

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF WATER RESOURCES

## WATER QUALITY INVESTIGATIONS

Report No. 3

# GROUND WATER BASINS IN CALIFORNIA



November, 1952

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November 1, 1952

FRANK B. DURKEE, *Director*  
*Department of Public Works*  
*Public Works Building, Sacramento, California*

DEAR MR. DURKEE: Transmitted herewith is a report entitled "Ground Water Basins in California." This report has been prepared under the authority of Section 229 of the Water Code, for transmittal to the Legislature and to the Regional Water Pollution Control Boards.

This report identifies the areas of alluvial-fill in the State of California which may be areas of ground water storage. It establishes a uniform name and numbering system for ground water basins which can be expanded as new areas of storage are identified. A selected bibliography pertaining to ground water resources in California has been included.

Very truly yours,



A. D. EDMONSTON, State Engineer

## ACKNOWLEDGMENT

Many of the data presented in this report and included in the bibliography were contributed by public and private agencies and individuals. Particular acknowledgment is made to the United States Geological Survey, Ground Water Branch, for its review of and comments on the report.

The following agencies contributed materially to this report:

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- United States Bureau of Reclamation
- California Division of Mines
- University of California at Berkeley
- University of California at Los Angeles
- University of Southern California
- California Institute of Technology
- Stanford University
- Pomona College
- Los Angeles County Flood Control District
- Orange County Flood Control District
- San Bernardino County Flood Control District
- San Bernardino Valley Water Conservation District
- Ventura County Water Survey

The voluntary and valuable cooperation received from these and other organizations and individuals is acknowledged with thanks.

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# CHAPTER I

## INTRODUCTION

### AUTHORIZATION

Section 229 of the Water Code directs that the California Department of Public Works, acting by and through the State Engineer, shall

“\* \* \* investigate conditions of the quality of all waters within the State, including saline waters, coastal and inland, as related to all sources of pollution of whatever nature and shall report thereon to the Legislature and to the appropriate regional water pollution control board annually, and may recommend any steps which might be taken to improve or protect the quality of such waters.”

### STATEMENT OF PROBLEM

In order to carry out the intent of Section 229 of the Water Code with respect to investigations of quality of ground waters within the State, it has been necessary first to compile available geologic data in order to locate and define the approximate boundaries of the more important ground water basins.

A base index map showing the principal areas of ground water storage in the State of California has not been previously prepared. Such a map has been compiled for this report in order to establish a uniform name and numbering system for ground water basins, which can be expanded as new areas of ground water storage are identified or as it is found necessary to divide the larger areas into subbasins. It will serve as a basis for the planning of future investigations of the ground water resources of California.

### SCOPE OF INVESTIGATION AND REPORT

The investigation has comprised a review and analysis of available data, and covers field and office work completed by the Division of Water Resources in the period July, 1950, to July, 1952. Information was obtained from the United States Geological Survey, United States Bureau of Reclamation, California Department of Natural Resources, Division of Mines, and from various universities in California.

This report identifies alluvial or valley fill areas which contain the principal ground water resources in California. However, the report is necessarily not complete because of lack of information for many areas of the State. In general, the areas of ground water storage identified include: (a) the major alluvium-filled areas of known ground water storage and extraction; (b) the extensive areas of alluvial-fill in the Colorado, Mojave, and Basin and Range desert areas

which may contain usable ground water, though little is known of their storage capacity or recharge; and (c) some of the smaller alluvium-filled areas which may furnish a portion of local domestic, irrigation, municipal and industrial water supplies.

In addition to these principal sources of ground water storage, there are other areas of storage in the State which have not been identified for this report. These areas were not included as little is presently known of their location, size, permeability, available storage capacity, water quality and degree of development.

### PRIOR INVESTIGATIONS AND REPORTS

A bibliography of published and unpublished investigations and reports pertaining to geology and hydrology of the ground water basins in California is included as Appendix D. This bibliography is presented in two sections. The first section is a selected bibliography of published reports and investigations pertaining primarily to ground water resources in California and includes reports of the following agencies: (a) California Department of Public Works, Division of Water Resources; (b) State Water Resources Board; (c) California Department of Natural Resources, Division of Mines; (d) United States Department of Interior, Geological Survey; and (e) United States Department of Interior, Bureau of Reclamation.

The second section comprises references to pertinent unpublished geologic investigations and reports completed since January 1937. The bibliography includes reports of the following agencies: (a) California Department of Public Works, Division of Water Resources; (b) California Department of Natural Resources, Division of Mines; (c) United States Geological Survey; (d) United States Bureau of Reclamation; (e) University of California at Berkeley; (f) University of California at Los Angeles; (g) University of Southern California; (h) California Institute of Technology; (i) Stanford University; and (j) Pomona College. Accompanying this second section is an index map which appears as Plate 3 in the report. The symbols appearing on the map correspond to the symbols before the references in the bibliography. If a bibliographic reference is lacking a symbol, the reference does not appear on the index map. All symbols except "X" are derived from the author's name or from the agency performing the work. The symbol

"X" has been assigned to several miscellaneous references which collectively cover a unit area.

The California Department of Natural Resources, Division of Mines, has published a comprehensive geologic bibliography and index map for the period prior to January, 1937. This bibliography, which includes both published and unpublished reports, appears in California Department of Natural Resources, Division of Mines, Bulletin No. 118, March, 1943, entitled "Geologic Formations and Economic Development of the Oil and Gas Fields of California." The index map appears in the California Journal of Mines and Geology; Vol. 33, No. 1, January, 1937, and on the State geologic map.

The United States Department of Interior, Geological Survey, has released a comprehensive geologic bibliography and index map of California entitled "Geologic Index Map of California," 1952.

Other references to reports and investigations pertaining to geology and ground water hydrology in California that have been published since January, 1937, can be found in the published bibliographies and index maps of the California Division of Mines, California Division of Oil and Gas, United States Geological Survey, Geological Society of America, American Association of Petroleum Geologists, American Geophysical Union, and American Society of Civil Engineers.

### NUMBERING SYSTEM

A basic state-wide decimal numbering system for ground water basins has been set up in cooperation with the State Water Pollution Control Board for use by that agency and the nine Regional Water Pollution Control Boards as well as the Division of Water Resources. This decimal system can be utilized in any standard punch card system.

Ground water basins have been assigned names and numbers which can be used in future reference to the individual basin. A decimal numbering system has been adopted in the form of x-xxx.xx, in which the digit to the left of the dash refers to the geographic region as prescribed in Section 13040 of the Water Code for water pollution control; the digits to the left of the decimal refer to the ground water basin number; and the digits to the right of the decimal refer to the sub-basin number within the main ground water basin. San Gabriel Valley, which is the thirteenth ground water basin identified in Region 4, would be numbered 4-13. Puente Basin, which is the twelfth subbasin identified in San Gabriel Valley, would be numbered 4-13.12. Lower Canyon Basin, which is the sixth subbasin identified in San Gabriel Valley, would be numbered 4-13.06. This decimal system will allow numbering up to 999 ground water basins in any one of the nine geographic regions, and 99 subbasins in any one ground water basin.

### GROUND WATER BASINS

Ground water in California occurs in a variety of rock types throughout the 11 geomorphic provinces of the State. Most of the readily available ground water is stored in the larger alluvium-filled valleys in these 11 provinces. These provinces display distinctive lithologic and structural features which influence the size, shape, depth and permeability of the alluvium-filled areas. The alluvium-filled areas, which are identified in this report, are composed of unconsolidated to poorly consolidated water-bearing alluvium of variable thickness. This alluvium is composed largely of continental flood-plain and fan deposits, with some interbedded lagunal sediments in the ground water basins which border the coast and inland bays. These alluvium-filled areas are underlain in many instances by water-bearing Plio-Pleistocene and late Tertiary sediments, such as the San Pedro, Aromas, Laguna, Paso Robles, Santa Clara, Saugus, Tulare, Tehama, Pico, Purisima, and Santa Margarita formations.

In addition to the alluvium-filled areas identified in this report, which are the principal areas of ground water storage, there are other rock units in the State which may contain variable quantities of ground water. These areas, which have not been identified in this report, include:

- (a) Numerous small, shallow, alluvium-filled valleys, particularly in the mountainous areas.
- (b) Extensive areas of semiconsolidated Plio-Pleistocene and late Tertiary sediments in the Coast, Transverse and Peninsular Ranges in the coastal segment of California. These sediments flank the alluviated valleys and basins and are permeable forebay areas to the sediments underlying the valleys.
- (c) Extensive areas of Tertiary volcanics in the Cascade Range and in the Modoc Lava Plateau of Northern California.
- (d) Extensive areas of decomposed granitics in the Transverse and Peninsular Ranges in Southern California.

