streams.

In general, the boundaries of an unusual or delicate habitat on our maps were drawn in such a way as to include a buffer zone around it. Sometimes the surrounding zone was designated as tolerating use of a low intensity. Streams selected for preservation either had buffer zones drawn roughly 100 feet on each side, or the adjacent vegetation received a low classification for tolerance and intensity of use.

Sources and Accuracy of Mapped Information

Most of the details of the distribution of the plant communities for the study area maps were taken from a series of U.S. Forest Service maps entitled "Vegetation Types of California" made between 1935 and 1945 by the Regional Forester's Office in San Francisco. The maps, many of which have not been published, are filed in the Map Room of the University of California, Santa Barbara, Library.

Enlarging these small maps 2.5 times to the scale of 1 inch equals 2,000 feet introduced inconsistencies due to photographic distortion and inaccuracies in the original maps. Therefore, physical features such as streams and topography were used to ensure that vegetation zones were correctly located. Without extensive investigation, it is impossible to gauge just how close our mapped ecological communities are to the positions of the actual ones. However, for the purpose of indicating the presence of broad ecological zones the maps are adequate.

SPECIES AND ECOLOGICAL COMMUNITIES OF PARTICULAR VALUE

Those species and ecological communities on the mainland of the County that are of unusual ecological interest and in need of special protection will be described in this section, with rare and endangered birds, reptiles, mammals, and plants discussed first. It should be remembered that the traditional view of preservation, as demonstrated by this list, is very narrow. There is no way to preserve birds, reptiles, mammals, and plants without preserving their environment, which includes a myriad of other species that live in the same ecosystem. Next, we discuss ecological communities that either are rare and/or endangered, or are the prime examples of ecological communities that are common in the County and are not endangered as yet. The high priority areas generally are designated "light recreation" (2-2), but if they are especially vulnerable, they are designated "no other use", i.e. scientific use only (1-1). Only coastal dunes and native grassland fall in this latter category. Species included in the bird, reptile, and mammal sections are taken from At The Crossroad, a volume about rare and endangered species prepared by the California Department of Fish and Game in 1974.

Birds

California Condor (*Gymnogyps californianus*) - This magnificent bird is now limited in range to portions of the coastal counties from Monterey to Los Angeles, and the interior Kern, King Tulare and Fresno counties. Its rapidly shrinking range once extended from

Napa to San Diego and inland to San Bernardino County, but present areas of maximum use include only northern Santa Barbara County and central Ventura County.

The present population described by Koford (1953) as "stable" consists of about 40 birds. Unhappily, the birds have an extremely low fecundity; sexual maturity is attained at 5 or 6 years of age, one female can produce an egg only once each two years, incubation and brooding of a chick takes at least six months. In addition, the chick is totally dependent on the parent until it is about 12 months old. Obviously, the trickle of young into the population is painfully slow, so that disturbance of the breeding population (which might disrupt reproduction) or loss of adult birds can rapidly reduce the size of the population, thus driving the animals to extinction.

Preservation of the species will require a firm commitment to the maintenance of a suitably large refuge. Since a small habitat will support fewer organisms than a large one, we cannot reduce the suitable habitat of this species without losing the Condor. It is recommended that a large portion of northeastern Santa Barbara County be regarded as "for the birds". Hunting should not be allowed in nesting and roosting areas. Koford (1953) reports that about one bird a year was shot in the past.

Peregrine Falcon (*Falcon peregrinus*) - This superb falcon is becoming extremely rare. It is believed to no longer be reproducing east of the Rocky Mountains. According to the State Department of Fish and Game, of the 10 active nests along the entire California coast, the one closest to Santa Barbara County is the oft-plundered nest on Morro Rock. The Peregrine Falcon formerly nested on Santa Cruz Island, and recent sightings have been recorded at the Goleta Slough and in the San Rafael Wilderness. In the foreseeable future no Peregrine Falcon nests can be expected in Santa Barbara County. Birds will occasionally be seen, but these almost certainly will be migrants. The most likely potentially suitable nesting habitats for this dying species will be the Channel Islands (Santa Rosa, San Miguel, and Santa Cruz) and, perhaps, Vandenberg Air Force Base. These areas are relatively undisturbed, and every effort should be made to keep them attractive to these birds.

Southern Bald Eagle (*Haliaeetus leucocephalus*) - Although not as rare as the Peregrine Falcon, this species, our national bird, is rapidly diminishing in numbers and faces the threat of extinction. According to Waldo Abbott of the Santa Barbara Museum of Natural History, several eagles nested in the late 1930's along the South Coast (Dos Pueblos Ranch, Rincon Creek, Mission Creek, Santa Cruz Island, and Anacapa Island) with the Dos Pueblos Ranch nest remaining active for about twenty years.

There have been few recent sightings in the County. One bird, probably a migrant, was seen at the Santa Barbara Bird Refuge in the fall of 1971. Slightly more encouraging, however, is the almost yearly appearance of several wintering birds at Lake Cachuma. Metcalf (1972) comments that one to four birds have wintered at Cachuma in eight of the past eleven years. If we expect these birds to continue to use the area, it is imperative that portions of the lake be left undisturbed. The present policy of limiting camping and recreational activity to the western two-thirds of the lake is suitable. Under

no circumstances should the eastern end of the lake be opened to human use; the continuing presence of the eagles may depend on it.

The California Brown Pelican (*Pelicanus occidentalis*) - To anyone who has seen the grace and ease with which this bird soars within inches of a cresting wave, the possibility of its extinction comes as a shock. Yet, although this bird is a common sight along the County's sea shore, few people realize that there is only one nesting colony along the entire California coast. When it was discovered that this colony of some 300 pairs on Anacapa Island had produced only three young in 1970, the public was horrified. In the past three years the picture has brightened slightly as 7, 57, and 34 young have been successfully reared. In the 1972 season a portion of the colony nested on Santa Cruz Island, a fact of immediate interest to Santa Barbara County.

If the Anacapa a colony is to continue to reproduce, it must not be disturbed. Pleasure craft should not be allowed to go as close to the colony as they presently do. Non-reproducing birds seem to tolerate human activity because they frequent harbors, but efforts should be made to restrict human activity in the vicinity of island roosts.

California Least Tern (*Sterna albifrons*) - The Least Tern, a summer visitor to the western United States, formerly nested in large groups on Santa Barbara and Carpinteria beaches according to Metcalf (1972). Recently, the birds have nested only at the mouths of the Santa Clara and Santa Ynez Rivers, and most birds reported are migrants. The California Least Tern has been largely eliminated from its former range by human activity.

Clapper Rail (*Rallus longirostris*) - The light footed race of the Clapper Rail is now extremely rare. Until 1959, a small group had been known in the Carpinteria Slough; a 1969 report from the Goleta Slough is the only more recent sighting in the County. These birds, restricted to coastal sloughs and estuaries, may be on the verge of disappearance in California because the number of coastal estuaries has declined and the environmental quality of the sloughs has deteriorated. If these birds are to survive in Santa Barbara County, every effort should be made to preserve the size and quality of the three existing South Coast sloughs (Devereux, Goleta, and Carpinteria).

Savanna Sparrow, Belding's Race (*Passerculus sandwichensis beldingi*) - The Belding's race of the Savanna Sparrow, like the Clapper Rail, is restricted to sloughs and salt marshes, where Pickleweed (*Salicornia*) is abundant. The sparrow is suffering the same fate as the rail, for largely the same reasons. The last census of the bird revealed only 11 breeding sites in Southern California, with 1,100 pairs of birds. To preserve this bird, strict conservation measures must be applied to the South Coast sloughs.

California Black Rail (*Laterallus jamaicensis*) - This bird is known to breed near San Diego, and perhaps in other sloughs and estuaries as far north as San Francisco. Sightings in Santa Barbara County are very irregular because the birds are extremely secretive. Because only sloughs provide the suitable habitat, their preservation is

essential if the Black Rail is to be found in the County.

Reptiles

Blunt-nosed Leopard Lizard (*Crotaphytus silus*) - This lizard occurs in the extreme northeastern part of the County (Montanucci, 1970). Its entire range consists of only certain portions of the San Joaquin Valley and surrounding foothills (Stebbins, 1966). Suitable habitat for this interesting lizard, which can eat other lizards and even small mammals, occurs in the extreme lower portion of the Cuyama drainage and the adjacent Ballinger, Santa Barbara, and Quatal Canyons. However, the habitat required by this lizard is rapidly being ruined by ORV's and the expansion of agriculture. Montanucci comments that portions of Ballinger Canyon are so badly torn up that it is doubtful that the lizard persists in the area.

Southern Rubber Boa (*Charina bottae umbratica*) - This snake, a true boa, has been recorded only in the mountainous areas of Riverside, San Bernardino, and Kern Counties. However, in Santa Barbara County, Madulce Peak, Big Pine Mountain, and San Rafael Mountain provide similar communities which probably include the Rubber Boa, and the snake may be unreported because it is extremely secretive.

Mammals

San Joaquin Valley Kit Fox (*Vulpes macrotis*) - The Kit Fox, a small, nocturnal carnivore weighing from four to six pounds, lives almost exclusively on Kangaroo Rats (*Dipodomys* spp.) , and thus, its distribution largely coincides with that of the rodents. Presently, the fox is concentrated in the southern San Joaquin Valley. According to Lyndal Laughrin of the University of California, Santa Barbara, an expert on these foxes, large portions of the Cuyama Valley and surrounding area provide habitat suitable for them. Efforts to prevent the present rapid destruction of much of the Cuyama Valley should be commenced immediately. ORV's, hunting, and predator poisoning should not be allowed in areas shown on the maps that should be left in their natural state. An attempt to determine the numbers of foxes in the area also should be made.

Guadalupe Fur Seal (*Arctocephalus townsendii*) - One sighting has been recorded in Ventura County on San Nicolas Island in 1949. Even though there have been no Santa Barbara County sightings, the seal may occur rarely on several of the Channel Islands.

Plants

Species included in this section are taken from the list compiled by California Native Plant Society in 1971. Species occurring on the Channel Islands have not been included. The distribution of many species is not known exactly. However, we have indicated the probable range of distribution from the extent of the habitat in which specimens were collected.

Cirsium loncholepis Petrak (Gracious Thistle) Sunflower Family - This deep-rooted

short-lived perennial without hair and with solitary or clustered flowers is found locally on coastal dunes and strand only in San Luis Obispo and Santa Barbara Counties. The type locality (locality from which the plant was collected and named) of the plant is near La Graciosa.

Cirsium rhotophilum Blake (Surf Thistle) Sunflower Family - This bushy, deep-rooted, short-lived perennial densely covered with white hair has a white flower. It is found locally on coastal dunes and strand only in Santa Barbara County. The locality is the Surf Dunes and environs. Other coastal dunes also should provide suitable habitat.

Corethrogyne leucophylla Jepson (Branching Beach-aster) Sunflower Family - This perennial with stem tips ascending from a horizontal base, leaves of white wool, yellow disk flowers and violet ray flowers is found locally. On coastal dunes, on coastal bluffs, and in coastal Pinus muricata stands. The type locality is Monterey.

Senecio blochmanae Sunflower Family - This low shrub with slender narrow leaves and yellow flowers is found locally on the Oso Flaco Dunes and probably in Vandenberg Dunes. The type locality is the mouth of the Santa Maria River.

Arctostaphylos refugioensis Gankin (Refugio Manzanita) Heather Family - This manzanita notable for its broad stalkless leaves with bases partially surrounding the stems is found growing in chaparral in the Refugio Pass region of the County. The plant also has been seen in the Jualachichi Summit area on the Jalama Road, and unlocated populations exist in the intervening portions of the Santa Ynez Range.

Agrostis hooveri Swall (Hoover's Agrostis) Grass Family - This slender, densely tufted perennial grass with purplish flower heads occurs in dry, sandy places, especially in low woodlands. Suitable habitat exists from Santa Maria to the north slope of Purisima Hills.

Eriodictyon capitatum Eastw. (Lompoc Yerba Santa) Phacelia Family - This tall shrub with resinous, narrow, entire leaves and lavender flowers usually is associated with stands of Pinus muricata. Known localities include the top of the Harris Grade (Highway 1), Purisima Hills, Pine Canyon on Vandenberg Air Force Base, several places near Lompoc, and the slopes of the extreme western end of the Santa Ynez Mountains.

Thermopsis macrophylla var. agnina J. T. Howell (False Lupine)

Legume Family - This lupine-like, bright yellow flowered, robust perennial herb prefers chaparral, especially on ridgetops, for its habitat. One known locality is on the southwest-facing slopes of Santa Ynez Peak.

Chorizanthe blakleyi Hardham (Blakley's Chorizanthe) Buckwheat Family - This erect, slender, much branched, annual prefers chaparral and grassy habitats, and is distributed locally on the north slope of the Sierra Madre Mountains.

Chorizanthe breweri S. Wats. (Brewer's Chorizanthe) Buckwheat Family - This

ascending to decumbent annual covered with short, grayish hairs is found in dry, rocky places in chaparral and oak woodland, commonly on serpentine, along the north slopes and canyons of the Sierra Madre Range. The only sample in the UCSB herbarium was collected in Schoolhouse Canyon.

Ceanothus impressus Trelease (Santa Barbara Ceanothus) Buckthorn Family - This low, evergreen, densely branched, blue flowered shrub with deeply grooved upper leaf surfaces is found in chaparral in Santa Barbara and San Luis Obispo Counties only. Two known localities are Burton Mesa and the Titan Gate Area of Vandenberg Air Force Base.

Cordylanthus littoralis J. F. Macbride (Seaside Bird's Beak) Snapdragon Family - This small diffusely branched annual with a white flower with purple markings prefers the inland sides of coastal strands and dunes, especially where that habitat includes Pinus muricata. Although listed as growing in Santa Barbara County by the California Native Plant Society (1971), Munz (1973) believes the plant to occur only on the Monterey Peninsula.

Cordylanthus maritimus Nutt. (Saltmarsh Bird's Beak) Snapdragon Family - This small annual with loosely branching stems and a purple flower and hairy foliage is limited to coastal salt marshes from Oregon to northern Baja California. It has been collected in the Carpinteria Slough, and its presence is suspected in the County's other three coastal salt marshes (Goleta, Devereux, and Surf).

Scrophularia atrata Pennell (Black-flowered Figwort) Snapdragon Family - This rather tall, leggy, perennial herb with square stems, opposite leaves and a small, dark maroon flower lives in dry rocky places, particularly if rich in diatomaceous earth. Coastal sage scrub generally is the community with which the plant is associated. Known localities are near Lompoc in the Purisima Hills and in Surf.

Ecological Communities of Greatest Interest

Within the County, fourteen ecological communities have been judged as either rare and/or endangered. The following summary descriptions list the characteristic plants within each community and the major locations. More detailed information, including the value, tolerance, and intensity classifications assigned to each area, is presented in the section on Mapped Areas and Communities.

High Montane Coniferous Forest (Mixed Coniferous Forest) - The plant community consists of large coniferous trees which are characteristic of the Sierra Nevada Mountains. Elements of the community include Sugar Pine (Pinus lambertiana), Jeffrey Pine (Pinus jeffreyi), Ponderosa Pine (Pinus ponderosa), White Fir (Abies concolor), Incense-cedar (Libocedrus decurrens), and California Black Oak (Quercus kelloggii).

The Mixed Coniferous Forest, according to Munz (1970), is found in Southern California in areas with an elevation of 5,000 to 8,000 feet. In Santa Barbara County, this plant

community only is well developed on the peaks of Big Pine, Madulce, and San Rafael Mountains. While California Black Oak is not found on these three mountains, it is found on the Zaca-Figueroa Ridge and on Little Pine Mountain.

Mixed Evergreen Forest - This plant community consists of trees and shrubs commonly associated with the cool redwood forests of the northern coast ranges and the Sierra Nevada. Characteristic plants include Tancak (Lithocarpus densiflora), Madrone (Arbutus menziesii), California Bay (Umbellularia californica), Bigleaf Maple (Acer macrophyllum), and California Huckleberry (Vaccinium ovatum). In the County, this community exists only on the cool, north-facing slopes and canyons of the Santa Ynez Range. Known localities include the north-facing slopes on Mt. Tranquillon, Kinevan Canyon, Painted Cave, Jualachichi Summit, and the north face of the Santa Ynez - especially between Gaviota and San Marcos Passes.

Closed Cone Pine Forest - Bishop Pine (Pinus muricata), the only closed cone pine in Santa Barbara County, is distributed spottily in areas which receive the cool damp oceanic influence. The tree is uncommon both statewide and in the County. Besides being limited to coastal localities, the trees are generally found on low hills and flats. Known localities include Vandenberg Air Force Base, Mt. Tranquillon, the Purisima Hills, an area near Orcutt, the extreme western end of the Santa Ynez Mountains, Jualachichi Summit, and small areas on hills near Lompoc.

Douglas Fir Forest - The Douglas Fir (Pseudotsuga menziesii), the most important lumber tree in North America, also is known as the "Oregon Pine". As the name implies, the focus of the tree's distribution is the Pacific Northwest, typically in the Mixed Evergreen Forest, a community occurring primarily in cool, moist climates. An extremely small stand of Douglas Fir, approximately twenty trees in a canyon of the Purisima Hills, is growing on a diatomaceous shale within a group of Bishop Pine (Pinus muricata). This is the southernmost natural grove known and, as such, is of great scientific interest.

Southern Oak Woodland - This plant community, as defined by Munz (1973), is now quite uncommon due to the rareness of the California Walnut (Juglans californica), an important indicator species. California Walnut (Juglans californica) is found in only four localities in the County, with the two best stands along Jalama and Rincon Creeks. Coast Live Oak (Quercus agrifolia) and other community components also occur at these two spots.

Coastal Dune and Strand - This unique and very delicate community occurs in several places in coastal Santa Barbara County but only about half of these are in an undisturbed state. Dunes can be found north of Point Sal (severely disturbed), between Point Sal and Purisima Point (slightly disturbed), south of Purisima Point (slightly disturbed), around Surf (moderately disturbed), and in Devereux Dunes (part slightly disturbed, and part moderately disturbed). Coastal dunes and strand support an extremely distinctive flora, which deteriorates rapidly with traffic.

Coastal Salt Marsh - This habitat occurs in the following estuaries or sloughs: Surf, Devereux, Goleta, and Carpinteria.

Coastal Bluff - The uncommon plant community in this habitat resides on the steep terrain between the extreme intertidal and the point at which the incline becomes level, with the best examples in the Point Sal area and on Santa Cruz Island. On the South Coast, the dominant plants include Atriplex spp., Coreopsis spp., Dudleya spp., Encelia californica, Opuntia spp., Phacelia spp., and Rhus intergrifolia. North of Point Conception, the floristic composition of the community changes with the addition of Amsinckia spectabilis and Erigeron glaucus. Certain plants also are lost north of Point Conception. Due to the typical steepness of its habitat, any activity which accelerates erosion, such as agriculture, grazing, or construction, is a peril to this community.

Native Grassland - Prior to the introduction of domestic grazers and non-native grasses, large portions of the state were covered with native grasses. At present, native grassland is almost nonexistent. Isolated patches of some native grasses grow in the County; probably the largest patch is along Las Tunas Road in Santa Barbara. Other small patches border Camino Cielo Road along the crest of the Santa Ynez range and the coast, west of Goleta.

Interior Cypress Forest - According to the fossil record, Cyresses are not as successful as they once were. Throughout the state, cyresses occur in small patches and usually grow on poor soils. In Santa Barbara County the sole Cypress grove (a stand of Cupressus sargentii) is located just northeast of Zaca Lake.

Canyon Oak - Big Cone Spruce - In general, the Big Cone Spruce (Pseudotsuga macrocarpa) is most common in the eastern third of the County, but small groups of trees are scattered throughout the County in places such as Figueroa Mountain. Its association with the Canyon Oak (Quercus chrysolepis) is limited, however.

Coulter Pine Forest - Coulter Pines (Pinus coulteri) are widely scattered throughout the County. The best example of these trees may be seen on Figueroa Mountain and in the Miranda Pine Mountain area of the Sierra Madre Range.

Rare Freshwater Habitats - Vernal pools are temporary standing bodies of water, found usually in small depressions which drain freshwater runoff and are underlain by non-porous soil. They are most common in the San Joaquin Valley, but are patchily distributed throughout the state. Because of their temporary nature, vernal pools support a highly specialized set of species, many of which only can be found in vernal pools.

Zaca Lake is Santa Barbara County's only natural lake. It is small (less than one mile in circumference, and only 46 feet deep), but is extremely picturesque.

Freshwater marshes are rare plant communities in the state, providing a unique habitat with a long growing season and relatively constant physical conditions. Very few

freshwater marshes occur in the County. Several spots along the Santa Ynez River support freshwater marsh communities; other small marshes can be found in Goleta along San Antonio Creek and on the edge of the slough.

Well-preserved Marine Intertidal Zones - Examples of well preserved intertidal zones are rare. At present, there may be very short stretches of the habitat along the beaches of Vandenberg Air Force Base. Most beaches in the County have been depleted of some of the larger and more conspicuous species. At present, even with newly enacted laws, it is still possible to collect anything which is edible. Furthermore, many beach users ignore or are unfamiliar with the laws and collect ornamental items such as shells and starfish. Fishermen use numerous worms and mussels for bait. Curious beachgoers kill many organisms by walking on them, exposing them to harsh conditions (by turning rocks), or by picking them up. As more and more intertidal areas are thus depleted of organisms, the process of replacement of lost individuals by young is slowed and even halted.

Prime Examples of Common Ecological Communities

In the following section, we delineate prime examples of ecological communities which are not uncommon. We believe that the relatively small areas we mark as prime examples, however, should receive the same consideration and treatment as communities previously listed that are rare or unusual in the County. Prime examples are patches within a large expanse of a given plant community that possess the dominant species of the community, and that remain in a relatively undisturbed state.

Prime examples have been mapped for the following categories:

- 13. Exposed Rocks, subtidal
- 40. Coastal Sage
- 41. Great Basin Sage
- 43. Chamise Chaparral
- 44. Mixed Chaparral
- 46. Serpentine Chaparral Associations
- 48. Montane Chaparral
- 60. Central Oak Woodland
- 62. Pinyon Juniper Woodland
- 64. Foothill Woodland
- 90, 92. Freshwater Streams

Exposed Rocks, subtidal (13) - Naples Reef is a prime example of this community. It is well known to scientists and recreational users as the best reef in the South Coast area. It supports an extremely large and diverse biota. Naples Reef is offshore, approximately six miles west of Goleta.

Coastal Sage (40) - This community, sometimes called "soft chaparral", is abundant in the County and usually found on dry and rocky slopes below the chaparral. The

community is dominated by California Sage (Artemisia californica). Prime examples can be found along Jalama Road and on the lower, southern flanks of Figueroa Mountain.

Great Basin Sage (41) - This plant community, dominated by Great Basin Sage (Artemisia tridentata), is extremely abundant in several western states and in eastern California. In Santa Barbara County, it can only be found in the Cuyama River Basin. The prime examples of the community occur in Ballinger, Quatal, and Santa Barbara Canyons. They support two endangered animals: Blunt-nosed Leopard Lizard (Crotaphytus silus) and San Joaquin Valley Kit Fox (Vulpes macrotus). We have delineated the habitat in the bed of the Cuyama River and its adjoining canyons. Since this area has been damaged extensively by ORV use (Montanucci, 1970), the precise area to be preserved should be determined by a field survey.

Chamise Chaparral (43) - This community, dominated by Chamise (Adenostoma fasciculatum), also is abundant in the County, and a prime example occurs on the slopes of Refugio Canyon. In this area, the community also contains a patch of the interesting parasitic plant Indian Warrior (Pedicularis densiflora).

Mixed Chaparral (44) - The prime example of this community is found on both sides of the San Marcos Pass area and to the east in the mountains. The community is composed of the following dominant genera: Rhamnus, Ceanothus, Arctostaphylos, Cercocarpus, Heterorneles, Yucca, Adenostoma, Prunus, Quercus, Rhus.

Serpentine Chaparral Association (46) - Because of its peculiar mineralogical properties, serpentine soil supports unusual plant communities. Certain characteristic species may be absent, while the community may be enriched by other unusual species. Prime examples of serpentine chaparral occur near Figueroa Mountain, close to De La Guerra Spring and Ranger Peak.

Montane Chaparral (48) - Different species of several lowland chaparral genera compose the Montane Chaparral community, including Ceanothus, Arctostaphylos, and Quercus. A prime example of this high altitude chaparral occurs in the McKinley Mountain lookout area.

Central Oak Woodland (60) - The dominant tree in the Central Oak Woodland is Valley Oak (Quercus lobata), which is widely distributed in the Santa Ynez Valley. A prime example occurs in Happy Canyon, and a more open savanna woodland occurs adjacent to the Santa Ynez River between Solvang and Lake Cachuma.

Pinyon-Juniper Woodland (62) - This plant community, usually found at elevations between 5,000 and 8,000 feet, is dominated by Pinyon Pine (Pinus monophylla) and California Juniper (Juniperus californica). The community is much more common in the desert portions of the state but is well represented in the northeastern Sierra Madre Mountains of Santa Barbara County near upper Cuyama Valley with a prime example extending about six miles east of Fox Mountain.

Foothill Woodland (64) - This plant community, dominated by Digger Pine (Pinus sabiniana) and several oaks usually is found on the slopes of inland valleys in the central portion of the County with some of the best examples located on the lower slopes of Figueroa Mountain.

Freshwater Streams (90. 92) - Most of the small freshwater streams in the County are intermittent, but a few flow continuously over short stretches. The following were chosen as prime examples: Rattlesnake Creek, Mission Creek, San Roque Creek, San Jose Creek, Dos Pueblos Creek, Tajiguas Creek, Arroyo Hondo Creek, Refugio Creek, Jalama Creek.

MAPPED AREAS AND COMMUNITIES²⁰

The following section contains a set of detailed descriptions of the different categories of ecological communities. It explains how we made our decision to classify each one as to its tolerance to a particular type and intensity of use. The numbers refer to the categories shown on the maps on file in the County Planning Department. All areas of ecological interest that were mapped are analyzed in this section. Following each location, the ratings assigned for value, tolerance and intensity of use are noted in parentheses. The code numbers refer to the list in Table 1. The distribution of the value and tolerance-intensity classifications is shown on the computer maps.

Coastal Strand and Marine Habitats

12. Exposed or Protected Rocky Intertidal Areas - Rocky points are noted for a distinctive and abundant biota. Only highly adapted organisms can tolerate conditions of an exposed rocky point - extreme wave shock, harsh and varying environmental conditions, and usually high intensity human use (and abuse). Also, all rocky intertidal areas are highly susceptible to disturbance and thus are very delicate. Rock turning (without returning), foot traffic, and handling are all highly injurious to intertidal forms. Collecting is destructive, and natural replacement by planktonic larvae of new individuals from other rocky points may be slow because rocky points usually are separated by long stretches of sandy beach.

Carpinteria Reef and Adjacent Coastal Bluffs (5-2-2)

Location: At the extreme southern edge of Carpinteria State Beach, together with the coastal bluffs for the next mile to the south.

Biological comments: The small reef exposed at low tide probably represents the most diverse intertidal area on the mainland south of Point Arguello. Representatives of relatively large taxonomic groups are commonly present at Carpinteria Reef and absent in other areas. Some species, rarely encountered at all on the South Coast (Elysia, Tigriopus, etc.), have been seen in the Carpinteria intertidal zone.

Recommendations: Due to the general fragility of intertidal rocky habitats, any collecting

at Carpinteria should be strictly prohibited, and recreational users should be educated as to the fragility of the intertidal zone. Clearly, the area is of high educational and scientific value.

Other North and South Coast Rocky Points

Locations:

Goleta Point (UCSB Campus Point), just west of Goleta County Beach (5-2-2)
Coal Oil Point, on the West Campus of UCSB (5-2-2) Point Conception (5-2-2)
Point Arguello (5-1-1)
Purisima Point (5-1-1)
Point Sal (5-2-3)

Biological comments: Many plants, invertebrate animals and conspicuous fish occur on or near rocky points. North of Point Conception a more diverse and entirely different fish community is to be found. Certain birds and mammals also frequent rocky points. Oystercatchers, certain Sandpipers, Turnstones, and Gulls all feed in the exposed rocky intertidal of points. The harbor seal (Phoca vitulina), commonly can be seen basking on the lee side of some points. Because the offspring of the benthic, invertebrate species may spend periods of up to several weeks in the plankton, those from one rocky point undoubtedly arrive to settle down on another point far away. Thus, the community (fauna and flora) on a rocky point is not independent of that on other points, and for all the species to exist, it is essential that several separate communities coexist.

Recommendations: The various sets of rocky points on the County's shores have been treated separately on the several maps. Obviously, from what has been said above, the biological makeup of all rocky points should be maintained to ensure the protection of a given one.

Certain of the County's points (Conception, Arguello, Purisima), by virtue of their location on inaccessible property, are less disturbed than others. In fact, it is still possible to find Red Abalone (Haliotis rufescens) intertidally there. It is recommended that these already relatively undisturbed points continue to receive strict protection and be maintained as areas of scientific study.

Point Sal, Coal Oil Point, and Goleta Point, although more disturbed, all have unique characteristics. Point Sal, as well as being extremely scenic, displays some extremely well defined vertical zonation - an interesting biological characteristic. Coal Oil Point, among other things, possesses a remarkably rich intertidal invertebrate fauna. Goleta Point is an extremely fine example of the exposed rocky point, and among other things, supports a large population of the nemertean worm (Emplectonema gracile).

The biological uniqueness of these rocky points argues for special consideration of each. Each one offers marvelous recreation and educational potential. However, recreation usage should be kept light, and an effort should be made to educate the

public as to the delicate and fragile nature of the intertidal. In general, rocky points will greatly improve if all but restricted scientific collecting is prohibited.

12. South Coast Intertidal Zone (5-1-1, 5-2-2, 5-2-3)

Location: The roughly 30 mile segment of the South Coast extending from Point Conception to Ellwood.

Biological comments: The criteria-used in the formulation of this intertidal preserve included the following items.

- Relatively undisturbed nature of the coast. Almost half of the stretch is owned by private individuals, and access to the beaches consequently has been limited.
- Diversity of habitats available for study. Exposed rocks, semiprotected rocks, and exposed and semi-protected sandy beaches would all be included in the proposed preserve.
- The area is of great interest to biogeographers. As a result of the seaward movement of the relatively cold California Current south of Point Conception, a cold water biota is found north of Point Conception, and a different warm water biota occurs south of the Point.
- The area provides a mainland study area analogous to the Channel Islands Scientific and Educational Preserve. At present, qualified study centers can gain access to the undisturbed intertidal zone on certain of the Channel Islands (Santa Cruz Island, Santa Rosa Island). Biologists know that comparisons between mainland and insular biotas can produce understanding of the basic interactions between communities, and between communities and their environments.

Recommendations: The intertidal zone is highly susceptible to human disturbance. Heavy recreational use of coastal areas results in habitat deterioration from collecting, food gathering, and traffic. In most areas, even relatively light recreational use is associated with the disappearance of certain organisms from the area. Realizing that we cannot completely justify the exclusion of persons from a 30 mile stretch of coast (even though at present such a policy applies to much of the Area), we have designated some areas as suitable for light recreation use, and others as only suitable for scientific investigations.

Point Sal (Categories 10, 12, 40) (5-1-1, 5-2-3, 3-2-2)

Location: The northernmost major rocky point (and adjacent beaches, slopes, and chaparral) in Santa Barbara County.

Biological comments: Besides being of biological interest, Point Sal is one of the most picturesque points in the County. The collage of seascape, cliffs, and bluff vegetation is

extremely handsome. Several distinct and well developed plant communities are present near Point Sal. One of the least disturbed patches of Coastal Sage (Artemisia californica and Salvia spp.) in the County exists above the steep slopes of the Point. Certain dominant members of this community (e.g. Encelia californica, a coastal sunflower) reach the northern limit of their ranges in the Point Sal area. Conversely, characteristic members of more northern floras (e. g. Erigeron glaucus), are present at Point Sal, where they reach the southern limit of their ranges. The steep slopes of the coastal bluffs near the Point support perhaps the best example of the limited coastal bluff plant community. Many members of this community (e. g. Coreopsis gigantea) are limited in distribution, or can only be found on steep bluffs.

The species composition of the rocky intertidal at Point Sal also emphasizes the unique nature of the area. Portions of the fauna (Pisaster ochraceus, Mytilus californianus) represent unique opportunities for study of such basic biological interactions as competition and predation. Some of the mussels in the area may be fifty years old. It would be valuable to know, among other things, how they have escaped the numerous seastars. The zonation of the animals and plants in distinct horizontal bands at Point Sal is one of the clearest examples of this ecological phenomenon in the County.

Recommendations: Point Sal is an extremely interesting collection of several biotic communities. It retains much of its biological character because access to it is limited. However, the fact that abalones (Haliotis cracherodii and Haliotis rufesens) cannot be found in the intertidal attests to its present and past human use.

To insure preservation of the existing communities at Point Sal, we believe that the present amount of human use of the area should not be markedly increased. Apparently, a great deal of fishing and beachcombing presently occurs in the Point Sal area. Lifting boulders, bait gathering, and traffic are injurious to organisms, as well as the bluff vegetation, in or near the intertidal zone. Efforts should be made to educate recreational users about correct environmental procedures. The area is ideally suited for status as a "natural area with access permitted."

13. Naples Reef and Inshore Area (1-2-2 and 5-1-1)

Location: Intertidal and subtidal area, six miles north of Goleta, extending a mile or so to sea.

Biological comments: The total subtidal biomass and organismal diversity to be found at Naples is not exceeded anywhere else in the County. Algologists such as Dr. M. Neushul of UCSB believe that the diversity of benthic algae at Naples is the best on the South Coast. Invertebrate zoologists go to Naples to collect scientifically and to observe uncommon organisms (e.g. colonial anthozoans, phoronids, certain bryozoans, and dorid and aeolid nudibranchs). Ichthyologists have found Moray Eel (Gymnothorax) only at Naples and one other Santa Barbara locality. Striped Perch (Embiotica lateralis) is uncommon elsewhere, but is consistently found at Naples Reef. The Catalina Goby (Lythrypnus) can only be seen regularly near the Channel Islands and at Naples Reef.

Recommendations: Because of its unusual biological character, Naples Reef should be maintained primarily as a scientific research and educational area. The Local Coastal Program, in consultation with the California Department of Fish and Game, recommends that continued recreational use of this area be permitted and monitored to prevent depletion of marine resources.

13. KELP BEDS

Location: Subtidal areas along coast.

Biological comments:²¹ Kelp beds are productive environments which serve as fish “nurseries” and thus are important to sport and commercial fishermen and biologists. These kelp beds are harvested regularly. Debate continues as to the effect harvesting may have on the kelp bed fish nursery function and on depletion of the kelp.

Recommendations: Specific studies should be undertaken to determine the effects of kelp harvesting and a management program should be developed to ensure continued productivity of the kelp beds.

20. Coastal Dunes (all 1-1-1)

Locations:

Devereux Dunes, on the southwestern edge of the UCSB West Campus, Vandenberg Dunes, south of Purisima Point and north to Lions Head, Oso Flaco Dunes, north of Point Sal to the Santa Maria river. Surf Dunes, at edge of the estuary at Surf.

Biological comments: Dunes with their associated biotas represent an extremely delicate and unstable environment. The sand constantly is in motion, and the only stabilization of the movement is derived from the relatively sparse, highly adapted vegetation. Any kind of travel over the dunes injures the vegetation, accelerates the movement of the sand, and thus produces environmental damage. The kinds of organisms living there are highly specialized to dunes, and in many instances are limited to them. Because dunes are invariably centers of intense human use, few of them remain in an undisturbed state. Consequently, many organisms characteristic of dunes are uncommon, rare, or endangered.

Munz (1970) classifies dune and coastal strand as a distinct plant community, with the following dominant genera: Franseria chamissonis, Lupinus spp., Abronia spp., Oenothera cheiranthifolia, Fragaria chiloensis, Mesembryanthemum spp., etc. He also notes that many plant species do not extend past Point Conception, from either the north or south. Thus the dunes of Santa Barbara County are especially interesting because of their special and distinct floristic makeup on either side of Point Conception. The California Native Plant Society (1971) lists three species (Cirsium rhotophilum, Corethrogyne leucophylla, and Senecio blochmanae) as rare or endangered and limited to dunes and coastal strand. For example, the type locality (that in which the species was first described) for Cirsium rhotophilum is the Surf dune area.

Recommendations: Because of their extremely delicate nature, dunes should be protected from all but certain scientific and educational uses (portions of the Guadalupe Dunes north of the Santa Maria River, already badly scarred by ORV use, excepted). The Vandenberg Dunes should be protected from military traffic. Ocean Beach County Park at the mouth of the Santa Ynez River should not be expanded. The dune area surrounding the park should be placed in a "preserve" status. The Regents of the University of California should be commended for their inclusion of the Devereux Dunes (under "preserve" status) in the Natural Land and Water Reserve System of the University. The other dunes in the County could be treated in a similar fashion.

34. Sloughs and Closed Bays

Goleta Slough (7-2-2) - An estuary is a tidally affected marshland which receives nutrients from freshwater runoff. Goleta Slough is one of perhaps ten estuaries on the California coast that still are in moderately good biological health. As a habitat (which includes mudflats, tidal channels, and channel bank microhabitats), the Goleta Slough supports a larger and more diverse fauna and flora than does any of the other three sloughs or closed bays in the County (Surf, Devereux, and Carpinteria). It is a major resting point for migratory water-fowl using the Pacific Flyway, with approximately 26 resident bird species and several more nesting summer species. The Black Rail, the light-footed Clapper Rail, and the Belding's Race of the Savanna Sparrow, all rare and endangered birds (California Fish and Game, 1974), may be among the resident species. The Slough's diverse avifauna is documented by observations of the Santa Barbara Audubon Society whose members regularly see rare birds in the area (e.g. Roseate Spoonbill). Although the slough now covers only 360 acres, raccoons, white-tailed kites, herons, bitterns, egrets, and a pair of grey foxes still can be found in relatively undisturbed areas.