Within California, 223 alluvium-filled valleys, which may be basins of usable ground water storage, have so far been identified. Names for these basins are based on terminology taken from published and unpublished reports, topographic maps, and local terminology. For ease in identification and planning of future water resources investigations, the ground water basins are named and numbered consecutively for each of the nine geographic regions prescribed by the Legislature for water pollution control. Of the total of 223 ground water basins, 18 basins are in North Coastal Region No. 1; 11 are in San Francisco Bay Region No. 2; 19 are in Central Coastal Region No. 3; 14 are in Los Angeles Region No. 4; 29 are in Central Valley Region

No. 5; 58 are in Lahontan Region No. 6; 45 are in Colorado River Basin Region No. 7; 9 are in Santa Ana Region No. 8; and 20 are in San Diego Region No. 9.

Plate 1 shows the location and generalized boundaries of the 223 ground water basins, and the relationship of these basins to the boundaries of the nine water pollution control regions and to the major surface drainage basins in the State. Plate 2 shows the location and generalized boundaries of ground water basins and subbasins in Los Angeles Region and Santa Ana Region. Plate 3 is an index map of unpublished geologic

mapping in California. Appendix A summarizes the ground water basins in the nine regions. Appendix B is an alphabetical list of the ground water basins in the State. Appendix C summarizes the ground water basins in each of the principal surface drainage basins in the nine regions, as outlined in Bulletin No. 1, Water Resources of California, a publication of the State Water Resources Board, 1951. Appendix D is a selected bibliography of published and unpublished reports pertaining to the geology and hydrology of ground water basins in California.



## CHAPTER II

# NORTH COASTAL REGION No. 1

The North Coastal Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises all basins including Lower Klamath Lake and Lost River basins draining into the Pacific Ocean from the California-Oregon state line southerly to the northerly boundary of the watershed of Lagunitas Creek in Marin County and its extension along the center line of Tomales Bay." The region extends approximately 370 miles along the coast from the California-Oregon line south to the northern boundary of Lagunitas Creek Basin, in Marin County, and ranges in width from 180 miles at the Oregon boundary to 30 miles in the southern portion. It occupies an area of approximately 19,000 square miles.

The North Coastal Region lies within four major geomorphic provinces, namely: Modoc Lava Plateau; Cascade Range; Klamath Mountains; and Coast Ranges. It is underlain in the southern and central parts by consolidated nonwater-bearing Jurassic, Cretaceous and Tertiary sediments of the Coast and Klamath Ranges provinces, and by lava flows and tuff beds of the Cascade Range and Modoc Lava Plateau provinces in the northern part of the region.

Eighteen ground water basins have been identified in the North Coastal Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Klamath River (1-2); Butte (1-3); Shasta (1-4); Scott River (1-5); Eel River (1-10); and Santa Rosa (1-18). Smaller alluvium-filled areas include the following valleys: Smith River Plain (1-1); Hayfork (1-6); Hoopa (1-7); Mad (1-8); Eureka Plain (1-9); Round (1-11); Laytonville Flats (1-12); Little Lake (1-13); Potter (1-14); Ukiah (1-15); Hopland (1-16); and Alexander (1-17).

Ground water in this region is stored primarily in Santa Rosa Valley (1-18) and in the larger shallow alluvium-filled valleys in the northern part of the region, such as Klamath River (1-2), Butte (1-3), Shasta (1-4), Scott River (1-5), and Eel River (1-10). Small quantities of ground water are stored in the several inland shallow alluvium-filled valleys such as Hayfork (1-6), Little Lake (1-13) and Ukiah (1-15).

Current ground water investigations in North Coastal Region include studies by the California Department of Public Works, Division of Water Resources; the United States Department of Interior, Geological Survey, Ground Water Branch; and the United States Department of Interior, Bureau of Reclamation. The Division of Water Resources has several types of ground water investigations under way. These include: (a) reconnaissance water quality investigations in Mad River (1-8); Eureka Plain (1-9) and Eel River Valley (1-10); (b) geologic and hydrologic investigations for determination of minimum standards of well construction in Mendocino County; and (c) water resources investigations for the State Water Resources Board in the Klamath River drainage basin. The United States Geological Survey, Ground Water Branch, in cooperation with the California Division of Water Resources has geologic investigations planned in Smith River Plain (1-1), Mad River valley (1-8), Eureka Plain (1-9) and Eel River valley (1-10), and geologic investigations under way in Little Lake (1-13), Potter (1-14), Ukiah (1-15), Hopland (1-16), Alexander (1-17) and Santa Rosa (1-18) valleys. The United States Bureau of Reclamation has water supply investigations under way in Butte Valley (1-4) and in the Klamath River drainage basin.

### CHAPTER III

## SAN FRANCISCO BAY REGION No. 2

The San Francisco Bay Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises San Francisco Bay, Suisun Bay, Sacramento River and San Joaquin River westerly from a line which passes between Collinsville and Montezuma Island and follows thence the boundary common to Sacramento and Solano Counties and that common to Sacramento and Contra Costa Counties to the westerly boundary of the watershed of Markley Canyon in Contra Costa County, all basins draining into the bays and rivers westerly from this line and all basins draining into the Pacific Ocean between the southerly boundary of the North Coastal Region and the southerly boundary of the watershed of Pescadero Creek in San Mateo and Santa Cruz counties." The region extends approximately 120 miles along the coast from Tomales Point south to Pescadero Point and averages 45 miles in width from east to west. It occupies an area of approximately 4,400 square miles.

The San Francisco Bay Region lies entirely within the Coast Range Province. This is an area underlain largely by nonwater-bearing Jurassic, Cretaceous and Tertiary sediments with numerous northwest-southeast trending alluvium-filled valleys.

Eleven ground water basins have been identified in the San Francisco Bay Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Petaluma (2-1); Napa-Sonoma (2-2); Suisun-Fairfield (2-3); Santa Clara (2-9); and Livermore (2-10). Smaller alluvial-fill areas include the following valleys: Pittsburg Plain (2-4); Clayton (2-5); Ygnacio (2-6); San Ramon (2-7); Castro (2-8); and Sunol (2-11).

Napa-Sonoma Valley has been subdivided into two valleys: Napa Valley (2-2.01) and Sonoma Valley (2-2.02). See Plate 1.

Ground water in this region is stored primarily in the alluvium-filled valleys adjacent to San Francisco Bay such as Petaluma (2-1), Napa-Sonoma (2-2), Suisun-Fairfield (2-3), Santa Clara (2-9), and in the large inland alluvium-filled valley known as Livermore (2-10). Small quantities of ground water are stored in Pittsburg Plain (2-4), Clayton (2-5), and Ygnacio (2-6) valleys adjacent to Sacramento-San Joaquin Delta, and in small inland valleys such as San Ramon (2-7), Castro (2-8), and Sunol (2-11). Appreciable quantities of ground water may be stored in the Livermore-Tassajero formation adjacent to Livermore Valley (2-10), and in the Santa Clara formation adjacent to Santa Clara Valley (2-9).

Current ground water investigations in San Francisco Bay Region include studies by the California Division of Water Resources and the United States Geological Survey, Ground Water Branch. The Division of Water Resources has several types of ground water investigations under way. These include: (a) reconnaissance water quality investigations in Clayton (2-5), Ygnacio (2-6) and San Ramon (2-7) valleys, and in the Pescadero Creek drainage basin along the coast south of San Francisco; (b) detailed water quality investigations in Santa Clara (2-9), Livermore (2-10) and Sunol (2-11) valleys; and (c) water resources investigations for the State Water Resources Board in Santa Clara Valley (2-9), and Livermore Valley (2-10). The United States Geological Survey, Ground Water Branch, in cooperation with the California Division of Water Resources has geologic investigations under way in Petaluma (2-1), Napa-Sonoma (2-2), and Suisun-Fairfield (2-3) valleys.

## CHAPTER IV

# CENTRAL COASTAL REGION No. 3

The Central Coastal Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises all basins, including Carrizo Plain in San Luis Obispo and Kern Counties, draining into the Pacific Ocean from the southerly boundary of the watershed of Pescadero Creek in San Mateo and Santa Cruz Counties to the southeasterly boundary, located in the westerly part of Ventura County, of the watershed of Rincon Creek." The region extends approximately 400 miles along the coast from the southern boundary of Pescadero Creek Basin in Santa Cruz County, to the northeastern boundary of Rincon Creek Basin in Ventura County. It averages approximately 50 miles in width and occupies an area of approximately 11,000 square miles.

The Central Coastal Region lies within two major geomorphic provinces, namely: Coast Ranges and Transverse Ranges. This is an area underlain by consolidated Jurassic, Cretaceous and Tertiary sediments. The coast ranges are orientated into a series of northwest-southeast trending mountain ranges. The east-west trending Transverse Ranges extend westward from Region 4 and form the southern section of Region 3.

Nineteen ground water basins have been identified in the Central Coastal Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Pajaro (3-2); Gilroy-Hollister Basin (3-3); Salinas (3-4); Santa Maria River (3-12); Cuyama (3-13); Santa Ynez River (3-15); and Carrizo Plain (3-19). Small alluvium-filled areas include the following valleys: Soquel (3-1); Cholame (3-5); San Antonio River (3-6); Carmel (3-7); Morro Bay (3-8); San Luis Obispo (3-9); Pismo Creek (3-10); Arroyo Grande (3-11); San Antonio Creek (3-14); Goleta Basin (3-16); Santa Barbara Basin (3-17); and Carpinteria Basin (3-18).

Subbasins have been identified in Salinas Valley (3-4). See Plate 1 and California Division of Water Resources, Bulletin No. 52, Salinas Basin Investigation, 1946, for location and extent of sub-basins. These sub-basins include: Pressure Area (3-4.01); East Side Area (3-4.02); Forebay Area (3-4.03); Arroyo Seco Cone (3-4.04); and Upper Valley Area (3-4.05).

Ground water in this region is stored primarily in Pajaro (3-2), Gilroy-Hollister Basin (3-3), Salinas (3-4), Santa Maria River (3-12), and Cuyama (3-13) valleys in the Coast Ranges; and in Santa Ynez River Valley (3-15), Goleta Basin (3-16) and Carpinteria Basin (3-18) in the Transverse Ranges. Small quantities of ground water are stored in numerous small alluvium-filled valleys such as Carmel (3-7), San Luis Obispo (3-9), and San Antonio Creek (3-14) valleys. Appreciable quantities of ground water may be stored in permeable segments of the Paso Robles, Purisima, Careaga, Santa Barbara, Casitas and Santa Margarita formations which flank some of the alluvium-filled valleys.

Current ground water investigations in Central Coastal Region include studies by the California Division of Water Resources; United States Geological Survey, Ground Water Branch; United States Bureau of Reclamation; and United States Department of Agriculture, Soil Conservation Service. The Division of Water Resources has several types of ground water investigations under way. These include: (a) reconnaissance water quality investigations in Gilroy-Hollister Basin (3-3), Carmel Valley (3-7) and Carrizo Plain (3-19); (b) detailed water quality investigations in Pajaro Valley (3-2); and continuing water quality investigations of the effects of oil field waste waters on ground water throughout the entire region; and (c) water resources investigations for the State Water Resources Board in Soquel (3-1), Pajaro (3-2), Gilroy-Hollister Basin (3-3), Salinas (3-4) valleys, and in San Luis Obispo County. The United States Geological Survey, Ground Water Branch, has continuing investigations under way in Santa Maria River (3-12), Cuyama (3-13), San Antonio Creek (3-14), Santa Ynez River (3-15) valleys, and in Goleta (3-16), Santa Barbara (3-17) and Carpinteria (3-18) basins. The United States Bureau of Reclamation has ground water investigations under way in Gilroy-Hollister Basin (3-3) and in Santa Barbara County. The United States Soil Conservation Service is making a ground water study in Gilroy-Hollister Basin (3-3).

## CHAPTER V

# LOS ANGELES REGION No. 4

The Los Angeles Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises all basins draining into the Pacific Ocean between the southeasterly boundary, located in the westerly part of Ventura County, of the watershed of Rincon Creek and a line which coincides with the southeasterly boundary of Los Angeles County from the ocean to San Antonio Peak and follows thence the divide between San Gabriel River and Lytle Creek drainages to the divide between Sheep Creek and San Gabriel River drainages." The region extends approximately 130 miles along the coast from Rincon Point south to the Los Angeles-Orange County boundary at Seal Beach, and averages 50 miles in width. It occupies an area of approximately 4,260 square miles.

The Los Angeles Region lies within two major geomorphic provinces, namely: Transverse Ranges and Peninsular Ranges. This is an area underlain in the northern and eastern sections by a basement complex of nonwater-bearing metamorphic and igneous rocks, and overlain in the coastal areas by a thick section of Tertiary sediments and water-bearing Quaternary fill.

Fourteen ground water basins have been identified in the Los Angeles Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Santa Clara River (4-4); Coastal Plain, Los Angeles County (4-11); San Fernando (4-12); and San Gabriel (4-13). Small alluvial-fill areas include the following valleys: Upper Ojai (4-1); Ojai (4-2); Ventura River (4-3); Acton (4-5); Pleasant (4-6); Arroyo Santa Rosa (4-7); Las Posas (4-8); Simi (4-9); Conejo (4-10); and Upper Santa Ana, Los Angeles County (4-14).

Subbasins have been identified in Santa Clara River Valley (4-4), Coastal Plain, Los Angeles County (4-11), San Fernando Valley (4-12), San Gabriel Valley (4-13) and upper Santa Ana Valley, Los Angeles County (4-14). See Plate 2 and California Division of Water Resources, Bulletin No. 46, Ventura County Investigation, 1933, for location and extent of subbasins in Santa Clara River Valley. See Plate 2, California Division of Water Resources, Bulletin No. 45, South Coastal Basin Investigation, Geology and Ground Water Storage Capacity of Valley Fill, 1934, and California Division of Water Resources, Bulletin No. 53, South Coastal Basin Investigation, Overdraft on Ground Water Basins, 1947, for location and extent of subbasins in Coastal Plain, Los Angeles County, San Fernando Valley and San Gabriel Valley.

Subbasins in Santa Clara River Valley (4-4) include: Oxnard Plain Pressure Area (4-4.01); Oxnard Plain Forebay Area (4-4.02); Mound Pressure Area (4-4.03); Santa Paula Basin (4-4.04); Fillmore Basin (4-4.05); Piru Basin (4-4.06); and Eastern Basin (4-4.07). Subbasins in Coastal Plain, Los Angeles County (4-11) include: West Coastal Plain—North (4-11.01); West Coast Basin (4-11.02); Central Coastal Plain Pressure Area (4-11.03)\*; Los Angeles Forebay Area (4-11.04)\*; Montebello Forebay Area (4-11.05)\*; Hollywood Basin (4-11.06)\*; Los Angeles Narrows Basin (4-11.07)\*; and La Habra Basin (4-11.08). Subbasins in San Fernando Valley (4-12) include: San Fernando Basin (4-12.01); Bull Canyon (4-12.02). Sylmar Basin (4-12.03); Pacoima Basin (4-12.04); Tujunga Basin (4-12.05); Little Tujunga Basin (4-12.06); and Verdugo Basin (4-12.07). Subbasins in San Gabriel Valley include: Main San Gabriel Basin (4-13.01); Monk Hill Basin (4-13.02)†; Pasadena Sub-Area (4-13.03)†; Santa Anita Sub-Area (4-13.04)†; Upper Canyon Basin (4-13.05); Lower Canyon Basin (4-13.06); Glendora Basin (4-13.07); Way Hill Basin (4-13.08); San Dimas Basin (4-13.09); Foothill Basin (4-13.10); Spadra Basin (4-13.11); and Puente Basin (4-13.12). Subbasins in Upper Santa Ana Valley, Los Angeles County (4-14) include: Chino Basin (4-14.01); Pomona Basin (4-14.02); Live Oak Basin (4-14.03); and Claremont Heights Basin (4-14.04).

Ground water in this region is stored primarily in the extensive sand and gravel aquifers in the coastal plain areas, such as Santa Clara River Valley (4-4) and Coastal Plain, Los Angeles County (4-11), and in the large inland alluvium-filled areas such as San Fernando (4-12) and San Gabriel (4-13) valleys. Small quantities of ground water are stored in the small inland alluvium-filled valleys such as Ojai (4-2), Las Posas (4-8), and Acton (4-5). Appreciable quantities of ground water may be stored in some of the more permeable late Tertiary sediments such as the Saugus formation in and adjacent to the Santa Clara River Valley.

\* Central Coastal Plain Pressure Area (4-11.03), Los Angeles Forebay Area (4-11.04), Montebello Forebay Area (4-11.05), Hollywood Basin (4-11.06), and Los Angeles Narrows Basin (4-11.07) are collectively known as Central Basin. See Calif. State Water Resources Board Report, Bulletin No. 8, Report on Central Basin, 1952.

† Monk Hill Basin (4-13.02), Pasadena Sub-Area (4-13.03), and Santa Anita Sub-Area (4-13.04) are collectively known as Raymond Basin Area. See Calif. Dept. Pub. Works, Div. Water Resources, Report of Referee, City of Pasadena vs. City of Alhambra, 1943.

Current ground water investigations in the Los Angeles Region include studies by the California Division of Water Resources, Los Angeles County Flood Control District, Los Angeles Department of Water and Power, United States Soil Conservation Service, Ventura County Water Survey and United Water Conservation District. The Division of Water Resources has several types of ground water investigations under way. These include: (a) water quality investigations in all ground water basins in Ventura County; (b) studies as watermaster in the Raymond Basin Area, San Gabriel Valley (4-13.02, 4-13.03 and 4-13.04); (c) water quality investigations in the Coastal Plain, Los Angeles County (4-11); (d) water resources investigations in all ground water basins in Ventura County; (e) continuing ground water studies under the South Coastal Basin Investigation in Coastal Plain, Los Angeles County (4-11), and San

Gabriel Valley (4-13); and (f) detailed geologic and hydrologic investigations in the Manhattan Beach area, West Coast Basin (4-11.02), for determination of the economic feasibility of construction of a ground water pressure ridge to prevent landward encroachment of sea water. The Division of Water Resources has recently completed a water resources investigation for the State Water Resources Board in Coastal Plain, Los Angeles County (4-11) and completed studies as referee in the adjudication of ground water rights in West Coast Basin, Los Angeles County (4-11.02). The Los Angeles Department of Water and Power and the United States Soil Conservation Service have ground water investigations under way in Coastal Plain, Los Angeles County (4-11) and San Fernando Valley (4-12). The Los Angeles County Flood Control District has similar studies in progress in all ground water basins in Los Angeles County.