The vegetation found in Goleta Slough is characteristic of and limited to coastal salt marshes and estuaries. Munz (1970) describes the coastal salt marsh as comprising a distinct plant community, typified by such genera as Salicornia, Suaeda, Distichlis, Spartina, Limonium, Frankenia, and Cordylanthus maritimus, a rare and endangered plant (California Native Plant Society, 1971). In addition, the slough is floristically enriched by numerous non-slough species.

The presence of certain species of fish and invertebrates further attests to the biological uniqueness of the Goleta Slough. Gillichthys mirabilis, Fundulus parvipinnis, and Platichthys stellatus, although not uncommon species, are limited to coastal estuaries. Hemigrapsus oregonensis, certain gammarid amphipods, Assiminea californica, Melampus olivaceus, Cerithidea californica, and numerous other invertebrates can only be found in the mud flats of sloughs and coastal salt marshes. Some of the latter species reach the northernmost limits of their range in the Santa Barbara Area.

In the Goleta Slough is a representative of a unique and increasingly rare type of habitat - the coastal salt marsh and estuary. Similar habitats in Orange, San Diego, and Los Angeles Counties have long since fallen to development. The slough supports a large and highly diverse flora and fauna, some elements of which are limited to estuaries and sloughs.

Recognized Rare and Endangered Species:

Cordylanthus maritimus

Black Rail - resident (?)

Belding's Race of Savanna Sparrow - summer visitor

California Least Tern - summer visitor

Light-footed Clapper Rail - resident (?)

Devereux Slough (7-2-2) - This small estuary located on the western portion of the UCSB West Campus is quite similar to the Goleta Slough. In addition, the Devereux Slough is close to a stretch of coastal dune. Uncommon, secretive (e.g. Aniella pulchra, a legless lizard), and rare and endangered organisms characteristic of coastal dunes may be located at the edge of the Devereux Slough. The same rare and endangered species found in the Goleta Slough also are found in the Devereux Slough, except for the Clapper Rail.

Carpinteria (Sandyland) Slough (7-2-2) - Many of the comments on the Goleta Slough also apply to the Carpinteria Slough. In addition, it is possible that this slough is less disturbed than the Goleta Slough. Like the Goleta Slough, it represents an "oasis" for migrating waterfowl. Similarly, it supports a large and, in many respects, unique biota, including all five rare and endangered species sighted in the Goleta Slough.

Recommendations on the Goleta, Devereux, and Carpinteria Sloughs:

Estuaries are delicate habitats that require tidal flushing and nutrient input from freshwater runoff to retain their productivity. Clearly, any tampering with either the marine or freshwater inputs decreases this productivity and, therefore, the biota. Traffic should be minimized, and no reduction in the size of the sloughs should be contemplated.

Mosquito abatement activities in these areas probably severely interfere locally with the other biota, especially the invertebrate fauna. These invertebrates are fundamental in

maintaining a diverse slough community; therefore such abatement activity imposes a cost in terms of loss of local diversity. Other potential costs of abatement include the removal of natural checks on the mosquitoes and, where pesticides are used, the increased probability of the mosquitoes developing resistance to insecticides. Resistance could pose a serious problem in the future if a mosquito-transmitted disease developed. These immediate and potential future costs must be balanced against the benefit of the reduction of nuisance mosquitoes. Unfortunately, not enough is known about the relationship between the local density of mosquito larvae in parts of the slough and the amount of nuisance that is created by biting adults; it may well be that quite high densities of mosquito larvae can be tolerated before a severe nuisance is created. We recommend that the Mosquito Abatement District actively seek to reduce control activities to the minimum level needed to prevent severe nuisance levels of mosquitoes. Some effort should also be made to educate the public to the fact that the disadvantage of a few, infrequent mosquito bites is to be balanced against the maintenance of diverse ecological communities in several selected areas such as these sloughs.

Present scientific and education use of sloughs (and the potentially enormous future use) should be regulated and limited to serious investigations and teaching. Recreation usage likewise should be limited and should be restricted to the boundaries of the areas.

Surf Area including Ocean Beach Park (Categories 20, 34, 80) (all 4-2-2)

Location: Salt marsh, small fresh water marsh, and dune area immediately on and surrounding Ocean Beach State Park.

Biological comments: The Surf salt marsh and adjacent area (including dune and freshwater marsh) are of great interest to biologists. The salt marsh, like the other three sloughs in the County, is an oasis for migratory waterfowl using the Pacific Flyway. The marsh also is a distinct plant community (characteristic genera include Salicornria, Suaeda, Distichlis, Frankenia, etc.) which provides habitat for numerous animals. Among the birds afforded suitable habitat by the coastal salt marsh are the endangered summer visitor, Belding's Race of the Savanna Sparrow, and the rare resident Black Rail (California Department of Fish and Game, 1974). The endangered plant Cordylanthus maritimus also is found in coastal salt marsh (California Native Plant Society, 1971). The dunes and coastal strand surrounding the Surf salt marsh are of great interest to the botanist. Cirsium rhotophilum, an endangered plant (California Native Plant Society, 1971), was first collected and described in the dunes of Surf (Munz, 1970). These dunes also contain the southernmost populations of certain coastal strand dominants (e. g. Evening-Primrose (Oenothera cheiranthifolia) and Sand-Verbena (Abronia latifolia) (Munz, 1970).

As the Santa Ynez River feeds the area, its rate of flow is decreased and small pockets of freshwater marsh are formed. Different plants (Scirpus and Typha) and animals (several amphibians) can be found in these regions where they are extremely close to

the more saline slough. Finally, the sandy beach at the mouth of the Santa Ynez River is the only spot in the County where the endangered California Least Tern has recently nested. These birds used to nest in large groups on several beaches in the South Coast area, but are usually now seen as migrants (Metcalf, 1972).

Recognized Rare and Endangered Species

Black Rail - resident (?)
California Least Tern - summer visitor
Savanna Sparrow - summer visitor
Cirsium routhophilum - dune
Cordylanthus maritimus - salt marsh

Recommendations: Quite obviously, the several habitats found at Surf provide a unique assemblage of biotic communities that is not found anywhere else in the County. As all of these communities (habitats) are delicate, they cannot tolerate heavy use of any kind. The rather small County park at Surf should not be expanded, and ORV's should not be allowed on the dunes. Likewise, traffic in the marshes should not be allowed.

40-49. Chaparral and Scrub Habitats: Preserves and Study Areas

Locations:

Mixed Chaparral surrounding San Marcos Pass (7-2-2)
Dwarf Chaparral adjoining the Purisima Hills (7-2-2)
Adenostoma-dominated Chaparral on Refugio Pass Road (3-2-2)
Coastal Sage near Point Sal (3-2-2)
Serpentine Chaparral near Figueroa Mountain (5-2-2)
Montane Chaparral near Cachuma Mountain (3-2-3)

Biological comments: Some of the so-called chaparral habitats are very well represented in Santa Barbara County. Several botanists and authors cite the San Marcos Pass area as a prime example of the Mixed Chaparral habitat. Where Chamise (Adenostoma fasciculatum) dominates the chaparral, some botanists see it as a distinct plant community; a prime example exists on the south-facing slope of Refugio Pass.

Coastal Sage, a plant community dominated by Artemisia californica, and species of Salvia (True Sage), is restricted to the South Coast Ranges, and is usually found below 3,000 feet. The Point Sal area contains a prime example of this plant community.

On the south side of the Purisima Hills, climatic and soil conditions provide a unique and interesting biological event - a Dwarf Chaparral community. Clearly, such communities, widely scattered throughout the state, are of extreme biological interest.

When chaparral occurs on serpentine (a rock type which does not support many

species of plants), its floristic makeup is altered. Some chaparral indicator species are not found, and the community is floristically enriched by certain plants which only grow (or are usually found) on serpentine. Serpentine Chaparral, therefore, is an extremely interesting plant community.

Characteristic lowland genera (primarily *Ceanothus*, and *Arctostaphylos*) persist in the Montane Chaparral, but the species composition of this high altitude plant community is quite different. The community is found in portions of Santa Barbara County, but is more characteristic of areas with higher elevations. Montane Chaparral, for example, can be found at 9,000 feet in the Sierra Nevada of California.

Recommendations: To insure the preservation of all species associated with the variety of chaparral and scrub habitat in the County it will be necessary to restrict use of several areas. In undisturbed areas, productive educational and research programs could be conducted. We recommend low-use chaparral preserves to perpetuate the present high diversity of habitats and communities to be found in the County.

43 & 70. Chaparral and Coastal Pine in the Western Santa Ynez Mountains (4-2-2 and 1-2-2)

Location: Slopes of the western Santa Ynez Mountains; principally between Point Conception and Gaviota Pass.

Biological comments: This relatively undisturbed area, consisting of much of the old Hollister Ranch, is of biological interest for several reasons. - Several of the canyon edges, by virtue of cool ocean breezes and fog, support groups of Bishop Pine (*Pinus muricata*). Closed cone pines, a group to which the Bishop Pine belongs, are uncommon and local in the statewide distributions; so efforts should be made to preserve existing stands. The endangered Yerba Santa (*Eriodictyon capitatum*), found only in Santa Barbara County, is to be found scattered about the area; and, according to Munz (1970), is closely associated with closed cone pine forests. The area also is extremely scenic. The train ride on the coastal edge of the area offers views of spring wildflower displays, wooded canyons, and graceful oaks.

Recommendations: The presence of *Pinus muricata* and *Eriodictyon capitatum* argues strongly for preservation of large portions of the area. To best preserve the "untouched" beauty of the area, recreation usage should be light, and grazing cattle should be prohibited in the Pine-Yerba Santa community.

Grassland

50. Natural Grasslands (all 5-1-1)

Locations:

An approximately 9 acre patch on Las Tunas Road in the City of Santa Barbara

A small patch on the coast bluffs west of Ellwood Pier Isolated patches on Camino Cielo West (Santa Ynez Ridge)

Biological comments: Prior to the arrival of the Spanish, who introduced herds of grazing animals and brought other grasses with them, much of the state was native grassland. However, with grazing, native grasses started to disappear as European grasses became established. The resulting competition has, in many areas, forced California native grasses to the verge of extinction. The California Native Plant Society lists 26 grass species as either rare, endangered, or possibly extinct. The grass family (Poaceae) ranks fifth on this society's endangered list.

Recommendations: Because of the rarity of native grasses, areas where they occur should be preserved. It is recommended that these areas should be subjected only to carefully regulated scientific study.

51. Introduced Grasses

More Mesa Grasslands (7-1-1)

Location: Approximately one square mile of bluff-top west of Hope Ranch and abutting the beach.

Biological comments: The More Mesa Grassland according to one authority on the White-tailed Kite, is the most important area in which this bird feeds and roosts on the South Coast. Contributing to the success of this uncommon species on the mesa are the ungrazed grasses which support large populations of California Meadow Mouse (Microtus californicus), the chief food-item of the kite.

Recommendations: It is our opinion that the California Department of Fish and Game has prematurely removed the White-tailed Kite from its list of rare and endangered species. The range of the kite is small, and the bird is specialized in both its prey and habitat preferences. The deep grasses on More Mesa support numerous meadow mice; grazing or other damage to the grass will drastically reduce the number of mice, thus affecting the kite population. If light recreation use is to be permitted, trails should be established to minimize disturbance to the grasses. Obviously, very light recreation should be the only use contemplated for the More Mesa grasslands.

Santa Maria Grassland as a Habitat for the Spadefoot Toad (8-2-3)

Locations: One habitat is two to three miles west of Santa Maria (on Betteravia Road), and the other is approximately one mile east of Santa Maria.

Biological comments: The Santa Maria area may be the only area in the County which provides a suitable habitat for Western Spadefoot Toad (Scaphiopus hammondi) (Stebbins, 1962). These unusual amphibians, which spend most of the year in self-constructed burrows, come to the surface during the wet months to breed in temporary

pools of water. They are most abundant in areas of short grass with sandy or gravelly soil.

Recommendations: Spadefoot toads are becoming extremely uncommon in areas they were once abundant and widespread. It is not unrealistic to believe that some or all of the five species of North American Spadefoot Toads, since they are secretive and their abundance and distributions are incompletely known, are becoming rare or even endangered. Except when breeding, they seem to be tolerant of moderate disturbance; and as long as disturbance to the soil is minimized, the Santa Maria Grassland can support various kinds of recreation.

Woodland and Savanna ²²

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60. Central Oak Savanna (8-2-2, 8-2-3, 8-2-4)

Location: A fairly large area of the central Santa Ynez Valley, from east of Lake Cachuma to north and west of the town of Santa Ynez.

Biological comments: This plant community, dominated by the stately deciduous Valley Oak (Quercus lobata), is an area of great scenic potential. In spring the wildflower display is breathtaking, with fields of poppies, lupines, and fiddlenecks spreading in all directions. Where not overgrazed, the community supports a diverse fauna, including Bobcat (Lynx rufus), Mule Deer (Odocoileus hemionus), and occasional bear or mountain lion. Scrub jays, acorn woodpeckers, and yellow-billed magpies are typical of the colorful avifauna. An interesting fauna of amphibians and reptiles (Clemmys marmorata, Thamnophis spp., Bufo boreas, Rana spp., etc.) occurs in the region, especially near the Santa Ynez River. Where relatively well managed, portions of the area (Santa Ynez Indian Reservation) support a reproducing population of the uncommon White-tailed Kite, an important resource for scientific research.

Recommendations: Although at present an area of extreme beauty, the Valley Oak Savanna is in danger of rather rapid destruction. Much of the valley is ranch land, and the cattle graze and kill the seedling oaks. The available evidence strongly suggests that oak regeneration in the valley is very sparse, much less than is needed to replace mature oaks as they die. Thus, if present conditions persist, the oaks will gradually disappear from most of the valley. We recommend that a study be made of regeneration in the valley and the effects of cattle grazing. We also recommend that, on the basis of the information obtained, an overall management plan for the valley be drawn up which would protect seedlings on a scale large enough to maintain the savanna oak

community in its present status. In addition, special treatment should be given to the bottomland south of Santa Ynez. This area supports a rather large population of White-tailed Kites. Destruction of the Oak Woodland habitat in this portion of the Santa Ynez Valley will result in a rapid decline in the number of birds in the area.

60. Santa Ynez Valley Canyon Communities (8-2-3)

Location: Several canyons immediately north of Lake Cachuma, Santa Ynez Valley.

Happy Canyon (including De La Guerra Spring)
Cachuma Creek Canyon
Santa Cruz Creek Canyon

Biological comments: These canyons, by virtue of the temporary streams running through them, are a somewhat wetter habitat than the surrounding Valley Oak Savanna. The spring wildflower display may be more diverse in these canyons than in any other Santa Barbara locality. An equally diverse fauna is supported by the numerous microhabitats present in each of these canyons. In addition, Happy Canyon abuts against the De La Guerra Spring area, a serpentine soil locality of extreme interest to biologists because of the selective inhibitory effects on plant growth.

Recommendations: These representatives of the valley canyon community should be protected from unregulated and haphazard development. Roads should be kept narrow. The total number of cattle should be regulated, for overgrazing destroys any area. Light grazing, however, is not incompatible with the beauty of some scenic resources. By reducing the total quantity of grass, cattle actually may make flowers more abundant and obvious.

61. Southern Oak Woodland - Rincon Creek (5-2-2)

Location: Extremely small patches of this community persist in the South Coast, area, with the only known stand of Juglans californica on the South Coast area growing along Rincon Creek (Griffin and Critchfield, 1972). This patch of Southern Oak Woodland represents a rare plant community that is of scientific value.

Biological comments: Munz (1970) defines this plant community as consisting of the following dominant species: Quercus agrifolia, Quercus engelmanni, Juglans californica, Rhus integrifolia, Rhus ovata, and Rhus trilobata.

Recommendations: Urbanization, expansion of agriculture, and certain kinds of recreation should not be allowed in the area. Campers, who tend to remove lower tree-limbs, glean, and trample also should be excluded.

64. Foothill Woodland (4-2-3, 8-2-3)

Location: A large area bordered on the west by Wheat Peak and Range Peak, and on

the east by Santa Cruz Guard Station and the Sisquoc Falls. The area represents the major distribution of Digger Pine (Pinus sabiniana) in Santa Barbara County. In the County, the Digger Pine is near the southern extreme of its range, the southernmost population being on Pine Creek in Ventura County (Griffin and Critchfield, 1972).

Biological comments: The Pinus sabiniana woodland is another example of the community which is much better represented in the northern part of the state. (Pinus sabiniana is endemic to California.) In general, wooded resources are uncommon in the County, and although the Digger Pine rarely forms forests, it does form rather handsome woodlands in some areas. Accordingly, careful consideration should be given to preservation of this woodland. Besides providing valuable habitat for numerous animals, Pinus sabiniana woodland is extremely valuable as a scenic resource.

Recommendations: Development of this area should be stopped, and further road construction should be prevented. However, moderate recreational use would be tolerated by the community.

Forest Habitats ²³

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65. Canyon Oak - BigCone Spruce (5-2-2)

Location: Juncal area of the upper portion of Santa Ynez River. This area lies approximately five to six miles north of Carpinteria on the north slope of the Santa Ynez mountains.

Biological comments: These steep north-facing slopes provide the climatological requirements of rather large stands of the Bigcone Spruce (Pseudotsuza macrocarna). Cliff Smith of the Santa Barbara Museum of Natural History regards the area as one of the prime examples of the Canyon Oak - Bigcone Spruce plant community to be found anywhere in the County. Another prime example, and perhaps the largest stand of the spruce in the County, occurs on the north slope of Ranger Peak, east of Figueroa Mountain.

Recommendations: These areas should be treated as prime examples of a relatively rare plant community. Animals living in the area include such uncommon species as Mountain Lion (Felis concolor) Ring-tailed Cat (Bassariscus astutus) Mountain Kingsnake (Lampropeltis zonata), and California Lyre Snake (Trimorphodon vandenburghi). Clearly, the localities support a varied, unusual, and scenic biota. As such, they should be protected from development and heavy recreation.

66. Coast Live Oak Forests (7-2-2)

Location and biological comments: These areas, where undisturbed, are composed of closely spaced trees of Coast Live Oak (Quercus agrifolia). The stands on Miramonte Hill, west of downtown Santa Barbara, are among the best examples of this plant community in the County. Immediately adjacent to these stands of Coast Live Oak are equally undisturbed areas of Coastal Sagebrush (Artemisia californica) and Mixed Chaparral. Native wildflowers form a good display in the spring. Larger stands also occur in the canyons of the Santa Ynez Mountains, especially near the Refugio Pass area.

Recommendations: Urbanization, expansion of agriculture, and moderate to heavy recreation should not be allowed in these areas. A “natural park” that could tolerate the lighter types of recreation would be desirable.

69. Mixed Evergreen Forest

Locations:

Painted Cave Area (5-2-2)

Kinevan Canyon Area (5-2-2)

Jualachichi Summit on Jalama Road (5-2-2)

North slope of Tranquillon Mountain (5-2-2)

Several other mapped localities on north slope of Santa Ynez Range between Gaviota Pass and Dos Pueblos Creek drainage (5-2-2)

Biological comments: Munz (1970) characterizes this plant community as lying “along inner edge of the redwood forest and on higher hills within it, mostly in the North Coast Ranges....” Plants associated with the community include Tanbark Oak (Lithocarpus densiflora), Madrone (Arbutus menziesii), California Bay (Umbellularia californica), and Bigleaf Maple (Acer macrophyllum). The Mixed Evergreen community, where it exists in the County, represents the persistence of a plant community that was more widely distributed when the climate was wetter and cooler. Animals associated with the community represent a diverse assemblage. Some of the species are found elsewhere in the County, but others, like the plants, are species that require cool, damp conditions (e.g. Ensatina eschscholtzi) and are abundant only further north.

Recommendations: Disturbance of the community should be minimized. Roads in the area should not be widened, and further development should be curtailed. These “islands” of vegetation are of tremendous scientific, educational, scenic, and light recreational value.

69-70. Jualachichi Summit (5-2-2, 4-2-2)

Location: A small (one quarter square mile) area southeast of the sharp turn at the Jualachichi Summit, six air miles from Jalama Ranch and slightly off Jalama Road.

Biological comments: This small area is of extreme botanical interest, and represents an "island" of north-coast vegetation in a "sea" of chaparral and grassland. A small stand of Bishop Pine (*Pinus muricata*) is surrounded by Mixed Evergreen elements (*Lithocarpus densiflora*, *Vaccinium ovatum*, *Myrica californica*, etc.). It is believed that the cool ocean breezes and fog contribute to the persistence of this small community. Pockets of native grasses, now quite rare, also grow where fine, sandy soil exists. The surrounding rocky soil supports a well-developed chaparral community, and on the south-facing slopes the rare and endangered Refugio Manzanita (*Arctostaphylos refugioensis*) is found. A handsome wildflower display also can be seen in this area including the uncommon Chocolate Lily (*Pritilaria bicolor*).

Recommendations: Widening of Jalama Road in the Jualachichi Summit area must not be contemplated. Destruction of the north-facing slopes in this small area will eliminate this interesting community. Grazing should be limited to areas well away from the summit. The presence of such an unusual community, as well as an endangered plant, calls for sensitive planning in this unusual and delicate area.

70-71. Purisima Hills (4-2-2, 1-1-1)

Location: A rather large elevated land mass, lying directly north of Lompoc and fifteen miles south of Santa Maria. The total area consists of about 25 square miles.

Biological comments: The Purisima Hills are of very great interest to the botanist. Located near the summit of Harris Grade on Highway 1 is one of the most extensive stands of Bishop Pine (*Pinus muricata*) to be found in the County, along with the endangered closed cone pine associate, Yerba Santa (*Eriodictyon capitatum*). Without doubt, however, of greatest biological interest in the Purisima Hills is a small group of Douglas Fir (*Pseudotsuga menziesii*). Some twenty trees, growing on nutrient-poor diatomaceous shale, lie within a group of Bishop Pine. The firs represent a relictual population of a tree common to cooler, wetter climates (Northern California to Canada). The next nearest group of Douglas Fir lies 85 air miles to the north. The lack of competition from other trees due to the poor soil and the coolness of the area in all likelihood contribute to the survival of these few trees.

Recommendations: Obviously, the occurrence together of an uncommon pine, a relict tree, and an endangered species justifies complete preservation of the area. Widening of the roads at the expense of the pines would be extremely unfortunate. The firs should be regarded as inviolate. Even trails through the area would accelerate erosion, and thus endanger the population.

74. Coulter Pine Forest

Forests containing this species occur in several places in the County.

Ridge of Santa Ynez Mountains

Locations:

La Cumbre Peak (5-2-2)

Santa Ynez Peak (4-2-4)

Ridge between Refugio Pass and Santa Ynez Peak (5-2-2)

Biological comments: The crest of the Santa Ynez mountains provides a unique South Coast habitat. Marine and Valley climatic influences help produce this ecotone. Among other things, Coulter Pine (Pinus coulteri) is found only at these three localities in the Santa Ynez Mountains. An indication of the biological uniqueness of the ridgetop habitat is the uncommon organisms associated with it. Two rare and endangered plants (Thermopsis macrophylla, and Arctostaphylos refugioensis) occur at the crest of the Santa Ynez Range. Thermopsis occurs on the slopes of Santa Ynez Peak, and the Arctostaphylos grows on the crest near Refugio Pass. The latter appears again at Jualachichi Summit on the Jalama Road, and probably occurs between the two localities.

Recommendations: Because of the limited size of these unique areas on the Santa Ynez Crest, an effort should be made to minimize disturbance to the habitat. The spraying of herbicide on the ridge should be curtailed. The U. S. Forest Service has banned ORV's from the area.

Miranda Pine Mountain and Associated Upland Area (1-2-3)

Location: Slopes and peaks of northern portions of the Sierra Madre Mountains in the County.

Biological comments: The chaparral occurring in this area is reminiscent of the same community 150 miles to the east in Riverside and Los Angeles Counties. A species occurring in the Sierra Madre but uncommon in the rest of the County is a Ribbonwood (Adenostoma sparsifolium). Coulter Pines (Pinus coulteri), uncommon on the coast, are well represented in this portion of the Sierra Madre Range. Incense Cedar (Calocedrus decurrens) also might occur in a few canyons of this part of the County. (It is known to occur farther east.) Some of the canyons in the area offer suitable habitat for certain mesic forms. The striking sword fern (Polystichum) can be found in Bates Canyon.

Recommendations: This portion of the Sierra Madre supports a diverse and local series of communities. It is of interest to the bio-geographer because of the floristic parallels that exist between this area and more southerly portions of the state. It also provides the kinds of habitat suitable for use by the endangered California Condor. Road building should be curtailed in the area, and further development should be prohibited. The area is ideally suited to outdoorsmen interested in light recreational activities.

Riparian Forests and Woodlands ²⁴

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75 Nojoqui Falls Park (6-2-2)

Location: A small park with falls and stream, approximately 1.7 miles east of Highway 101 between Solvang and Gaviota.

Biological comments: This riparian community, continuing some distance below the falls, is one of the few continuously damp and cool communities in the County. The luxurious growth of Liverworts (Marchantia) and Maidenhair Ferns (Adiantum jordanii) on and near the falls is probably unparalleled in the County. For the past several years a Spotted Owl, a bird regarded as “threatened” by the National Wildlife Federation, has roosted in the thick stand of California Bay (Umbellularia californica) along Nojoqui Creek.

The Middle Gaviota Formation, on which Nojoqui Falls and Creek lie, is a rich fossil bearing formation according to Dr. R. Norris. Certain mollusks including the snail Turritella variata, an indicator species of a particular fossil fauna, are abundant.

Recommendations: This extremely beautiful area has great biological and recreational potential. Expansion of the park facilities in the direction of the falls should not be contemplated. The ferns (originally uncommon, and now as a result of County-wide collection, rare) and the fossil beds should be carefully protected from collectors. As a consequence, recreational use of the creek near the falls should be limited to the trail.

76. Trees Serving as Traditional Roosting Sites (5-2-2)

Locations:

Three trees (Cypress, Eucalyptus, and Pine) near the parking lot of the Music Academy of the West .

A group of Eucalyptus trees near the headquarters of the Dos Pueblos Ranch
A group of Eucalyptus trees on the southwest end of Coronado Drive in Goleta
Turkey Vulture summer roost in Eucalyptus on San Jose Creek north of Highway 101

Biological comments: “Butterfly trees” are used by massive numbers of the Monarch Butterfly (Danaeus plexippus) as communal roosts during the fall and winter months. After this period the animals disperse, but return to the localities again for the same

period the next year. The benefits derived by the organisms from the roosting behavior are not completely understood, but the behavior obviously is essential to their survival.

Turkey Vultures are large carrion-eating birds which are residents of Santa Barbara County. The number of birds in the County dramatically swells when vultures which have wintered elsewhere return. It is in the late spring, summer, and early fall months that large numbers of vultures congregate at communal roosts. The row of Eucalyptus on the west bank of San Jose Creek, just north of Highway 101, has been an active roost for approximately 35 years.

Recommendations: The roosting behavior and the dispersion of the Monarch Butterflies in the spring is of extreme scientific interest. Quite obviously, the roosts also are unusual "habitats", of educational value as well as of general public interest. The roosts tolerate some disturbance but should not be subjected to intense development. It is essential that a zone about 100 feet wide surrounds each area. Protection of the Turkey Vulture roost in Goleta should be similar to that given to the Butterfly Trees.

80. Freshwater Marsh (5-2-2)

Freshwater marshes, an extremely uncommon habitat in the County, are well exemplified by the small area near the Goleta Sanitary District Plant, east of the Santa Barbara Airport Terminal. Portions of the Santa Ynez River and a small portion of the Surf Lagoon also are marsh, but these areas are discussed separately. Other small marshes exist like islands, scattered along the coast and the major rivers. The plant community is characterized by the following dominant genera (Munz, 1970): Scirpus, Typha, and Carex. Animals associated with freshwater marshes are waterfowl (Ducks, Geese, Rails, Blackbirds, Bitterns, etc.), certain rodents, frogs, and aquatic reptiles (e.g. Thamnophis couchi). Most members of the freshwater marsh community cannot tolerate a reduction of water quality or quantity. The marsh areas are suitable for light recreation, but should be protected from other uses.

Aquatic Freshwater Communities

90 & 92. Streams (6-2-3, 6-2-2, 2-2-2, 1-2-2)

All the streams of the County are delicate habitats because even a cursory survey indicates that their character is changed greatly, generally to a less desirable condition, by any development of the riparian land. Highway or road construction, housing development, orchards, and even grazing at the intensity that is typical locally profoundly affect the streams. Some undesirable effects are the increased erosion of banks, increased siltation in slower reaches, more abundant growths of algae, higher water temperatures, loss of fish from the community, and decreased diversity among the invertebrates (insects, worms, crustaceans, etc.) of the biological community. It is easy to understand how these changes detract considerably from the aesthetic value of the streams and the lands bordering them. Other potential problems may not be so apparent. Decay of abundant algal growths at high summer water temperatures may

result in unpleasant odors, and in swarms of nuisance insects which breed in the decaying algae. The changes in composition of the insect fauna likewise may result in insect nuisance problems. We have observations, though they have not been tested in any quantitative fashion, that blackfly or buffalo gnat (Simuliidae) larvae become more abundant in those streams heavily influenced by people in the Santa Barbara area. The adults of these flies are serious nuisances, delivering bites which are painful to many people and serving as vectors of several livestock diseases. Although we know of no such disease problems in the County at present, continued destruction of streams may create them in the future.

Protection of stream habitats, enhancing their aesthetic value and avoiding serious problems of the sort just discussed, need not involve any substantial economic burden. Preservation of strips of riparian land, with intact communities of native vegetation analogous to the "buffer strips" now left by many enlightened logging operations, can serve to insulate the stream habitats from many of the insults of human activities. The vegetation, particularly its root systems and associated humus, can serve as a sponge to absorb runoff coming from developed lands in the watershed during times of heavy precipitation. Release of this moisture in drier seasons will serve to dampen fluctuations in streamflow. At the same time, these buffer strips will catch much of the silt carried by the runoff, and catch and bind quantities of important nutrients, such as phosphorus, that otherwise will contribute to excessive fertilization of the stream. Buffer strips should not, of course, be open to grazing; and establishment of these areas would put an end to the slipping, slumping, and erosion of soils commonly caused by the removal of vegetation and the constant pressure of animal traffic on steep slopes along the streams.

Pesticides should not be used on buffer strips except under very exceptional circumstances. On the other hand, soils of the strip may bind certain categories of pesticides which enter in runoff from developed lands. This binding action will delay or prevent the influence of pesticides upon stream communities and, perhaps, also upon marine communities which receive the stream waters.

A number of streams of the area serve as sewers, receiving septic and nutrient-rich waters from poorly designed septic tank drain fields. In several situations it appears that drain fields are, in fact, nonexistent, and the stream receives extremely septic wastes from a pipe presumably connected directly to the sewage system of a dwelling. Establishment and inspection of buffer strips logically could involve correction of these situations.

We do not know how wide buffer strips would have to be to have a substantially beneficial effect with respect to these various objectives. The effectiveness of buffer strips of various widths in protecting streams from logging activities currently is under study (by Dr. D.C. Erman of the University of California, Berkeley, supported by the Water Resources Center), and results of these studies may have some relevance to the situations under consideration here. Obviously, the wider the strip the greater the degree of protection afforded, but full protection may be economically unfeasible. We

estimate that as little as 100 feet on either side of a stream could provide a good deal of protection to the stream, although this width would have to be increased where the slope of the land is significant.

Other indirect benefits of buffer strips probably are obvious. These bands of native vegetation traversing a community would provide an aesthetically pleasing backdrop. They could provide areas for rest, relaxation, and nature appreciation. Foot trails, limited picnic facilities, and where the slope is not great, equestrian paths would not interfere greatly with their primary purposes.

Stream Protection Criteria: Streams deserving greater protection than that afforded to those simply classified as delicate habitats include Rattlesnake, Dos Pueblos, Tajiguas, Arroyo Hondo, Refugio, Jalama, Mission above the 250 foot elevation, San Roque above Foothill Road, and San Jose above the U.S.G.S. gaging station at about the 100 foot elevation. In selecting these streams for preservation as scientific study areas, and for protection from human activities other than very light recreation, we considered several factors. Of primary importance was the degree to which the habitat and the aquatic biotic communities already have been altered by human activities. It is important to preserve some communities and habitats that approximate, as nearly as possible, their natural condition. Second, we chose streams that already are substantially protected because their upper reaches lying in Los Padres National Forest are immune to intensive development. In this way, preservation of representative native habitats can be obtained at minimal additional cost and inconvenience to the public. Third, we felt it important to afford full protection to the upper and middle reaches of some of the streams which, at lower elevations, run through centers of urban development. Two lines of reasoning underlie this decision. Because these areas are close to the city, they provide a place where people conveniently can enjoy some of their natural heritage and where amateur and professional scientists can make observations, although, of course, such activities should be non-destructive. Second, the waters of these creeks, upon reaching the urban areas, will be of the highest attainable quality, thus making it easier to maintain water quality as the stream flows through the community and helping to avert problems stemming from nuisance-level growths of algae and abundant noxious aquatic insects.

Besides providing habitat for strictly aquatic forms, streams also provide habitat for creatures only partially dependent on water. For example, Stebbins (1966) when commenting on the habitat preferences of the uncommon California Mountain Kingsnake says "Search for it in the vicinity of well-illuminated rocky streams in wooded areas..." Numerous other terrestrial or amphibious vertebrates are most abundant near streams. Some roost there, others forage there, and still others return to these areas to reproduce. Thus, streams cannot be thought of as only providing habitat for purely aquatic forms. Nor is it biologically sound to regard the immediate streambed as the extent of the community. In most instances, the stream community extends far into the adjacent watershed.

Biological comments on individual streams: Rattlesnake, Mission and San Roque

Creeks have their headwaters in Los Padres National Forest. Until they flow on to private land, they have aquatic biological communities that probably are quite similar to their original biota. Protection of the lower reaches undoubtedly would permit recuperation of the biotic communities in these areas. Rattlesnake Creek and Mission Creek, with the combined flow of Rattlesnake below Foothill Road, supported the reproduction of migratory sea-run rainbow ("steelhead") trout within the recent past. Because these streams only recently have become degraded, the trout populations could be reestablished in the future. Mission Creek flows through the Santa Barbara Botanic Garden, a collection of native California plant assemblages. To maintain the Garden's aesthetic and scientific value, the creek must be protected from further influences of grazing, septic tank leachate, and other human activities that now affect it.

San Jose Creek has its origin and runs for a considerable distance in the National Forest. The creek is used as a study area by University of California classes and research investigators, and is of considerable interest because of altitudinal variations in water chemistry and aquatic biota. A long stretch of the stream supports a highly varied aquatic fauna including large populations of the amphibious salamander (Taricha torosa) and rainbow trout (Salmo gairdneri). The stream retains its desirable natural qualities for some distance after flowing onto privately owned lands probably because of the steep, rugged terrain of its canyon, which discourages many human activities, and due to the fact that local residents along the waterway appreciate its relatively undisturbed state. Water is piped from the stream for domestic or agricultural purposes, detracting from the creek's naturalness and its value as a scientific study area. However, this is a relatively easy matter to correct. Avocado ranching along the lower reaches probably has increased siltation, and caused algal growth and bank erosion. Efforts should be made to minimize the effects of agriculture and to allow repair and restoration of this area of the stream. Long-time residents recall that the stream supported annual runs of steelhead trout until the early 1940's. The failure of the steelhead runs may have been caused by several successive years of below average rainfall, but no doubt siltation and removal of water from the stream also contributed to an unfavorable situation for steelhead migration. The lower portion of the stream has been channelized. The original streambed remains between Kellogg and Fairview Avenues, south of Hollister Avenue. This tree-lined area should be retained as a scenic backdrop and greenbelt for Goleta.

Dos Pueblos Creek originates in Los Padres National Forest and flows to the ocean through a ranch which has long maintained natural vegetation along its borders. It is widely regarded as one of the local streams which has suffered the least human impact. Tajiguas and Arroyo Hondo Creeks lie in situations very much like that of Dos Pueblos, and for portions of their lengths also remain in a fairly natural state. At least the latter, perhaps both, still contain trout.

Refugio Creek lies in a situation which, with respect to slope, soil conditions, and vegetation, is much like that of San Jose Creek. Several sorts of development have occurred along Refugio Creek, but for much of its length riparian areas retain the cover of natural vegetation. The stream has a rich invertebrate fauna and populations of small

fish (Cyprinidae). The lower reaches have suffered some damage from agriculture, since orchards extend to the stream banks. As in San Jose Creek, water is piped out by canyon residents. Nevertheless, the creek remains one of the richest of the readily accessible streams in the area. It has served as a study area for several scientific investigations. With relatively minor efforts to mitigate existing adverse impacts, and with continued protection, Refugio Creek would have inestimable aesthetic and scientific value. A small area near the mouth of the stream is at present under public control, in Refugio Beach State Park.

These creeks represent transects of the entire height of the Santa Ynez Range. As the water flows to the sea, it passes through plant communities which vary in species composition. Plants or animals either in or near the water at the ridge sometimes are not present at lower elevations.

Jalama Creek provides a cool, moist habitat most of the year for many water-loving plants and animals (e.g. Maidenhair Fern (Adiantum) and Monterey Salamander (Ensatina). Also growing near the stream course is a small stand of California Walnut (Juglans californica), one of five in the County. Several plant communities about this riparian habitat of the creek, including Coastal Sage, several types of chaparral, and the giant Coreopsis (Coreopsis gigantea).

Little is known about the many other intermittent streams in the County. San Antonio Creek on Vandenberg Air Force Base has marshes along it that should be protected. Some of the many back-country streams in the northeastern half of the County may have been affected by grazing and recreational use. However, much of this region remains close to its natural state and should be kept that way.

92. Permanent Streams: the Santa Ynez River (6-2-3, 5-2-2)

Location: A major river flowing east to west through the entire central portion of Santa Barbara County.

Biological comments: The Santa Ynez River, by virtue of its length, passes through a variety of plant communities and geologic formations. Because of differing topographic features and soil characteristics, it also supports several different ecological communities along its course, such as freshwater marshes, large reservoirs, and riparian communities. Numerous of the County's plants and animals are most abundant in, or are almost limited to, the Santa Ynez River area. Two of the five groups of California Walnut (Juglans californica) grow near the edge of the river. Cottonwood (Populus trichocarpa) in the County is largely restricted to the banks of the western half of this river. Box Elder (Acer negundo) similarly is most abundant along the Santa Ynez River. The physical and biological makeup of the river changes dramatically from east to west. The Pacific Pond Turtle (Clemmys marmorata) is most abundant in the eastern third of the river. The mouth of the river, on the other hand, supports the only recent nesting colony of the endangered California Least Tern in the County. (Metcalf, 1972).

Recommendations: The completion of the Cachuma Dam in 1952 illustrated the delicate nature of the Santa Ynez River. At the same time that the dam created a lake habitat, it eliminated a large Steelhead run. To preclude further environmental problems, future development of the Santa Ynez River should be halted, and further depletion of river water should not be tolerated. Far too many ecological communities would suffer with any further diminution in the flow of the river. For similar reasons, no noxious or polluting materials should be permitted to be added to the drainage where the river flows through urban areas.

95. Lake Los Carneros (5-2-2)

Location: Two small bodies of fresh water located on the grounds of the Stow House, Goleta.

Biological comments: Although Lake Los Carneros is not a natural body of water, it has become established in the biological sense, and at present supports a rather large and stable ecological community.

The plankton community, at least in the smaller lake, is as diverse and large as in any fresh water resource in the County. Both lakes are surrounded by typical aquatic vegetation (Typha, Scirpus, etc.), and portions of the surrounding land are wooded. At certain times of the year, Lake Los Carneros quite possibly may support the largest diversity of birds of any area of similar size in the County. In ten years, 224 species have been recorded either on the lake or in the immediate vicinity. Sixty-four species are known to nest in the area, and approximately 200 species may be seen during any given year.

Recommendations: Lake Los Carneros is a marvelous scientific, educational, and recreational resource. It is believed that the ecological balance of the lakes can be maintained in the face of moderate recreational use. Regulated line fishing is indicated, and informal gatherings and walks seem to be tolerated by the biota. However, because of the severe erosion and the excessive noise they create, motorcycles should be strictly excluded.

95. Zaca Lake (5-2-3)

Location: A small natural lake, approximately four miles northwest of Figueroa Mountain and ten miles north of the town of Santa Ynez.

Biological comments: Zaca Lake is the only natural lake in Santa Barbara County. Because of its seasonal tendency to become anaerobic, the waters of the lake (over 40 feet deep) do not support a large or diversified biota. However, the area immediately around the lake is of extreme biological interest. Coulter Pines grow on the east shore. Several thousand feet to the northeast of the lake grows a stand of Cupressus sargentii. These cypresses are extremely spotty in their distribution and generally are found growing on extremely poor soil. Their present distribution is a result of their inability to

compete with the more successful conifers. The Sargent Cypress group at Zaca Lake is the only Cypress growing wild in Santa Barbara County.

Natural lakes have one characteristic that makes them of unique importance. They serve as “ecological libraries”, storing information about past biological communities in their vicinity. They serve this function because certain sorts of biological structures, such as pollen grains or the skeletons of tiny aquatic plants and animals that fall to the bottom are preserved there. The successive layers of these fossilized remains can be dated, and so the past history of the organisms in the lake and the vegetation around it can be reconstructed very accurately. Because Zaca Lake is the only such “ecological library” in the County, it serves a unique function here.

Recommendations: Careful planning should be directed toward the future of Zaca Lake. The area could tolerate light recreation, but high intensity camping or other heavy recreational use would detract from the beauty and environmental health of the lake. Wales et. Al. (1972) have suggested that the lake and its surroundings be considered as one of nine natural landmarks in Santa Barbara and Ventura Counties. In 1895 the Santa Maria Times editorialized that the scenery of Zaca Lake “reminds one of the Rockies or Sierras.” Let us hope that the same will be said a century later.

96. Lake Cachuma (1-2-3, 1-1-1)

Location: In the eastern end of the Santa Ynez Valley, approximately 15 miles northwest of Santa Barbara.

Biological comments: Cachuma Lake, the largest inland body of water in the County, attracts numerous migratory birds and acts as home for a wide variety of plants and animals. A rookery of Great Blue Herons can be found in the dead Valley Oak (Quercus lobata) at the eastern end of the lake. It also is possible to observe such uncommon predatory birds as Sharp-shinned Hawks, Cooper’s Hawks, Red-shouldered Hawks, Ospreys, and the endangered Southern Bald Eagle at this same section of the lake.

Recommendations: The eastern end of the lake, at present undisturbed, should continue to receive total protection. Traffic into this portion of the lake would reduce the attractiveness of this habitat to the large birds of prey which now frequent the area. It also would be desirable to maintain the Park Department’s present policy of preventing use of the northern shore.

97. Coastal Vernal Pools (5-2-2)

Locations: -

Two pools near Mescalitin Island, adjacent to the Santa Barbara Airport
One pool at the western edge of Isla Vista
One pool northwest of the Devereux Slough

Biological comments: Vernal pools, the results of rain or runoff which collects in areas of poor drainage, support highly interesting ecological communities during late winter and early spring. Vernal pools commonly have a characteristic and unique biota. Indicator plants include Downingia spp., Lepidum spp., Limnanthes douglasii, and Lythrum hyssopifolia. Most of the animals present in these transitory bodies of water have drought-resistant stages and thus are able to persist year after year. Reproductively specialized crustaceans are commonly found in vernal pools.

Recommendations: Vernal pools' brief seasonal existence represents a marvelous opportunity for the biologist to examine the dynamics of opportunistic species. The pools' extreme susceptibility to disturbance justifies classifying them as unusual and delicate habitats. The comments we made about mosquito abatement in sloughs apply also to vernal pools, but the solution is somewhat easier here since we can select a few pools for special treatment. We recommend that whenever possible no control activities be carried out in these four pools, that otherwise only the minimum required to avoid severe nuisance be carried out, and that studies be done to help achieve this goal.

TWO GEOGRAPHIC AREAS OF PARTICULAR ECOLOGICAL INTEREST

Channel Islands

It is a common practice to divide the Southern California islands into the Northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz and Anacapa), and the Southern Channel Islands (Santa Catalina, San Clemente, Santa Barbara, and San Nicolas). Three of the islands, Santa Cruz, Santa Rosa and San Miguel, which together with Santa Barbara Island are within the County, lie on an east-west axis 19 to 27 miles from the mainland. Geologically, the three Northern Channel Islands in Santa Barbara County are a westward extension of the Santa Monica Mountains and have been separated from the mainland for at least 100,000 years, or perhaps several times as long. During this period the northern islands probably were interconnected, and did not separate finally until the most recent interglacial period, about 18,000 years ago.

The histories of the Channel Islands are quite similar. They were inhabited by Indians at differing population densities. A radiocarbon date of about 30,000 years B.P. (before the present) is available from a burned and disfigured dwarf mammoth found in an alluvial fan on Santa Rosa Island. Early Spanish explorers probably made contact with the islands as early as the mid-sixteenth century. By the mid-nineteenth century white settlers arrived and introduced grazing animals. Grazing persists to the present. Santa Barbara, Santa Cruz and Santa Rosa Islands now are privately owned; while San Miguel is federally owned. Unlike the earlier inhabitants, the present landowners have shown a tendency to avoid overgrazing and have attempted to control and to limit the importation of "non-native" organisms.

The Channel Islands are extremely interesting to the biologist because they are a showcase for the way in which fundamental biological processes proceed. The workings

of evolution and Mendelian genetics, both cornerstones to the science of biology, can be observed on these islands. For example, the relatively well-known geochronologies of the islands can shed light on the question of rates of evolution. The ecological phenomena of diversity and abundance also are more easily studied on islands because the relatively small size of most islands imposes more immediately binding constraints on the communities they support. Further, island peculiarities such as high rates of endemism, gigantism, and dwarfism are illustrated by organisms living on the Channel Islands.

San Miguel Island - Because of its small size (14 square miles) and rather limited topographic diversity, San Miguel Island supports fewer plant communities than do the other two, and has no trees. San Miguel also nicely illustrates the theory proposed by island ecologists that for islands at the same distance from the mainland, the smaller the island, the fewer species it supports. (See Table 2.) Perhaps the outstanding biological feature of San Miguel Island is the sea lion rookeries located on the extreme western end. These rookeries are the southernmost breeding localities for the Steller Sea Lion (Eumetopias jubata) (Bartholomew, 1967). The breeding population, now slightly more than 100 animals, has been reduced greatly from 2,000 in the late 1930's. It is believed that this reduction may be related to a gradual increase in the ocean temperature around the Channel Islands. In addition to the Steller Sea Lion, the California Sea Lion (Zalophus californianus) breeds on the western tip of San Miguel. Little or no breeding occurs on either Santa Cruz or Santa Rosa Island. San Miguel also is the only Santa Barbara County island to support a breeding population of the Northern Elephant Seal (Mirounga angustirostris). Finally, there have been occasional reports of Sea Otter (Enhydra lutris) (Allanson, 1955), but it is doubtful that this animal now breeds in the area. However, the type specimen for the southern race of the Sea Otter was taken from San Miguel in 1905, and it is reasonable to believe that the otter eventually could recolonize the area if the island is left undisturbed. Malva Rosa (Lavatera assurgentiflora), reported by Munz to occur on the Santa Barbara islands, actually may occur only near the elephant seal rookery on San Miguel Island. This plant should be included on the California Native Plant Society "Rare and Endangered Species" list.

TABLE 2. NUMBERS OF SPECIES OF PLANTS AND VERTEBRATES ON CHANNEL ISLANDS AND IN SANTA MONICA MOUNTAINS

<u>Island</u>	<u>Area in Square Miles</u>	<u>No. of Species and Sub- species, Native Plants</u>	<u>No. of Species of Terrestrial Mammals</u>	<u>No. of Species of Amphibians & Reptiles</u>	<u>No. of Species of Resident Land Birds</u>
Santa Cruz	96	420	10	9	37
Santa Rosa	84	340	4	4	25
San Miguel	14	190	2	3	15
Santa Monica Mountains (on the mainland)	320	640			

Source: Raven (1967), Savage (1967), von Bloeker (1967) and Diamond (1969).

TABLE 3. RARE AND ENDANGERED SPECIES ON THE CHANNEL ISLANDS OF SANTA BARBARA COUNTY

<u>San Miguel Island</u>	<u>Santa Rosa Island</u>	<u>Santa Cruz Island</u>
<u>Plants</u>	<u>Plants</u>	<u>Plants</u>
<u>Helianthemum Greenei</u> Rob	<u>Dudleya blochmanae insularis</u> Moran	<u>Helianthemum Greenei</u> Rob
<u>Malacothrix indecora</u> Green	<u>Dudleya candelabrum</u> Rose	<u>Haplopappus canus</u> Blake
<u>Erysimum insulare</u> Green	<u>Erysimum insulare</u> Greene	<u>Malacothrix indecora</u> Greene
<u>Phacelia divaricata insularis</u> Munz	<u>Arctostaphylos subcordata</u> Eastw.	<u>Dudleya candelabrum</u> Rose
<u>Eriogonum grande</u> Greene	<u>Phacelia divaricata insularis</u> Munz	<u>Dudleya nestotica</u> Moran
<u>Galium californicum miguelense</u> Jeps	<u>Salvia brandegei</u> Munz	<u>Arabis hoffmannii</u> Roll.
<u>Galium catalinense buxifolium</u> Dempster	<u>Lotus argophyllus adsurgens</u> Raven	<u>Thysanocarpus conchuliferus</u> Greene
	<u>Pinus torreyana</u> Parry	<u>Arctostaphylos subcordata</u> Eastw.
	<u>Gilia tenuiflora hoffmannii</u> Grant	<u>Lotus argophyllus adsurgens</u> Raven
<u>Animals</u>	<u>Eriogonum grande</u> Greene	<u>Lotus scoparius</u> Traskiae Raven
<u>Urocyon littoralis</u> (Island Fox)	<u>Galium californicum miguelense</u> Jeps.	<u>Malacothamnus fasciculatus nesioticus</u> Kearn.
<u>Brown Pelican</u>	<u>Castilleja mollis</u> Penn.	<u>Eriogonum grande</u> Greene
	<u>Berberis pinnata insularis</u> Munz	<u>Galium catalinense buxifolium</u> Dempster
	<u>Eriophyllum nevinii</u> Gray	<u>Ribes thacherianum</u> Munz
	<u>Castilleja latifolia</u> H & A	<u>Mimulus brandegei</u> Penn.
		<u>Berberis pinnata insularis</u> Munz
	<u>Animals</u>	<u>Eriophyllum nevinii</u> Gray
	<u>Urocyon littoralis</u> (Island Fox)	<u>Sibara filifolia</u> Greene
	<u>Brown Pelican</u>	
		<u>Animals</u>
		<u>Urocyon littoralis</u> (Island Fox)
		<u>Brown Pelican</u>
		<u>Southern Bald Eagle</u>
		<u>Peregrine Falcon</u>

Santa Rosa Island - The next largest (84 square miles) and the most seaward of the three islands, Santa Rosa supports a number of plant communities. Eight kinds of trees occur on the island including three oaks, two pines, a cottonwood, a cherry, and an ironwood. Of these trees, the ironwood (*Lyonothamnus floribundus* subsp. *asplenifolius*), oak (*Quercus tomentella*), and cherry (*Prunus lyonii*) are found elsewhere only on the Southern California islands (i.e. they are endemic). One of the pines, *Pinus torreyana*, is found only on Santa Rosa Island, and at an area north of San Diego. The island grove is about a half mile long, and occurs on a ridge. Most of the trees are wind-pruned, and none is more than 35 feet tall (Haller, 1967). Haller notes, however, that the trees appear healthy and that numerous young trees are growing on the slopes. In addition, Santa Rosa Island has three endemic plant taxa: *Dudleya blochmaniae* subsp. *insularis* (Live Forever), *Arctostaphylos sub cordata* var. *confertiflora* (Manzanita), and *Gilia tenuiflora* subsp. *Hoffmannii* (*Gilia*) (Raven, 1967)

Island Fox (*Urocyon littoralis*), an example of island dwarfism (it is the size of a small housecat) and a rare carnivore (California Fish and Game, 1974), is found on Santa Rosa Island. As is the case with the foxes on the six larger islands, the Santa Rosa Island Fox is considered to be a distinct subspecies, *Drogon littoralis santarosae* (von Bloeker, 1967). A list of rare and endangered species on the island is given in Table 3.

Santa Cruz Island - Santa Cruz is the largest of the four Santa Barbara County islands (96 square miles), and also is closest to the mainland. According to the theory of island ecology, Santa Cruz Island should support more species of organisms.

The data in Table 2 bear out the theory. Bishop Pine forests (*Pinus muricata*), recognizably different from mainland stands, can be found in several areas. Some elements (*Acer macrophyllum*, *Arbutus menziesii*, etc.) of the Mixed Evergreen Woodland community are found on one or two cool north-facing slopes. A unique type of woodland, the Channel Island Woodlands, is well represented on Santa Cruz Island by *Cercocarpus betuloides* var. *blancheae*, *Heteromeles arbutifolia* var. *macrocarpa*, *Lyonothamnus floribundus*, *Prunus lyonii*, *Quercus agrifolia*, *Quercus macdonaldii*, and *Quercus tomentella*. Various types of chaparral can also be found on the Island: Chamise Chaparral (43), Mixed Chaparral (44), Coastal Sage (40), and Channel Islands Chaparral (49). The Channel Islands Chaparral is unique to most of these islands because it contains endemics from each. Also, in spite of heavy grazing, patches of native grasses (50) still persist on portions of Santa Cruz Island. The Island also supports a large population of Santa Cruz Island Fox (*Urocyon littoralis santacruzae*). The Island Scrub Jay documents the phenomenon of gigantism, for it is about 30 percent larger than the mainland form.

Besides having more plant communities and more species of plants, Santa Cruz Island also supports more species of birds, mammals, reptiles and amphibians than does either San Miguel or Santa Rosa (Table 2). Thus, such common mainland forms as Gopher Snake (*Pituophis melanoleucus*), Side-blotched Lizard (*Uta stansburiana*), and Big-eared Harvest Mouse (*Reithrodontomys megalotis*) are found on Santa Cruz Island,

but not on either San Miguel Island or Santa Rosa Island. The rare and endangered species are summarized in Table 3.

Santa Barbara Island - This island, consisting of only one square mile of land, is 34 miles from the mainland. Although very tiny, and in spite of its relatively small biota, Santa Barbara Island is very interesting to the biologist. The Island Night Lizard, (Klauberina riversiana), persists only on Santa Barbara, San Nicolas, and San Clemente Islands. This animal is regarded as a primitive lizard which survives only because there is no predation by snakes or severe competition from other lizards on these isolated islands. The flora of Santa Barbara Island is interesting because of its relatively high degree of endemism; six of the 40 species are shared with several other islands. Further, until it was driven to extinction by feral rabbits, Dudleya traskiae was found only on Santa Barbara Island. The California Sea Lion (Zalophus californianus) is known to breed on the Island, and Northern Elephant Seal (Mirounga angustirostris) regularly sun themselves on the rocks there.

Analysis and Recommendations - The owners of Santa Cruz Island and the owners of Santa Rosa Island are managing their ranching in ways which tend to preserve those natural ecosystems that remain on the islands. On both islands, building construction has been kept to a minimum and roads are not paved. The owners have been extremely cooperative in encouraging scientific research and study by University classes on Santa Cruz Island. Many scientific publications have resulted from this activity.

We believe that the grazing by introduced mammals on all these islands has been destructive to the natural ecosystems there. However, sheep have been removed from Santa Rosa and the number reduced on Santa Cruz Island: we believe that this reduction has been beneficial and should be continued. We recommend that the introduced feral mammal grazers be reduced drastically on the other islands.

As long as the owners continue their enlightened policies of land use and permit scientific research, the natural ecosystems are protected and the islands serve as excellent research sites. Because we know so little about how ecosystems function, it is essential to protect places such as this from further human use. Because these are islands, they would be doubly attractive to visitors. Any change in island status that would promote heavy traffic would result in the trampling of some of the more delicate plant communities, frightening of the sea lions, and collection of the intertidal abalones. Because species have smaller populations on islands, they are more vulnerable to local extinction, and because recolonization from the mainland or other islands also is less likely, we believe that the numbers of species would decline drastically if human traffic increased from the present low level. For all these reasons we recommend that entry to the Islands continue to be regulated; our code designation therefore would be 1-1-1.

Vandenberg Air Force Base (3-2-2, 7-2-2, 5-2-2, 1-1-1, 1-2-2, 5-1-1)

Location: Approximately 160 square miles of coastal land between Point Sal and Point

Arguello.

Biological comments: Because of the specialized interests of the military, the vast majority of the Base land is undisturbed. Wales, Matlovsky, and Bennett (1972) in their Inventory of Potential Natural Landmarks of Santa Barbara and Ventura Counties, submitted to the Institute of Ecology of the University of California, Davis, singled out the Vandenberg area for special consideration. Twelve plant communities lie within the confines of the Base. Including Coastal Dunes, Coastal Salt Marsh, Coastal Sage, Chamise Chaparral, Mixed Chaparral, Introduced Grasses, Southern Oak Woodland, Coast Live Oak Forests, Mixed Evergreen Forests, Coastal Pine Forests, Lowland Riparian Woodland, and Freshwater Marsh. Clearly, a like diversity of animals can be expected to be associated with this array of plant communities.

Because of its geographic location, Vandenberg experiences two different climatological regions. The vegetative composition to some degree reflects these meteorological parameters, and botanists regard the area as in many respects representing a boundary between northern and southern California plant types. Coincidentally, largely because of the flow of the California Current, which swings seaward south of Points Arguello and Conception, drastic differences in the makeup of marine communities can be observed on either side of these points. Fish and other marine organisms are equally affected by these changes in temperature. Such common marine invertebrates as the Spiny Lobster and the Sea Pansy are not found north of Vandenberg. Conversely, numerous organisms (e.g. the crab Cryptolithoides, certain hydrozoans, etc.) with a more northerly range are not found south of Vandenberg except on those Channel Islands bathed by the California Current.

The coastal dunes between Point Sal and Purisima Point and those immediately south of Purisima Point are in an excellent state of preservation. Vehicular traffic largely has been excluded, thus leaving the extremely delicate dune plant community in good biological health. Mount Tranquillon is a striking beacon on the southern portion of the base. A healthy example of the mixed evergreen plant community, discussed earlier, lies on the north-facing slopes of the Tranquillon Ridge. The area also is dotted with patches of Bishop Pine (pinus muricata), and in at least one location, Pine Canyon, the Closed Cone Pine associate Eriodictyon capitatum also is known to occur. Finally, portions of Vandenberg are known to contain deposits of diatomaceous earth from which some very striking vertebrate fossils have been collected.

Recognized rare and endangered species that are present include the following.

Agrostis hooveri (locally distributed)
Ceanothus impressus (Burton Mesa, Titan Gate, etc.)
Cirsium rhotophilum (Coastal Strand and Dune)
Senecio blochmanae (Coastal Strand and Dune)
Corethrogyne leucophylla (Coastal Strand and Dune)
California Least Tern (summer visitor)
Southern Bald Eagle (migrant)

Peregrine Falcon (migrant)

Other uncommon organisms are Pinus muricata, Ceanothus ramulosus var. fascicularis, and Arcostaphylos pechoensis var. viridissima.

Analysis and Recommendations - Because of its undisturbed nature, present restricted use, and unique biological characteristics, Vandenberg Air Force Base ideally is suited for preservation as a scientific research area. The often quoted comments of Remington (1971), while discussing the future status of the Channel Islands, may be equally applicable to the Vandenberg.

“...even relatively little park-style recreational development and occupancy will surely be disastrous... In contrast to their modest rank as tourist wonders these lands are a scientific resource, far superior in biological and archaeological research value to most national parks and monuments... as an environmental complex for ecological and evolutionary education at the university and high school level, superb use could be made... I would propose a new concept that might be known by some such name as National Scientific and Educational Preserve... The focus would be on protecting wild areas as scientific sites rather than providing for the large number of tourists for whose needs the National Park Service functions.”

CONCLUSIONS AND RECOMMENDATIONS

In making the following recommendations, we have been guided by the conviction that it is imperative to preserve for the future as much biological diversity, that is, as many different species and communities, as possible. In particular, our goal has been to try to ensure that Santa Barbara County's ecosystems will remain in 50 or 100 years pretty much as they are today. The County is well endowed with biological diversity, containing examples of half of the plant communities found in California. In the rapidly urbanizing coastal area of Southern California, Santa Barbara County is an ecological island in a spreading sea of megalopolis, in part because it has been blessed with environmentally conscious citizens.

This is a time of accelerating loss of species, and each species that becomes extinct represents an option foreclosed; the genetic material, once lost, can never be reconstituted. If we were to do nothing to preserve the diversity of species, we would be condoning the loss of an estimated 100 species per year. While it is true that we can survive without many species that now exist, the problem is that we do not know how many we need to survive, and more important, which species we need now or will need in the future.

It is important to realize that, in order to preserve species, we must preserve whole ecosystems. Since such preserved areas are essentially islands, there will be a continual process of local extinctions of species and simplification of the community, such as occurs on oceanic islands. To minimize this problem, preserved areas should

be as large and numerous as possible, they should be as round in shape and clustered as possible, and they should be surrounded by buffer zones.

Having identified the areas of special biological interest, two other classes of areas remain in the County. First are the existing urban and agricultural lands which generally are of little interest to the biologist, with rare exceptions. However, intensive urban and agricultural uses can affect ecological communities through air pollution, use of pesticides, or feedlot runoff; and such impacts should be considered when preparing land use plans. Second are the ecosystems in the remainder of the County which, while they may not be rare or endangered, will nonetheless disappear if the areas are transformed to urban or agricultural use. By and large, these areas lie in hilly or mountainous country and are unlikely to come under pressure for change of use. The major exception, in which our recommendation conflicts with current use, is the rolling grazing lands of the Santa Ynez Valley. These areas, famous for their beautiful "parkland" landscape of oak trees and open fields, will not survive in their present state because grazing prevents the oaks from regenerating. Some change in use will be necessary if we are to maintain these ecosystems.

To preserve the ecosystems of biological interest, the County and the cities should adopt the following policies.

Coastal Strand and Marine Habitats

- Collecting at Carpinteria and adjacent coastal bluffs should be strictly prohibited.
- At North and South Coast rocky points, recreational use should be limited, and all but restricted scientific collecting should be prohibited.
- Portions of the South Coast intertidal preserve should be made available for light recreation use, while certain key areas should be closed to the public and limited to scientific investigations. Fishing should be prohibited in the entire area.
- Point Sal should be classified as a natural area with access permitted, but the present amount of human activity should not be markedly increased.
- Naples Reef and inshore area should be maintained primarily as a scientific research and educational area. The Local Coastal Program, in consultation with the state Department of Fish and Game, recommends that continued recreational use of this area be permitted and monitored to prevent depletion of marine resources.
- Coastal dunes should be protected from all but scientific and educational uses, except portions of the Guadalupe Dunes already scarred by ORV's. Wherever possible, dune areas should be placed in a "preserve" status. Ocean Beach County Park should not be expanded.
- In Goleta, Devereux, and Carpinteria sloughs, scientific and educational research

and recreational activities should be limited, traffic should be minimized, and the present size of the sloughs should be maintained. The Mosquito Abatement District should be encouraged to reduce control activities to the minimum level needed to avoid severe nuisance problems and to carry out studies to achieve this goal.

- The County Park in the Surf Area should not be expanded, ORVs should not be allowed on the dunes, and traffic should not be permitted in the marshes.

Chaparral and Scrub Habitats

- In six selected low use chaparral preserves, only educational and research programs should be conducted.
- In the Chaparral and Coastal Pine Habitat in the western Santa Ynez Mountains, recreational use should be limited. Grazing cattle should not be permitted in the Pine- Yerba Santa Community. The area to be considered is a relatively narrow band of Bishop Pine and Yerba Santa bordered on the west by Damsite Canyon and on the east by Canada de Alegria.

Grassland

- Native grasslands should be subjected only to regulated scientific study wherever they occur.
- On the More Mesa grasslands, only very light recreation restricted to trails should be permitted, in order to protect the White-tailed Kite.
- In the Santa Maria Grassland where the Spadefoot Toad lives, moderate intensity recreation can be tolerated as long as soil disturbance is minimized.

Woodland and Savanna

- To support the Central Oak Savanna and protect the White-tailed Kite, a program of seedling protection should be instituted in the Santa Ynez Valley and grazing restricted to appropriate areas.
- In the Santa Ynez Valley canyon communities, unregulated and haphazard development should be prohibited, roads should be kept narrow, and cattle grazing closely controlled.
- In the Southern Oak Woodland along Rincon Creek, urban development and all but very light recreation should not be allowed.
- In the Foothill Woodland between Santa Cruz Guard Station and Wheat Peak, development should be stopped, and further road construction should be prevented. Moderate recreational use would be acceptable.

Forest Habitats

- The Canyon Oak-Bigcone Spruce Forest Habitat is a relatively rare plant community that should be protected from development and heavy recreational use.
- In Coast Live Oak Forests, urbanization, expansion of agriculture, and moderate or heavy recreational use should not be allowed. A natural park would be desirable.
- In the Mixed Evergreen Forest Habitat, disturbance should be minimized by keeping roads as they are and curtailing development.
- In the Jualachichi Summit area, Jalama Road should not be widened, and cattle grazing should not be permitted near the summit.
- The Purisima Hills should be preserved by limiting road widening and restricting the number of trails.
- In the Coulter Pine Forest on the ridge of the Santa Ynez Mountains, the practice of spraying herbicide should be curtailed. The U.S. Forest Service has banned ORV's in order to minimize disturbance of the habitat.
- In the Miranda Pine Mountain and associated upland area, light recreation activities could be allowed, but road building and development should be stopped.

Riparian Forests and Woodlands

- Nojoqui Falls Park should not be expanded in the direction of the falls, and recreational use should be limited to the trail.

Introduced Trees and Scrubs

- Around trees serving as traditional roosting sites for butterflies and Turkey Vultures, a 100 foot wide buffer zone should be established for protection of these species.

Swampy Habitats

- Fresh water marshes are suitable for light recreation, but should be protected from other uses.

Aquatic Habitats

- The nine streams in the County deserving special protection are Rattlesnake, Mission, San Roque, San Jose, Dos Pueblos, Tajiguas, Arroyo Hondo, Refugio, and Jalama Creeks. Only scientific study and light recreation activities should be

permitted in or near these streams, and buffer strips at least 100 feet wide should be established. Pesticides should not be used in these buffer zones.

- Development of the Santa Ynez River should be halted, the river water should not be depleted further, and no pollutants should be discharged into the river.
- At Lake Los Carneros, moderate recreational use could be tolerated, but motorcycles should be strictly excluded.
- Zaca Lake can tolerate limited recreation activities. However, high intensity camping or other heavy recreational use would detract from the beauty and environmental health of the lake, which has been suggested for classification as one of the nine natural landmarks of Santa Barbara and Ventura Counties.
- The eastern end of Lake Cachuma should remain undisturbed to protect the bird habitat, and the lake's north shore also should remain closed to the public.
- With the agreement of the Mosquito Abatement District four specially selected vernal pools should receive the absolute minimum amount of treatment needed to avoid severe nuisance problems.

Two Geographic Areas of Particular Ecological Interest

- On the Channel Islands, human entry should continue to be limited in order to protect the natural ecosystems. Grazing should be closely regulated to prevent destruction of plant communities.
- Vandenberg Air Force Base should be preserved as a scientific research area and classified as a National Scientific and Educational Preserve.

An Interim Implementation Policy

- The County should evaluate each of these recommendations in preparing environmental impact reports, in order to ensure that adequate consideration is given to preserving ecological communities.

Mineral Resources

INTRODUCTION

Three major classes of mineral resources have been found in Santa Barbara County. Petroleum and natural gas in onshore and offshore fields are the principal mineral fuels, accounting for approximately half of the total value of mineral production in the County. Mercury, the only metallic resource, has not been produced commercially in recent years. The non-metallic mineral resources include diatomite, limestone, phosphate, rock, sand, and gravel. While additional exploration may uncover new resources sites, it is unlikely that any major new commercial grade deposits of mineral resources will be discovered in the near future. However, over the long term, increasing demand for scarce mineral sources may lead to renewed exploration and extraction.

The study of mineral resources for the Conservation Element focused primarily on the County's known resources. Analysis of offshore oil drilling was not included in this study because the County and the cities lack jurisdiction over this activity, and because responsible State and federal agencies currently are studying the subject. Once these studies are complete, the County should evaluate the findings and review State and federal policies on offshore oil drilling in the Santa Barbara Channel as a basis for making any recommendations that are necessary to bring these policies into conformity with the Comprehensive Plan.

LOCATIONS OF KNOWN RESOURCES

On the County-wide Mineral Resources map, all known resource sites are indicated. Only the names of the oil and gas fields are shown. Production statistics for each of these sites are available. For obvious reasons, abandoned oil and gas fields are not shown. Information on these resource sites was compiled from maps and publications of the California Division of Oil and Gas, the County Assessor's Office (Mineral Appraiser), the California Division of Mines and Geology (Bulletin I80-C), the U.S. Soil Conservation Service, the County Department of Public Works, and the County Petroleum Administrator.

Oil and Gas Fields - Twenty-six oil and gas fields are located in the County. However, only 18 fields yielded oil and 13 fields produced gas in 1973. In addition, five fields have dry gas reserves, but only three are productive: Caliente Offshore, Gaviota Offshore, and Molino Offshore. The 15 wells located in the La Goleta Field presently are being used for gas storage. As of the end of 1972, 23 billion cubic feet of natural gas had been injected there for later-use.

Santa Barbara County Mineral Resources

	Oil, Dry Gas Field (Name)
	Diatomite
	Rock, Sand, or Gravel
	Other Rock, Sand, or Gravel Source
	Phosphate
	Quicksilver Mines

Mercury - Only two locations for mining mercury have been developed in the County. The Gibraltar District Quicksilver Mine is located south of Gibraltar Reservoir in the Santa Ynez Mountains, and the Cachuma District Quicksilver Mines are situated in the San Rafael Mountains ten miles north of Lake Cachuma.

Diatomite - South of Lompoc are six known deposits of diatomite from which most of the diatomite produced in the United States is mined. The open pit operations are owned by two producers: Johns-Manville and Grefco. A 1,000 foot section of beds has been exposed at the main pits. Only the lower 550 feet contains high grade diatomite, and a limited number of beds lying in this section are being exploited for ore (Davis and Evans, 1973).

Limestone - The only viable site for limestone production, the Beehive Rock Quarry, is situated south of Lake Cachuma, in the Indian Creek area between Tequepis Canyon and Hilton Canyon.

Phosphate - Phosphate rock is found in a deposit in a 200 foot section of the Santa Margarita Formation south of New Cuyama, at the foot of the Sierra Madre Mountains, on Forest Service Land. According to the California Division of Mines and Geology, potash, zinc, and copper oxide also were present in the rock that was mined there in the 1960's.

Rock, Sand, and Gravel - Commercial production of rock, sand, and gravel occurs at twelve sites in the County. On the South Coast west of Goleta, the six resource sites for yellow sand are Arroyo de Los Zorrilas Sand, Arroyo-Quemado Sand, Canada de la Huerta Sand, Doty Sand, Ellwood Ranch, and Las Varas Canyon Sand. Buellflat Sand and Gravel and Gardner Ranch Sand and Gravel are situated in the Santa Ynez River flood plain west of Solvang. Matilija Limestone and Santa Maria Stone are found in the Lompoc area. In the Santa Maria-Orcutt area, Guadalupe Dune Sand is used for sandblasting and foundary sand, and Airox Expansible (burnt) Shale is employed in light weight concrete (Mineral Information Service, v. 13, no. 5, 1960). Finally, Sisquoc Sand and Gravel and Santa Maria Stone are found in the Sisquoc-Tepusquet area. Other sand and gravel deposits probably are widespread in the river channels in the County. Because they are not being exploited at present and data on their quality are not available, the map boundaries should be considered tentative

PRODUCTION AND RESERVES

In general, mineral production in Santa Barbara has declined over the past ten years, and it is unlikely that this trend will reverse itself because known reserves are being depleted and new deposits have not been located. Furthermore, as environmental controls become increasingly dominant, the "viability of older mining operations declines because operators find it uneconomical to meet the new environmental standards. Under the federal Clean Air Act and the Clean Waters Act, environmental quality standards and emissions standards for hazardous substances, as well as for other

pollutants and effluents, have been established by the federal Environmental Protection Agency. Under the Porter-Cologne Water Quality Control Act enacted by the State Legislature in 1970, the State Water Quality Control Board and the Regional Water Quality Control Boards are responsible for the quality of wastewaters and are particularly concerned with the color, odor, taste, temperature, oil and grease, dissolved oxygen, pH value and "acid mine water", copper and iron content, toxicity to fish, and turbidity and settleable matter, all of which have a bearing on mining activities. Similarly, the State Air Resources Board and the County Air Pollution Control District are empowered by the Mulford-Carrell Act and the federal Clean Air Act to administer regulations to achieve and maintain adopted air quality standards and to enforce prescribed emissions standards.

The statistics on production and reserves presented in this section are incomplete, primarily because of limitations on disclosure. For oil and gas, the data are quite extensive, and the historical records compiled by the California Division of Oil and Gas are very detailed. However, none of the other mineral resources that are commercially mined in the County is monitored as carefully, and production statistics on individual deposits or operations generally are not released. In other California counties, producers have cooperated with the California Division of Mines and Geology in making confidential data available for analysis, the most noteworthy example being Evans study of sand and gravel in Orange County (Evans, 1973). This type of analysis, however, was outside the scope of study prescribed for the Conservation Element.

Oil and Gas Production - Over 1,800 wells in the County produced 16.7 million barrels of oil in 1976, down slightly from 1975 production, and continuing a downward trend in production levels. In 1965 for example, oil production was more than 26 million barrels. The decline in natural gas production has been even more marked, dropping from 81.7 billion cubic feet in 1965 to 18.5 billion cubic feet in 1976. The County's proved acreage for oil production at the end of 1976 was 28.345, down slightly from the 1975 level. In 1976 Santa Barbara's oil and gas production accounted for 5 per cent of the state's oil production and 6 per cent of the state's natural gas production.

Preliminary figures for 1977 indicate that onshore oil production increased slightly from 13.9 million barrels to 14.9 million. According to the state Division of Oil and Gas, this increase is largely due to secondary recovery efforts. Offshore production in state leases dropped from 3.4 to 3 million barrels, and production in federal leases was down 12.2 per cent to 12.2 million barrels. Total 1977 production from onshore County wells and all channel wells was 29.3 million barrels, down 6.26 per cent from 1976. Production statistics from 1969 through 1976 are presented in Table 1.

Mercury Production - At present, mercury is not being mined in the County. In fact, throughout the state mercury production in 1973 dropped 78 per cent from 1972 levels, and only three small mines were producing on an intermittent basis. Producers are holding back because of the low price of mercury caused by curtailed military usage following the end of the Vietnam War and by the federal Environmental Protection Agency's tight emissions controls (Davis, 1974). Geologists of the California Division of

Mines and Geology have predicted that many of the mines not now in operation again will become active once the price per flask reaches \$400 (Davis and Evans, 1973). The average price in 1973 was \$288. Statistics on mercury reserves are not published.

Diatomite - Statistics on production and reserves of diatomite in the County are not published. However, previous studies have estimated that Santa Barbara County deposits have a useful life of 80 years (Mineral Appraiser, personal communication).