## CENTRAL VALLEY REGION No. 5

The Central Valley Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises all basins including Goose Lake Basin draining into the Sacramento and San Joaquin Rivers to the easterly boundary of the San Francisco Bay region near Collinsville." The region extends from the eastern end of the California-Oregon line southward to the Tehachapi Mountains, and from the crest of the Coast Ranges on the west to the crest of the Sierra Nevada Mountains on the east. The Central Coastal Region averages more than 500 miles in length, 120 miles in width and occupies an area of approximately 59,000 square miles.

The Central Valley Region lies within five major geomorphic provinces, namely: Modoc Lava Plateau, Cascade Range, Coast Ranges, Great Valley, and Sierra Nevada. This is an area underlain by an extensive central alluvial plain, the Sacramento and San Joaquin valleys. This plain comprises a variable thickness of unconsolidated water-bearing Quaternary sediments underlain by a thick section of Cretaceous and Tertiary sediments. To the east and south, the Great Valley overlaps the Sierra Nevada Mountains. The latter are composed of a complex of semiconsolidated Tertiary sediments in the foothill areas and older nonwater-bearing metamorphic and igneous rocks in the main portion of the Sierras. To the west and south, the Great Valley overlaps the eastern slopes of the Coast Ranges. The Coast Ranges are composed largely of nonwater-bearing Cretaceous and Jurassic sediments, overlain by Tertiary sediments in the foothill areas. To the north, the area is underlain by extensive deposits of lava flows and tuff beds.

Twenty-nine ground water basins have been identified in the Central Valley Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Big (5-4); Fall River (5-5); Anderson-Cottonwood (5-6); Sierra (5-12); Sacramento (5-21); and San Joaquin (5-22). Small alluvial-fill areas include the following valleys: Goose Lake (5-1); South Fork Pit River (5-2); Jess (5-3); Lake Almanor (5-7); Mountain Meadows (5-8); Indian (5-9); American (5-10); Mohawk (5-11); Upper Lake (5-13); Scott (5-14); Kelseyville (5-15); High (5-16); Burns (5-17); Coyote (5-18); Collayomi (5-19); Berryessa (5-20); Panoche (5-23); Squaw (5-24); Kern River (5-25); Walker Basin Creek (5-26); Cummings (5-27); Tehachapi Valley West (5-28); and Castaic Lake (5-29).

Ground water in this region is stored primarily in the extensive sand and gravel deposits in the Sacramento (5-21) and San Joaquin (5-22) valleys. Smaller quantities occur in the shallow alluvium-filled valleys in the Coast Ranges and northern Sierra Nevada

Mountains, such as Kelseyville (5-15), Collayomi (5-19) and Sierra (5-12); and in the large alluvium-filled marshlands in the Modoc Lava Plateau, such as Big (5-4) and Fall River (5-5) Valleys. Appreciable quantities of ground water may be stored in localized areas within the volcanics in Modoc Lava Plateau, and in some of the semiconsolidated Tertiary sediments along the eastern slopes of the Coast Ranges. Small quantities of ground water occur in the fractured metamorphic and granitic rocks in the Sierra Nevada Mountains.

Current ground water investigations in Central Valley Region include studies by the California Division of Water Resources; United States Geological Survey, Ground Water Branch; United States Bureau of Reclamation; United States Soil Conservation Service, and numerous irrigation districts throughout the valley. The Division of Water Resources has several types of ground water investigations under way. These include: (a) reconnaissance water quality investigations in the Feather River, American River and Putah Creek drainage basin areas; (b) detailed water quality investigations in Sutter-Yuba area in Sacramento Valley (5-21), and in the Stockton, Lindsay, Fresno, Arvin-Edison and west side areas of San Joaquin Valley (5-22); and continuing water quality investigations of the effects of oil field waste waters on ground waters in San Joaquin Valley (5-22); (c) water resources investigations for the State Water Resources Board in Upper Lake (5-13), Scott (5-14) and Kelseyville (5-15) valleys in Lake County; Placer County in Sacramento Valley (5-21); and Calaveras-Delta, Mokelumne River, and Farmington-Collegeville areas in San Joaquin Valley (5-22); (d) water resources investigations in Putah Creek area in Sacramento Valley (5-21) and Kaweah Delta in San Joaquin Valley (5-22); and (e) a continuing well measuring program in the east side of San Joaquin Valley (5-22), from Madera County to the south end of San Joaquin Valley. The United States Geological Survey, Ground Water Branch, in cooperation with the California Division of Water Resources, has geologic investigations under way in Solano County in Sacramento Valley (5-21); along the west side of San Joaquin Valley (5-22), and in the entire San Joaquin Valley (5-22). The United States Bureau of Reclamation has continuing ground water investigations under way in Sacramento Valley (5-21), and in localized areas along the east side of San Joaquin Valley (5-22). The United States Soil Conservation Service has continuing ground water investigations under way in portions of San Joaquin Valley (5-22), Cummings Valley (5-27), and Tehachapi Valley West (5-28).

## CHAPTER VII

# LAHONTAN REGION No. 6

The Lahontan Region as defined in Section 13040 of the Water Code " \* \* \* comprises all basins east of the Santa Ana, Los Angeles, and Central Valley regions from the California-Oregon boundary to the southerly boundary located in Los Angeles and San Bernardino Counties of the watershed draining into Antelope Valley, Mojave River Basin and Dry Lake Basin near Ivanpah." The Lahontan Region averages more than 500 miles in length and ranges in width from a few miles in the northern part of the region to approximately 170 miles in the south. It occupies an area of approximately 33,000 square miles.

The Lahontan Region lies within three major geomorphic provinces, namely: Basin and Range; Modoc Lava Plateau; and Mojave Desert. This is an area underlain in the central and southern sections by the Mojave Desert and Basin and Range complex of mountain ranges composed of nonwater-bearing rocks separated by extensive alluviated desert plains. The northern section of the region is underlain in part by Basin and Range complex and in part by the extensive areas of lava flows and tuff beds of the Modoc Lava Plateau Province.

Fifty-eight ground water basins have been identified in the Lahontan Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Surprise (6-1); Madeline Plains (6-2); Honey Lake (6-4); Mono (6-9); Long (6-11); Owens (6-12); Eureka (6-16); Saline (6-17); Death (6-18); Middle Amargosa Basin (6-20); Lower Kingston (6-21); Upper Kingston (6-22); Riggs (6-23); Red Pass (6-24); Pahrump (6-28); Mesquite (6-29); Ivanpah (6-30); Kelso (6-31); Broadwell (6-32); Soda Lake (6-33); Silver Lake (6-34); Cronise (6-35); Coyote Lake (6-37); Cave Canyon (6-38); Troy (6-39); Lower Mojave River (6-40); Middle Mojave River (6-41); Upper Mojave River (6-42); El Mirage (6-43); Antelope (6-44); Fremont (6-46); Harper (6-47); Superior (6-49); Cuddleback (6-50); Pilot Knob (6-51); Searles (6-52); Indian Wells (6-54); and Panamint (6-58). Small alluvial-fill areas

include the following valleys: Willow Creek (6-3); Tahoe (6-5); Carson (6-6); Topaz (6-7); Bridgeport (6-8); Adobe Lake (6-10); Black Springs (6-13); Fish Lake (6-14); Deep Springs (6-15); Wingate (6-19); Bicycle (6-25); Avawatz (6-26); Leach (6-27); Langford (6-36); Tehachapi Valley East (6-45); Goldstone (6-48); Salt Wells (6-53); Coso (6-55); Rose (6-56); and Darwin (6-57).

Ground water in this region is stored primarily in the larger desert plain areas such as Owens (6-12), Antelope (6-44) and Indian Wells (6-45) valleys. There may be appreciable quantities of ground water in many of the smaller alluvium-filled areas. Very little is known about the water-bearing character of the alluvium-filled areas in the Basin and Range Province. In many instances, the area indicated as alluvial fill is underlain at shallow depths by nonwater-bearing basement complex rocks, or semiconsolidated Tertiary sediments which are low in permeability and poor in water quality.

Current ground water investigations in Lahontan Region include studies by the California Division of Water Resources; United States Geological Survey, Ground Water Branch; Los Angeles Department of Water and Power; Los Angeles County Flood Control District; and San Bernardino County Flood Control District. The Division of Water Resources has a reconnaissance water quality investigation under way in Madeline Plains Drainage Basin, and a geologic investigation for the State Water Resources Board in all ground water basins in the desert areas. The United States Geological Survey, Ground Water Branch, has a geologic investigation under way in the northern part of Antelope Valley (6-44) and has planned a geologic investigation in Indian Wells Valley (6-54). The Los Angeles Department of Water and Power has continuing ground water investigations under way in Owens Valley (6-12), while the Los Angeles County Flood Control District has similar studies under way in Antelope Valley (6-44).

## CHAPTER VIII

# COLORADO RIVER BASIN REGION No. 7

The Colorado River Basin Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises all basins east of the Santa Ana and San Diego regions draining into the Colorado River, Salton Sea and local sinks from the southerly boundary of the Lahontan region to the California-Mexico boundary." The region extends about 180 miles in a north-south direction, 150 miles in an east-west direction, and occupies an area of approximately 20,000 square miles.

The Colorado River Basin Region lies within four major geomorphic provinces, namely: Mojave Desert; Transverse Ranges; Colorado Desert; and Peninsular Ranges. This is a broad interior region consisting largely of an eastern and northern segment, the Mojave Desert, which is composed of extensive mountain ranges of nonwater-bearing igneous and metamorphic rocks, separated by broad expanses of alluvium-filled desert plains. The southern portion of the region is a low-lying basin composed of extensive lake bed and alluvial fan deposits, underlain by a nonwater-bearing basement complex of igneous and metamorphic rocks. Very little is known about the water-bearing character of the extensive alluvium-filled areas throughout the region.

Forty-five ground water basins have been identified in the Colorado River Basin Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Lanfair (7-1); Fenner (7-2); Ward (7-3); Rice (7-4); Chuckawalla (7-5); Pinto Basin (7-6); Cadiz (7-7); Bristol (7-8); Dale (7-9); Twentynine Palms (7-10); Deadman (7-13); Johnson (7-18); Lucerne (7-19); Coachella (7-21); Borrego (7-24); Imperial (7-30); Chocolate (7-32); East Salton Sea Basin (7-33); Amos (7-34); Ogilby (7-35); Yuma (7-36); Arroyo Seco (7-37); Palo Verde (7-38); Palo Verde Mesa (7-39); Calzona

(7-41); Vidal (7-42); Chemehuevis (7-43); Needles (7-44); and Piute (7-45). Small alluvium-filled areas include the following valleys: Copper Mountain (7-11); Warren (7-12); Lavie (7-14); Bessemer (7-15); Ames (7-16); Means (7-17); Morongo (7-20); West Salton Sea Basin (7-22); Clark (7-23); Ocotillo (7-25); Terwilliger (7-26); San Felipe (7-27); Vallecito-Carrizo (7-28); Coyote Wells (7-29); Orcopia (7-31); and Quien Sabe Point (7-40).

Ground water in this region is probably stored primarily in Coachella (7-21) and Imperial (7-30) valleys in the Colorado Desert; in the larger desert plain areas in the Mojave Desert; in Borrego Valley (7-24) in the Peninsular Ranges; and in the flood plain sediments in the several valleys adjacent to the Colorado River.

Current ground water investigations in Colorado River Basin Region include studies by the California Division of Water Resources, Coachella County Water District, Imperial Irrigation District, University of California, and United States Geological Survey. The Division of Water Resources has undertaken a geologic and hydrologic investigation to determine ground water resources, quality and uses in all basins in the Colorado River Basin region. This report will be included in a comprehensive water pollution report of the region which is now being prepared by the United States Public Health Service. The University of California at Los Angeles, the Coachella County Water District and the Imperial Irrigation District have continuing cooperative ground water investigations under way in Coachella (7-21) and Imperial (7-30) valleys. The United States Geological Survey has a geologic investigation under way in Twentynine Palms Valley (7-10), and a continuing water level measuring program in Borrego Valley (7-24).



## CHAPTER IX

# SANTA ANA REGION No. 8

The Santa Ana Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises all basins draining into the Pacific Ocean between the southeasterly boundary of the Los Angeles Region and a line which follows the drainage divide between Los Trancos and Moro Canyons from the ocean to the summit of the San Joaquin Hills; thence along the divide between lands draining into Newport Bay and into Laguna Canyon to Niguel Road; thence along Niguel Road and Los Aliso Avenue to the divide between Newport Bay and Aliso Creek drainage; thence along that divide and the southeasterly boundary of the Santa Ana River drainage to the divide between Baldwin Lake and Mojave Desert drainages; thence along that divide to the divide between Pacific Ocean and Mojave Desert drainages." The region extends approximately 25 miles along the coast from the Los Angeles-Orange County boundary to the San Joaquin Hills, and attains a maximum width of 90 miles. It occupies an area of approximately 2,850 square miles.

The Santa Ana Region lies within two major geomorphic provinces, namely: Transverse Ranges and Peninsular Ranges. This is an area underlain in the eastern and northern sections by a basement complex of granitic and metamorphic rocks. In the coastal areas the basement complex is overlain by a thick section of Tertiary and Quaternary sediments.

Nine ground water basins have been identified in the Santa Ana Region (See Appendix A). Extensive alluvium-filled areas in excess of 100 square miles include the following valleys: Coastal Plain, Orange County (8-1); Upper Santa Ana Valley (8-2); and San Jacinto Basin (8-5). Small alluvium-filled areas include the following valleys: Cajalco (8-3); Elsinore Basin (8-4); Hemet Lake (8-6); Big Meadows (8-7); Seven Oaks (8-8); and Bear (8-9).

Subbasins have been identified in Coastal Plain, Orange County (8-1) and Upper Santa Ana Valley (8-2). See Plate 2, and California Division of Water Resources Bulletin No. 45, South Coastal Basin Investigation, Geology and Ground Water Storage Capacity of Valley Fill, 1934, and California Division of Water Resources Bulletin No. 53, South Coastal Basin Investigation, Overdraft on Ground Water Basins, 1947, for location and extent of subbasins in Coastal Plain, Orange County and Upper Santa Ana Valley.

Subbasins in Coastal Plain, Orange County (8-1) include: East Coastal Plain Pressure Area (8-1.01); Santa Ana Forebay Area (8-1.02); Irvine Basin (8-1.03); La Habra Basin (8-1.04); Yorba Linda Basin (8-1.05); Santa Ana Narrows Basin (8-1.06) and Santiago Basin (8-1.07). Subbasins in Upper Santa Ana Valley (8-2) include: Chino Basin (8-2.01); Claremont Heights Basin (8-2.02); Cucamonga Basin (8-2.03); Rialto Basin (8-2.04); Colton Basin (8-2.05); Bunker Hill Basin (8-2.06); Lytle Basin (8-2.07); Upper Cajon Basin (8-2.08); Lower Cajon Basin (8-2.09); Devil Canyon Basin (8-2.10); Yucaipa Basin (8-2.11); Beaumont Basin (8-2.12); San Timoteo Basin (8-2.13); Reche Canyon Basin (8-2.14); Riverside Basin (8-2.15); Arlington Basin (8-2.16); Temescal Basin (8-2.17); Bedford Basin (8-2.18); Coldwater Basin (8-2.19); and Lee Lake Basin (8-2.20).

Ground water in this region is stored primarily in the extensive deposits of sand and gravel in the Coastal Plain, Orange County (8-1), Upper Santa Ana Valley (8-2), and in San Jacinto Basin (8-5). Small quantities of ground water are stored in the several inland shallow alluvium-filled valleys such as Cajalco (8-3), Hemet Lake (8-6), and Bear (8-9). There are very small quantities of ground water in localized areas within the decomposed granities which underlie the southeastern section of Region 8.

Current ground water investigations in Santa Ana Region include studies by the California Division of Water Resources, United States Geological Survey, Ground Water Branch, Orange County Flood Control District, San Bernardino County Flood Control District, Riverside County Flood Control and Water Conservation District, Orange County Water District, San Bernardino Valley Water Conservation District, City of San Bernardino Water Department and others. The Division of Water Resources has several types of ground water investigations under way. These include: (a) water quality investigations in Coastal Plain, Orange County (8-1) and Upper Santa Ana Valley (8-2); (b) continuing ground water studies under South Coastal Basin Investigation in Coastal Plain, Orange County (8-1), Upper Santa Ana Valley (8-2), and in San Jacinto Basin (8-5); (c) water resources investigations for the State Water Resources Board in Coastal Plain, Orange County (8-1), Upper Santa Ana Valley (8-2), Elsinore Basin (8-4), and San Jacinto

Basin (8-5); and (d) a ground water investigation in the Upper San Jacinto Basin adjudication. The United States Geological Survey, Ground Water Branch, has cooperative geologic investigations under way in the coastal segment of Coastal Plain, Orange County (8-1) and in the San Bernardino area in Upper Santa Ana Valley (8-2). Orange County Flood Control

District has continuing ground water studies under way in Coastal Plain, Orange County (8-1), and in portions of Upper Santa Ana Valley (8-2), while the San Bernardino County Flood Control District, San Bernardino Valley Water Conservation District and San Bernardino Water Department have similar studies under way in Upper Santa Ana Valley (8-2).

## CHAPTER X

# SAN DIEGO REGION No. 9

The San Diego Region, as defined in Section 13040 of the Water Code, " \* \* \* comprises all basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary." The region extends approximately 90 miles along the coast from the drainage divide in the San Joaquin Hills south to the California-Mexico boundary, and averages 45 miles in width. It occupies an area of approximately 3,830 square miles.