TABLE 1. OIL AND GAS PRODUCTION IN SANTA BARBARA COUNTY

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Average number of producing oil wells								
Actual	1,611	1,587	1,605	1,603	1,595	1,673	1,755	1,849
Actual and potential	2,645	2,694	2,814	2,834	2,873	2,773	2,814	2,889
Average number of producing gas wells								
Actual	16	15	13	26	26	23	8	8
Actual and potential	33	33	33	32	31	32	18	16
Oil production (millions barrels) ^a	21.7	20.2	19.0	18.2	19.1	18.5	17.1	16.7
Gas production (million cubic feet)	78,326	62,643	48,371	52,498	46,427	29,880	21,668	18,501
Proved acreage	32,965	28,265	28,880	28,085	28,045	27,925	27,865	28,345

Source: Annual Reports of the State Oil and Gas Supervisor, California Division of Oil and Gas.

a. Does not include federal offshore leases.

Limestone - Statistics on production and reserves of limestone in the County are not released. The deposits of high grade algal limestone in the Eocene Blanca Formation are known to be extensive; so it might be reasonable to expect these reserves to be adequate at least for near term needs (California Region Framework Study Committee, 1971).

Phosphate Production - In the 1960's phosphate was mined in the County in relatively small quantities, primarily to meet the needs of farmers in the San Joaquin Valley. Recently, there has been renewed interest in this deposit, and commercial production may resume. However, phosphate is not produced at the present time in the County.

Rock, Sand, and Gravel - The historical record of rock, sand, and gravel production, shown in Table 2, is not as complete as the record for oil and gas, mainly because of limitations on disclosure. Sand and gravel production declined from the 1968 high of 2,494,000 short tons to a low in 1971 of 1,190,000 short tons. However, in 1972 production once again increased to 1,536,000 short tons. Stone production in 1972 was 19,000 short tons.

TABLE 2. SAND AND GRAVEL PRODUCTION IN SANTA BARBARA COUNTY

<u>Year</u>	<u>Production (Short Tons)</u>
1967	1,593,000
1968	2,494,000
1969	1,262,000
1970	1,120,000
1971	1,190,000
1972	1,536,000

Source: California Division of Mines and Geology

Over the past several years, production of sand and gravel has ranged from 4.4 to 6 tons per capita, well below the California Division of Mines and Geology's estimate of 7.7 tons per capita needed in a growing area but above the minimum level of 4.4 tons per capita needed in a stable, built-out or slow growing area (Evans, 1973). Some sand and gravel currently is imported from Ventura County and Orange County by Consolidated Rock Products Company

ENVIRONMENTAL IMPACTS

Generally, knowledge about potential adverse environmental impacts resulting from mineral resource extraction in the County is quite limited. Only a few activities have

been studied in detail, and even for these the record still is spotty. As a result, it has not been possible to assess systematically the environmental impacts of each mineral extraction activity in the County. Before suggesting a procedure that might increase the flow of knowledge and improve the state of information on this subject, it may be helpful to review some of the problems that presently exist and to indicate some of the actions being taken to mitigate the adverse impacts.

The repercussions of an oil spill or blow-out at an onshore drilling site have been well documented in the popular press as well as in scientific journals. Under the direction of the California Oil and Gas Division, oil spill contingency plans for District 3, which includes Santa Barbara County, have been prepared. These plans are designed primarily to minimize adverse environmental impacts, particularly on natural drainage systems. State requirements also have been promulgated to curtail wastewater discharges into the ocean and to regulate Class I dump sites for disposal of oil field wastes. But the oil industry still needs to refine its fail-safe programs so that its imperfect record can be improved.

The major problems associated with mercury mining stems from the proximity of the Cachuma District Quicksilver Mines to Lake Cachuma. Because leaching from an open pit operation could reach the lake, the potential adverse impact on water quality must be scrutinized carefully. An environmental impact report being prepared in conjunction with a proposal to reopen these mines will examine the ability of the proposed new leaching method to meet federal standards and to safeguard water quality.

Mining diatomaceous earth presents similar problems that have not yet been fully resolved. Airblown particulate matter has a serious impact on air quality. In northern Santa Barbara County in 1970, over nine tons of particulate matter were emitted by mineral operations - a figure representing close to 70 per cent of the total amount of particulate matter emitted daily in this area. County Air Pollution Control District regulations have been relatively effective in reducing these emissions. To further reduce the level of emissions, the federal Environmental Protection Agency recently ordered that additional dust collectors be installed at the Lompoc mines. Buffer zones surrounding the diatomite mines, as well as around other mineral extraction activities, may be the only viable way to reduce their impact on particularly sensitive members of the population, including people with respiratory problems, young children, and the elderly.

Adverse environmental impacts from, rock, sand, and gravel operations are manifold. For example, the activities can undermine adjacent development, reduce detrital material flowing to the ocean, thereby aggravating coastal erosion problems, and pollute groundwater basins if the pits are backfilled without proper precautions. According to one study, sand and gravel mining in the Santa Ynez River and the Santa Maria River during the period from 1945-55 removed one quarter to two-thirds, respectively, of these rivers' annual estimated sediment yield. Continued production at this rate could seriously impair beach formation along the northern section of the Santa Barbara Coast (Bowen and Inman, 1966, as cited in the South Central Coast Regional Commission's

Report on Geology, 1974). The extent and severity of these potential problems in the County has not been studied in a systematic fashion, so it is not possible to determine what action might be necessary to correct potential adverse impacts.

In order for the County to be able to minimize adverse direct or indirect environmental impacts, it should have discretionary review authority over all mineral extraction activities on an annual basis, particularly over the expansion of present activities. This review should be conducted as prescribed under the California Environmental Quality Act. It may be that certain small operations do not have significant adverse environmental impacts, in which case they should be allowed to continue as at present or to expand if desired. However, in those instances in which the impacts of mining would pose a serious threat to the natural or human environment, the County should be able to curtail operations or to require that remedial action be taken in a timely fashion. In reviewing mineral resource activities' potential impacts, cumulative impacts on the environment must be considered, as well as the impacts of individual operations. For example, all of the sand and gravel operations in a river basin have to be analyzed collectively as well as individually, and the cumulative impact on sediment yield for beach formation and replenishment assessed. Similarly, projected waste discharges into the air or water from a proposed activity must be considered in the light of background levels of pollutants already being emitted and projected to be emitted by existing activities (and other projected activities) before reaching a decision on the particular proposal.

FUTURE NEEDS AND POTENTIAL DEFICITS

In one sense, the question of future mineral resources needs and potential deficits in the County cannot be answered precisely until the population and economic studies that will be made for the Comprehensive Plan have been completed, and the Land Use and Circulation Elements have been revised. For example, the demand for aggregate material is dependent on the rate and location of urban development in the County and, in all likelihood, would differ under each possible growth and development alternative. Opportunities for the importation of aggregate materials from adjacent counties likewise will depend on their future local needs. However, some mineral resources, particularly oil, gas, mercury, and diatomite, will be mined primarily to meet regional, state, and national demands. Forecasting the future needs and potential deficits for exported resources is well beyond the scope of this study, especially in the light of changing international political factors, new mining, processing, and transportation technology, and expanding environmental protection controls.

Under the circumstances, the most useful next step for the County would be to undertake a study in cooperation with the California Division of Mines and Geology to determine future needs and potential deficits of rock, sand, and gravel and other mineral resources production, once the Comprehensive Plan has been completed. The Division of Mines and Geology already has conducted a detailed study of the sand and gravel industry in Orange County and has indicated its interest in pursuing similar studies in other counties, according to James R. Evans, Geologist and Mineral Resources

Coordinator. The Los Angeles metropolitan region already suffers from a shortage of exploitable local sand and gravel deposits that will have an increasingly adverse economic impact.

Ventura County also is experiencing potential problems in the Santa Clara River deposits and has begun to import gravel from Los Angeles County (Evans, personal communication). The critical factor will be to determine how Santa Barbara County can protect its resources and exploit them to meet future needs without adverse environmental consequences.

Questions such a study should address include the following:

- What are the reserves of existing sand and gravel deposits and other mineral resources currently being mined?
- How much longer will these sites be commercially viable?
- How much rock, sand, and gravel is imported into the County, where is it coming from, and what are the prospects for continued reliance on out-of-County resources? (It also would be important to determine whether Santa Barbara County is exporting any rock, sand, and gravel.)
- Where are potential exploitable rock, sand, and gravel deposits located in the County, and what is the commercial grade at each location?
- What are the potential adverse environmental impacts at each site, and how could they be mitigated?

Once these questions have been answered, the County and the cities can formulate a comprehensive program for the protection and exploitation of their valuable mineral resources that responds to anticipated future needs. It also will be important to evaluate the answers to these questions in relation to the Open Space Element, the Recreation Element, and the Land Use Element of the Comprehensive Plan to determine what priorities might be assigned to resource sites for exploitation, and what sites should remain untouched because of potential adverse impacts that could not be mitigated.

A vital component of a program for the protection and exploitation of the County's mineral resources is the rehabilitation and ultimate use of depleted or abandoned mineral resource sites. In this context, operators should be required to provide plans for rehabilitation of their sites, once all of the commercial grade deposits have been extracted, and to indicate the ultimate use of the sites. In many instances, opportunities for use during rehabilitation may exist. For example, a mineral resource site could be used for solid waste disposal if the bottom of the pit were above the groundwater table and no threat of contamination existed. When the site had been filled, it could be improved for park or recreation use. Such a program in Orange County resulted in a park and ballfield and a golf course.

Other uses of abandoned or depleted mineral resource sites that do not require filling include water-based recreation, and water percolation of groundwater recharge. In the Livermore-Amador Valley east of San Francisco, Kaiser Sand and Gravel Company donated one of its abandoned gravel pits, which had been filled with water, to the East Bay Regional Park District. Opportunities in Santa Barbara County also may exist for innovative rehabilitation and ultimate use plans.

Under current County regulations, an applicant for a conditional use permit for a mineral extraction activity is not required to submit a rehabilitation or ultimate use plan. Experience in other California communities has demonstrated that the benefits of this requirement can be significant and far-reaching. A case by case examination of the existing mineral resource activities in the County might reveal valuable opportunities to coordinate mineral resource extraction with public recreation, flood control, solid waste management, or groundwater recharge programs.

CONCLUSIONS AND RECOMMENDATIONS

Mineral resource extraction in the County makes a relatively important contribution to the local, state, and national economies, and, as such, should be encouraged. At the same time, every effort should be made to minimize direct and indirect adverse environmental impacts, and to achieve and maintain federal and State standards of emissions controls and environmental quality. Much already has been done by the County to achieve these goals, the oil drilling ordinances and the air and water pollution control regulations being prime examples. However, the County and the cities should continue to push for necessary environmental safeguards, as well as to encourage exploration for new resource sites. To meet these general objectives, the County and the cities should adopt the following policies on mineral resource extraction:

~~No mineral resource extraction should be permitted in the County if significant adverse impacts on the air, water, or land environment would result, if flooding and erosion problems would be increased, or if polluting emissions likely to be generated directly or indirectly by the activity in question would result in adopted federal or State environmental quality standards being exceeded. In addition to the relevant policies within this Element, all proposed surface mining operations shall be required to be consistent with the policies contained in the other elements of the Santa Barbara County Comprehensive General Plan, all relevant sections of the Santa Barbara County Code, and all relevant sections of State law.~~

- Under provisions of the Surface Mining and Reclamation Act of 1975, the County must adopt ordinances to establish procedures for the review of site reclamation plans and issuance of permits to conduct surface mining operations. Within one year after State geologists map areas of mineral deposits, the County must establish resource management policies for incorporation into the Comprehensive Plan. The Board of Supervisors on October 23, 1978, adopted Ordinance No. 3065 (Case No. 77-0A-33), amending Santa Barbara County Zoning Ordinance No. 661 relative to surface mining operations and reclamation

plan requirements. The State has not yet mapped County mineral resources.

- The County, in cooperation with responsible federal and State agencies, should undertake a study to evaluate its mineral resources, particularly rock, sand, and gravel, to determine how to protect and exploit them to meet future needs without adverse environmental impacts. The Comprehensive Plan then should be examined in light of the new information gleaned from this analysis, and revisions of the plan made as necessary to achieve maximum compatibility of mineral resource extraction programs with other planned land uses. The results of studies of offshore oil drilling also should be considered in this analysis.

Agricultural Resources

INTRODUCTION

Agriculture plays an important role not only in Santa Barbara's economy but also in the state and national economies. As a consequence, the agricultural resources of the County must be assessed carefully in order to prepare the best possible program for their conservation and to integrate that program into the Comprehensive Plan. Santa Barbara County can escape the fate of the once fruitful Santa Clara Valley through wise land use planning that recognizes the need to preserve valuable agricultural resources and balances that need against the demand for land for urban growth. Suitability of land for agriculture has been analyzed in relation to soils, water resources, and ecological systems. The natural resources required for agricultural production must be present in the right combination to create a productive environment. At the same time, potential adverse impacts of agricultural operations cannot be ignored. The effects of agricultural activities on air and water quality must be assessed, along with their impact on sensitive ecological communities and on residents of nearby urban development, when judging the suitability of an area for agriculture.

MAJOR CROPS AND HISTORICAL TRENDS

Each year the richness of Santa Barbara County's agricultural production is summarized in the Agricultural Commissioner's Annual Crop Report. In 1976, production in the County reached an all-time high with 30 crops grossing over a million dollars each. In Table 1 these agricultural products are ranked according to gross value. Table 2 illustrates the yearly increase in agricultural production values. County-wide, a total of fifteen vegetable crops, ten field crops, and six fruit and nut crops are produced along with nursery, flower, and seed crops and beef and dairy products. The climate, soils, and water resources provide unique opportunities for many specialty crops in the County, as this list and the summary analysis below clearly indicate.

Cattle and Calves

Beef cattle graze on an estimated 750,000 acres of grasslands in the County. Some ranchers raise both cows and calves, while others prefer to buy young livestock for weight gain. Two major feed lots are currently in operation, one in Betteravia and one in Santa Maria, with a combined total of approximately 12,000 head of cattle. Over the first eight years of the past decade, annual cattle and calf production averaged 101,000 head, while in 1972 production dropped to 79,600 head, to be followed in 1973 by a new low of 76,500 head. In 1976 cattle and calf production dropped to 62,823. Clearly, the increasing cost of grain caused by shortages and sales overseas was

TABLE 1
1976 MILLION DOLLAR PRODUCTS

<u>1976 Ranking</u>		<u>1975 Ranking</u>	
1.	Cattle and Calves	\$19,870,060	1
2.	Lettuce, Head	16,408,200	2
3.	Broccoli	12,321,552	3
4.	Strawberries	11,236,050	5
5.	Celery	8,461,800	10
6.	Alfalfa Hay	7,441,581	13
7.	Avocados	7,243,207	6
8.	Milk, Cow	7,014,330	7
9.	Dry Beans	6,776,008	12
10.	Indoor Decorative Potted Plants	6,277,590	11
11.	Lemons	5,856,650	4
12.	Cauliflower	5,623,680	9
13.	Flowerseed	4,315,600	14
14.	Chrysanthemums, Cut	3,873,367	16
15.	Eggs	3,872,700	19
16.	Pasture, Nonirrigated	3,066,279	18
17.	Orchids	2,792,754	20
18.	Grapes, Wine	2,644,814	22
19.	Bean Seed	2,583,124	8
20.	Ornamental Trees and Shrubs	2,046,581	25
21.	Potatoes	2,009,280	17
22.	Ground Cover, Bedding and Veg. Plants	1,945,750	27
23.	Tomatoes	1,734,104	15
24.	Lettuce, Leaf	1,545,620	30
25.	Cabbage	1,527,735	23
26.	Grain Hay	1,489,600	26
27.	Carrots	1,470,469	24
28.	Sugar Beets	1,323,348	21
29.	Gypsophila	1,142,747	29
30.	Greenhouse Grown Flowers and Foliage	1,109,620	28

Source: 1976 Agricultural Crop Report, Agricultural Commissioner

TABLE 2

COMPARATIVE AGRICULTURAL VALUES

+1976	\$165,914,852
*1975	157,762,384
1974	151,245,967
1973	152,492,076
1972	115,140,543
1971	108,725,570
1970	97,533,460
1969	92,773,860
1968	90,363,720
1967	88,016,920
1966	85,737,590

+Preliminary
*Revised

Source: 1976 Agricultural Crop Report,
Agricultural Commissioner

a major factor that led to this contraction in production. Preliminary 1977 figures suggest a further decline in numbers due to the drought and a lowering in prices.

Dairy cattle are raised primarily in the Santa Maria Valley, but dairies also are found around Lompoc and in the Santa Ynez Valley.

The number of dairy operations has declined in recent years, and production has decreased 23 per cent since 1964. Each year the decline has been relatively steady, averaging 3 per cent annually with increases in production only in the periods 1964-1965 and 1971-1972.

Horses

In 1973, 54 horse ranches were operating commercially in the County. On 40 of these, Arabian stock was raised, while thoroughbreds were raised on the remaining 14. In the Santa Ynez Valley, interest is growing in sport and pleasure horses. Although accurate statistics on the present horse population and recent trends are not available, the County Farm Advisor believes that the Santa Ynez Valley could become the light horse center of Southern California.

Vegetable Crops

The County's vegetable production includes artichokes, lima beans, broccoli, cabbage, carrots, cauliflower, corn, lettuce, peppers, potatoes, pumpkins, spinach, and tomatoes. Most of these truck crops are grown principally in the Santa Maria Valley, but favorable conditions in the Lompoc Plain, the Santa Ynez Valley, and the south coast have encouraged vegetable production there as well. In 1976 the total vegetable crop harvested acreage was 32,885, a slight drop from 1975 figures of 33,696.

Field Crops

Field crops in the County include barley, beans, alfalfa, oats, silage corn, sugar beets, and wheat. The field crop acreage represents about 1.1 per cent of the total acreage in the state, if non-irrigated pasture is excluded to make the statistics comparable. Preliminary figures show total field crop production for 1976 at 851,641, slightly lower than 1975.

Fruit and Nut Crops

Avocados, lemons, oranges, strawberries, walnuts, and wine grapes are the fruit and nut crops presently grown on over 16,000 acres of land. From 1963 to 1972 the County's orchard and vineyard production was less than 1 per cent of the total production state-wide, but with the recent expansion in avocados and wine grapes, this share should increase. Planted avocado orchard acreage in 1976 was 4,579, with 3,530 acres of bearing orchards. Lemon production has dropped from 55,000 tons in 1975 to 33,155 tons in 1976. Strawberry acreage increased in 1975 from 642 acres to 738,

while walnuts dropped slightly from 1,615 to 1,514 acres. Finally, total vineyard acreage now amounts to about 6,000 acres.

Cut Flowers and Nursery Products

Cut flowers, principally orchids, carnations, chrysanthemums, and gypsophilia, are grown primarily on the South Coast in the Carpinteria area. Over 12 million square feet of production area with 616 field acres is devoted to these products, up from 543 acres 1975. Seed crops are grown on over 8,300 acres primarily around Lompoc and Santa Maria, about 25 per cent less acreage than was utilized in 1964.

1977 Agricultural Production

Preliminary 1977 figures show a record gross value of \$190,807,697, an increase of almost \$25 million over 1976. Avocados, listed in seventh place the year before, reached first place in 1977, with a crop valued at more than \$18 million. Broccoli, with \$17.4 million in revenue, and head lettuce, valued at \$16.9 million, are listed in second and third place, with cattle and calves, at \$16.3 million, placing fourth. Other million dollar products are noted in the 1977 Agricultural Crop Report.

AGRICULTURAL LAND USE

Approximately 120,000 acres of land in the County currently are under cultivation. About thirty-five per cent of this land is devoted to irrigated field row crops. The next most extensive crop type is nonirrigated grain, a category which also includes some dryland beans and other dryland crops but excludes non-irrigated pasture. Irrigated pasture, including alfalfa and forage crops, occupies over 24,000 acres. Citrus, avocado, walnut, and deciduous fruit are grown on 16,300 acres, the bulk of which is found on the South Coast. Seed crops (a category including bean, flower, and vegetable seeds) are produced on 8,300 acres. The newest crop to be introduced in Santa Barbara County is wine grapes, and vineyards now occupy 6,000 acres. Table 3, from the 1975 Agricultural Land Use Survey, Santa Barbara County,²⁵ shows agricultural land use within hydrologic units. Agricultural trends may be seen in Table 4, also from the UCSB crop survey.

TABLE 3: 1975 AGRICULTURAL ACREAGE BY HYDROLOGIC UNIT

HYDROLOGIC UNIT	GRAIN*	FIELD	PASTURE	TRUCK	DECIDUOUS	CITRUS ^a	VINEYARD	SEMI-AG	ORNAMENTAL	TOTAL
Cuyama Basin	7923	180	6044	37	86		187	153		14610
+ Nipomo Basin	22	540	544	7585					138	8829
Santa Maria Basin	3824	8402	5447	19525			5121	605	488	43412
Casmalia Sub-Area	628						694	19		628
San Antonio Basin	2643	2205	788	1023	5		9	90	2136	9189
Lompoc Sub-Area	541	3656	387	2219	151		121		516	7572
Santa Rita Sub-Area	896	4228	599	745	467		484	33	129	4671
Duellton Sub-Area	1674	265	1330	613	143		240	194	35	10668
Santa Ynez Sub-Area	5014	900	3537	371	347					403
Cachuma Basin	269	110	24	4	105	510				1266
Surf-Tajiguas Area	638		9		34	528				651
Goleta WD #3	89				109	1322		9	54	1739
Goleta WD #2	202	118	31	12	27	3050		457	103	3981
Goleta WD #1	3		14	209	3	98		223	2	334
Santa Barbara, City of		4		4	8	679	2	516	10	1282
Montecito WD Area	21		31	15		158			2	160
Summerland WD Area						3106			474	3791
Carpinteria WD Area	12	6	45	63		96				96
Carpinteria Foothills						378			50	428
+ Ventura County										
Hydrologic Unit Totals	24429	20614	10830	32425	1485	9925	6058	2384	4137	121,007
+ Santa Barbara County Totals	24407	20074	18206	24840	1485	9547	6858	2304	3949	111,830

* Dry Farmed
 + Outside Santa Barbara County
 + Excludes Nipomo Basin and Ventura County Area

^a The Geography Remote Sensing Unit includes avocados in this category.

TABLE 4
CHANGES IN AGRICULTURAL LAND USE BETWEEN 1966 AND 1975¹
 (In Acres)

	<u>Irrigated Agriculture</u>		<u>Non-irrigated Agriculture</u>	
	<u>'75 Totals</u>	<u>Acreage Change</u>	<u>'75 Totals</u>	<u>Acreage Change</u>
Cuyama Valley	6,534	+ 1,759	7,923	- 2,397
Santa Maria- Sisquoc Valley	38,983	+ 8,588	3,824	- 4,426
San Antonio Valley ²	4,715	+ 1,585	3,271	- 3,679
Santa Ynez Valley				
Lompoc- Santa Rita	15,234	+ 3,864	1,437	
Buellton- Santa Ynez				
Cachuma	<u>8,528</u>	- 1,157	<u>6,987</u>	- 5,236
Surf to Tajiguas	628	- 1,312	638	- 567
Goleta Valley City of Santa Barbara	5,611	+ 1,306	294	- 191
Montecito	111	- 189	0	- 30
Summerland	745	- 170	21	- 19
Carpinteria Valley	160	- 120	0	- 60
COUNTY TOTALS	<u>3,790</u>	- 415	<u>12</u>	- 8
	<u>85,039</u>	<u>+13,979</u>	<u>24,407</u>	<u>-16,613</u>

1. The above totals do not include the "Semi-Ag" category, so the indicated totals and changes are presumed to more accurately depict planting trends.

2. Casmalia area included.

SOURCE: Agricultural Land Use Survey, UCSB Geography Remote Sensing Unit and Santa Barbara County Water Agency, May, 1976.

AGRICULTURAL SUITABILITY

So far, the analysis of agricultural resources has focused on production and land use without examining the environmental factors that make an area highly productive. It is important to know the agricultural suitability of presently cultivated areas in order to set priorities for agricultural preservation. A systematic assessment of agricultural potential in areas not currently farmed can assist land use planners to identify which lands should be reserved for agricultural expansion. An initial step in gauging the relative suitability of lands for agricultural production is to analyze the natural resource base and potential environmental impacts without reference to market trends for particular commodities. Land values, accessibility to markets and processing plants, and other economic factors affecting the cost of production at a given location also are important, but for comprehensive land use planning they are not the most critical determinants of agricultural land suitability. These issues are examined in the County's agricultural economics study.²⁶

The three major environmental determinants of agricultural suitability are water supply, soils, and climate. In the Water Resources chapter, the availability of water and the distribution of water supplies are discussed in relation to agricultural land use.

Soil resources were analyzed using data from the U.S. Soil Conservation Service and the County Farm Advisor to determine the relative capability of the land for various major crops, and the results are presented in the following section. Climate, while one of the most important determinants of agricultural suitability, has not been analyzed in detail to determine the micro-climatic variations within the County. Climatologists for the National Weather Service have published extensive material on temperature, rainfall, relative humidity, sunshine, and cloudiness and their impact on the growing season in Santa Barbara County. Summaries of these data are available in the soil surveys of the Soil Conservation Service. Because climatic factors are unlikely to affect significantly the land use planning decisions to be made in the Comprehensive Plan, this information is not repeated here. However, in preparing the soils capability classifications, climatic factors have been considered in the relative suitability rankings.

Agricultural suitability is not solely a function of natural resources. The potential environmental impacts on water resources and on ecological systems also affect the relative suitability of an area for agricultural production. Land use planning has to incorporate these factors as well.

Soils

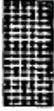
Two separate complementary systems of ranking soil capability for major crops are available. County-wide, the U.S. Soil Conservation Service has indicated the soil capability for agricultural production for each soil type. This approach shows quite clearly the potential for most but not all agricultural crops. The capability classifications are employed in the County's agricultural preservation program, described in a later

section of this chapter, to determine eligibility for designation as prime land. Because these suitability classes do not always reflect the potential for some of the crops produced in the County, such as avocados, wine grapes, and flowers, the soil series also have been given suitability classifications. The Soil Conservation Service has defined eight soil capability classes. Classes I and II are considered to be prime soils because they impose few limitations on agricultural production, and almost all crops can be grown successfully on these soils. Limited agricultural soils are grouped into Classes III and IV either because few crops can be grown on these soils, special conservation measures are required, or both of these conditions exist. Classes VI and VII include soils that are suited primarily for rangeland, woodland, and wildlife habitat. Class V, which also falls in this category, is not found in the County. Finally, soils and landforms that are unsuited for agricultural use are placed in Class VIII.

The Soil Conservation Service soil surveys in Santa Barbara County were conducted at two different times. The north County area was surveyed in 1964, and the results were issued in 1972. The South Coast area was surveyed in 1973 and 1974, and field maps were made available for use in preparing the soils maps for the Conservation Element. The soil capability classes were mapped County-wide, and the soil series were mapped in the study areas. Both the soil capability classifications and the soil series information were included in the computer data bank as part of the environmental data system.

The Soils: Agricultural Capability map shows the distribution of lands falling in each of the four capability classes. The acreages are summarized in Table 5. Over 100, 000 acres in the County are classified as prime agricultural soils, and another 128,000 are classified as limited agricultural soils.

Santa Barbara County Soils: Agricultural Capability

	Prime Agricultural Soils (Class I and II)
	Limited Agricultural Soils (Class III and IV)
	Primarily Rangeland, Woodland or Wildlife Habitat (Class VI and VII)
	Non-Agricultural Open Space Uses (Class VIII)

Note. Where no data are shown, natural soil types have been altered, and no agricultural capability classification is associated with present conditions.

SOILS: AGRICULTURAL CAPABILITY, SANTA BARBARA COUNTY

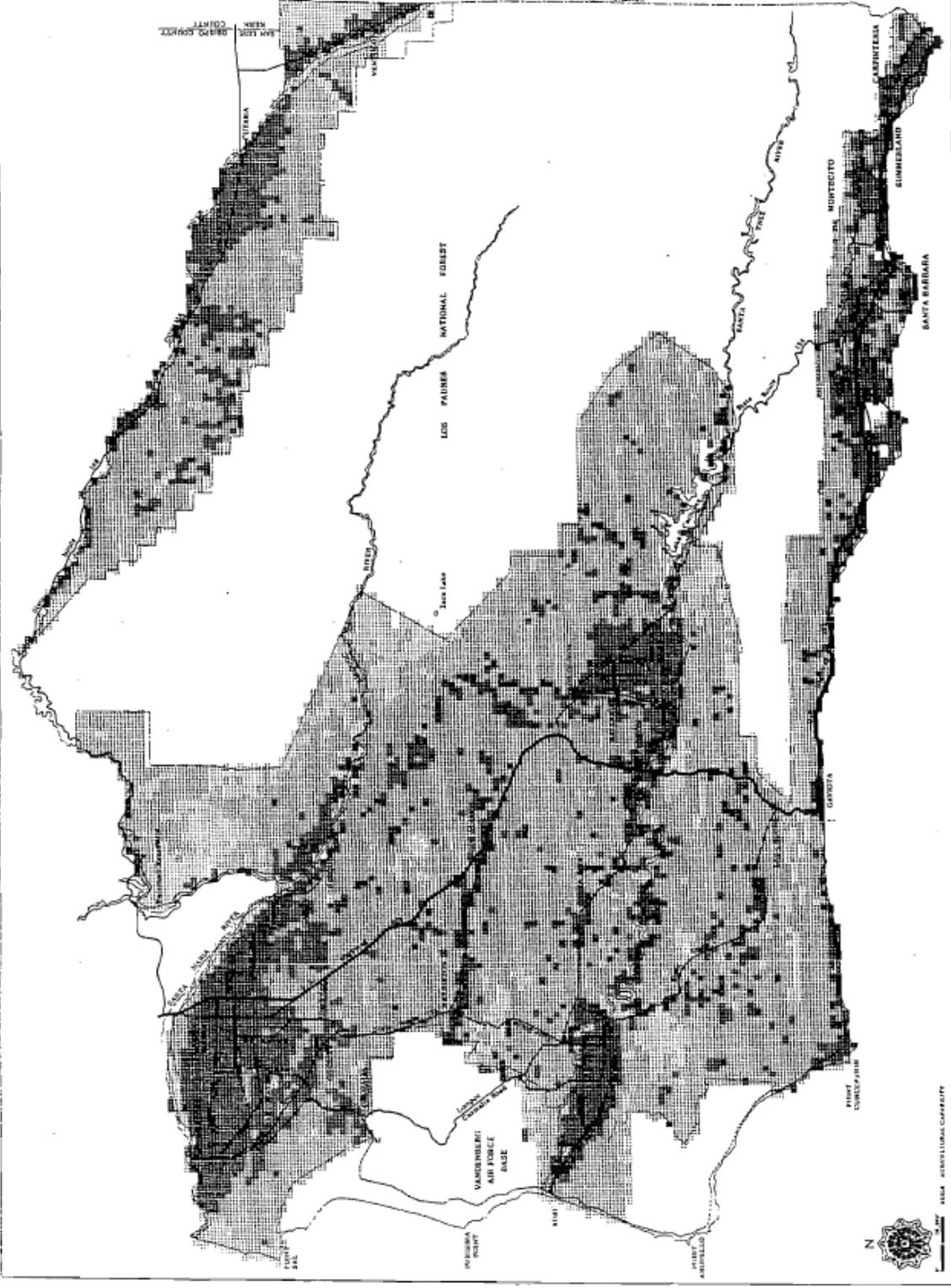


TABLE 5. SOILS: AGRICULTURAL CAPABILITY

<u>Soil Capability Classes</u>	<u>Total Acres County-wide^a</u>	<u>Per Cent of Total</u>
Prime agricultural soils Class I and II	104,500	12
Limited agricultural soils Class III and IV	128,600	14
Primarily rangeland, wood- land, and wildlife habitat Class VI and VII	555,000	62
Non-agricultural open space uses, Class VIII	<u>104,100</u>	12
Total	892,200	

(a) Acreage computed for computer analysis area only.

Source: U.S. Soil Conservation Service

The County Farm Advisors' Office evaluated the suitability for production for each major crop type in each study area separately and ranked the soil series accordingly. Where slope also is a factor, separate rankings were made for each slope category. The soil series suitability ratings for each of the city's major crop types are shown in Table 6.

Environmental Impacts

The environmental impact of modern agricultural operations often can have far-reaching effects. Unfortunately, much research still remains to be done on the impacts of agricultural waste products on air quality, water quality, and ecological systems, as well as on human health.

The problem perhaps is best illustrated by the case of DDT and other pesticidal chemicals which involve not only the accumulation of residues in air, soils, water, and wildlife but also result in increasing concentrations as these residues move up the food chain. Even today, scientists are not in complete agreement on the desirability of banning DDT and other pesticides because the alternatives often create equally damaging effects. Over the past several years monitoring activities have increased, but the information base still is not adequate to assess accurately the full range of impacts of agricultural operations in the County. Consequently, the major issues can be raised in this section, but the answers must await further research.

Agricultural production's impact on basin-wide air quality results primarily from debris burning and orchard heaters. Air polluting emissions also come from fuel-burning farm machinery, but an emissions inventory for these particular sources has not yet been compiled. The emissions attributable to agricultural production in Santa Barbara County are summarized in Table 7. With the advent of State and federal emissions control programs for mobile sources and County regulations for stationary source emissions, the proportion of total emissions attributable to agriculture may increase slightly, especially on burn days, but air quality should improve.

TABLE 7. AIR POLLUTING EMISSIONS FROM AGRICULTURAL OPERATIONS IN SANTA BARBARA COUNTY

	<u>Tons Per Day</u>	<u>Per cent of all Station- ary Source Emissions</u>	<u>Per cent of Total Emissions</u>
Organic gases	5.4	30	12
Particulate matter	3.3	23	21
Nitrogen oxides	0.2	3	1
Sulfur dioxide	.1	50	16
Carbon monoxide	8.5	71	6

Source: California Air Resources Board, 1970, published in 1972--latest complete figures available.

Irrigated agriculture, dairying, and feedlots have the greatest impact on water resources of all agricultural operations. The problem of increased mineralization of groundwater, already mentioned in the Water Resources chapter, combined with accumulation of salts in soils can be minimized through sound management practices. Water quality objectives for agricultural uses set by the Regional Water Quality Control Board are being reinforced by implementation of a nondegradation policy permitting no increase in the mineral content of present water. Surface runoff carrying animal wastes from feedlots and dairy farms can degrade water quality if not properly controlled. The American Chemical Society has estimated that each animal produces wastes equivalent to the untreated waste of 4.5 people. With this fact in mind, the problems of waste

disposal for large feedlots and dairy operations can present significant problems. Control measures to minimize these impacts are described in the Central Coastal Basin Water Quality Control Plan. The feedlot in Betteravia currently is modifying its waste disposal practices to conform to the Regional Water Quality Control Board's requirements.

Only specific local impacts of agricultural operations on water quality were incorporated into the evaluation of the suitability of lands for agricultural use. Lands tributary to surface water supplies and overlying groundwater basins were rated to show how important these environmental constraints are in determining agricultural suitability. A more detailed discussion of the various categories that have been identified for the protection of local water resources is presented in the Water Resources chapter.

Ecological systems are affected directly and indirectly by agricultural operations. Along many South Coast streams, avocado ranching has increased siltation and encouraged algal growth, contributing to the decline of trout. In the Santa Ynez Valley, overgrazing has prevented the oaks from regenerating. Other examples are discussed in the Ecological Systems chapter. It is important to note that the tolerance intensity classification system for environmental biology was designed to take into account the potential adverse impacts of agriculture on the County's ecological systems.

The environmental impacts of agricultural operations at the edge of urban areas often are cited as justification for conversion of these lands to urban use. Many contend that intensive agriculture - orchards, irrigated truck crops, and flower crops, for example - is not compatible with urban development. But, until the last several decades cultivated agriculture surrounded most of California's cities, and in many urban areas a harmonious relationship still survives. Many thoughtful people believe that land values and property taxes are the major factors inhibiting the viability of farming close to or intermingled with urban development and that adverse environmental impacts can be minimized through improved operating practices. Obviously, air pollution in urban areas affects crop yields, but County, State, and federal control measures to improve air quality will mitigate this problem substantially. Noise and traffic conflicts caused by agricultural operations can be resolved, albeit at some cost and inconvenience. Similarly, the problems of plant disease and vandalism, upon close scrutiny, are not insurmountable. In the final analysis, the economic and environmental benefits of maintaining highly productive agriculture in and adjacent to urban areas may outweigh the costs of environmental controls necessary to achieve compatibility.