The San Diego Region lies entirely within the Peninsular Ranges Province. This is an area underlain in the eastern and central portions by a basement complex of granitic and metamorphic rocks. In the coastal areas the basement complex is overlain by flat-lying marine Tertiary sediments.

Twenty ground water basins have been identified in the San Diego Region (See Appendix A). There are no extensive alluvium-filled areas in the San Diego Region. Small alluvium-filled areas include the following valleys: San Juan (9-1); San Mateo (9-2); San Onofre (9-3); Santa Margarita (9-4); Temecula (9-5); Coahuila (9-6); San Luis Rey (9-7); Warner (9-8); Escondido (9-9); San Pasqual (9-10); Santa Maria (9-11); San Dieguito (9-12); Poway (9-13); Mission (9-14); San Diego River (9-15); El Cajon (9-16); Sweetwater (9-17); Otay (9-18); Tia Juana Basin (9-19) and Jamul (9-20).

Ground water in this region is stored primarily in the numerous shallow and alluvium-filled river valleys such as Santa Margarita (9-4), San Luis Rey (9-7), and Tia Juana Basin (9-19); and in the inland shallow alluvium-filled valleys such as Temecula (9-5), Santa Maria (9-11), and El Cajon (9-16). Appreciable quantities of ground water may be stored in localized areas within the decomposed granitics which underlie the central and eastern sections of Region 9, and in the semiconsolidated Tertiary sediments along the coast. These areas have not been included in this report as little is known of their size, permeability, storage capacity and water quality.

Current ground water investigations in San Diego Region include studies by the California Division of Water Resources. The Division of Water Resources has (a) a water quality investigation in progress in El Cajon (9-16) Valley; (b) is conducting studies in Tia Juana Basin (9-19) and Temecula (9-5) Valley, as referee in the adjudication of ground water rights; and (c) has a detailed geologic and hydrologic investigation under way in the coastal segment of San Luis Rey Valley (9-7) for determination of the economic feasibility of construction of a subsurface barrier to prevent the landward encroachment of sea water.

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## APPENDIXES

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## APPENDIX A

### GROUND WATER BASINS IN CALIFORNIA BY REGIONS

#### NORTH COASTAL REGION No. 1, GROUND WATER BASINS

Ground Water Basin	Number	Ground Water Basin	Number
Smith River Plain	1- 1	Eel River Valley	1-10
Klamath River Valley	1- 2	Round Valley	1-11
Butte Valley	1- 3	Laytonville Flats	1-12
Shasta Valley	1- 4	Little Lake Valley	1-13
Scott River Valley	1- 5	Potter Valley	1-14
Hayfork Valley	1- 6	Ukiah Valley	1-15
Hoopa Valley	1- 7	Hopland Valley	1-16
Mad River Valley	1- 8	Alexander Valley	1-17
Eureka Plain	1- 9	Santa Rosa Valley	1-18

#### SAN FRANCISCO BAY REGION No. 2, GROUND WATER BASINS

Ground Water Basin	Number	Ground Water Basin	Number
Petaluma Valley	2- 1	Ygnacio Valley	2- 6
Napa-Sonoma Valley	2- 2	San Ramon Valley	2- 7
Napa Valley	2- 2.01	Castro Valley	2- 8
Sonoma Valley	2- 2.02	Santa Clara Valley	2- 9
Suisun-Fairfield Valley	2- 3	Livermore Valley	2-10
Pittsburg Plain	2- 4	Sunol Valley	2-11 1/3
Clayton Valley	2- 5		

#### CENTRAL COASTAL REGION No. 3, GROUND WATER BASINS

Ground Water Basin	Number	Ground Water Basin	Number
Soquel Valley	3- 1	Morro Bay Valley	3- 8
Pajaro Valley	3- 2	San Luis Obispo Valley	3- 9
Gilroy-Hollister Basin	3- 3	Pismo Creek Valley	3-10
Salinas Valley	3- 4	Arroyo Grande Valley	3-11
Pressure Area	3- 4.01	Santa Maria River Valley	3-12
East Side Area	3- 4.02	Cuyama Valley	3-13
Forebay Area	3- 4.03	San Antonio Creek Valley	3-14
Arroyo Seco Cone	3- 4.04	Santa Ynez River Valley	3-15
Upper Valley Area	3- 4.05	Goleta Basin	3-16
Cholame Valley	3- 5	Santa Barbara Basin	3-17
San Antonio River Valley	3- 6	Carpinteri Basin	3-18
Carmel Valley	3- 7	Carrizo Plain	3-19

#### LOS ANGELES REGION No. 4, GROUND WATER BASINS

Ground Water Basin	Number	Ground Water Basin	Number
Upper Ojai Valley	4- 1	San Fernando Valley	4-12
Ojai Valley	4- 2	San Fernando Basin	4-12.01
Ventura River Valley	4- 3	Bull Canyon Basin	4-12.02
Santa Clara River Valley	4- 4	Sylmar Basin	4-12.03
Oxnard Plain Pressure Area	4- 4.01	Pacoima Basin	4-12.04
Oxnard Plain Forebay Area	4- 4.02	Tujunga Basin	4-12.05
Mound Pressure Area	4- 4.03	Little Tujunga Basin	4-12.06
Santa Paula Basin	4- 4.04	Verdugo Basin	4-12.07
Fillmore Basin	4- 4.05	San Gabriel Valley	4-13
Piru Basin	4- 4.06	Main San Gabriel Basin	4-13.01
Eastern Basin	4- 4.07	Monk Hill Basin	4-13.02
Acton Valley	4- 5	Pasadena Sub-area	4-13.03
Pleasant Valley	4- 6	Santa Anita Sub-area	4-13.04
Arroyo Santa Rosa Valley	4- 7	Upper Canyon Basin	4-13.05
Las Posas Valley	4- 8	Lower Canyon Basin	4-13.06
Simi Valley	4- 9	Glendora Basin	4-13.07
Conejo Valley	4-10	Way-Hill Basin	4-13.08
Coastal Plain, Los Angeles County	4-11	San Dimas Basin	4-13.09
West Coastal Plain—North	4-11.01	Foothill Basin	4-13.10
West Coast Basin	4-11.02	Spadra Basin	4-13.11
Central Coastal Plain Pressure Area	4-11.03	Puente Basin	4-13.12
Los Angeles Forebay Area	4-11.04	Upper Santa Ana Valley, Los Angeles County	4-14
Montebello Forebay Area	4-11.05	Chino Basin	4-14.01
Hollywood Basin	4-11.06	Pomona Basin	4-14.02
Los Angeles Narrows Basin	4-11.07	Live Oak Basin	4-14.03
La Habra Basin	4-11.08	Claremont Heights Basin	4-14.04 5 2

## CENTRAL VALLEY REGION No. 5, GROUND WATER BASINS

Ground Water Basin	Number	Ground Water Basin	Number
Goose Lake Valley	5-1	High Valley	5-16
South Fork Pit River Valley	5-2	Burns Valley	5-17
Jess Valley	5-3	Coyote Valley	5-18
Big Valley	5-4	Collayomi Valley	5-19
Fall River Valley	5-5	Berryessa Valley	5-20
Anderson-Cottonwood Valley	5-6	Sacramento Valley	5-21
Lake Almanor Valley	5-7	San Joaquin Valley	5-22
Mountain Meadows Valley	5-8	Panoche Valley	5-23
Indian Valley	5-9	Squaw Valley	5-24
American Valley	5-10	Kern River Valley	5-25
Mohawk Valley	5-11	Walker Basin Creek Valley	5-26
Sierra Valley	5-12	Cummings Valley	5-27
Upper Lake Valley	5-13	Tehachapi Valley West	5-28
Scott Valley	5-14	Castaic Lake Valley	5-29
Kelseyville Valley	5-15	Excelsior Valley	5-30

(8.9)

## LAHONTAN REGION No. 6, GROUND WATER BASINS

Ground Water Basin	Number	Ground Water Basin	Number
Suprise Valley	6-1	Ivanpah Valley	6-30
Madeline Plains	6-2	Kelso Valley	6-31
Willow Creek Valley	6-3	Broadwell Valley	6-32
Honey Lake Valley	6-4	Soda Lake Valley	6-33
Tahoe Valley	6-5	Silver Lake Valley	6-34
Carson Valley	6-6	Cronise Valley	6-35
Topaz Valley	6-7	Langford Valley	6-36
Bridgeport Valley	6-8	Coyote Lake Valley	6-37
Mono Valley	6-9	Caves Canyon Valley	6-38
Adobe Lake Valley	6-10	Troy Valley	6-39
Long Valley	6-11	Lower Mojave River Valley	6-40
Owens Valley	6-12	Middle Mojave River Valley	6-41
Black Springs Valley	6-13	Upper Mojave River Valley	6-42
Fish Lake Valley	6-14	El Mirage Valley	6-43
Deep Springs Valley	6-15	Antelope Valley	6-44
Eureka Valley	6-16	Tehachapi Valley East	6-45
Saline Valley	6-17	Fremont Valley	6-46
Death Valley	6-18	Harper Valley	6-47
Wingate Valley	6-19	Goldstone Valley	6-48
Middle Amargosa Basin	6-20	Superior Valley	6-49
Lower Kingston Valley	6-21	Cuddleback Valley	6-50
Upper Kingston Valley	6-22	Pilot Knob Valley	6-51
Riggs Valley	6-23	Searles Valley	6-52
Red Pass Valley	6-24	Salt Wells Valley	6-53
Bicycle Valley	6-25	Indian Wells Valley	6-54
Avawatz Valley	6-26	Coso Valley	6-55
Leach Valley	6-27	Rose Valley	6-56
Pahrump Valley	6-28	Darwin Valley	6-57
Mesquite Valley	6-29	Panamint Valley	6-58

## COLORADO RIVER BASIN REGION No. 7, GROUND WATER BASINS

Ground Water Basin	Number	Ground Water Basin	Number
Lanfair Valley	7-1	Borrego Valley	7-24
Fenner Valley	7-2	Ocotillo Valley	7-25
Ward Valley	7-3	Terwilliger Valley	7-26
Rice Valley	7-4	San Felipe Valley	7-27
Chuckawalla Valley	7-5	Vallecito-Carrizo Valley	7-28
Pinto Basin	7-6	Coyote Wells Valley	7-29
Cadiz Valley	7-7	Imperial Valley	7-30
Bristol Valley	7-8	Orcopia Valley	7-31
Dale Valley	7-9	Chocolate Valley	7-32
Twentynine Palms Valley	7-10	East Salton Sea Basin	7-33
Copper Mountain Valley	7-11	Amos Valley	7-34
Warren Valley	7-12	Ogilby Valley	7-35
Deadman Valley	7-13	Yuma Valley	7-36
Lavie Valley	7-14	Arroyo Seco Valley	7-37
Bessemer Valley	7-15	Palo Verde Valley	7-38
Ames Valley	7-16	Palo Verde Mesa	7-39
Means Valley	7-17	Quien Sabe Point Valley	7-40
Johnson Valley	7-18	Calzona Valley	7-41
Lucerne Valley	7-19	Vidal Valley	7-42
Morongo Valley	7-20	Chemehuevis Valley	7-43
Coachella Valley	7-21	Needles Valley	7-44
West Salton Sea Basin	7-22	Piute Valley	7-45
Clark Valley	7-23		

WATER QUALITY INVESTIGATIONS

SANTA ANA REGION No. 8, GROUND WATER BASINS

<i>Ground Water Basin</i>	<i>Number</i>	<i>Ground Water Basin</i>	<i>Number</i>
Coastal Plain, Orange County	8- 1	Devil Canyon Basin	8- 2.10
East Coastal Plain Pressure Area	8- 1.01	Yucaipa Basin	8- 2.11
Santa Ana Forebay Area	8- 1.02	Beaumont Basin	8- 2.12
Irvine Basin	8- 1.03	San Timoteo Basin	8- 2.13
La Habra Basin	8- 1.04	Reche Canyon Basin	8- 2.14
Yorba Linda Basin	8- 1.05	Riverside Basin	8- 2.15
Santa Ana Narrows Basin	8- 1.06	Arlington Basin	8- 2.16
Santiago Basin	8- 1.07	Temescal Basin	8- 2.17
Upper Santa Ana Valley	8- 2	Bedford Basin	8- 2.18
Chino Basin	8- 2.01	Coldwater Basin	8- 2.19
Claremont Heights Basin	8- 2.02	Lee Lake Basin	8- 2.20
Cucamonga Basin	8- 2.03	Cajalco Valley	8- 3
Rialto Basin	8- 2.04	Elsinore Basin	8- 4
Colton Basin	8- 2.05	San Jacinto Basin	8- 5
Bunker Hill Basin	8- 2.06	Hemet Lake Valley	8- 6
Lytle Basin	8- 2.07	Big Meadows Valley	8- 7
Upper Cajon Basin	8- 2.08	Seven Oaks Valley	8- 8
Lower Cajon Basin	8- 2.09	Bear Valley	8- 9

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SAN DIEGO REGION No. 9, GROUND WATER BASINS

<i>Ground Water Basin</i>	<i>Number</i>	<i>Ground Water Basin</i>	<i>Number</i>
San Juan Valley	9- 1	Santa Maria Valley	9-11
San Mateo Valley	9- 2	San Dieguito Valley	9-12
San Onofre Valley	9- 3	Poway Valley	9-13
Santa Margarita Valley	9- 4	Mission Valley	9-14
Temecula Valley	9- 5	San Diego River Valley	9-15
Coahuila Valley	9- 6	El Cajon Valley	9-16
San Luis Rey Valley	9- 7	Sweetwater Valley	9-17
Warner Valley	9- 8	Otay Valley	9-18
Escondido Valley	9- 9	Tia Juana Basin	9-19
San Pasqual Valley	9-10	Jamul Valley	9-20

APPENDIX B  
ALPHABETICAL LIST OF GROUND WATER  
BASINS IN CALIFORNIA

<i>Ground Water Basin</i>	<i>Number</i>	<i>Ground Water Basin</i>	<i>Number</i>
Acton Valley	4- 5	Coastal Plain, Los Angeles County	4-11
Adobe Lake Valley	6-10	West Coastal Plain—North	4-11.01
Alexander Valley	1-17	West Coast Basin	4-11.02
American Valley	5-10	Central Coastal Plain Pressure Area	4-11.03
Ames Valley	7-16	Los Angeles Forebay Area	4-11.04
Amos Valley	7-34	Montebello Forebay Area	4-11.05
Anderson-Cottonwood Valley	5- 6	Hollywood Basin	4-11.06
Antelope Valley	6-44	Los Angeles Narrows Basin	4-11.07
Arlington Basin, Upper Santa Ana Valley	8- 2.16	La Habra Basin	4-11.08
Arroyo Grande Valley	3-11	Coastal Plain, Orange County	8- 1
Arroyo Santa Rosa Valley	4- 7	East Coastal Plain Pressure Area	8- 1.01
Arroyo Seco Cone, Salinas Valley	3- 4.04	Santa Ana Forebay Area	8- 1.02
Arroyo Seco Valley	7-37	Irvine Basin	8- 1.03
Avawatz Valley	6-26	La Habra Basin	8- 1.04
		Yorba Linda Basin	8- 1.05
Bear Valley	8- 9	Santa Ana Narrows	8- 1.06
Beaumont Basin, Upper Santa Ana Valley	8- 2.12	Santiago Basin	8- 1.07
Bedford Basin, Upper Santa Ana Valley	8- 2.18	Coldwater Basin, Upper Santa Ana Valley	8- 2.19
Berryessa Valley	5-20	Collayomi Valley	5-19
Bessemer Valley	7-15	Colton Basin, Upper Santa Ana Valley	8- 2.05
Bicycle Valley	6-25	Conejo Valley	4-10
Big Meadows Valley	8- 7	Copper Mountain Valley	7-11
Big Valley	5- 4	Coso Valley	6-55
Black Springs Valley	6-13	Coyote Valley	5-18
Borrego Valley	7-24	Coyote Lake Valley	6-37
Bridgeport Valley	6- 8	Coyote Wells Valley	7-29
Bristol Valley	7- 8	Cronise Valley	6-35
Broadwell Valley	6-32	Cucamonga Basin, Upper Santa Ana Valley	8- 2.03
Bull Canyon Basin, San Fernando Valley	4-12.02	Cuddleback Valley	6-50
Bunker Hill Basin, Upper Santa Ana Valley	8- 2.06	Cummings Valley	5-27
Burns Valley	5-17	Cuyama Valley	3-13
Butte Valley	1- 3		
		Dale Valley	7- 9
Cadiz Valley	7- 7	Darwin Valley	6-57
Cajalco Valley	8- 3	Deadman Valley	7-13
Calzona Valley	7-41	Death Valley	6-18
Carmel Valley	3- 7	Deep Springs Valley	6-15
Carpinteria Basin	3-18	Devil Canyon Basin, Upper Santa Ana Valley	8- 2.10
Carrizo Plain	3-19		
Carson Valley	6- 6	East Coastal Plain Pressure Area, Coastal Plain, Orange	8- 1.01
Castaic Lake Valley	5-29	County	7-33
Castro Valley	2- 8	East Salton Sea Basin	3- 4.02
Caves Canyon Valley	6-38	East Side Area, Salinas Valley	9- 4.07
Central Coastal Plain Pressure Area, Coastal Plain Los		Eastern Basin, Santa Clara River Valley	1-10
Angeles County	4-11.03	Eel River Valley	9-16
Chemehuevis Valley	7-43	El Cajon Valley	6-43
Chino Basin, Upper Santa Ana Valley, San Bernardino		El Mirage Valley	8- 4
and Riverside Counties	8- 2.01	Elsinore Basin	9- 9
Chino Basin, Upper Santa Ana Valley, Los Angeles		Escondido Valley	1- 9
County	4-14.01	Eureka Plain	6-16
Chocolate Valley	7-32	Eureka Valley	5- 5
Cholame Valley	3- 5	Fall River Valley	7- 2
Chuckawalla Valley	7- 5	Fenner Valley	4- 4.05
Claremont Heights Basin, Upper Santa Ana Valley, San		Fillmore Basin, Santa Clara River Valley	6-14
Bernardino County	8- 2.02	Fish Lake Valley	4-13.10
Claremont Heights Basin, Upper Santa Ana Valley, Los		Foothill Basin, San Gabriel Valley	3- 4.03
Angeles County	4-14.04	Forebay Area, Salinas Valley	6-46
Clark Valley	7-23	Fremont Valley	
Clayton Valley	2- 5	Gilroy-Hollister Basin	3- 3
Coachella Valley	7-21	Glendora Basin, San Gabriel Valley	6-48
Coahuila Valley	9- 6	Goldstone Valley	3-16
		Goleta Basin	5- 1
		Goose Lake Valley	5- 1