Agricultural Suitability Models

Two separate analytical models were designed to determine the suitability of lands for agricultural use County-wide and in the study areas, taking into account both natural resources and potential environmental impacts. Environmental analysis utilizing mathematical modeling techniques still is an imprecise instrument, and few models have been devised to evaluate systematically agricultural potential by crop type. Relative suitability of lands for agricultural use can be gauged if acceptable assumptions

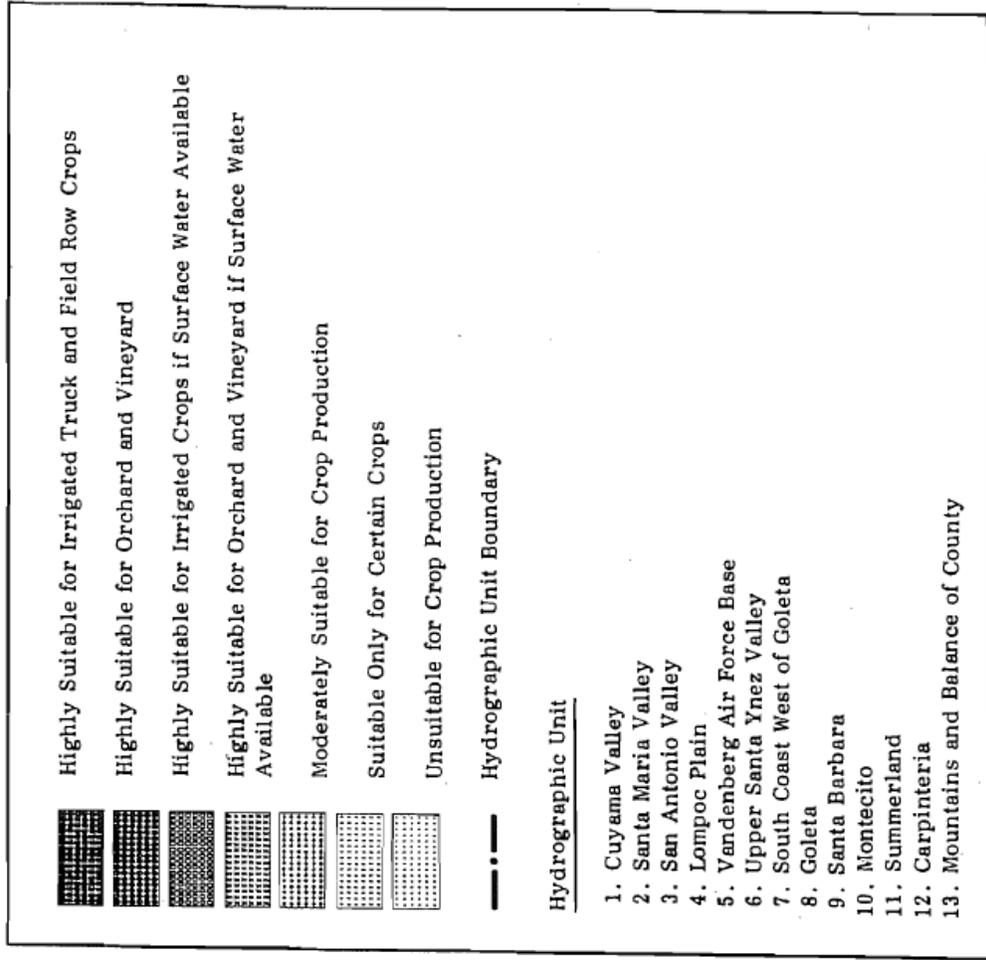
are made about the importance of each environmental factor in determining overall suitability and if cut-off points for different levels of adverse impacts are established. However, these suitability models have not been tested empirically, and the data they utilize are not precise enough to estimate potential crop yields at particular locations. Despite these limitations, agricultural suitability models are valuable tools for comprehensive land use planning because they show where the opportunities for agricultural expansion lie and provide a structure for assigning priorities to croplands for preservation of agricultural use.

In the following discussion of the two agricultural suitability analyses, no reference is made to the computer program procedure utilized. A detailed description of the analytical model steps, the numerical weights assigned to each environmental factor, and the cut-off points for each of the mapped categories is included in Appendices A and B.

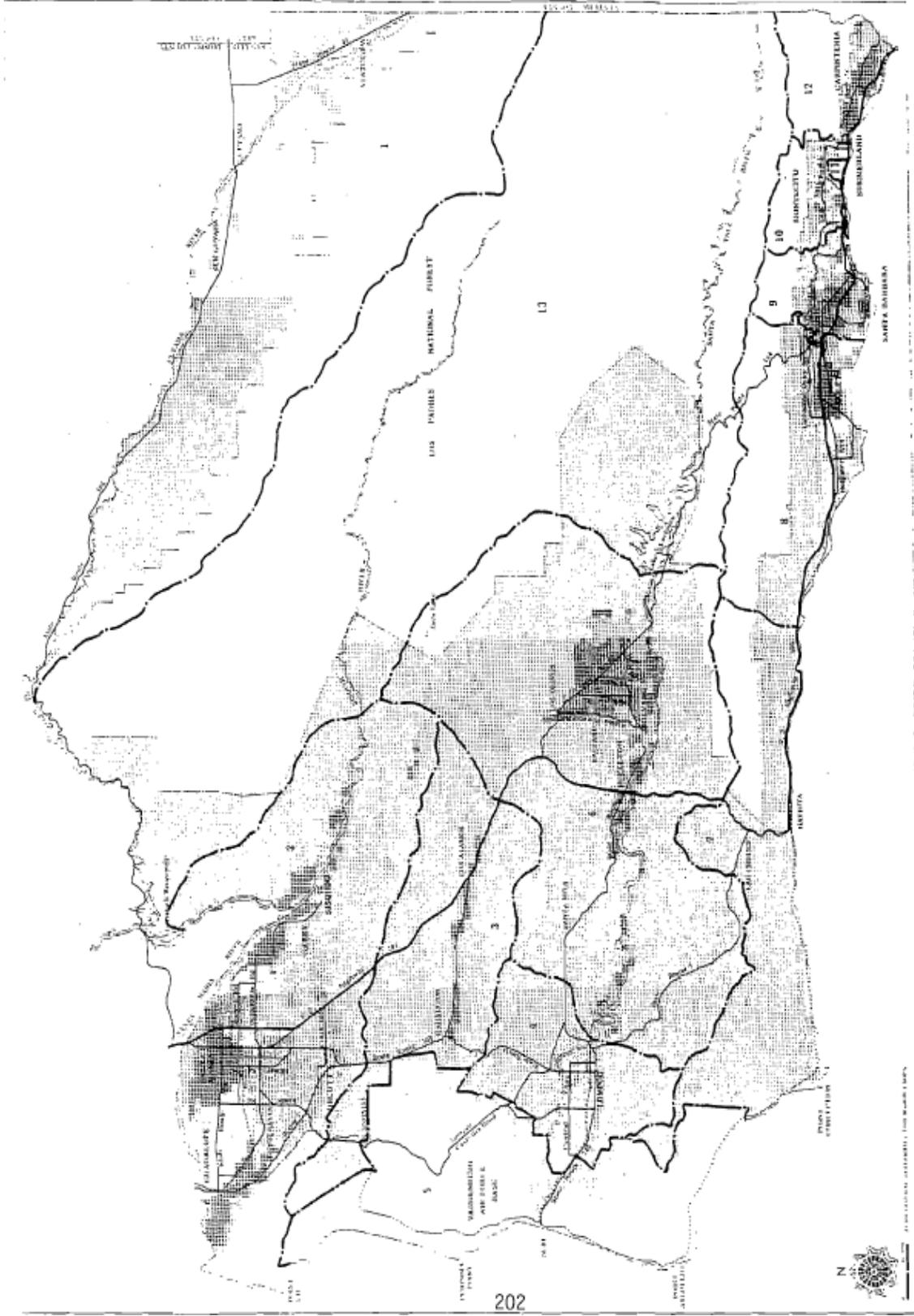
The County-wide Model - The objective of this analytical model is to identify and rank areas suitable for agricultural production. All lands in the County are classified in one of seven suitability categories. In this way, the relative suitability of lands presently under cultivation can be compared with that of lands that are likely candidates for agricultural expansion. Areas suitable for irrigated truck and field row crops are distinguished from areas suitable for orchards and vineyards and areas suitable for specialty crops in order to take account of each major crop type's specific requirements. Because urban land use was not included in the County-wide data file, presently urbanized lands have been given suitability rankings too. The major purpose of this model is to assess agricultural suitability of lands outside the study areas, utilizing County-wide environmental data; so the inclusion of urban lands will not distort the planning process.

Agricultural suitability in the County-wide model was determined by three separate indices. The Environmental Resource Index combines the Soil Conservation Service's soil capability classifications with the indices of availability of groundwater. Areas with Class I and II soils and adequate groundwater received the highest score. A Landform Index was computed by combining the data on the proportion of the 92 acre grid cell falling in three separate slope categories: 0-10 per cent slope, 11-20 per cent slope, and 21-30 per cent slope. Flat areas are assumed to be more suitable for irrigated agriculture than extremely hilly areas, while orchards and vineyards generally are viable on slopes up to 30 per cent. The Landform Index was grouped into four ranges to show whether the land in a particular grid cell is predominantly flat, gently sloping hills, rolling hills, or steep slopes. Environmental Constraints, the third index, includes flood hazards, protection of local water resources, the tolerance-intensity classification for environmental biology, and high groundwater. Each of the sub-classifications of these factors was assigned a weight representing the degree of constraint it imposes on agricultural production. The weights then were combined into a summary index for Environmental Constraints. The County-wide Agricultural Suitability map was produced by assigning cut-off points for each index, with lower indices representing lower suitability. The detailed steps for computer programming are presented in Appendix A.

Santa Barbara County Agricultural Suitability for Major Crops



AGRICULTURAL SUITABILITY FOR MAJOR CROPS, SANTA BARBARA COUNTY



This model shows that in the County-wide study area over 33,000 acres of land is highly suitable for irrigated crops, and an additional 34,000 acres are highly suitable if surface water is available. Most of this land is located in the Santa Maria Valley, the Lompoc area, and the Santa Ynez Valley, as one would expect from the current agricultural land use pattern. Lands highly suitable for orchard and vineyard, which also may be moderately suited for irrigated agriculture, include 43,340 acres where adequate groundwater is available and 31,770 acres where supplemental surface water supplies would be required. Limited agricultural soils, Class III and IV, are the limiting factor in these categories. Over 47,000 acres located primarily in the Santa Maria Valley, the Santa Ynez Valley, and the Cuyama Valley are judged to be moderately suitable for cultivated agriculture. Finally, lands that are suitable only for certain crops occupy close to a third of the County-wide study area. Here, opportunities for specialty crops not shown in the other categories might be found.

Land can be shown as unsuitable for agricultural use for several reasons. When no prime or limited agricultural soils are present, the land obviously is unsuitable for irrigated crops. It also would be unsuitable for fruit and nut crops if it is subject to severe environmental constraints. If at least three of the following four conditions exist, an area is considered unsuitable for agricultural use.

- The land is in a floodway.
- The land is tributary to surface water supplies, or overlies unconfined groundwater.
- Ecological communities within the area could not tolerate even moderate intensity agriculture.
- High groundwater is present.

When the County-wide Agricultural Suitability map is compared with the Agricultural Preserve map, it becomes clear that most of the highly suitable land already is used for agricultural production or for urban development. However, in the Santa Maria Valley, undeveloped lands near Orcutt have moderate to high agricultural potential. At the head of the San Antonio Valley near Vandenberg Air Force Base, expansion of existing agricultural operations onto lands judged highly suitable might be viable. Similarly, west of Lompoc several hundred acres are shown with high potential provided that surface water is available. The lands shown as highly suitable at Point Conception are subject to strong winds, and it is unlikely that crops could be grown there profitably, according to the County Farm Advisor. In the hills east of Las Cruces Ranch potential for orchards is indicated, but water supply might pose a problem. Finally, in the Cuyama Valley agricultural expansion onto lands adjacent to existing cropland might be advantageous. In general, it appears that no major areas with high agricultural potential have been overlooked by the County's farmers.

The County-wide Agricultural Suitability map is utilized in preparing the Open Space Element to assist in classifying lands outside of the study areas. Presently cultivated

lands will be ranked according to their agricultural suitability to set preliminary priorities for open space designation and preservation programs. Areas not under cultivation or non-irrigated areas capable of being upgraded to more intensive agricultural use will be analyzed in relation to other possible open space functions that they might serve, to determine whether any potential conflict exists or whether these lands can even qualify for an open space designation.

The Study Area Model - A separate analytical model was designed for the urban study areas to identify and to rank lands suitable for intensive cultivation that were not in irrigated crop production in 1971. The 1974 agricultural land use data were not available in time to be included in the study area data files; so some of the areas suitable for agricultural expansion already have been put into intensive cultivation. In these instances, the model still is useful in indicating the relative importance of these areas for preservation of agriculture. Suitability for six major crop types was gauged by utilizing the soil series classifications prepared by the County Farm Advisor and his staff. (See Table 6.) An area might be shown as suitable for more than one crop type, and, for this reason, a composite suitability map was prepared.

The structure of the study area model is similar to the County-wide model except that the information base is at a finer scale. Each grid cell in the study areas is 5.74 acres, while the grid cells County-wide are almost 92 acres. Two separate indices were calculated. The Soil Suitability Index was based on the soil series classifications shown in Table 6, and on the slope in the cell. Each cell was given a rating of suitability: high, moderate, low, or unsuitable. Because slope was included in this calculation, a Landform Index is not necessary. The Environmental Constraints Index combines the weights assigned to the same environmental factors as considered in the County-wide model: flood hazard, protection of local water resources, tolerance-intensity classification for environmental biology, and high groundwater. Water availability, of course, must be evaluated prior to making final decisions on agricultural expansion.

The greatest opportunities for expansion lie with non-irrigated crops and vineyards if only highly suitable land is considered, and most of the land in these categories is found in the Santa Ynez Valley and Santa Maria study areas. For the three types of irrigated crops and for orchard, the only major potential expansion areas on highly suitable land are in the Santa Maria area. Moderately suitable areas, where soils are less suitable and environmental constraints are greater, are found in larger units in all the study areas, with the greatest acreage lying in the Santa Ynez Valley.

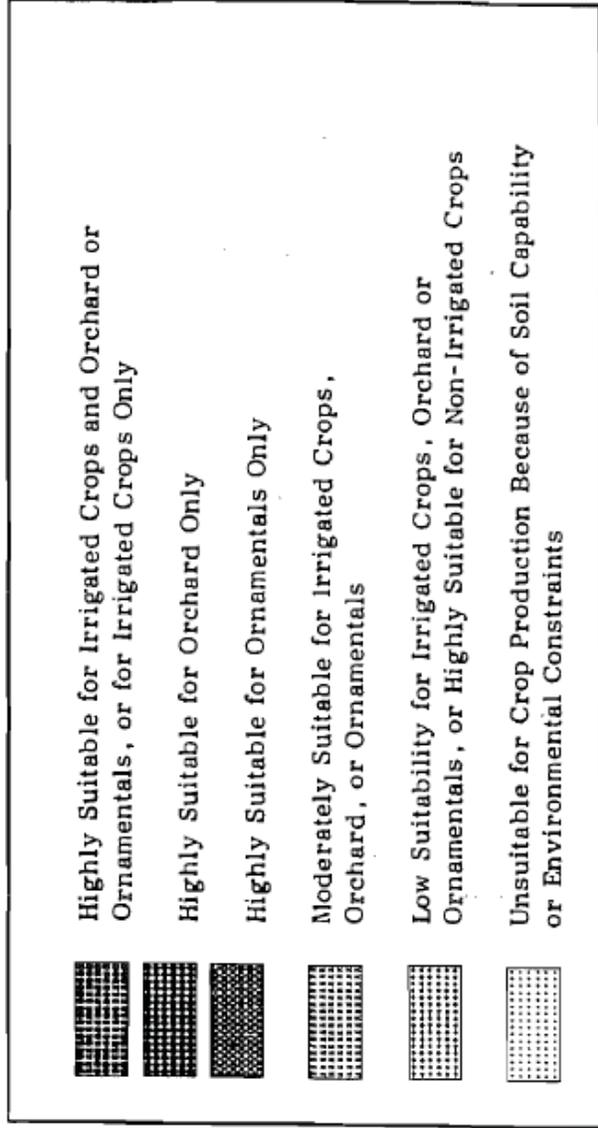
In this category, more land can be used for orchard, irrigated grain, pasture and alfalfa, and irrigated ornamental crops than for any other crop type, assuming that either groundwater or surface water supply is available. Most of the opportunities exist on the South Coast. As one would expect, for each crop type the greatest amount of land falls in the categories of low suitability and suitable with environmental problems.

The following study area maps of Suitability for Agricultural Expansion show the distribution of lands within each of the composite categories. In most instances the

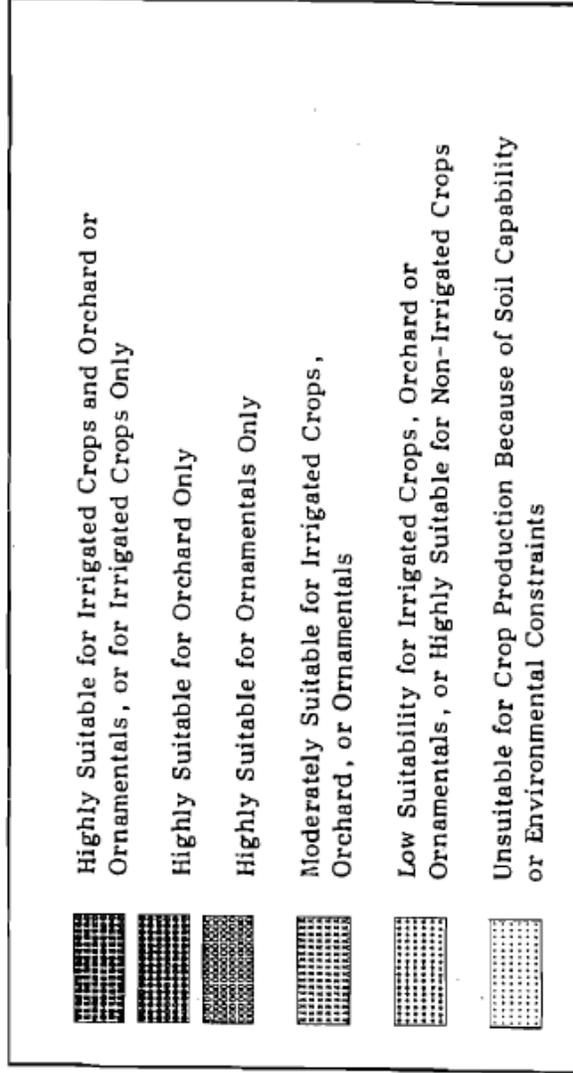
isolated uncultivated areas surrounded by agricultural lands (infill areas) now are being farmed, according to the 1974 agricultural land use up-date. In other areas, comparison of existing agriculture with the agricultural expansion potential maps shows that some non-irrigated crop lands have been classified as unsuitable because of environmental constraints. On the individual suitability maps for each crop type, these areas are shown as suitable with environmental problems. However, because the objective of the model was primarily to identify areas of high and moderate suitability for major crop types, specific lands where certain crops might be viable may not be indicated as such on the maps if the environmental factors and soil capability revealed low potential coupled with adverse environmental impacts.

SUITABILITY FOR EXPANSION OF AGRICULTURE

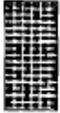
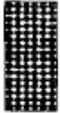
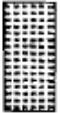
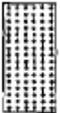
South Coast Study Area ~ East Suitability for Expansion of Agriculture



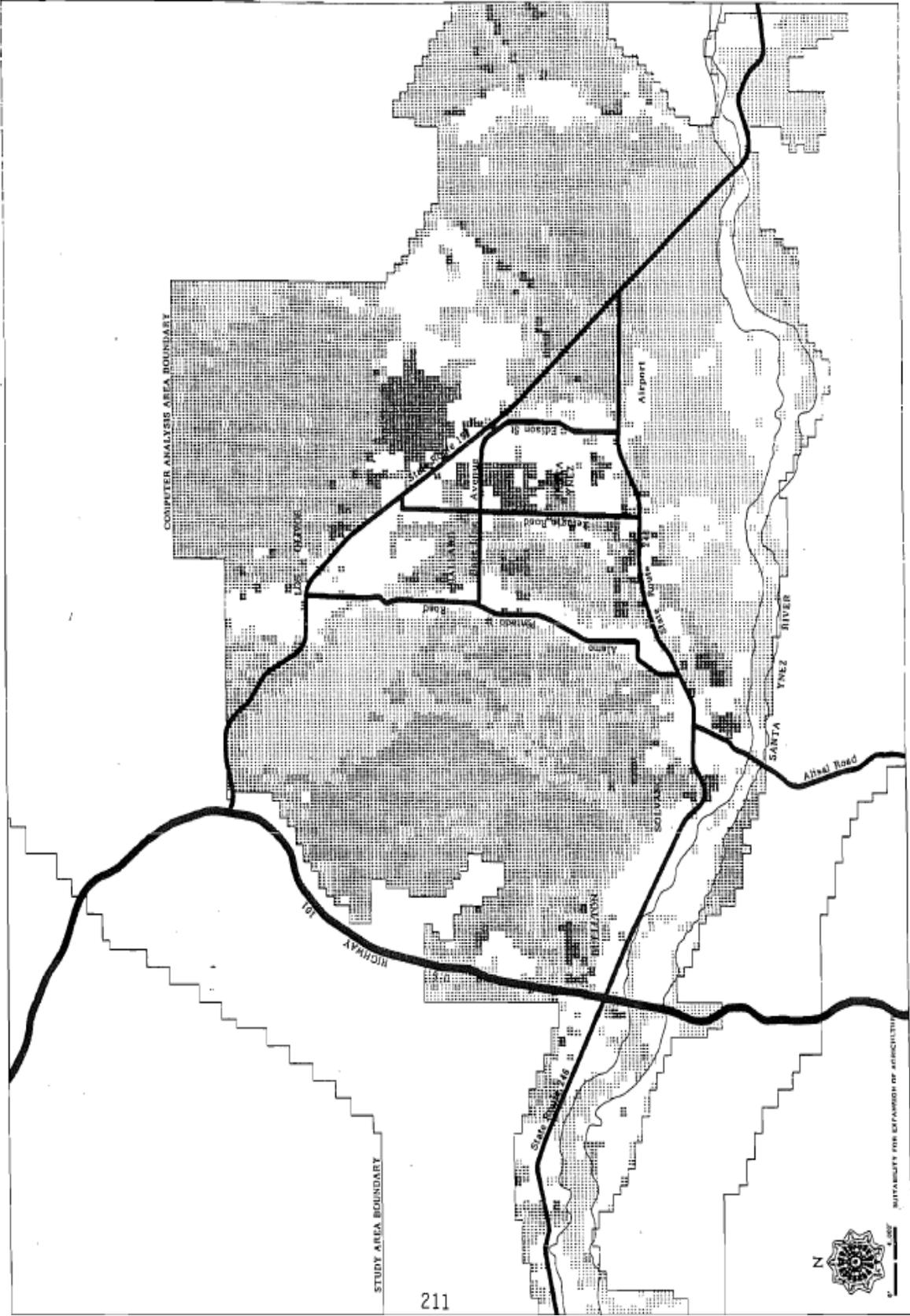
South Coast Study Area ~ West Suitability for Expansion of Agriculture



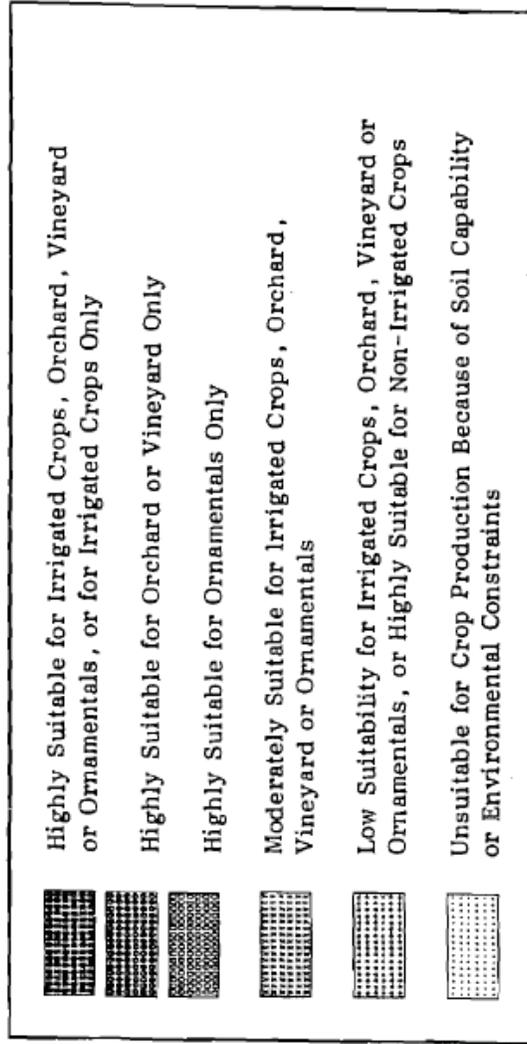
Santa Ynez Valley Study Area Suitability for Expansion of Agriculture

	Highly Suitable for Irrigated Crops, Orchard, Vineyard or Ornamentals, or for Irrigated Crops Only
	Highly Suitable for Orchard or Vineyard Only
	Moderately Suitable for Irrigated Crops, Orchard, Vineyard or Ornamentals
	Low Suitability for Irrigated Crops, Orchard, Vineyard or Ornamentals, or Highly Suitable for Non-Irrigated Crops
	Unsuitable for Crop Production Because of Soil Capability or Environmental Constraints

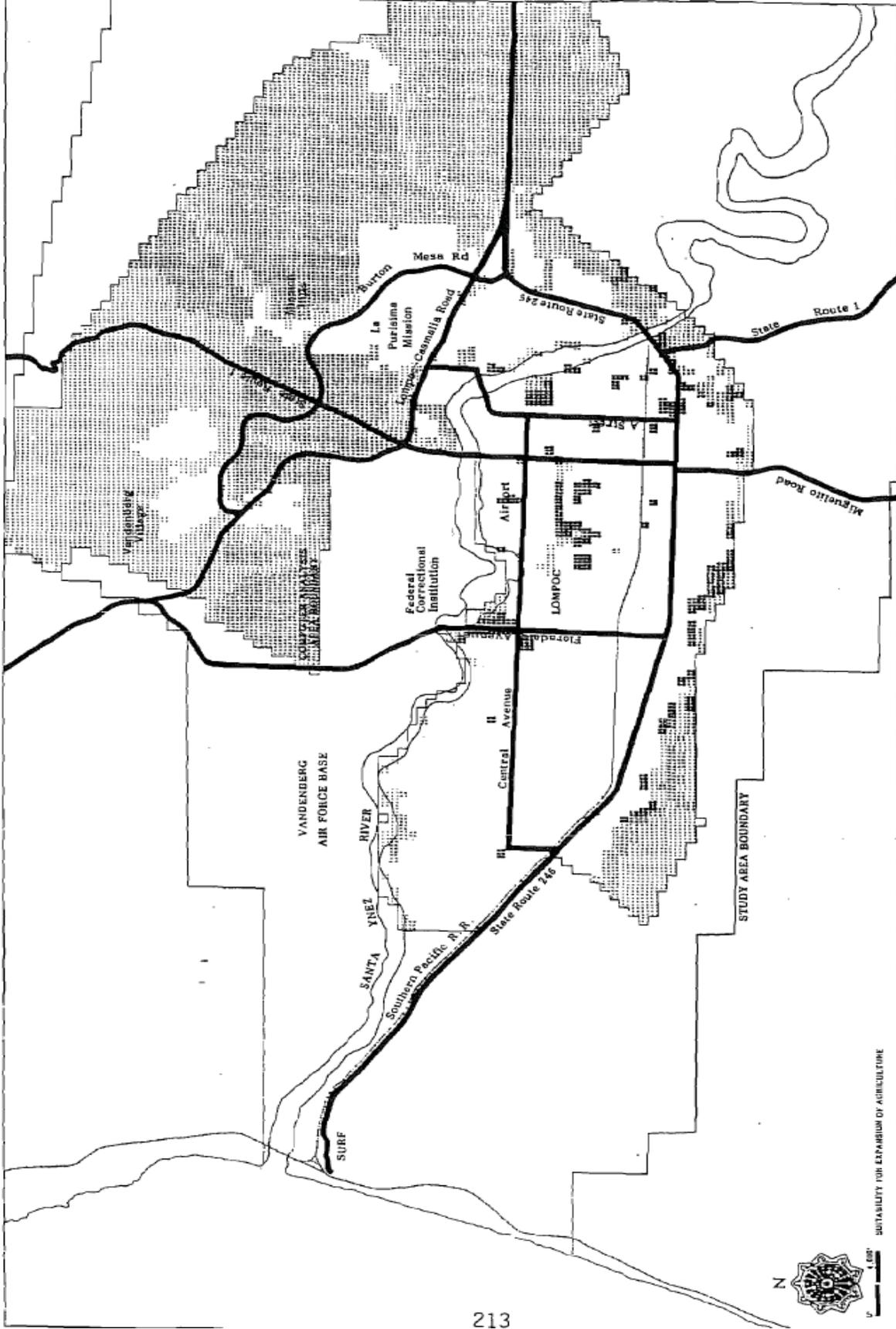
SANTA YNEZ VALLEY AREA



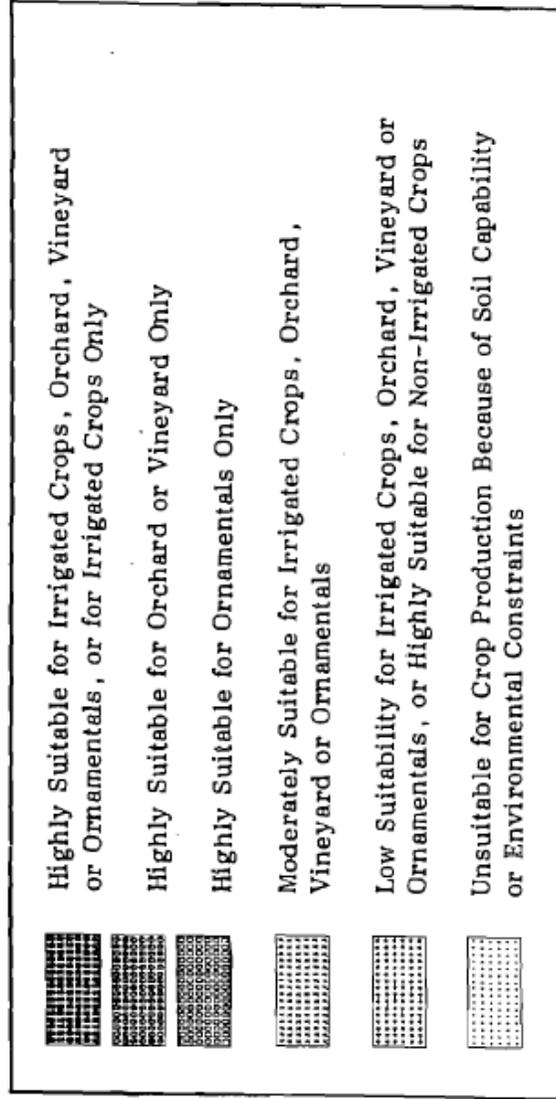
Lompoc Study Area Suitability for Expansion of Agriculture



LOMPOC AREA



Santa Maria-Orcutt Study Area Suitability for Expansion of Agriculture



On the South Coast near Carpinteria, most of the potential expansion areas in the hills are judged to be moderately suitable for agriculture. The infill areas are in orchards already. In Summerland, large areas of moderate suitability for all irrigated crops and orchards are indicated. However, some of these areas that already have been put into non-irrigated crop production could be upgraded. The lands around Montecito are judged moderately suitable for agricultural expansion, and in many of these areas orchards now are found. In Santa Barbara, only areas of low suitability remain for agricultural expansion. In Goleta, opportunities for expansion exist in small isolated areas of moderate suitability. Finally, west of Goleta there are extensive areas with moderate and low suitability. Some of these moderately suitable lands might be put into orchards.

In the Santa Ynez Valley, the lands north of Santa Ynez with high agricultural potential presently are in irrigated production, and portions of the moderately suitable lands to the east are in non-irrigated production. In other parts of the Valley, non-irrigated crops can be found on lands of low suitability and on lands with environmental problems. West of Santa Ynez lies an area with high suitability for orchard use only, and some small areas exhibiting high suitability for all irrigated crops. Around Solvang there also are lands that are highly suitable for orchards. Some of the land shown as moderately suitable is used for growing non-irrigated crops. North of Buellton and Solvang, most of the land not being cultivated has moderate to low suitability for all types of crops.

Turning to the Lompoc study area, fewer opportunities for agricultural expansion can be found. North of Lompoc, some irrigated crops and non-irrigated crops are being grown on lands of moderate suitability. In the Vandenberg Village area east of Mission Hills, almost all of the land has moderate agricultural potential. The areas with high potential currently are being cultivated except for sites surrounded by urban development in the City of Lompoc.

The greatest potential for expansion of farming exists in the Santa Maria study area. On the north side and the east side of the City of Santa Maria are lands with high potential for irrigated agriculture. South of the City the potential is only moderate. Recent expansion of non-irrigated crops to the southwest appears to have taken place on lands with environmental problems. Around Orcutt, ornamental crops, orchards, and vineyards could expand onto lands with high suitability. In fact, the recent vineyard expansion has occurred on such lands. Most of the remaining land in this study area has moderate potential for agricultural expansion.

PRESERVATION OF AGRICULTURE

As pressure for urban development and second home and “ranchette” subdivision increase, farmers often are tempted to sell out and reap the profits land speculators are willing to pay them because they believe that they cannot afford to keep their land in agricultural use indefinitely. Property taxes levied on the market value of agricultural land, rather than its present use, often make the difference between profit and loss for a

farmer, especially if he is producing relatively low value crops or using his land for grazing. To rectify this situation, in 1965 the State Legislature passed the California Land Conservation Law, also known as the Williamson Act, which authorized counties and cities to designate agricultural preserves and to assess land within these preserves on the basis of its present use if the property owner agrees to hold his land in that use for 10 years. Under the act, contracts between the property owners and counties or cities are automatically renewed annually for a term of ten years subject to cancellation provisions generally involving substantial penalties.

Santa Barbara County's agricultural preserve program was initiated in 1966, and approximately 500,000 acres (90% of the eligible agricultural land) presently come under the program. All lands lying within agricultural preserves are under contract, so that the owners can realize the tax benefits of the program.

Qualifications for lands to be designated as agricultural preserves are found in "Criteria For Agricultural Preserves," adopted by the Santa Barbara County Board of Supervisors. The land must either be in a Class I or II Soil Capability classification, as prescribed by the U.S. Soil Conservation Service, or qualify for an 80 to 100 rating in the Storie Index System to be designated prime land, in which case the minimum size of a preserve is 40 acres. Land also can qualify as prime if it supports livestock at a density of one animal per acre, is in orchard use that can return at least \$200 per acre, or is devoted to other agricultural production that generally would return \$200 per acre. Farm land not meeting these qualifications is classified as non-prime, and the minimum size for an agricultural preserve is 100 acres. However, in certain instances, very prime land of at least 5 acres in a separate ownership may be combined with adjacent prime land to meet the 40 acre minimum requirement.

The history of the agricultural preserve program, summarized in Table 8, shows a consistent increase in acreage since 1967. As of March 1, 1977, total agricultural preserve acreage amounted to 494,398, involving 803 contracts and 2,325 parcels. The lands currently designated as agricultural preserves are shown on the County-wide Agricultural Preserve map.

TABLE 8
 ACREAGE OF AGRICULTURAL PRESERVES IN SANTA BARBARA COUNTY

	Carpinteria Area	Goleta Area	Refugio ^{a/} Area	Lompoc ^{b/} Area	Santa Ynez ^{c/} Area	Los Alamos ^{d/} Area	Santa Maria ^{e/} Area	Guadalupe Area	Cuyama Area	S.B. County Total
1967	-	2,493	0	1,234	7,182	20,522	0	0	0	31,431
1968	45	953	3,851	18,817	33,693	40,097	3,131	0	0	100,587
1969	58	1,959	1,438	31,475	42,114	10,280	5,452	2,183	0	94,959
1970	0	61	11,605	9,976	15,370	19,498	40,243	17,576	11,345	125,674
1971	841	163	3,206	3,168	8,408	6,776	8,107	2,264	0	32,933
1972	272	641	14,281	13,170	9,064	204	2,996	400	1,172	42,200
1973	84	12	5,744	4,017	5,206	1,200	1,922	0	120	18,305
1974	345	149	1,045	1,546	1,462	0	1,255	0	2,780	8,582
1975	83	483	8,914	834	4,239	0	210	0	730	15,493
Total	1,728	6,914	50,084	84,237	126,738	98,577	63,316	22,423	16,147	470,164

Data compiled by S.B.Co. Water Agency from S.B.Co. Planning Department Files.

a/ Includes: Gaviota, Las Cruces, Najoqui, Refugio, Point Conception, El Capitan, Bixby and Hollister Ranches.

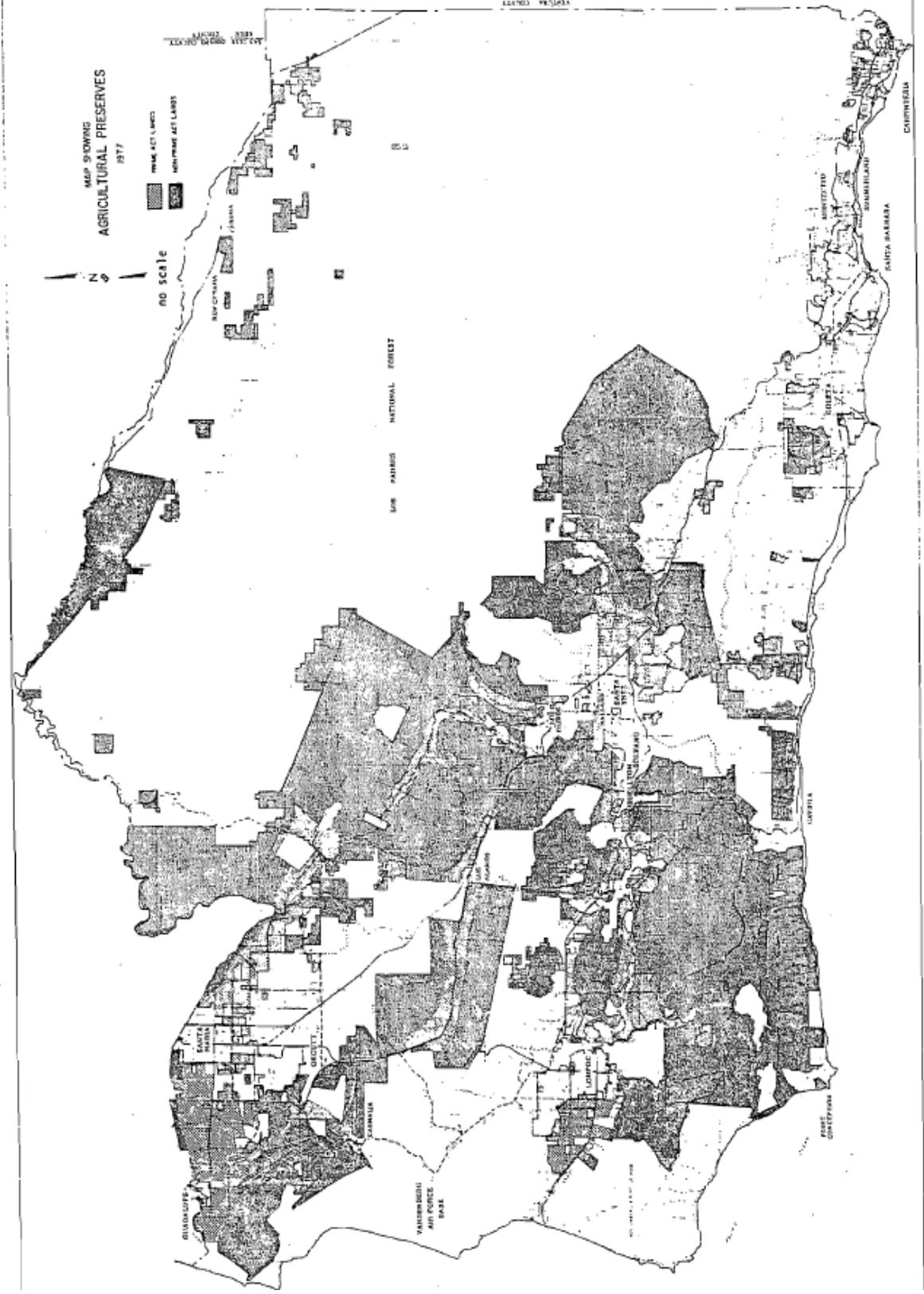
b/ Includes: Lompoc, Santa Rita, Drum Canyon Area.

c/ Includes: San Marcos Pass Area, Cachuma Area, Solvang, Santa Ynez, Ballard, Los Olivos and Buellton.

d/ Includes: Foxen Canyon

e/ Includes: Santa Maria, Orcutt, Casmalia, Garey, Sisquoc, Tepusquet and Betteravia.

AGRICULTURAL PRESERVES, SANTA BARBARA COUNTY



Williamson Act agreement coverage includes the following types of property:

<u>Allocation</u>	<u>Total Acres</u>	<u>Percent of Total</u>
Homesites	824.30	.18
Urban Prime*	20,919.69	4.53
Prime	30,137.46	6.53
Non-Prime	409,733.47	88.76

*Prime land within one mile of city limits

Source: Agricultural Preserve Advisory Committee, Santa Barbara County Agricultural Preserve Program, 1975.

In the Santa Maria area, the boundaries of the preserves generally lie within one quarter mile of existing urban development, and in certain locations on the west side of the city, the preserves actually adjoin developed areas. Similarly, on the west side of Lompoc, the agricultural preserves are less than a half mile from residential development. On the South Coast, several of the preserves also are quite close to existing development, especially in Carpinteria and in Goleta. This pattern of agricultural preserves is uncommon in other counties because farmers generally have been reluctant to enter into Williamson Act agreements if their land has apparent urban development potential. In Santa Barbara County, as a result of the agricultural preserve program, most of the urban areas already are blessed with the beginning of greenbelts around them.

CONCLUSIONS AND RECOMMENDATIONS

The high productivity of Santa Barbara's agricultural resources has earned the County its standing as an important source of food and flowers for state and national markets. The expansion of agriculture in recent years has been made possible in part because adequate water supplies were available at reasonable prices. As a consequence, the County's irrigated acreage has increased by 25 per cent since 1966. Opportunities for expansion of intensive agriculture exist for all major crops, and the major constraint in the future may be the availability and the price of water. Table 9 indicates current irrigation costs and projected costs through year 2000. (See also Appendix C.)

TABLE 9
 PROJECTED IRRIGATION WATER COSTS^{a/}
 (\$/Acre-foot)^{b/}

	Groundwater ^{c/}			Cachuma Project			1976 Prelim. Data for State Project Water		
	1975	1980	2000	1975	1980	1990	2000	Without Subsidy	With Subsidy
South Coast	14	15	17	17	17	204	198	181 ^{a/}	175 ^{a/}
Carpenteria CWD ^{d/}				45	50	41	30		
Goleta, Montecito, d/ Summerland CWD				70	50	41	30		
West Goleta ^{e/}						363	353	262 ^{h/}	252 ^{h/}
Santa Ynez	15	16	19	20					
SYRWCD ID #1 ^{f/}				20	15	12	9		
Lompoc	10	11	12	13					
San Antonio	12	13	15	16					
Cuyama	15	17	20	22					
Santa Maria-Sisquoc	10	11	13	14				42	43
								39 ^{i/}	40 ^{i/}

a/ Abstracted from Newton, et al, "The Economic Demand for Irrigation Water in Santa Barbara County," SBCWA, March 1977. The subsidy is hypothetical and was assumed for study purposes

b/ All figures in 1975 dollars, discounted for inflation. The rate of inflation was assumed to be eight percent short term (1975-80) and four percent long term (1980-2000).

c/ Cost to private groundwater pumpers as a function of projected increases in power consumption due to increased pumping lift, and increasing energy cost. Changes in groundwater levels are indicated in the description of each hydrologic basin. Increases in energy costs were forecast using the Pacific Gas & Electric Agricultural Rate as a base except on the South Coast where the Southern California Edison agricultural rate was employed. Energy rates were projected to increase at the rate of two percent per year above the annual rate of inflation. Well pumps were assumed to operate at 60 percent efficiency.

Source: SBCWA, Present and Future Water Needs, October 31, 1977.

Notes to Table 9: (continued)

- d/ Basic variable water cost for gravity flow delivery.
- e/ Glenn Annie to Fajiguas Canyon.
- f/ SBCWA projection.
- g/ Subsidy includes 25 percent of SPW capital costs. (assumed for study purposes)
- h/ Subsidy includes 25 percent of SPW capital costs and 50 percent of local pipeline distribution costs. (assumed for study purposes)
- i/ Subsidy includes 25 percent of SPW capital costs, inclusive of spreading costs. (assumed for study purposes)

Agricultural preservation in the County has been extremely successful to date in placing lands adjacent to urban areas, as well as more remote lands, under Williamson Act agreements. The County and the cities should adopt the following policies to protect and enhance their agricultural resources:

- The Agricultural Preserve Advisory Committee should assess the impact of reducing the acreage requirements for participation in the Agricultural Preserve Program and make recommendations to the Board of Supervisors based on this assessment.
- Mitigation of potential environmental impacts of some agricultural operations should continue to be encouraged.
- The County and cities should assist the Regional Water Quality Control Board in examining the potential affects of agricultural operations and urban wastewater disposal on groundwater quality to minimize potential adverse impacts of some agricultural operations.
- The County and cities should take all measures necessary to protect agricultural lands from urban impacts, e.g. trespassing and theft.

Historic Sites

INTRODUCTION

Santa Barbara's historical heritage is well known for its richness and diversity. Within the County, prime examples of historic sites survive from each of the major periods in California history. The sites of Indian settlements, mentioned briefly in this chapter, are dealt with extensively in the chapter on Archaeological Resources. From the Hispanic era have come the Presidio and the three Missions, as well as many important adobes. The American era, which dates from 1846, also is well represented in the County. One measure of this richness is indicated by the list of over 80 sites in the County found in the State Department of Parks and Recreation's California History Plan. This is twice as many sites per capita as the average state-wide. Local experts have predicted that a comprehensive inventory, now underway, will reveal nearly ten times more examples that enrich the historical heritage of Santa Barbarans as well as other Californians and Americans.

Historic preservation in the County and in California has become increasingly important during the past two decades because of recurring threats of demolition to make way for new development. As a result, the County and the Cities of Santa Barbara, Carpinteria, and Lompoc have created advisory landmark preservation committees. Working in concert with the Board of Supervisors and the city councils, these committees have embarked on local programs of preservation designed to complement existing State and national efforts. At present, the State and national historic preservation programs are obliged to focus their limited resources on the preservation of a relatively few selected buildings deemed to be of greatest significance. If most of Santa Barbara's historic sites are to be preserved for the education and enjoyment of present and future generations, a far greater effort will be necessary than is underway today. For this program to be successful, increased private participation also will be necessary. To date, the study of historic sites has been directed primarily toward those that have been recognized as significant by the local historical societies. These sites have been inventoried, and a map has been prepared showing the locations of 104 sites. The issues of historic preservation also have been analyzed in order to determine what additional steps should be undertaken by the County.

MAJOR HISTORICAL RESOURCES

Before listing all the known historical sites in the County, it might be beneficial to describe the major ones - those which ranked highest on local historical societies' priority lists. Many of these sites already are protected by State and national preservation programs, which will be discussed subsequently. These descriptions are not intended to narrate the County's local history which already has been extensively and thoroughly documented elsewhere. Instead, the objective is to identify the most important characteristics of these resources that make them valuable and worthy of preservation. In the Implementation Program, alternate means to ensure protection of these sites, as well as all other known historic resources, and to enhance them through

appropriate controls on adjacent land uses will be evaluated.

El Presidio de Santa Barbara - Established in 1782 as part of the Spanish effort to secure sovereignty in California, the Presidio of Santa Barbara is the only one of the four presidios in the state that currently is planned to be restored on its original site. Since 1964, the Santa Barbara Trust for Historic Preservation has been working on land acquisition and restoration of the Royal Presidio in cooperation with the State Department of Parks and Recreation. El Cuartel, a soldier's family quarters, and the Caneda Adobe are the sole portions of the original structures still intact. Adjacent properties have been acquired, and the Trust is excavating the Chapel site as an archaeological project. These properties make up what is now designated El Presidio de Santa Barbara State Historic Park. With financial assistance from the State, and from El Presidio Joint Powers Committee composed of representatives of the Trust and City, County and State officials, the Trust is focusing on historical and archaeological research, acquisition of additional properties, and preparation for reconstruction of the original buildings.

Mission Santa Barbara - One of the most graceful and architecturally significant Missions constructed by the Spanish settlers in the early nineteenth century, Mission Santa Barbara truly deserves its title of "Queen of the Missions". The Mission originally was founded in 1786, shortly after the Presidio, by the Franciscan fathers as the tenth of the 21 Missions established in California. The present buildings, a delicate blend of Moorish and Spanish architecture, were built in 1815 to replace the structures destroyed in the 1812 earthquake. Of interest is the fact that this is the only Mission in California where the altar light has never been extinguished.

The Mission Water Works and Grist Mill includes two dams, reservoirs, aqueducts, and a water-powered grist mill. The upper reservoir and dam, located in the Botanic Gardens, was completed in 1806, while the grist mill and the lower reservoir were not finished until 1827.

Mission La Purisima Concepcion - The eleventh Mission, founded in 1787 and located north of Lompoc, was an important seat of Mission government in California for eight years in the early nineteenth century. The present buildings, built at a different location after the 1812 earthquake, have been restored by the State, and today the Mission and 966 acres surrounding it are a State Historic Park. Under the State Beach, Park, Recreational, and Historical Facilities Bond Act of 1974, funds will be available for the State Department of Parks and Recreation to purchase 156 acres of land located directly opposite the Mission, thereby preserving the unique historical and environmental quality of the surrounding area. Urban land development would have threatened the scenic quality of the Mission site and might have destroyed archaeological and historical sites in front of the Mission.

Mission Santa Ines - The nineteenth Mission, with its grist mill, was established by the Franciscans at Santa Ynez in 1805. A period of prosperity based principally on ranching lasted until 1850, after which the buildings began to fall into disrepair. However, some

portion of the Mission always was habitable and served as a church. Today, in its attractive setting, the Mission is a State Historical Landmark, frequently visited by those interested in early California history.

Carrillo Adobe - Located in the City of Santa Barbara at 11 East Carrillo Street, this adobe (also known as the Joaquin Carrillo House) was built by Daniel Hill, a settler from Massachusetts, for his Spanish bride in 1826. Here in 1833, Isabel Larkin was the first American child to be born in California. Today, very little of the original structure remains because most of the adobe has been restored.

Covarrubias Adobe - This restored adobe at 715 Santa Barbara Street in Santa-Barbara is a prime example of Spanish-Colonial architecture. Domingo Carrillo built the adobe in 1817 for his bride, and Mexican officials, including the last Governor, lived in it. In July 1846, the last Mexican Congress was held here.

De la Guerra Adobe - Today, El Paseo is built around one of Santa Barbara's important adobes. The house of Don Jose de la Guerra, the fifth commandant of the Presidio, at 11 East de la Guerra Street was built between 1819 and 1826. The structure houses shops, and the garden and court are used for important civic, cultural, and social events.

Rafael Gonzales, Ramirez, or Vhay Adobe - What local historians have called one of the best examples of California residential architecture of the Spanish era is located at 835 Laguna Street in Santa Barbara. Rafael Gonzales built this adobe in 1825. Today, it is a National Landmark and is judged to have "national significance" in the National Register of Historic Places.

Vincente Ortega Adobe, Arroyo Hondo - In the foothills north of Route 101 between Goleta and Gaviota Pass is an adobe built in the late 1840's or early 1850's by descendants of Jose Francisco Ortega, the founder of Santa Barbara. The adobe remains in its original condition and has not been subjected to restoration. Consequently, it is an extremely important example of early adobe construction. No official landmark status under County, State, or national programs has yet been conferred on this building.

INVENTORY OF HISTORIC SITES

The key to a meaningful preservation program is the inventory of historic and architecturally significant sites. Only after a comprehensive list has been made of the adobes, buildings, and other features of historical or architectural interest, can the County begin to set its' priorities for preservation. Because decisions on which structures are to be preserved permanently cannot be made in a vacuum, it is essential to know as much about the relative importance of each candidate for preservation as possible. In order not to duplicate a comprehensive inventory currently being sponsored by the County, this study did not go beyond previously published lists of historic sites; so the list should be viewed as a starting point, and not a comprehensive summary of

Santa Barbara's historic sites.

The first step in preparing the inventory for the Conservation Element was to combine the lists of historic sites of the Santa Barbara Historical Society and the State Department of Parks and Recreation. Mr. Robert Gates, Librarian of the Santa Barbara Historical Society, then reviewed the list, eliminated duplications, and indicated which buildings or adobes are no longer standing. He also mapped the location of each site. Subsequent review by other local historians resulted in the addition of several more historic sites.

Two maps of historic sites and features were prepared. On the South Coast Historic Sites map, 62 adobes, buildings, sites, and other features are indicated, while on the County-wide Historic Sites map, 42 are shown. (Sites shown on the South Coast map are not repeated on the County-wide map.) In the tables facing each map, the geographic area, identification number, and name of the site or feature is listed along with pertinent notes including the status under County, State or national landmark preservation programs. Sites of buildings that recently have been demolished are not mapped, although previously published lists still may include them. On the South Coast map, the historic buildings and sites in the "El Pueblo Viejo" District are indicated on an inset map in order to show their locations more precisely.

Historical resources in the County can qualify for landmark status under several register and classification programs. The National Historic Landmarks program and the National Register of Historic Places are oriented primarily toward historic places of national significance, although the National Register also maintains a list of places of state or local significance. The register of California Historical Landmarks is compiled by the California Historical Landmarks Advisory Committee, and includes historical features judged to have state-wide significance. The County's program to identify historic landmarks began in 1966 with the establishment of the Santa Barbara County Advisory Landmark Committee.

National Landmarks in the County include the Vhay House (Rafael Gonzales adobe), the Old Santa Barbara Mission, Water Works and Grist Mill, the De la Guerra Orena Adobe, also known as the Los Alamos Ranch House, and La Purisima Mission. However, neither the Vhay House nor the Los Alamos Ranch House are California Historical Landmarks. These four National Landmarks also are included in the National Register of Historic Places which classifies them as having "national significance". The only other sites in the County listed in the National Register are the Presidio and Painted Cave which is categorized as having "state significance".

The California Historical Landmarks Advisory Committee has designated 13 State Landmarks. Two of these (Santa Barbara Mission and La Purisima Mission) also have National Landmark status. In the "El Pueblo Viejo" District of the City of Santa Barbara, the six designated landmarks are the Carrillo Adobe, the Casa De la Guerra, the Covarrubias Adobe, Santa Barbara Mission, Santa Barbara Presidio, and the Lobero Theater. The Captain H.G. Trussell-Winchester or Hastings Adobe and Burton Mound

are the two other State Landmarks-located in the City of Santa Barbara. The remaining State Landmarks, not previously mentioned, are Gaviota Pass, the Indian Village Site in Carpinteria, Mission Santa Ines, and "well hill 4" near Santa Maria (not mapped).

TABLE 1. HISTORIC SITES IN THE SOUTH COAST STUDY AREA

<u>Geographic Area, Map Number, and Name</u>	<u>Notes</u>
CARPINTERIA	
<u>Adobe</u>	
1. Heath	
<u>Historic Sites and Buildings</u>	
2. Carpinteria Tar Pit	
3. Indian Village Site	
4. Torrey Pine at Ward House	California Historical Landmark. Carpinteria City Landmark, over 100 feet high, from Santa Cruz Island 1900.
SUMMERLAND	
<u>Adobe</u>	
5. Massini	
<u>Historic Sites and Buildings</u>	
6. First Oil Well	
7. Fleischmann House	
MONTECITO	
<u>Adobes</u>	
8. Casa San Ysidro	
9. Hosmer	
CITY OF SANTA BARBARA, "EL PUEBLO VIEJO" DISTRICT	
<u>Adobes</u>	
10. Birabent/Rochin	
11. Buenaventuro Pico	
12. Caneda	
13. Carrillo	California Historical Landmark.
14. Casa Arrellanes	
15. Casa de la Guerra	California Historical Landmark.
16. Covarrubias	California Historical Landmark.
17. El Cuártel	California Historical Landmark.
18. Gaspar Orena	
19. "Historic"	
20. Lugo	
21. Ramirez/Gonzales (Vhay House)	National Landmark, "national significance" in National Register. Circa 1825.
22. Refugio Cordero	
23. Santiago De la Guerra	
<u>Historic Sites and Buildings of Historic or Architectural Interest</u>	
24. County Court House	
25. Knox Home	First brick office building.
26. La Rinconada	
27. Lobero Theater	California Historical Landmark.
28. Meridian Studios (20)	Located in front of Lugo Adobe.
28. Miranda Adobe	

HISTORIC SITES
SOUTH COAST AREA- EAST

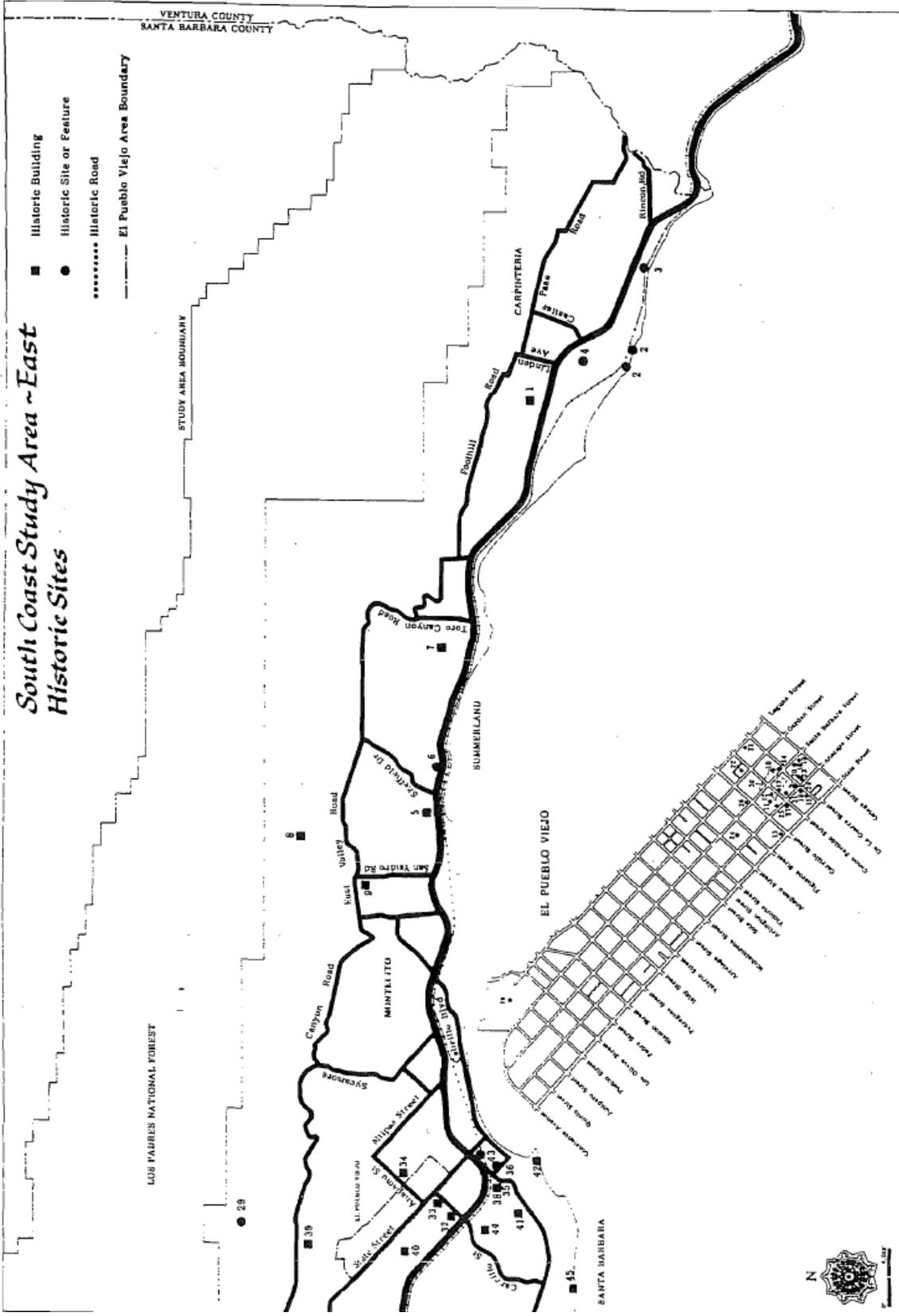


TABLE 1. HISTORIC SITES IN THE SOUTH COAST STUDY AREA (Cont.)

29. Santa Barbara Mission, Water Works, and Grist Mill	National Landmark, "national significance" in National Register, California Historical Landmark.
30. Santa Barbara Presidio	National Register, California Historical Landmark, State Historic Park.
31. U.S. Post Office	
CITY OF SANTA BARBARA	
<u>Adobes</u>	
32. Botiller Monterey Two Story Adobe/Grand Adobe	
33. Bruno Orella	
34. Kirk/Arrellanes	
35. Trussel-Winchester/Hastings	California Historical Landmark, circa 1854.
<u>Historic Sites and Buildings</u>	
36. Burton Mound	California Historical Landmark.
37. Cieneguitas Indian Village and Chapel Site	
38. Fernald House	Victorian, 1860-1.
39. Glendessary Home	
40. Henry Penry House	Oldest brick house in Santa Barbara.
41. Hunt/Stambach House	Barber, Architect.
42. Mispu	Prehistoric site, Indian and Hispanic eras.
43. Moreton Bay Fig Tree	Protected by City Tree Ordinance.
44. Peshine House and Chapel	
45. Santa Barbara Lighthouse	
SANTA BARBARA TO GAVIOTA PASS	
<u>Adobes</u>	
46. Daniel Hill	
48. Vincente Ortega	
<u>Historic Sites and Buildings</u>	
49. Cathedral Oaks	
50. Dos Pueblos	Prehistoric sites.
51. El Refugio and El Capitan Beach Parks	
52. Fremont Oak Tree	
53. Gaviota Landing	
54. Gaviota Pass	California Historical Landmark, State Historic Park.
55. Hope Home	Santa Barbara County Landmark.
56. Largest Bay Tree in the World	Old San Marcos Pass Road.
57. Mescalitan Island Area	
58. Old Stage Road (Slippery Rock)	
59. Sexton House	Victorian.
60. Sherman Stow House	Santa Barbara County Landmark.
61. Tajiguas Ranch	Restoration of Ortega Adobe.
62. Whaling Camp	

HISTORIC SITES, SANTA BARBARA COUNTY

*Santa Barbara County
Historic Sites*

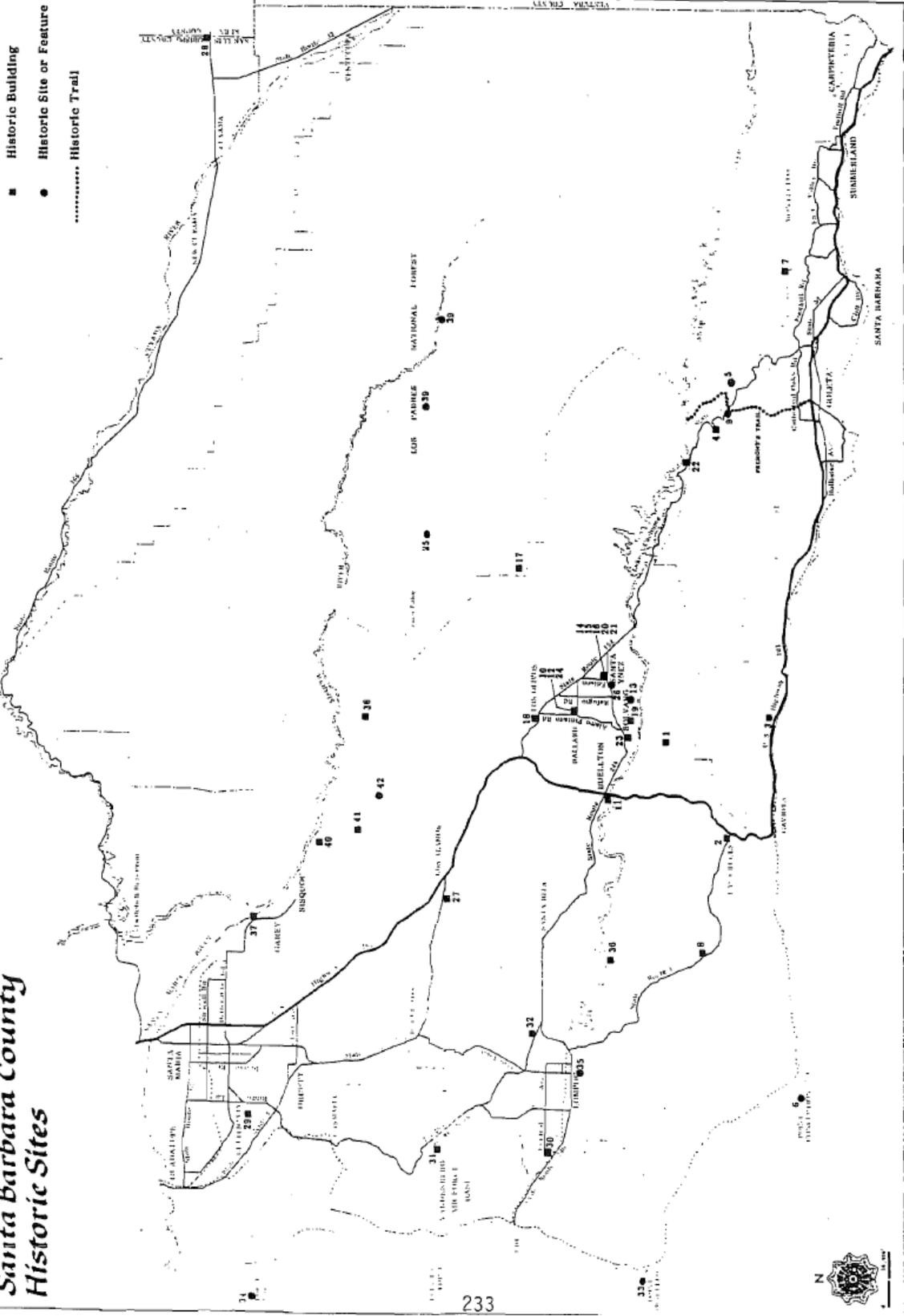


TABLE 2. HISTORIC SITES IN SANTA BARBARA COUNTY (Cont.)

LOS ALAMOS

27. De la Guerra Orena Adobe/Los Alamos Ranch House National Landmark, "national significance" in National Register.

CUYAMA

28. Alexis Godey Adobe

BETTERAVIA

29. Elizalde Adobe

LOMPOC AND SANTA MARIA AREA

30. Artesia School Santa Barbara County Landmark.
31. Jesus Maria Rancho Adobe National Landmark, "national significance" in National Register, California Historical Landmark;
32. La Purisima Mission State Historical Park.
Historic shipping point.
33. Point Arguello
34. Point Sal
35. Site of Original Mission
36. Santa Rosa

SISQUOC AND TEPUSQUET AREA

Adobe

37. Santa Maria Built by Juan Pacifico Ontiveras.

Historic Sites and Buildings

38. Manzana School Santa Barbara County Landmark.
39. Sanctuary for Condors – Hurricane Deck
40. Sisquoc Church/Foxen Memorial Chapel* Santa Barbara County Landmark.

FOXEN CANYON

Adobes

41. Frederick Wickenden
42. Site of Benjamin Foxen Adobe

TABLE 2. HISTORIC SITES IN SANTA BARBARA COUNTY

<u>Geographic Area, Map Number, and Name</u>	<u>Notes</u>
SOUTH COAST	
<u>Adobes</u>	
1. Alisal Ranch Headquarters	
2. Cordero	
3. Vicente Ortega Adobe Ranch	Arroyo Hondo.
<u>Historic Sites and Buildings</u>	
4. Cold Spring Tavern	
5. Painted Cave	"State significance" in National Register.
6. Point Conception Lighthouse	
7. Rattlesnake Canyon Dam	An old Mission dam.
8. San Julian Ranch	
9. San Marcos Pass Kinevan's Stage Coach Stop	
SANTA YNEZ VALLEY	
<u>Adobes</u>	
10. Ballard Stage Station	
11. De la Cuesta	Built by Dr. Roman de la Cuesta.
<u>Historic Sites and Buildings</u>	
12. Ballard School	Santa Barbara County Landmark, circa 1883.
13. College Ranch	First college in the County.
14. Edsell and Strahan Grocery	
15. Hartman's Grocery	
16. John Miller House and Tank	Circa 1888.
17. Marre Ranch	
18. Mattei's Tavern	
19. Mission Dam and Water Works Ruins	Site of Indian Springs.
20. Original Santa-Ynez Jail	
21. Ruff Brothers Hardware	
22. San Marcos Ranch Ruins	Restoration potential.
23. Santa Ines Mission	California Historical Landmark.
24. Santa Ynez Presbyterian Church/Ballard Church	Santa Barbara County Landmark, circa 1898.
25. Site of Davey Brown Cabin	
26. Zanja Cota Indian Reservation	Original reservation on Hunt property.

Only eight County Landmarks have been designated. The Hope Home and the Sherman Stow House are located on the South Coast. Two County Landmarks can be seen in the Santa Ynez Valley, the Ballard School and the Santa Ynez Presbyterian Church. The Artesia School (a County historic site) is in the Lompoc Area. South of the Sisquoc River, the Manzana School is in Schoolhouse Canyon, and the Dabney Cabin (not mapped) is on Manzana Creek. The Sisquoc Church is in the Tepusquet area north of Foxen Canyon.

In the past few years, interest in Victorian buildings and more recent buildings of architectural or symbolic interest has grown. In the city of Santa Barbara alone, 14 buildings have been suggested to the City Landmarks Committee as being worthy of preservation because of their aesthetic value:

- Arlington Theater El Castillo
- El Centro
- El Paseo
- E1 Presidio (an office complex)
- Historical Society Museum
- La Arcada Building
- Mortimer Cook House
- Museum of Art
- Museum of Natural History
- San Marcos Building
- Savoy Hotel
- Southern Pacific Railroad Station and Roundhouse
- St. Anthony's Seminary

Buildings of architectural or aesthetic interest, including many churches and residences, also can be found elsewhere in the County especially on the South Coast, but thus far, a systematic survey has not been completed.

A review of current efforts to compile inventories of historic places will put the lists in Tables 1 and 2 in perspective. In the California History Plan published in 1973²⁷ over 3,000 historic features are listed, representing the results of the State Department of Parks and Recreation's Phase I inventory. Only 72 of these sites are located in Santa Barbara County. In Phase II, currently underway, it is anticipated that more than 50,000 historic places will be added to the inventory. It is estimated that as many as 1,000 sites will be included in the County inventory of which perhaps 500 will be prehistoric and Indian sites. None of the prehistoric and Indian sites will be mapped, in order to prevent looting and destruction.

Each of the six historical societies in the County is preparing a list of sites for a separate area of the County: Carpinteria-Summerland, Santa Barbara-Montecito, Goleta, Santa Ynez, Lompoc, and Santa Maria-Cuyama, utilizing forms and procedures prescribed by the State Department of Parks and Recreation. The inventory process is designed to

produce information on the ownership and physical condition of the resource, its relation to historic events, and its significance. Where possible, data on the original design and date of construction, historic and present use, present environment, and threat of destruction also will be supplied. Once the local area inventories have been completed, the County Coordinator and the County Advisory Landmark Committee will review them and forward to the State completed forms on those places approved by the Committee for entry in the State-wide Inventory of Historic Sites. The criteria for selection of sites in this survey include both historic association and architectural merit. Specifically, the local historical societies are asked by the State Department of Parks and Recreation to consider the following factors taken from published criteria of the National Trust for Historic Preservation in preparing their inventories:

Architectural merit and historical association are the bases for selecting buildings in a survey. Structures might have important associations with historic figures or have been the scene of important events. They may illustrate architectural types or periods or represent the works of known architects or craftsmen. Evidence of coherent planning and design, harmonious proportions, good scale and well-designed interiors also serve to indicate architectural value. Structures that illustrate the development of American architecture regionally or nationally or that relate to distinctive historical contributions of cultural or ethnic groups deserve consideration. Properties that have remained in their original condition should be recorded because they illustrate precisely a given period. Structures unique in design or detail or that are surviving examples of a period or style are of interest, as well as neglected building types such as factories, railroad stations or shops. If several buildings are of equal architectural interest, the one with the most known history should be inventoried. Give priority to identifying and recording significant structures threatened with demolition or alteration. Take care to achieve a reasoned mix of building periods and types to present a balanced view of an area.

Upon completion of the Phase II State-wide Inventory of Historic Sites, the County will have sufficient data to embark upon a more comprehensive preservation program designed to complement the State program.

PRESERVATION PROGRAMS

One way to gain a perspective of the need to launch an intensified historic preservation program as soon as possible is to look at the number of buildings that have been demolished over the past 10 to 15 years. Since the Santa Barbara Historical Society's list was prepared in the sixties, three houses and five adobes have been lost. In the City of Santa Barbara, the Sexton Victorian House, the Broome Victorian House, the Packard House, and the Dover Adobe are no longer standing. In the Santa Ynez Valley, two adobes have been destroyed: the Janin and the Don Agustin Janssens. In Guadalupe, the two story Arrelanes Adobe was demolished in 1958 and the Diego Olivera Adobe finally collapsed because it had not been maintained. Whatever the reasons were that rationalized destruction of these historical resources (and, in certain

instances, they may have been valid) it nonetheless is unfortunate that these buildings were not covered by a preservation program. Even though the State Department of Parks and Recreation, the County, one of the cities, or a private foundation might not have decided to purchase any of these buildings in the final analysis, the period of time that a preservation program would have given to responsible public agencies and private organizations to find an alternate means of preservation might have kept the bulldozers away permanently from one or more of them.

The County's historic preservation program's primary purpose is to protect and enhance historic sites. Under County Ordinance 1716, the Advisory Landmark Committee can designate landmarks of historic or architectural significance and can impose restrictions on the owners of these landmarks in order to ensure their preservation. All actions of the Landmark Committee are subject to confirmation by the Board of Supervisors, or else they have no effect beyond 90 days. Unfortunately, the Committee has not used this authority since 1970, but the County's recent renewed interest in the Committee's activities may counter this trend.

The Committee may limit the use of a County Landmark to protect it. Because the environment of an historic site often is as important as the site itself, the Committee may regulate land uses in the vicinity of a County Landmark and prohibit construction, destruction, or alteration of adjacent buildings or structures as may be necessary to ensure the Landmark's preservation and enhancement. If any of these conditions is imposed, it also must be confirmed by the Board of Supervisors to remain in effect for more than 90 days.

In addition, the Landmark Committee can recommend to the Board of Supervisors that it purchase historical properties or acquire the development rights of such properties. The Board is empowered to take such an action if it would be necessary or expedient under the County's preservation program. For example, if the owner of an adobe of historic significance wanted to develop his property, the County could purchase the property, or it could pay the owner the difference between the value of the property in its present use and its fair market value assuming it could be developed as permitted in the zoning district in which it was located. Under the second alternative, the County would purchase the development rights from the owner, but he would retain ownership of his adobe and would be permitted to remodel it in accord with conditions set by the Committee and approved by the Board of Supervisors.

Under State Law (Government Code, Sections 50280-50289), the County can enter into a 20 year historical properties contract with a qualified property owner that will give the owner the benefits of an assessment based on the restricted use of his property. This contract is automatically renewable annually in the same way that a Williamson Act agreement is. Historical properties that qualify for this kind of tax treatment are California Historical Landmarks that meet the criteria of the California Historical Landmarks Advisory Committee and one of the following four conditions as well:

- The property is the first, last, only, or most significant property in the County or

region.

- The property is associated with an individual or group having a profound influence on California history.
- The property is a prototype or example of a period, style, architectural movement, or construction technique, or is a notable example or best surviving work of an architect, designer, or master builder.
- The property is listed in the National Register of Historic Places.

Commercial properties can qualify for historical properties contracts as long as the aims of the County and State's preservation programs are met. County Landmarks, however, are not eligible under the law at present.

In the absence of a landmark designation and restrictive conditions, the County has very limited power to prevent a property owner from altering or destroying a building or feature of historic or architectural significance. Only in the environmental impact assessment process would direct and indirect threats to historic sites be identified. Moreover, the findings of an environmental impact report are not binding on the County. A project that alters or destroys an historic or architecturally significant site can be permitted for overriding social or economic reasons.

CONCLUSIONS AND RECOMMENDATIONS

The County's historically and architecturally significant sites and features represent valuable links with the past and should be preserved. To date, 25 landmarks have been designated under County, State, and national preservation programs, and the City of Santa Barbara has created a Landmark Committee and adopted preservation regulations. However, over the past 15 years an equal number of significant sites probably have been significantly altered or destroyed. The County Advisory Landmark Committee, which has been relatively inactive over the past several years, has the potential to play an important role in the County's preservation program and should renew and expand its efforts. The historic sites inventory presently being conducted by the local historical societies for the State Department of Parks and Recreation will provide an important information resource for the County, once it is completed. To strengthen existing preservation programs, the County and the cities should adopt the following policies.

- The County should retain the period of time, prescribed in County Ordinance 1716, during which a County Advisory Landmark Committee designation and restrictive conditions remain in effect without Board of Supervisors' confirmation for 90 days in order to allow more time for alternate means of preservation to be evaluated.
- The Santa Barbara County Advisory Landmark Committee should evaluate the Historic Sites Inventory of the Conservation Element in order to determine which

sites qualify for a County Historical Landmark designation, and should recommend that the Board of Supervisors approve such designations along with appropriate restrictive conditions. When the County-wide Historical Sites Inventory for the State Department of Parks and Recreation has been completed, the Committee also should review this information and should recommend County Landmark designations for qualified sites and features.

- Present environmental impact assessment procedures should be revised in order to require a detailed evaluation of direct and indirect impacts on any site or feature included in the County's Historic Sites Inventory and an analysis of alternate means for preservation by the County Advisory Landmark Committee.
- Qualified property owners should be encouraged by the County Advisory Landmark Committee to enter into historical properties contracts with the County to ensure permanent preservation of historically or architecturally significant sites.

Archaeological Sites

INTRODUCTION

In order that the findings and recommendations of the archaeologists be understood in their proper context, brief summaries of relevant topics are presented below.

Early Archaeology in California

Records of the earliest European contacts with the Indians of Alta California convey an impression of aboriginal homogeneity. The Mission Fathers were somewhat better equipped to observe cultural variability among California Indians, but surprisingly little information is contained in their records. Pre-professional ethnography (Baurnhoff, 1958), such as that done by Powers (1877) and Bancroft (1883), began what was to become a trend toward classifying Indian groups by their differences and similarities. Professional ethnography continued this classification effort.

The most significant professional ethnography in California was done by Kroeber and his students in the thirty years following the turn of the century. Their work on ethnographic classification was carried out with a sense of urgency. A major goal of their work was to record as much ethnographic information as possible before the Indians and their culture were completely destroyed by modern civilization.

As a result of this goal, the archaeology of California was almost entirely neglected during this period. Unfortunately, the forces that were eradicating Indian civilization were also destroying archaeological sites, the data base for prehistoric studies.

Special Characteristics of Santa Barbara County Archaeology

The Chumash were the historic Indian population of Santa Barbara County. By all early accounts, they were a numerous group with a well-developed material culture and social organization. Archaeological research has confirmed these early impressions of the Chumash and their predecessors. These data have provided the justification for the opinion that the Chumash were the most advanced Indian group in California.

The extraordinary status of the Chumash has attracted the layman since the early days of American occupation (c. 1850). The artifacts collected from coastal and large interior sites are displayed in museums in the United States and abroad. The rock art found in back-country rockshelters has also been a focal point of popular interest in the Chumash Indians.

Archaeological material left by the Chumash is currently being used to test theories of cultural evolution. The range of current special research topics related to explanation of the development of Chumash culture is wide.

Archaeological sites as a data base are also important for future research. The

trajectory of future research is difficult to predict, yet the data must be preserved for future problem solution.

In sum, the Chumash were an advanced group of Indians. Popular interest in their history and artifacts is extensive. The archaeological record left by the Chumash is critical for present and future research.

Early Archaeology in Santa Barbara County

Early archaeology in Santa Barbara County and in the rest of California was of very poor quality and, except for a few instances, is unusable for present research concerns of archaeologists. The work of R. L. Olson (1930) and D. B. Rogers (1929) in the coastal strip of the Santa Barbara Channel and the Channel Islands contributed to the prehistoric equivalent of classificatory understanding achieved by the ethnographers in the preceding thirty years. The great bulk of subsequent archaeological research in the same area has been geared to filling out the understanding achieved by Rogers and Olson (Horne, 1974: 1).

Archaeological work in the interior of Santa Barbara County is extremely limited in scope (cf. Harrington, 1927; Rogers, 1935, Snow 1935a, 1935b; Strong, 1935). The primary objective of interior archaeology in the County has been directed toward cave archaeology and rock art (Horne, 1973: 2-3). Relatively little work in the interior has concentrated on patterns of site distribution or on understanding variability in the known population of sites. Very recently, the University of California at Santa Barbara, California State University at Northridge, and the U.S. Forest Service have begun systematic studies in the interior. The data derived from this work is currently being studied, and no results have yet been published.

In sum, the archaeology of Santa Barbara County is best known through unsystematic investigation of the coastal area and known only through a precariously small sample in the interior. The resulting limited state of knowledge constrains our ability to predict accurately areas of probable site locations or to assess accurately the archaeological potential of a given area.

Status of the Archaeological Resources of Santa Barbara County

The Indians of Santa Barbara County and the modern population of the same area show preference for the same general locations, although factors causing these similar population distributions are probably different (Heizer, 1960: 9). As a result, present populations have damaged many archaeological sites. The rapid attrition of the archaeological data base has caused concern among archaeologists. The California State Archaeological Task Force (Moratto, 1973: 2) has estimated that 50 per cent of all archaeological sites in California have been destroyed. The same group estimated that 81 per cent of archaeological sites in Santa Barbara County have been destroyed (Moratto, 1973: 18). The rate of destruction has increased with the acceleration of development in the County since 1960. Although the estimated percentage of destroyed

sites in the County appears too high, all archaeologists would share the opinion that a significantly high percentage of sites are no longer available for research. The rapid erosion of the data base for archaeology has forced archaeologists to expend effort toward the preservation of the remaining archaeological resources of the County.

Since the data base for archaeology is in clear jeopardy and since archaeological sites are a non-renewable resource, archaeologists regard the remaining sites as the non-living equivalent of an endangered species.

Professional Assessment of the Importance of Archaeological Sites

Professional guidelines governing the assessment of the importance of archaeological sites are stated below:

- Archaeological sites are a non-renewable resource.
- All remaining archaeological sites are of equal importance; each represents part of a system of cultural development and adaptation. Priority for site excavation should not be confused with the importance of an archaeological site.
- The state of preservation of archaeological sites is not a relevant variable for assessment of the importance of an archaeological site; all archaeological sites contain information which can contribute to the reconstruction of the prehistory of Santa Barbara County.
- Historic cemetery sites (less than 200 years old) must not be disturbed in any manner (excavation, construction, looting).

CLASSIFICATION OF SITE DENSITY AREAS

All of the information on archaeological resources classified for this report was obtained from the files of the Department of Anthropology at the University of California at Santa Barbara. Such files are not considered to contain adequate information for specific project areas, nor to be complete for any of the areas delimited. Most of the survey work which has been carried out in Santa Barbara County has, to this point, been random and unsystematic, with the exception of a few recent studies.

Utilizing available data, archaeological resource areas in the County were mapped. The map is not included in this publication because of the necessity of keeping sensitive information regarding site locations out of public hands. However, a copy of the map is on file with the County for use in preparing Environmental Impact Reports and otherwise evaluating applications for development permission. Each region delimited as an archaeological resource area was given three designations. The first is an acronymic label for each region (e.g., Sierra Madre Ridge is designated SMR). A topographic classification was deemed necessary because the type of adaptation represented in archaeological sites and the density of such sites varies according to environment. The second designation is topographic and consists of three classes:

1. Mountain ridge
2. Valley bottom
3. Coastal strand

The third designation indicates the density of archaeological sites in the region. Two classes of density are included:

1. High density: greater than one site per square mile
2. Low density: less than one site per square mile

Based on this system of classification, Sierra Madre Ridge, which is located in a mountainous area and contains a high density of sites, would be designated SMR-1-1,

In many cases, the boundaries for each region were based on available data and should not be interpreted as conclusive. Three mapping factors affected the boundary and density designations:

- Several sites scattered over a wide area and known only by means of unsystematic survey were grouped as a unit. This usually resulted in a designation of "low density" for that region. In many cases, further systematic survey would likely reveal additional site locations, resulting in a change in density designation.
- Two or more high density areas located nearly adjacent to one another were grouped as a unit. This often necessitated including areas between them which, to our knowledge, have not been surveyed and therefore contain no known sites. This practice tended to lower the calculation of site density.
- Smaller regions in which a few sites were densely clustered were simply circled. The smaller such a unit, the greater the error in density classification.

Sections of the map which do not have acronymic, topographic, and density designations have not been surveyed. It should not be assumed that these sections contain no archaeological resources, only that no information is available.

DESCRIPTION OF DENSITY AREAS

For the same reason that the map of archaeological site areas has not been published, specific descriptions of their locations which appeared in the archaeologists' report have been deleted from this published version. The original report is on file with the County.

South Coast (SC) - Coastal - High Density - The South Coast represents one of the most important archaeological regions in California. This is the area most densely occupied by the Chumash at the time of Spanish contact, and archaeological evidence confirms that it was so occupied for a considerable period of time. Site density in the area is very high, although the area has not been systematically surveyed. Probably 90

per cent of the remaining sites directly on the coast have been recorded, chiefly by Rogers (1929). However, areas just a few hundred yards away from the coast are not well known, although they can be considered high density areas on the basis of what is known about the Santa Barbara-Goleta foothills.

San Marcos Pass (SMP) - Mountain - High Density - This area has not been systematically surveyed. San Marcos Pass is known from historic records to have been a major Indian trade route between the coast and the Santa Ynez Valley. Sites in the area are predominately rockshelters, and pictographs are reported from a number of locations.

Upper Santa Ynez River (USY) - Valley - High Density - The area to the east of Lake Cachuma has been intensively surveyed (Horne, 1973) and has yielded a remarkable number of sites, as has the environs of the lake itself. Presumably, a large number of sites are now under the waters of the lake. Consequently, the protection of those sites which are still available to us is imperative to the understanding of archaeology of this region. Unsurveyed areas of the valley to the east and west of this region will quite likely turn out to be high density, as well as many of the canyons around the lake area.

Solvang (S) - Valley - High Density - This area includes historic sites associated with the Mission, a probable protohistoric (i.e., active shortly before or at the time of Spanish contact) village site, and some possibly related smaller sites. The preservation of historic and protohistoric Indian remains is important in the study of the impact of more complex European cultures on the Chumash. The entire length of the Santa Ynez River is probably high density, but large sections of this area have not been even casually surveyed.

Happy Canyon (HC) - Mountain - High Density - The only portion of this area that has been adequately surveyed is the region around Cachuma Camp, but casual survey of Happy Canyon indicates that the entire canyon is high density.

Pendola (P) - Mountain - High Density - The high site density of this small area supports the hypothesis that the entire length of the Santa Ynez can be considered high density. Surveys of intervening areas probably would connect this area with the Upper Santa Ynez high density region, as well as with the Juncal Ridge region.

Juncal Ridge (JR) - Mountain - High Density - See Pendola.

Zaca Lake (ZL) - Mountain - High Density - Zaca Lake is not only high in site density, but represents a special adaptation to unusual environmental conditions. Historic occupation is known for the Zaca Lake area. It is the only example of this type of adaptation in Santa Barbara County, and as such, every effort should be made to preserve these archaeological resources.

Hurricane Deck (HD) - Mountain - High Density - The Hurricane Deck area presents many interesting archaeological problems. At present, however, the area is subject to

heavy recreational use, with resulting destruction of sites by vandals and looters. Fortunately, many of the sites in the area are located away from the main trails. This, in combination with the difficulty of the terrain in general, serves to discourage all but the most intrepid looters.

Sierra Madre Ridge (SMR) - Mountain - High Density - This area was subjected to intensive systematic survey in 1973. It is an area of remarkably high density and includes many pictograph sites. From extant data on Sierra Madre, Hurricane Deck, and Santa Barbara potrero areas, it is plausible to assume that much of the wilderness area contains a high density of archaeological sites. The U.S. Forest Service plans to open this area shortly to recreational use. Such use will undoubtedly subject the sites in the area to heavy damage and looting. Alternatives to this should be closely examined.

Santa Barbara Potrero (SBP) - Mountain - High Density - This area is delimited by the grassy vegetation of the potrero. It is an area of high density which, with further survey work, will probably be linked to the Sierra Madre Ridge area to the northwest, and the Santa Barbara Canyon region to the northeast.

Davey Brown Canyon (DBC) - Mountain - High Density - An historical interior village is known in this area, as well as related smaller sites. Sunset Canyon is environmentally distinct and may be of importance, although it has not been surveyed, and is therefore not included in this region.

Potrero Seco (PS) - Mountain - High Density - The area is a mountainous region adjacent to the Ventura County line.

Santa Barbara Canyon (SBC) - Mountain - High Density - See Santa Barbara Potrero.

Vandenberg (V) - Coastal - High Density - The Vandenberg region has been subjected to intensive survey over the last few years by Larry Spanne of Alan Hancock College (Spanne 1974). Spanne's investigations have revealed a very high density of sites on Vandenberg Air Force Base and in adjacent areas. As very little is known at present of the archaeology of the northwestern portion of the County, every effort should be made to ensure the protection of sites in this area.

Birabent Canyon (BC) - Mountain - Low Density - This region is little known, and as is true of many of the low density areas presented here, may prove to be of higher density with adequate survey.

Santa Cruz Creek (SCC) - Mountain - Low Density - Very little is known of this region as no systematic survey has been carried out.

Nojoqui Summit (NS) - Valley - Low Density - Nojoqui Pass is another known Chumash trade route, and the region includes pictograph sites. Protection of this area for further research should contribute much to our understanding of the Chumash.

Rancho San Julian (RSJ) - Mountain - Low Density - Very little is known of this area.

Lompoc (L) - Valley - Low Density - Although this region is designated as low density, archaeological knowledge of the district is sparse and it is probable that more sites exist here. See Upper Santa Ynez River, Pendola.

Point Conception (PC) - Coastal - Low Density - A few sites from this area are known, but it is probable that more exist. Once again, with adequate survey of the intervening region, it is probable that the entire coastline of Santa Barbara County can be linked into one large high density zone.

THREATS TO ARCHAEOLOGICAL RESOURCES

Archaeological sites are a non-renewable resource. In Santa Barbara County archaeological resources include shell middens, rockshelters, lithic scatters, caves, pictographs, and petroglyphs, each of which represents separate and distinct activities of the aboriginal inhabitants. In order to understand the importance of the following recommendations for site preservation, the nature of present and potential threats to archaeological sites must be recognized.

Site Destruction: General

Any alteration of the surface of a site constitutes destruction to some extent. Such alterations include both surface collection by amateurs and modifications of the ground surface. Destruction of archaeological sites is accelerating rapidly. Since 1960, 16,000 sites have been destroyed in California alone, and the estimated per annum rate of destruction is 1,400 (Moratto, 1973: 4). This does not mean that sites which have already been partially destroyed are less important than those which are well preserved. Partially destroyed sites still contain information relevant to studies of prehistoric populations.

Threats to archaeological sites can be classified into two groups, direct and indirect. The former includes actual alteration of the land upon which a site is located. The latter refers to increased access to an area or alteration of the surrounding area so near a site that the site may eventually be destroyed. For documented examples of site destruction in California, see Moratto (1973).

Direct Threats to Sites

Urban growth and agricultural development are primary sources of direct site destruction. Such activities include, but are not limited to,

- Plowing Bulldozing
- Residential construction Industrial construction
- Grading for roads and highways
- Construction of parking lots

Construction of airstrips

Construction of railways (Moratto, 1973; King, Moratto, and Leonard. n.d.; Sparme, 1974).

Any activity which involves building directly on the surface of a site or running vehicles over a site poses a direct threat of destruction. Other examples of such direct destructive factors include:

Cattle grazing

Water projects (eroding and burying sites)

Off-road vehicles

Recreational developments

Natural forces (water and wind)

Unauthorized collecting of artifacts (Moratto, 1973; King, Moratt, and Leonard n.d.; Spanne , 1974).

Indirect Threats to Sites

One of the most significant indirect threats for the destruction of archaeological sites is public access. Vandalism has always been a source of destruction to sites, and it becomes greater with increased access to areas of archaeological significance. Examples of factors contributing to vandalism of archaeological resources include increase in temporary or permanent population in the vicinity of a site through construction of housing projects, trailer parks, campgrounds, or recreation areas; construction of roads which are open to the public (or opening up of previously restricted roads) providing access to areas of archaeological significance; and publication of known site locations or areas of site density.

Activities which alter the immediate environs of archaeological sites provide a second type of indirect threat. Re-directing stream channels and construction (of the types listed under Direct Threats) which may increase or stimulate erosion are examples of such potential destruction.

The relative seriousness of these threats varies depending on topography, population density, facility of access, and numerous other factors. In the past, mining, agriculture, and logging were of primary significance as destructive forces (Moratto 1973: 3). At present, urbanization and public access appear to be the principal sources of site destruction.

CONCLUSIONS AND RECOMMENDATIONS

In order to assure the preservation of a full cross-section of sites representing the various adaptations in time and space of the prehistoric and historic occupants of Santa Barbara County, the following general recommendation is made. Preservation of archaeological resources should not be biased toward a single topographic or environmental class or toward sites of a particular time period. Therefore, it is necessary

to evaluate archaeological sites and their settings on an individual basis. No general guidelines can legitimately be prescribed for the archaeological importance of any particular area without on-the-spot evaluation by a competent local archaeologist. (A list of approved archaeologists in Santa Barbara County is available from the Office of Environmental Quality, County of Santa Barbara, from the Department of Anthropology, University of California, Santa Barbara, and from the Santa Barbara Museum of Natural History.)

As local archaeologists are more familiar with the needs and problems existing in an area, they are better qualified to evaluate the importance of any particular site in their area. The problem of qualifications is a difficult one. For instance, field experience alone does not qualify an individual to properly evaluate archaeological sites. Some degree of graduate training in method and theory also is necessary. This is the reason why the list of archaeologists was prepared.

The following recommendations are made with reference both to general urban expansion in the County and to development of specific project areas:

- Once the most likely direction of urban growth has been determined from the Comprehensive Plan, those archaeological site areas most likely to be subjected to development should be systematically surveyed. Such surveys would provide information on the nature and location of sites that would be useful to planners and developers before modification begins.

For specific project areas, the following steps should be taken:

- A systematic ground survey of the project area and alternative areas should be carried out by the archaeologist selected. Preliminary testing of sites within the designated construction area may be included.
- A report should be submitted by the archaeologist to the planners and developers concerned with the project and to responsible government agencies. This report should include details on surface and sub-surface finds, evaluation of the area and the sites it may contain, and suggestions for further actions concerning archaeological resources.

The following list of recommendations presents suggested ways in which archaeological studies may be incorporated into corporate, private, and public projects. They are listed in descending order of preference (adapted from King, Moratto and Leonard n.d.):

- Archaeological sites may be incorporated into parks or landscaped areas in such a way that no damage will be done to the archaeological materials.
- Areas with archaeological sites may also be designated as limited use areas where they can be protected from vandalism. For either of these first two alternatives, a preliminary survey and surface collection by a competent archaeologist must be carried out prior to any action. Buffer zones adjacent to

these sites may be necessary, but the extent of such a zone must be determined for each site.

- Outdoor museums are a feasible alternative to destruction when the nature of the archaeological remains is such that their careful excavation and preservation by professionals would prove attractive to the public. This alternative would be of value to the public relations of many private firms, and would serve to increase the awareness of the County's prehistory among both residents and tourists. A museum of this sort might consist of a simple tin roof and fence protecting ongoing or completed excavations and appropriate displays of artifacts. Painted Cave is an example of how this approach has been implemented in Santa Barbara County.
- One method of preserving sites for future archaeological investigation is through the use of extensive land fill. If sites scheduled for possibly damaging use could be covered with sufficient clean fill to avoid damage, such sites would be preserved.
- Salvage excavation is a last resort in the "preservation" of archaeological information. Such short notice excavations destroy relevant information which might be more effectively excavated with future improved archaeological methods and techniques. In salvage archaeology, it frequently is impossible to generate an adequate research design before excavation is commenced. Considering these factors, the loss of valuable information is inevitable. In addition, salvage operations are expensive undertakings. Consequently, every effort should be made to preserve, rather than excavate; endangered archaeological sites.

Other recommended approaches which might increase the protection and preservation of archaeological resources include:

- Public purchase and protection of representative sites from each topographic class (King, Moratto and Leonard n.d. :15) .
- Granting of tax relief to private owners protecting archaeological resources (King, Moratto, and Leonard n. d.:15). Protection should include no alteration of the ground surface of any archaeological site, and no surface or subsurface collecting by private owners or the public. If this approach is implemented, specific guidelines for private protection of sites can be obtained from archaeologists at the University of California, Santa Barbara.
- Action by the County to preserve and protect known historic cemetery sites (less than 200 years old). Such a policy has been legislated by the State but initiative taken by County officials would ensure enforcement of the law.
- Designation of high density archaeological resource areas as Historical Monuments. Applications for placing such areas on the National Register of

Historic Places presently are pending in Santa Barbara County.

- Development of public education programs which would include general information on the prehistory of Santa Barbara County, with emphasis on the importance of archaeological sites as a data base for further understanding of the aboriginal inhabitants. Such a program might decrease the rate at which archaeological resources are destroyed by vandalism.

Conservation and Energy

Energy conservation suggests the judicious development and rational use of resources important for maintaining an acceptable standard of living. The relationship between energy and conservation, in other words, suggests that the production of energy resources and the consumption of these resources are two sides of the conservation coin.

Santa Barbara County is somewhat unique in the sense that more energy is produced in the area than is consumed. If measured in terms of British Thermal Units (BTU's), for example, onshore Santa Barbara oil and gas production yielded 93 trillion BTU in 1977, while consumption in the form of natural gas, electricity, and gasoline amounted to 49 trillion BTU.

The realities of energy development and consumption, however, dictate that both the production of energy resources and the use of these resources will require difficult decisions for local, state, and federal policy-makers. Although the decisions pertaining to energy conservation will increasingly require an understanding of the close relationships between production and consumption, these two aspects of energy conservation will be treated separately in this discussion.

PRODUCTION

As depicted in Table 1 of the Mineral Resources Chapter (p. 175), Santa Barbara County onshore oil and gas production has been declining. Whether this trend will continue is difficult to determine. Nevertheless, it is possible (and useful) to delineate the factors which are certain to influence production rates.

To some extent, the decline of production is a reflection of the fact that many fields are relatively old, suggesting that they are reaching the point of depletion. Yet the rate and extent of decline have been heavily influenced by a wide range of international, national, and local developments. By the late 1960's, for example, Santa Barbara oil and gas (as elsewhere in the U.S.) were more costly to produce than the cheaper and more plentiful resources being developed throughout the world. With the rapid escalation of prices for foreign oil during the early 1970's, domestic oil resources became more competitive.

If price were the only consideration, one could expect that domestic oil production would have reversed its historical decline rather quickly. Higher prices for oil should have encouraged the exploration of oil and gas in Santa Barbara County (both offshore and onshore). Similarly, the increased value of oil and gas could be expected to stimulate production from existing fields through the use of enhanced recovery techniques.

The fact that domestic oil, and particularly California crude, has not responded to this apparent opportunity for revival can be attributed to a variety of regulatory and environmental constraints during the 1970's. The nature of these constraints is best

understood by looking at the extraction, processing, and marketing stages of oil production.

EXTRACTION

Most of the oil in Santa Barbara County is both “heavy” and “sour,” meaning it is low gravity and high in sulfur content. Because of its low gravity, continued production of most of Santa Barbara County oil requires the use of enhanced recovery techniques, typically steam injection (the heat from the steam being necessary to increase the flow of the oil). This operation frequently requires a considerable consumption of fuel. In some cases as much as one barrel of oil is consumed for every two barrels produced under steam injection. The use of steam injection methods can also result in a significant increase in emissions from oil field operations.

An additional problem faced by oil producers in recent years has been a dramatic rise in the cost of electricity, necessary to operate oil well pumps. Although information on Santa Barbara oil production electrical costs is not available, it has been estimated that electrical costs in the Long Beach area have escalated 300 percent in recent years, the single most important increase in operation costs.

PROCESSING

The “heavy” and “sour” characteristics of Santa Barbara oil also make processing difficult. Although this oil could be refined into higher quality products, such as gasoline and low sulfur fuel oils, most refineries in California are not equipped to refine the heavier and high sulfur crude oil into anything other than asphalt or lower grade fuel oils.

The willingness and ability of refiners to accept and process heavy, sour crude has been highly dependent on the federal government’s “entitlements policy,” whereby refiners are paid subsidies to purchase oil which otherwise would have been economically unattractive. The entitlement permitted California crude proved insufficient to make it an economically viable proposition. Moreover, West Coast refiners have been flooded by Alaskan and Elk Hills oil. The result has been a glut of oil on the West Coast, with California oil being the least attractive source of oil, since it tends to be heavier and more sour than other sources, and because the entitlements program did not provide adequate subsidies to the refiners.

The existing glut of heavy fuel oils on the West Coast is likely to continue for the near future, while much of the rest of the U.S. and the world is looking for oil. Somewhat ironically, production of oil from older onshore fields has been restricted by federal pricing policies, while pressures increase to develop oil in offshore federal lease areas.

MARKETING

The “heavy” and “sour” characteristics of Santa Barbara and California crude have

produced additional problems at the consumer stage. The ability to market heavier fuel oils, the cheapest and most logical product for California crude, has been made difficult not only because of the new surge of supplies mentioned previously, but because of existing environmental restrictions on the consumption of these fuels. The electric utility companies are a large consumer of fuel oils, but growing air quality concerns have led to restrictions on the percentage of sulfur content permitted in the fuel consumed. The result has been an increasing dependence of West Coast refiners and utility companies on low-sulfur oil sources, notably Indonesia.

Because of problems associated with extraction, processing, and consumption of California oil, production of Santa Barbara County oil has not responded to the opportunities arising from the worldwide increase in the price of petroleum. By 1977-78, the problem became one of not only continued decline in production, but the threat of production being "shut-in." Some 200-300 wells were reported shut-in in California. Only a few of these occurred in Santa Barbara County, but a number of other operators felt compelled to restrict production.

Belated action on the part of the federal government finally came in 1978. Since the prospect of losing California oil production contradicted the stated federal objective of increasing domestic production, the Department of Energy has taken several steps to remove a number of the obstacles mentioned above. The entitlement program was restructured to permit greater incentives to refiners to accept the heavier California crude, and exemptions have been granted to permit the "export" of California crude to refineries elsewhere in the U.S. which have a need for this crude. Several measures of the pending National Energy Plan are likely to continue or extend the incentives necessary to encourage California oil production.

With the removal of many of the constraints, oil production in the County can be expected to reverse its decline and could conceivably lead to both an expansion of production in existing fields and an interest in new development. Opportunities for expansion could exist in both the North County inland areas as well as along the Coast.

It is at this point that the County will play an important role in the future of mineral resources in the area. Expansion of production is almost certain to be accompanied by the use of enhanced recovery techniques, particularly steam injection. If steam injection is based on current technology, such production will have significant air quality implications. In general terms, the two stated objectives of the Conservation Element (p. 181) - to encourage oil and gas development yet protect the environment - will come into conflict.

At a minimum, effective planning at the County level should include a coordination of oil developments in the inland areas, the coastal areas, and offshore. Since the County will be facing the prospects of new oil development in all these areas simultaneously, and since developments in one area could impact those in other areas, coordination will be essential. This is particularly true in terms of proposals for new oil-related facilities. Since much of the new activity onshore and offshore will be located in the North County,

the County may be presented with new opportunities, perhaps in the form of consolidation of facilities, and new problems, most likely in the form of environmental quality.

CONSUMPTION

Regardless of the rate of production of oil and gas resources in this County or around the world, increasing attention has been paid to the need for reducing consumption of these resources. The major reasons for this perceived need are familiar:

1. fossil fuel resources are finite and becoming more difficult to exploit
2. the environmental costs of uncontrolled consumption of fossil fuels are significant and increasing
3. the economic costs of fossil fuels are certain to increase, largely because of factors 1 and 2

Government officials, energy industry spokespersons, university scholars, and the public at large have all recognized the importance of energy conservation. In more recent years, programs and policies have emerged to address the problem. The three utility companies which serve Santa Barbara County (Southern California Gas, Southern California Edison, and Pacific Gas and Electric) frequently provide energy conservation suggestions to their customers. Regulatory agencies such as the California Public Utilities Commission are deeply involved in energy conservation programs in conjunction with the utility companies. The State Energy Commission regularly makes proposals to the legislature designed to reduce the level of energy consumption and/or encourage the use of environmentally benign and renewable resources such as solar energy. The centerpiece of the emerging National Energy Plan is to reduce the nation's dependence on fossil fuel energy sources, particularly foreign sources.

To date, the policies and programs of these agencies rely on a mixture of voluntary and mandatory measures. Voluntary measures, usually in the form of providing information and creating economic incentives, comprise the central thrust of these programs and policies. If and when the voluntary measures fail to reduce consumption, the balance is likely to shift to more stringent mandatory measures, such as building code and appliance standards.

Whatever the mixture of voluntary and mandatory conservation policies, local governments are certain to play a significant role. In contrast to plans for new oil platforms, LNG plants, or power generating plants, energy conservation is one aspect of the "energy question" where local governments can play an active and positive role. The County of Santa Barbara has become familiar with the real constraints imposed upon its authority when presented with large-scale oil and gas development projects. Constraints associated with future plans for a power generation facility in the County will be at least as severe. Energy conservation programs, on the other hand, are particularly well-suited for local governments. Successful energy conservation measures, particularly

those of a voluntary nature, require more direct contact with the end-user. As energy consuming entities themselves and as the most visible level of government to the energy consuming public, local governments have a tremendous opportunity and responsibility to become active participants in confronting the energy problem.

Local governments are beginning to respond to these opportunities. The Counties of San Diego, Santa Clara, San Bernardino, and Sacramento have all adopted an “energy element” to their Comprehensive Plans. In each case, energy conservation and the promotion of solar energy are central to their program. The State Energy Commission and the Federal Department of Energy have programs to support local efforts. The National Association of Counties considers energy conservation a top priority for local governments.

The opportunities for energy conservation in California are substantial. The California Public Utilities Commission, for example, recently stated that, if every owner of a gas-heated furnace would simply turn off the pilot light during the summer months, the equivalent of 22-25 billion cubic feet would be saved; this is almost twice as much gas as the entire County consumed in 1977. A 1978 report by the Energy Commission suggests that a combined energy conservation and solar energy conversion program would reduce the need for natural gas in 1985 by 513 mmcf; this is equivalent to the amount of gas that would be imported at that time from Indonesia for the proposed LNG facility. A 1978 report by an agency of the Department of Energy argues that as much as 86 percent of all of California’s energy needs could be provided by the year 2025 with a strong program for energy conservation and conversion to renewable resources. On a nation-wide basis, a Council of Environmental Quality report to the President projects that 86 percent of all U.S. energy needs would be satisfied by a similar program by the turn of the century.

Energy conservation, particularly when integrated with a program to convert to alternative energy sources, is being seen as a major, if not the major, new “source” of energy.

Santa Barbara County abounds with energy resources. Some of these resources, primarily oil and gas, have been produced and “exported” for some time. The development of additional oil and gas resources in the Santa Barbara Channel, Alaska, and overseas promise to make the Channel and the onshore coastal areas of the County the location for the transportation and distribution of “imported” resources. Additional local energy resources, primarily solar energy, have yet to be developed on a significant scale. Energy conservation, the judicious development and rational use of all these resources, is an issue badly in need of a program.

RECOMMENDATIONS

1. Expand and improve the information pertaining to current and expected patterns of energy consumption in the County.

DISCUSSION:

Effective planning for energy conservation is dependent upon accurate information regarding the types and quantities of energy consumed in the County. The charts presented here (see page 266) should be seen as an initial effort to identify a comprehensive energy consumption profile.

Of particular value would be a more accurate understanding of the end-use of energy consumption. For example, Chart III suggests that, in the residential sector, the major energy consuming activities are space heating and water heating, and that most of this energy is provided by natural gas. Since natural gas is in short supply in California and since considerable reduction in consumption in Santa Barbara County can be realized by such actions as increased insulation and installation of solar energy equipment, end-use information can be helpful in identifying areas most appropriate for energy conservation programs. Similar information for other sectors – commercial, industrial, agricultural, and governmental - is more difficult to determine, but will prove important in any effort to identify and promote opportunities for energy conservation.

2. Identify the potential for energy conservation measures and for the promotion of policies to convert to non-fossil fuel energy sources.

DISCUSSION:

Within the last decade, substantial knowledge about a wide variety of energy conservation techniques and energy conversion possibilities has become available. Some alternatives, such as hydroelectric or geothermal, are not particularly well-suited for this County, while alternatives such as solar energy, wind, and biomass offer significant potentials.

In the effort to identify the types and scale of these potentials, it is important to match the type of energy to the end-use. For example: solar energy is best suited for low and medium temperature heat requirements such as hot water, space heat, and some industrial heat processes; wind energy is particularly well-suited for operations such as pumping; and biomass can provide gaseous or liquid fuels for transportation.

3. Review and coordinate the implementation of energy conservation related County policies and ordinances.

DISCUSSION:

Building codes, environmental impact reviews, ordinances governing the use of lighting, and land-use plans are examples of public policies which have a significant influence on levels and types of energy consumed. While the general guidelines for these policies are usually mandated by State and Federal law, local governments often have an opportunity to adopt or enforce variations most suitable for local regions and most consistent with local interests. An effective local government response to these

opportunities requires an on-going effort to consciously pursue energy conservation as a priority and to coordinate County agency activities in these areas.

4. Implement an aggressive conservation and alternative energy program for County and public facilities.

DISCUSSION:

Local governments have an opportunity to be in the forefront in demonstrating the effectiveness of conservation and alternative energy applications by adopting these measures for their own facilities. After a thorough investigation of energy consumption patterns in County facilities (as part of recommendation 3), it will be possible to identify and implement specific conservation and conversion measures most appropriate for these facilities. Many measures will certainly be cost-effective in the sense of assured and near-term payoffs. Other measures may require a substantial front-end investment with longer term life-cycle payoffs. An aggressive program would willingly assume the burdens of the front end costs because of the longer-term benefits and because of the value of these projects for promoting community energy conservation and alternative energy applications.

5. Establish on-going public education energy conservation outreach programs.

DISCUSSION:

The success of federal, state, and local energy conservation measures will ultimately depend upon public acceptance of their value and viability. In some cases, the building industry, developers, realtors, or banks may feel that certain policies are either unnecessary or impose a hardship on their operations. Citizens may feel conservation or alternative energy requirements are unrealistic. Extensive public hearings prior to implementation can help prevent the adoption of unjustifiable measures. Confusion and possibly resistance on the part of the affected groups or individuals can be reduced by active participation of County representatives in workshops, public hearings, literature distribution, and related public education programs.

6. Actively participate in the energy conservation programs of the local, state, and federal agencies.

DISCUSSION:

Such participation can take two forms: as an advocate and as a recipient of grants. Opportunities for participation in both forms are certain to increase as public and private agencies become aware of the complexities and long-term nature of energy planning.

As an advocate, the County can follow the evolving energy policy-making efforts of neighboring county agencies, state, and federal legislatures, and regulatory commissions, offering support for effective policies and constructive criticism for ill-

advised measures. Of particular value would be an active role in the rulings of the Public Utilities Commission and the California Energy Commission. These two agencies are central to the emerging energy policy in California and will be critical to the fate of energy conservation and alternative energy applications.

Simultaneously, the County can actively seek participation in the funding opportunities for energy conservation programs available through state and federal agencies. Because of the high priority attached to the energy issue, and because of the as yet unfulfilled promise of energy conservation, state and federal agencies are increasing the opportunities for assistance to those local governments which demonstrate a commitment to these objectives.

7. Consider energy conservation and conversion to alternative energy sources the central focus of an Energy Element for the Santa Barbara County Comprehensive Plan.

DISCUSSION:

An Energy Element could, and should, embrace a wide variety of issues.

- A comprehensive assessment of conventional energy production operations in the County, existing and proposed.
- A comprehensive assessment of conventional energy consumption in the County.
- A thorough description of the impacts of conventional and nonconventional energy production and consumption patterns.
- A coordination of County efforts in the review and (if necessary) revision of current energy-related County-policies, as well as ensuring successful cooperation with appropriate state and federal agencies.

If the potentials of energy conservation are to be realized, energy conservation and the conversion to alternative energy sources must be considered essential to all aspects of an Energy Element.

CHART I
 ENERGY PRODUCTION AND CONSUMPTION-- Santa Barbara County, 1977
 10¹² (trillion) BTU

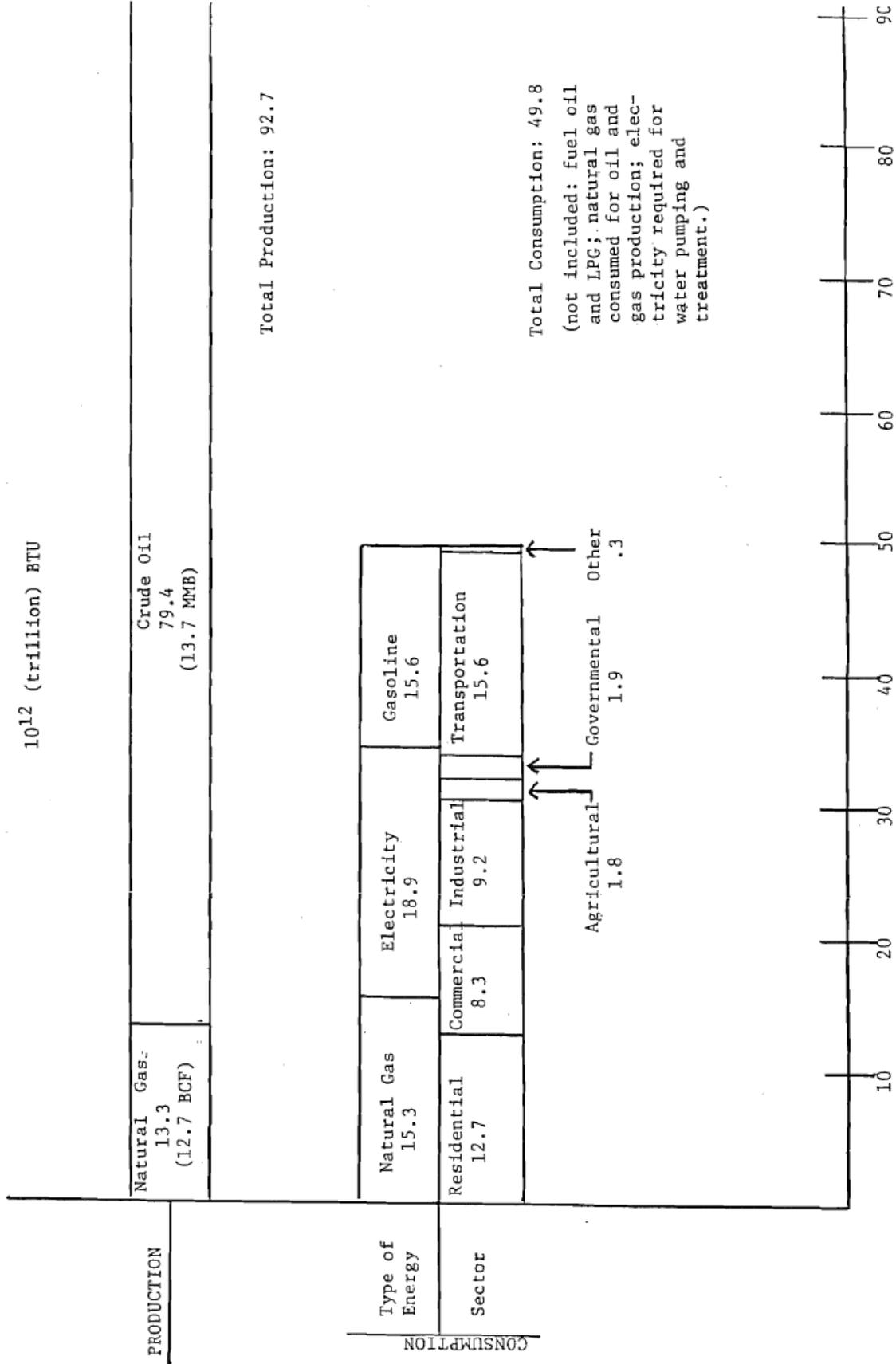


CHART II

NATURAL GAS AND ELECTRICITY CONSUMPTION-- Santa Barbara County, 1977

By Sector: 10¹² BTU

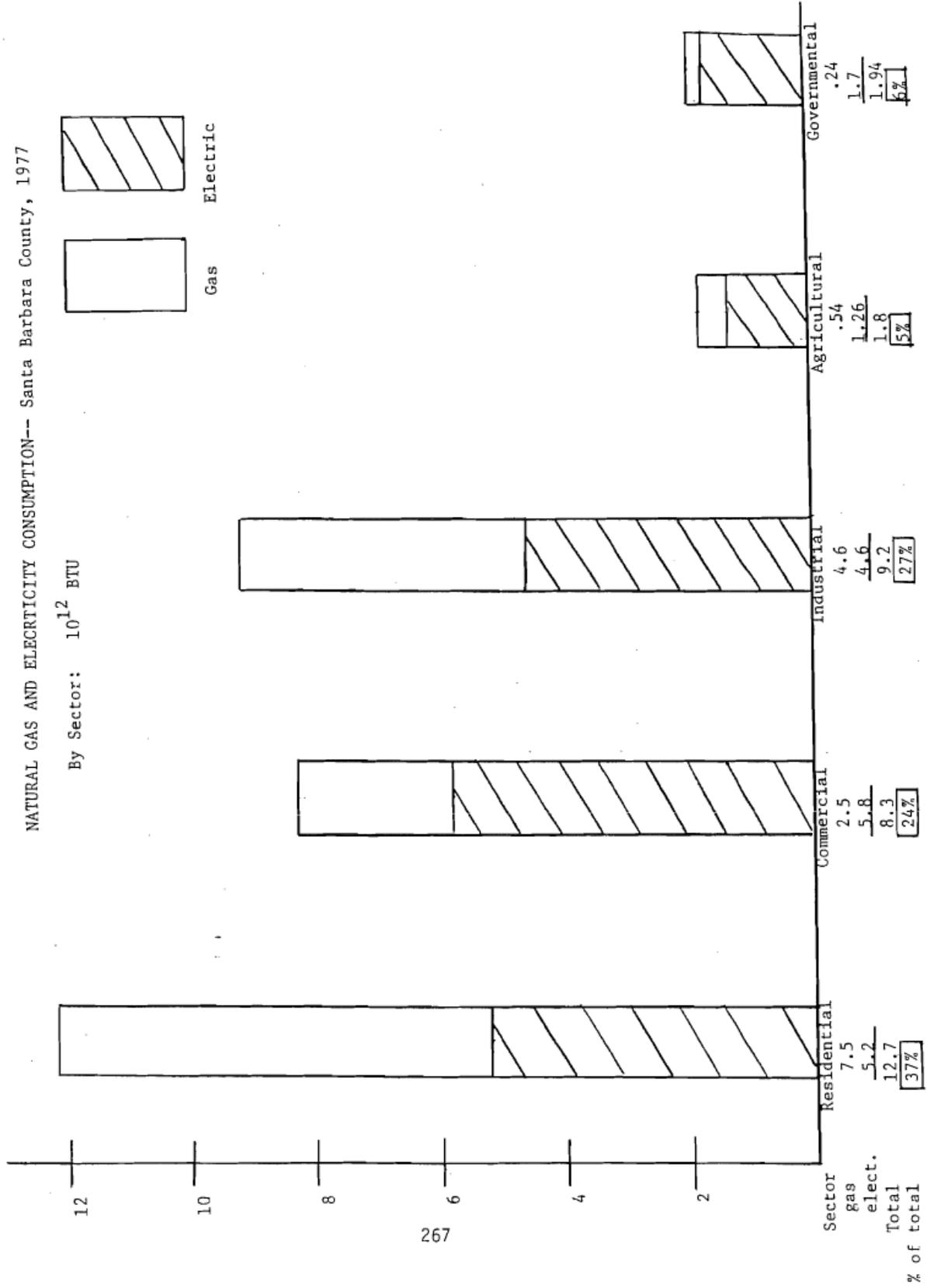
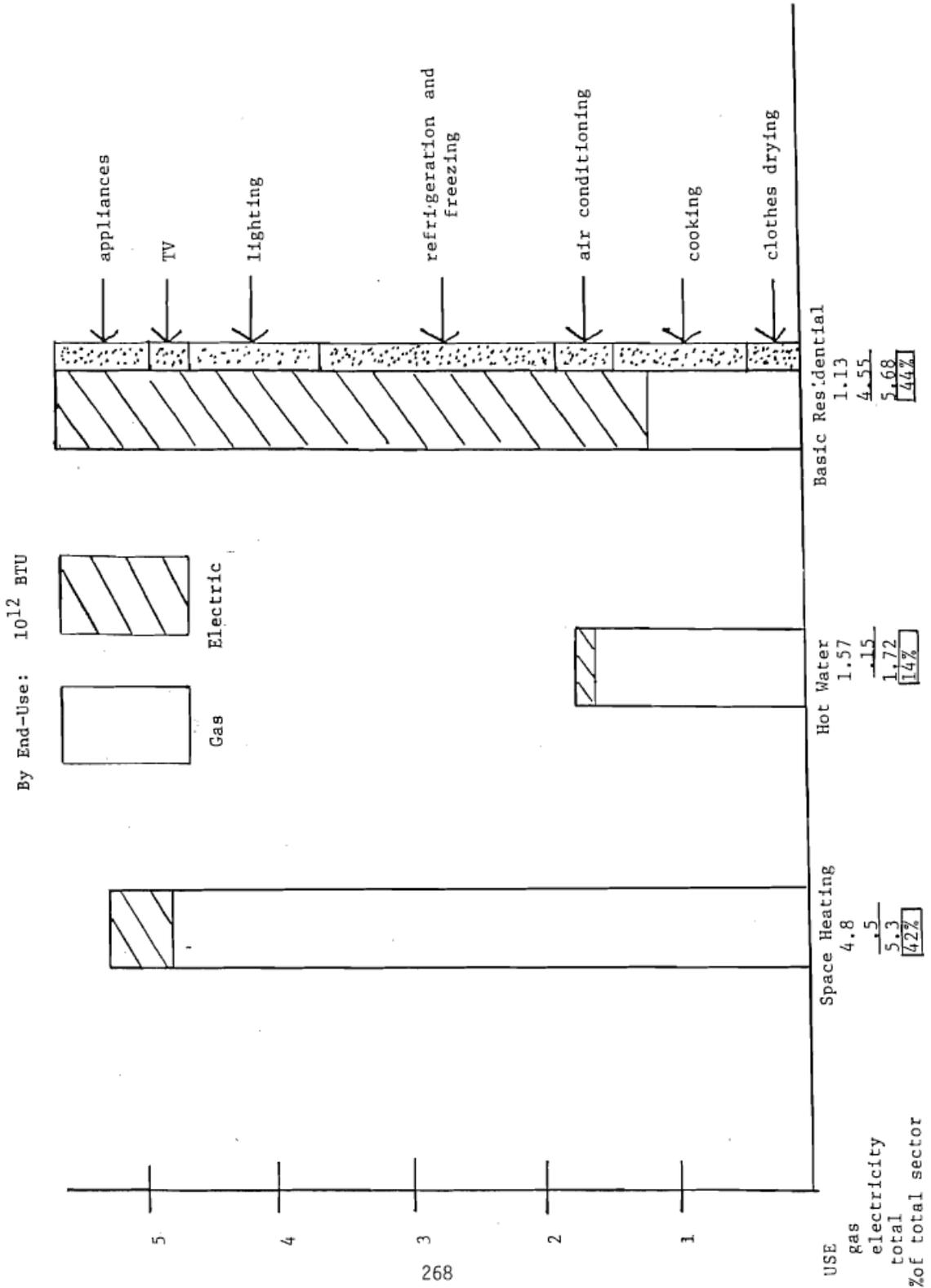


CHART III
 RESIDENTIAL ENERGY CONSUMPTION-- Santa Barbara County, 1977



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Appendices

APPENDIX A: AGRICULTURAL SUITABILITY COUNTY-WIDE, MODEL STEPS FOR COMPUTER PROGRAMMING

1. Exclude from consideration all cells with coastal beaches or marshes, or an environmental biology tolerance-intensity classification for only regulated scientific study.
2. Assign weights to the sub-classifications of environmental resources.

	<u>Weight</u>
<u>Soils: agricultural capability</u>	
Prime agricultural soils:	
Class I and II	10
Limited agricultural soils:	
Class III and IV	7
Primarily rangeland, woodland, and wildlife habitat:	
Class VI and VII	3
Non-agricultural open space uses:	
Class VIII	0
<u>Availability of groundwater</u>	
Areas wherein wells produce adequate quantity and quality of water	10
Areas wherein wells have small yield or marginal water quality	5
Areas underlain by groundwater of unsuitable quality or by non-water bearing deposits	0
Sum weights to compute Environmental Resource Index, range 0-20.	

3. Assign weights for slope according to the following formula. Flat areas are

assumed to be more suitable for irrigated agriculture than areas with steep slopes.

Slope: 0-10 per cent

Divide the number representing the per cent of the cell falling in this category by 10. If no area within the cell is over 10 per cent slope, the weight would be 10 ($100 \div 10$).

Slope: 11-20 per cent

Divide the number representing the per cent of the cell falling in this category by 20.

Slope: 21-30 per cent:

Divide the number representing the per cent of the cell falling in this category by 40.

Sum weights to compute Landform Index, range 0-10.

<u>Landforms</u>	<u>Landform Index</u>
Flat	9 - 10
Gentle slopes	7 - 9
Rolling hills	4 - 7
Steep slopes, mountains	0-4

4. Assign weights to the sub-classifications of environmental constraints. For flood hazard and protection of local water resources, stream channels are not weighted as a binding constraint because they occupy only a portion of a 92 acre cell.

	<u>Weight</u>
<u>Flood hazard</u> *	
Areas without potential flood problems - Categories 5, 8, 9	10
Areas within 100 year flood plain Categories 3, 4	8
Areas with local drainage problems Categories 6, 7, 11	7
Areas within floodway or area of potential flood hazard Categories 2, 10	6
*(See <u>Seismic Safety Element</u> for explanation of rating system.)	

	<u>Weight</u>
Stream channels Category 1	9
<u>Protection of local water resources</u>	
Stream channels Category 1	9
Areas tributary to present surface water supplies Category 2	6
Areas tributary to future surface water supplies Category 3	7
Areas overlying groundwater or tributary to groundwater basins Categories 4, 5	9
Other areas Category 6	10
<u>Tolerance-intensity classification of environmental biology</u>	
Very high tolerance (7-5)	10
High tolerance (7-4)	9
Moderate-high tolerance (3-5)	7
Moderate-low tolerance (3-4)	3
Low tolerance (3-3)	1
Limited tolerance (3-2)	0
<u>High groundwater*</u>	
High problem rating (31)	0
High-moderate problem rating (33)	2
Other problem ratings (35, 22, 21, 26, 23, 14, 12, 11)	5
*(See <u>Seismic Safety Element</u> for explana- tion of rating system.)	

Sum weights to compute Environmental Constraints Index, range 0-35.

5. Map: Suitability for Agricultural Expansion utilizing the following seven categories.

Highly suitable for irrigated truck and field row crops

Environmental Resource Index = 20

Landform Index = 9 - 10

Environmental Constraints = 28 - 35

Highly suitable for orchard or vineyard

Environmental Resource Index = 17

Landform Index = 1 - 10

Environmental Constraints = 28 - 35

Highly suitable for irrigated crops if surface water is available

Environmental Resource Index = 15

Landform Index = 9 - 10

Environmental Constraints = 28 - 35

Highly suitable for orchard or vineyard if surface water is available

Environmental Resource Index = 12, 7

Landform Index = 1 - 10

Environmental Constraints = 28 - 35

Moderately suitable for crop production

Environmental Resource Index = 12 - 20

Landform Index = 7 - 10

Environmental Constraints = 23 - 35

Suitable only for certain crops

Environmental Resource Index = 7 - 20

Landform Index = 1 - 10

Environmental Constraints = 18 - 35

Unsuitable for crop production

Balance of County

APPENDIX B: SUITABILITY FOR AGRICULTURAL EXPANSION IN STUDY AREAS, MODEL STEPS FOR COMPUTER PROGRAMMING.

1. Exclude from consideration all cells with existing intensive agriculture, urban land use, coastal beaches, marshes, or an environmental biology tolerance-intensity classification for only regulated scientific study. (Non-irrigated cropland is assumed to have potential for more intensive cultivation.)
2. Assign weights to the soil series to represent the suitability for each of the six major crop types, taking slope into account as necessary. (See Table in Agricultural Resources chapter.) These suitability rankings will represent the Soil Suitability Index for each crop type.
3. Assign weights to the sub-classifications for Municipal and Industrial Water Distribution according to the following formula. Areas not easily served by surface water systems could be served by wells; so the results of this model will be checked against the Availability of Groundwater maps.

	<u>Weights</u>
Areas capable of being served Category 1	10
Areas requiring minimal extensions Category 2	8
Category 4	7
Areas requiring significant reinforcement of distribution system Category 3	6
Category 5	5
Areas requiring major extensions and reinforcement of distribution system Category 7	3
Category 6	2

4. Assign weights to the sub-classifications of environmental constraints. In the study areas, stream channels are weighted as binding constraints because a significant portion of a 5.74 acre grid cell might be required for their protection.

	<u>Weight</u>
<u>Flood hazard</u> Areas without potential flood problems Categories 5, 8, 9	10
Areas within 100 year flood plain Categories 3, 4	8

Areas with local drainage problems Categories 6, 7, 11	7
Areas within floodway or area of potential flood hazard Categories 2, 10	6
Stream channels Category 1	1
<u>Protection of local water resources</u> Other areas Category 6	10
Areas overlying groundwater or tributary to groundwater basins Categories 4 and 5	9
Areas tributary to future surface water supplies Category 3	7
Areas- tributary to present surface water supplies Category 2	6
Stream channels Category 1	1

<u>Tolerance-intensity classification of environmental biology</u>	<u>Weight</u>
Very high tolerance (7-5)	10
High tolerance (7-4)	9
Moderate-high tolerance (3-5)	9
Moderate-low tolerance (3-4)	3
Low tolerance (3-3)	1
Limited tolerance (3-2)	0

<u>High groundwater</u>	
High problem rating (31)	0
High-moderate problem rating (33)	2
Other problem ratings (35, 22, 21, 26, 23, 14, 12, 11)	5

(See Seismic Safety Element for explanation of rating system.)

Sum weights to compute Environmental Constraints Index, range 0-35.

6. For each crop type, map Agricultural Suitability for (insert crop type) utilizing the following categories.

Highly suitable for (insert crop type)

Soils Suitability = 3

Environmental Constraints = 30 - 35

Municipal and Industrial Water Distribution = 6 - 10

Highly suitable for (insert crop type) if adequate groundwater available

Soils Suitability = 3

Environmental Constraints = 30 - 35

Moderately suitable for (insert crop type)

Soil Suitability = 2 - 3

Environmental Constraints = 25 - 35

Municipal and Industrial Water Distribution = 6 - 10

Moderately suitable for (insert crop type) if adequate groundwater available

Soil Suitability = 2 - 3

Environmental Constraints = 25 - 35

Low suitability for (insert crop type)

Soil Suitability = 1 - 3

Environmental Constraints = 25 - 35

Municipal and Industrial Water Distribution = 6 - 10

Low suitability for (insert crop type) if adequate groundwater available

Soil Suitability = 1 - 3

Environmental Constraints = 25 - 35

Suitable with environmental problems

Soil Suitability = 1 - 3

Environmental Constraints = 5 - 35

Unsuitable

Balance of study area

7. Combine the individual suitability rankings into a composite map of Suitability for Agricultural Expansion, utilizing the following six categories. Lands that are in the "suitable with environmental problems" category for all crops are shown as unsuitable because of environmental constraints.

Highly suitable for irrigated crops, orchard, vineyard or ornamentals, or for irrigated crops only

Highly suitable for ornamentals only

Moderately suitable for irrigated crops, orchard, vineyard or ornamentals

Low suitability for irrigated crops, orchard, vineyard or ornamentals, or highly suitable for non-irrigated crops

Unsuitable for crop production because of soil capability or environmental constraints

***APPENDIX C: PAYMENT CAPACITIES FOR VARIOUS CROPS PER
HYDROLOGIC BASIN***

TABLE 1
 CARPINTERIA BASIN

<u>Crop</u>	<u>Yield Ton/Acre</u>	<u>Farm Price Avg/Unit</u>	<u>Gross Crop Value Per Acre</u>	<u>Production^{a/} Cost Per Acre</u>	<u>Net Value Per Acre</u>	<u>Applied Water AF/AC Cost/AC</u>	<u>Payment Capacity Per AF Applied Water</u>
Avocado	3.8	764.00	2,933.76	1,983.20	950.56	1.6	639.10
Lemons	12.4	175.35	2,174.34	2,276.34	-102.00	1.5	- 23.00

<u>Crop</u>	<u>Present Water Cost % of Prod. Cost</u>	<u>Present Pay Capacity % of Prod. Cost</u>	<u>\$225/AF Water Cost % of Prod. Cost</u>
Avocado	3.63	32.23	15.9
Lemons	2.97	- 1.01	13.3

^{a/} Includes cost of Water.

Source: Joyner, D. Demand Analysis for Irrigation Water, University of California Cooperative Extension, Santa Barbara County, March 1976.

TABLE 2

GOLETA BASIN

Crop	Yield Ton/Acre	Farm Price Avg/Unit	Gross Crop Value Per Acre	Production ^{a/} Cost Per Acre	Net Value Per Acre	Applied Water AF/AC Cost/AC	Payment Capacity Per AF Applied Water	Present		\$225/AF Water Cost % of Prod.Cost
								Water Cost % of Prod.Cost	Pay Capacity % of Prod.Cost	
Avocado	3.8	764.00	2,933.76	2,023.20	910.56	1.6	112.00	5.54	31.59	15.9
Lemon	12.4	175.35	2,174.34	2,313.84	-139.50	1.5	105.00	4.54	- 1.1	13.3
Walnuts	.6	484.00	290.40	406.45	-116.05	1.5	105.00	25.83	-1.8	52.9

^{a/} Includes cost of water.

Source: Joyner, D. Demand Analysis for Irrigation Water. University of California Cooperative Extension, Santa Barbara County, March 1976.

TABLE 3

SANTA YNEZ BASIN

Crop	Yield Ton/Acre	Farm Price Avg/Unit	Gross Crop Value		Production ^{a/} Cost Per Acre	Net Value Per Acre	Applied Water AF/AC	Applied Water Cost/AC	Payment Capacity Per AF Applied Water
			Per Acre	Per Acre					
Beans	1.0	489.98	489.98	451.58	38.40	1.5	22.50	40.60	
Sugar Beet	24.3	25.73	623.95	530.69	93.26	3.0	45.00	46.09	
Corn	30.8	14.00	431.76	312.98	118.78	2.5	37.50	62.51	
Carrot	20.9	72.87	1,525.90	1,526.50	-.68	2.5	37.50	14.76	
Lettuce	16.0	125.63	2,010.08	1,987.98	22.10	2.8	41.25	23.04	
Tomatoes	26.3	45.18	1,190.04	1,022.50	167.54	2.0	30.00	98.77	
Alfalfa	8.0	55.00	441.65	453.36	-11.71	4.0	60.00	12.07	
Walnuts	.7	484.00	338.80	350.95	-12.15	3.3	49.50	11.32	
Vineyard	3.5	398.00	1,393.00	1,251.00	142.00	2.0	30.00	86.00	

Crop	Present		Present Pay Capacity % of Prod. Cost	\$225/AF Water Cost % of Prod. Cost
	Water Cost % of Prod. Cost	Water Cost % of Prod. Cost		
Beans	4.98	8.99	44.1	
Sugar Beet	8.48	8.68	58.1	
Corn	11.98	19.97	67.1	
Carrot	2.46	.97	27.4	
Lettuce	2.07	1.16	24.4	
Tomatoes	2.93	9.66	31.2	
Alfalfa	13.23	2.66	69.6	
Walnut	14.10	3.23	71.2	
Vineyard	2.40	6.87	26.9	

^{a/} Includes cost of Water.

Source: Joyner, D. Demand Analysis for Irrigation Water, University of California Cooperative Extension, Santa Barbara County, March 1976.

TABLE 4

LOMPOC BASIN

Crop	Yield Ton/Acre	Farm Price Avg./Unit	Gross Crop Value Per Acre	Production ^{a/} Cost Per Acre	Net Value Per Acre	Applied Water AF/AC	Cost/AC	Payment Capacity Per AF Applied Water
Beans	1.0	489.98	489.98	444.18	45.80	1.5	15.00	40.53
Sugar Beet	24.3	25.73	623.95	514.69	109.26	3.0	30.00	46.42
Corn	30.8	14.00	431.76	300.48	131.28	2.5	25.00	62.51
Broccoli	3.9	246.85	962.71	924.85	37.86	2.5	25.00	25.15
Cabbage	19.7	79.58	1,569.32	1,456.28	113.04	2.5	25.00	55.22
Carrots	20.9	72.87	1,525.90	1,511.00	14.90	2.2	22.00	16.77
Cauliflower	5.6	286.48	1,595.69	1,432.76	162.93	3.0	30.00	64.31
Celery	28.0	122.69	3,437.77	3,308.29	129.48	3.8	38.00	44.07
Lettuce	16.0	125.63	2,010.08	1,972.73	37.35	2.6	26.00	24.37
Alfalfa	8.0	55.00	441.65	428.36	13.29	3.5	35.00	13.80
Walnuts	.7	484.00	338.80	309.45	29.35	1.8	18.00	26.30
Vineyard	3.5	398.00	1,393.00	1,233.00	160.00	1.2	12.00	143.33
Comm. Flrs.	4,800.0*	.67	3,216.00	2,212.00	1,004.00	1.8	18.00	567.78

* Flowers per acre

^{a/} Includes cost of water.

Source: Joyner, D. Demand Analysis for Irrigation Water, University of California Cooperative Extension, Santa Barbara County, March 1976.

TABLE 4 (cont'd)

LOMPOC BASIN

<u>Crop</u>	<u>Present Water Cost % of Prod. Cost</u>	<u>Present Pay Capacity % of Prod. Cost</u>	<u>\$225/AF Water Cost % of Prod. Cost</u>
Beans	3.38	9.13	44.1
Sugar Beets	5.83	9.02	58.2
Corn	8.32	20.80	67.2
Broccoli	2.70	2.72	38.5
Cabbage	1.72	3.79	78.2
Carrots	1.46	1.11	24.9
Cauliflower	2.09	4.49	32.5
Celery	1.15	1.33	20.7
Lettuce	1.32	1.24	22.9
Alfalfa	8.17	3.22	66.7
Walnuts	5.82	8.49	70.0
Vineyard	.97	11.62	18.1
Comm. Flrs.	.81	25.67	11.0

TABLE 5

SAN ANTONIO BASIN

Crop	Yield Ton/Acre	Farm Price AVG/Unit	Gross Crop Value Per Acre	Production ^{a/} Cost Per Acre	Net Value Per Acre	Applied Water AF/AC	Cost/AC	Payment Capacity Per AF Applied Water
Beans	1.0	489.98	489.98	444.78	45.20	1.3	15.60	46.77
Sugar Beet	24.3	25.73	623.95	527.69	96.26	3.5	42.00	39.50
Corn	30.8	14.00	431.76	305.48	126.28	2.5	30.00	62.51
Carrot	20.9	72.87	1,525.90	1,515.40	10.50	2.2	26.40	16.77
Tomatoes	26.4	45.18	1,190.49	1,022.50	167.99	2.5	30.00	79.20
Alfalfa	8.0	55.00	441.65	447.36	-5.71	4.5	54.00	10.73
Vineyard	3.5	398.00	1,393.00	1,245.00	148.00	2.0	24.00	86.00

Crop	Present Water Cost % of Prod. Cost	Present Pay Capacity % of Prod. Cost	\$225/AF Water Cost % of Prod. Cost
Beans	3.51	10.52	40.6
Sugar Beet	7.96	7.49	61.9
Corn	9.82	20.46	67.2
Carrot	1.74	1.11	24.9
Tomatoes	2.94	7.75	36.2
Alfalfa	12.07	2.40	72.0
Vineyard	1.93	6.91	27.0

^{a/} Includes cost of Water.

Source: Joyner, D. Demand Analysis for Irrigation Water, University of California Cooperative Extension, Santa Barbara County, March 1976.

TABLE 6

SANTA MARIA BASIN

Crop	Yield Ton/Acre	Farm Price Avg/Unit	Gross		Production ^{a/} Cost Per Acre	Net Value Per Acre	Applied Water		Payment Capacity Per Af Applied Water
			Crop Value Per Acre	Per Acre			AF/AC	Cost/AC	
Beans	1.0	489.98	489.98	444.18	45.80	1.5	15.00	40.53	
Sugar Beet	24.3	25.73	623.95	514.69	109.26	3.0	30.00	46.42	
Corn	30.8	14.00	431.76	300.48	131.28	2.5	25.00	62.51	
Broccoli	3.9	246.85	962.71	924.85	37.86	2.5	25.00	25.15	
Cabbage	19.7	79.58	1,569.32	1,456.28	113.04	2.5	25.00	55.22	
Carrots	20.9	72.87	1,525.90	1,511.00	14.90	2.2	22.00	16.77	
Cauliflower	5.6	286.48	1,595.69	1,432.76	162.93	3.0	30.00	64.31	
Celery	28.0	122.69	3,437.77	3,308.29	129.48	3.8	38.00	44.07	
Lettuce	16.0	125.63	2,010.08	1,972.73	37.35	2.6	26.00	24.37	
Strawberry	21.6	484.27	10,460.23	9,180.00	1,280.23	4.0	40.00	330.06	
Tomatoes	26.3	45.18	1,190.04	1,012.50	177.54	2.0	20.00	98.77	
Potatoes	17.1	85.00	1,450.95	1,343.54	107.41	2.5	25.00	52.96	
Chili Pepper	1.7	700.00	1,190.00	1,158.20	31.80	4.0	40.00	17.95	
Alfalfa	8.0	55.00	441.65	428.36	13.29	3.5	35.00	13.80	
Vineyard	3.5	398.00	1,393.00	1,233.00	160.00	1.2	12.00	143.33	

^{a/} Includes cost of Water.

Source: Joyner, D. Demand Analysis for Irrigation Water, University of California Cooperative Extension, Santa Barbara County, March 1976.

TABLE 6 (Cont'd)

SANTA MARIA BASIN

Crop	Present	Present	\$225/AF Water Cost % of Prod. Cost
	Water Cost % of Prod. Cost	Pay Capacity % of Prod. Cost	
Beans	3.38	9.13	44.1
Sugar Beet	5.83	9.02	58.2
Corn	8.32	20.80	61.2
Broccoli	2.70	2.72	38.5
Cabbage	1.72	3.79	28.2
Carrot	1.46	1.11	24.9
Cauliflower	2.09	4.49	32.5
Celery	1.15	1.33	20.7
Lettuce	1.32	1.24	23.1
Strawberry	.44	3.60	9.0
Tomatoes	1.98	9.76	31.2
Potatoes	1.86	3.95	30.0
Chili Pepper	3.45	1.55	44.6
Alfalfa	8.17	3.22	66.7
Vineyard	.97	11.62	18.1

TABLE 7
 SISQUOC BASIN

Crop	Yield Ton/Acre	Farm Price Avg./Unit	Gross Crop Value Per Acre	Production ^{a/} Cost Per Acre	Net Value Per Acre	Applied Water AF/AC	Applied Water Cost/AC	Payment Capacity Per AF Applied Water	Present	
									Water Cost % of Prod. Cost	Pay Capacity % of Prod. Cost
Beans	1.0	489.98	489.98	442.18	47.80	1.3	13.00	46.77		
Sugar Beet	24.3	25.73	623.95	519.69	104.26	3.5	35.00	39.79		
Corn	30.8	14.00	431.76	300.48	121.28	2.5	25.00	62.51		
Broccoli	3.9	246.85	962.71	909.85	52.86	1.0	10.00	62.86		
Carrot	20.9	72.87	1,525.90	1,519.00	6.90	3.0	30.00	12.30		
Potatoes	17.1	85.00	1,450.95	1,348.54	102.41	3.0	30.00	44.14		
Alfalfa	8.0	55.00	441.65	438.36	3.29	4.5	45.00	10.73		
Vineyard	3.5	398.00	1,393.00	1,241.00	152.00	2.0	20.00	86.00		
										\$225/AF
Beans			2.94	10.58						40.6
Sugar Beet			6.73	7.66						61.9
Corn			8.32	20.80						67.2
Broccoli			1.10	6.91						20.0
Carrot			1.97	.81						31.2
Potatoes			2.22	3.27						33.9
Alfalfa			10.27	2.45						72.0
Vineyard			1.61	6.93						26.9

^{a/} Includes cost of Water.

Source: Joyner, D. Demand Analysis for Irrigation Water, University of California Cooperative Extension, Santa Barbara County, March 1976.

TABLE 8

CUYAMA BASIN

Crop	Yield Ton/Acre	Farm Price Avg./Unit	Gross Crop Value		Production ^{a/} Cost Per Acre	Net Value Per Acre	Applied Water		Payment Capacity Per AF Applied Water
			Per Acre	Per Acre			AF/AC	Cost/AC	
Corn	30.8	14.00	431.76	303.48	128.28	3.2	28.00	48.84	
Alfalfa	8.0	55.00	441.65	438.36	3.29	5.0	45.00	9.66	

Crop	Present		Present Pay Capacity % of Prod. Cost	\$225/AF Water Cost % of Prod. Cost
	Water Cost % of Prod. Cost	Pay Capacity % of Prod. Cost		
Corn	9.23	16.09	72.3	
Alfalfa	10.27	2.20	74.1	

^{a/} Includes cost of Water.

Source: Joyner, D. Demand Analysis for Irrigation Water, University of California Cooperative Extension, Santa Barbara County, March 1976.

APPENDIX D: PERSONS CONSULTED BY THE ENVIRONMENTAL BIOLOGISTS

Waldo Abbott, Senior Curator of Vertebrates at the Santa Barbara Museum of Natural History.

Paul Barker, Assistant Supervisor, U. S. Forest Service, Goleta.

Dr. Selina Bendix, Environmental Review Officer, Department of City Planning, San Francisco.

Jerry Berry, U.S. Forest Service, Goleta.

Richard Bray, Fisheries Biologist, University of California, Santa Barbara.

Larry Carver, Map Room, University of California, Santa Barbara.

J. Hamber, Assistant Curator of Vertebrates at the Santa Barbara Museum of Natural History.

Karen Kellogg, Member of Isla Vista Planning.

Martin Kellogg, Member of Isla Vista Planning.

Lyndal Laughrin, Island Specialist, Marine Science Institute, University of California, Santa Barbara.

Milton Love, Fisheries Biologist, University of California, Santa Barbara.

Gene Martin, Game Warden, California Department of Fish and Game, Santa Barbara.

Dr. Robert Norris, Professor of Geology, University of California, Santa Barbara.

Dr. Michael Neushul, Professor of Biology, University of California, Santa Barbara.

Craig Rudolph, Vertebrate Biologist and Environmental Consultant, Santa Barbara.

Cliff Smith, Botanist and Curator at the Santa Barbara Museum of Natural History.

Dr. Dale Smith, Professor of Botany, University of California. Santa Barbara.

Dr. E. Hochberg, Curator of Invertebrates at the Santa Barbara Museum of Natural History.

T. Tutschulte, Marine Biologist, University of California, Santa Barbara.

David Ono, Marine Biologist, California Department of Fish and Game.

CITATIONS

- ¹ [Resolution No. 79-189](#) (Case No. 78-GP-6) Amended April, 2nd 1979 (Adopting Resolution of Conservation Element.)
- ² OC5 Project Task Force, Office of Planning and Research, October 1977
- ³ Santa Barbara County Water Agency, "What the Water Agency Is and Does," November 1977, p. 1.
- ⁴ [Resolution No. 94-284](#) (Case No. 84-GP-008), Amended May 24, 1994 (adopted by reference Conservation Element Groundwater Resources Section and CONS/GWB 1 through 6 maps; added statement "This chapter's text and maps *regarding* groundwater are superseded in their entirety by the text and maps of the Groundwater Resources Section, dated May 1994).
- ⁵ [Resolution No. 94-527](#) (Case No. 94-GP-14), Amended November 8, 1994 (Amended Conservation Element Groundwater Resources Section)
- ⁶ Santa Barbara County Water Agency, "[Adequacy of the Santa Maria Groundwater Basin](#)," December 1977, p. 5-10.
- ⁷ Sources: Santa Barbara County Water Agency, Present and Future Water Needs of Santa Barbara County,. 2nd ed., January 13,1978; Water Needs Versus Water Availability, November 29, 1977; Adequacy of the Groundwater Basins of Santa Barbara County, December 15, 1977.
- ⁸ Geotechnical Consultants, Inc., March 3, 1978.
- ⁹ Includes areas inside Santa Barbara City served by the Goleta W.D. but excludes areas in Goleta served by the City.
- ¹⁰ "Phreatophyte": deep-rooted plant that obtains its water from the groundwater basin or the layer of soil just above it.
- ¹¹ inside and outside 1.0. #1
- ¹² There are also riparian areas along Salsipuedes and El Jaro Creeks south, of the Santa Ynez River. These areas cover about 2-miles and contain about 970 acres of irrigated ag that demand about 1,500 AFY. In addition, north of the Santa Ynez River there is a small riparian area along Santa Rosa Creek and its tributaries. This area covers 11 miles and contains about 750 acres of irrigated ag that demand about 1,425 AFY.
- ¹³ See Santa Barbara County Water Agency, "Adequacy of the Groundwater Resources in the Lompoc Area," July 27, 1977
- ¹⁴ "Consumptive Use"--water permanently removed from the system.
- ¹⁵ "According to the County Water Agency, the estimated 1977-78 overdraft for the entire Lompoc Groundwater Basin is about 1,750 AFY. This is a reduction from the 1975-76 estimate of 3,000 AFY, and is due to consumer conservation and, particularly, to the diversion of municipal and industrial wastewater from the Vandenberg Village system to the Lompoc Regional Waste-water Treatment Plant."
- ¹⁶ "Adequacy of the Groundwater Resources in the Lompoc Area ,," p. 36
- ¹⁷ See Santa Barbara County Water Agency, "Adequacy of the Santa Maria Groundwater Basin," November 1977.

¹⁸ and projected land use changes as shown on the 1965-78 Land Use Plans.

¹⁹ Source: Santa Barbara County Water Agency, Adequacy and Economics of Water Resources Development Alternatives, March 13, 1978.

²⁰ [Resolution No. 03-120](#) (Case No. 00-GPA-6) Adopted April 15th, 2003 (Adopted Supplement to the Mapped Areas and Communities Section, Oak Tree Protection In the Inland Rural Areas of Santa Barbara County)

²¹ Source: County of Santa Barbara-City of Carpinteria Local Coastal Program, Environmentally Sensitive Habitat Areas, November 1977.

²² [Resolution No. 03-120](#) (Case No. 00-GPA-5) Amended April 15th, 2003 (Added Woodland and Savanna introduction)

²³ [Resolution No. 03-120](#) (Case No. 00-GPA-5) Amended April 15th, 2003 (Added Forest Habitats introduction)

²⁴ [Resolution No. 03-120](#) (Case No. 00-GPA-5), Amended April 15, 2003 (Added Riparian Forests and Woodlands introduction)

²⁵ University of California, Santa Barbara, Geography Remote Sensing Unit

²⁶ See University of California, Cooperative Extension, "Economic Impacts of Resource Use," September 1975. Other reports are in preparation.

²⁷ Updated in March 1976