## ALPHABETICAL LIST OF GROUND WATER BASINS IN CALIFORNIA—Continued

Ground Water Basin	Number	Ground Water Basin	Number
Hayfork Valley	1- 6	Ocotillo Valley	7-25
Harper Valley	6-47	Ogilby Valley	7-35
Hemet Lake Valley	8- 6	Ojai Valley	4- 2
High Valley	5-16	Orcopia Valley	7-31
Hollywood Basin, Coastal Plain, Los Angeles County	4-11.06	Otay Valley	9-18
Hoopa Valley	1- 7	Owens Valley	6-12
Hopland Valley	1-16	Oxnard Plain Forebay Area, Santa Clara River Valley	4- 4.02
Honey Lake Valley	6- 4	Oxnard Plain Pressure Area, Santa Clara River Valley	4- 4.01
Imperial Valley	7-30	Pacoima Basin, San Fernando Valley	4-12.04
Indian Valley	5- 9	Pahrump Valley	6-28
Indian Wells Valley	6-54	Pajaro Valley	3- 2
Irvine Basin, Coastal Plain, Orange County	8- 1.03	Palo Verde Mesa	7-39
Ivanpah Valley	6-30	Palo Verde Valley	7-38
Jamul Valley	9-20	Panamint Valley	6-58
Jess Valley	5- 3	Panoche Valley	5-23
Johnson	7-18	Pasadena Sub-Area, San Gabriel Valley	4-13.03
Kelseyville Valley	5-15	Petaluma Valley	2- 1
Kelso Valley	6-31	Pilot Knobe Valley	6-51
Kern River Valley	5-25	Pinto Basin	7- 6
Klamath River Valley	1- 2	Piru Basin, Santa Clara River Valley	4- 4.06
La Habra Basin, Coastal Plain, Los Angeles County	4-11.08	Pismo Creek Valley	3-10
La Habra Basin, Coastal Plain, Orange County	8- 1.04	Pittsburg Plain	2- 4
Lake Almanor Valley	5- 7	Piute Valley	7-45
Lanfair Valley	7- 1	Pleasant Valley	4- 6
Langford Valley	6-36	Pomona Basin, Upper Santa Ana Valley, Los Angeles County	4-14.02
Las Posas Valley	4- 8	Potter Valley	1-14
Lavic Valley	7-14	Poway Valley	9-13
Laytonville Flats	1-12	Pressure Area, Salinas Valley	3- 4.01
Leach Valley	6-27	Puente Basin, San Gabriel Valley	4-13.12
Lee Lake Basin, Upper Santa Ana Valley	8- 2.20	Quien Sabe Point Valley	7-40
Little Lake Valley	1-13	Reche Canyon Basin, Upper Santa Ana Valley	8- 2.14
Little Tujunga Basin, San Fernando Valley	4-12.06	Red Pass Valley	6-24
Live Oak Basin, Upper Santa Ana Valley, Los Angeles County	4-14.03	Rice Valley	7- 4
Livermore Valley	2-10	Riggs Valley	6-23
Long Valley	6-11	Rialto Basin, Upper Santa Ana Valley	8- 2.04
Los Angeles Forebay Area, Coastal Plain, Los Angeles County	4-11.04	Riverside Basin, Upper Santa Ana Valley	8- 2.15
Los Angeles Narrows Basin, Coastal Plain, Los Angeles County	4-11.07	Rose Valley	6-56
Lower Cajon Basin, Upper Santa Ana Valley	8- 2.09	Round Valley	1-11
Lower Canyon Basin, San Gabriel Valley	4-13.06	Sacramento Valley	5-21
Lower Kingston Valley	6-21	Salinas Valley	3- 4
Lower Mojave River Valley	6-40	Pressure Area	3- 4.01
Lucerne Valley	7-19	East Side Area	3- 4.02
Lytle Basin, Upper Santa Ana Valley	8- 2.07	Forebay Area	3- 4.03
Madeline Plains	6- 2	Arroyo Seco Cone	3- 4.04
Mad River Valley	1- 8	Upper Valley Area	3- 4.05
Main San Gabriel Basin, San Gabriel Valley	4-13.01	Saline Valley	6-17
Means Valley	7-17	Salt Wells Valley	6-53
Mesquite Valley	6-29	San Antonio Creek Valley	3-14
Middle Amargosa Basin	6-20	San Antonio River Valley	3- 6
Middle Mojave River Valley	6-41	San Diego River Valley	9-15
Mission Valley	9-14	San Dieguito Valley	9-12
Mohawk Valley	5-11	San Dimas Basin, San Gabriel Valley	4-13.09
Monk Hill Basin, San Gabriel Valley	4-13.02	San Felipe Valley	7-27
Mono Valley	6- 9	San Fernando Basin, San Fernando Valley	4-12.01
Montebello Forebay Area, Coastal Plain, Los Angeles County	4-11.05	San Fernando Valley	4-12
Morongo Valley	7-20	San Fernando Basin	4-12.01
Moro Bay Valley	3- 8	Bull Canyon Basin	4-12.02
Mound Pressure Area	4- 4.03	Sylmar Basin	4-12.03
Mountain Meadows Valley	5- 8	Pacoima Basin	4-12.04
Napa-Sonoma Valley	2- 2	Tujunga Basin	4-12.05
Napa Valley	2- 2.01	Little Tujunga Basin	4-12.06
Sonoma Valley	2- 2.02	Verdugo Basin	4-12.07
Needles Valley	7-44	San Gabriel Valley	4-13
		Main San Gabriel Basin	4-13.01
		Monk Hill Basin	4-13.02
		Pasadena Sub-Area	4-13.03
		Santa Anita Sub-Area	4-13.04

## DIVISION OF WATER RESOURCES

## ALPHABETICAL LIST OF GROUND WATER BASINS IN CALIFORNIA—Continued

<i>Ground Water Basin</i>	<i>Number</i>	<i>Ground Water Basin</i>	<i>Number</i>
San Gabriel Valley—Continued		Temescal Basin, Upper Santa Ana Valley	8- 2.17
Upper Canyon Basin	4-13.05	Terwilliger Valley	7-26
Lower Canyon Basin	4-13.06	Tia Juana Basin	9-19
Glendora Basin	4-13.07	Topaz Valley	6- 7
Way-Hill Basin	4-13.08	Troy Valley	6-39
San Dimas Basin	4-13.09	Tujunga Basin, San Fernando Valley	4-12.05
Foothill Basin	4-13.10	Twentynine Palms Valley	7-10
Spadra Basin	4-13.11		
Puente Basin	4-13.12	Ukiah Valley	1-15
San Jacinto Basin	8- 5	Upper Cajon Basin, Upper Santa Ana Valley	8-12.08
San Joaquin Valley	5-22	Upper Canyon Basin, San Gabriel Valley	4-13.05
San Juan Valley	9- 1	Upper Kingston Valley	6-22
San Luis Obispo Valley	3- 9	Upper Lake Valley	5-13
San Luis Rey Valley	9- 7	Upper Mojave River Valley	6-42
San Mateo Valley	9- 2	Upper Ojai Valley	4- 1
San Onofre Valley	9- 3	Upper Santa Ana Valley, Los Angeles County	4-14
San Pasqual Valley	9-10	Chino Basin	4-14.01
San Ramon Valley	2- 7	Pomona Basin	4-14.02
San Timoteo Basin, Upper Santa Ana Valley	8- 2.13	Live Oak Basin	4-14.03
Santa Ana Forebay, Coastal Plain, Orange County	8- 1.02	Claremont Heights Basin	4-14.04
Santa Ana Narrows, Coastal Plain, Orange County	8- 1.06	Upper Santa Ana Valley, San Bernardino and Riverside	
Santa Anita Sub-Area, San Gabriel Valley	4-13.04	Counties	8- 2
Santa Barbara Basin	3-17	Chino Basin	8- 2.01
Santa Clara Valley	2- 9	Claremont Heights Basin	8- 2.02
Santa Clara River Valley	4- 4	Cucamonga Basin	8- 2.03
Oxnard Plain Pressure Area	4- 4.01	Rialto Basin	8- 2.04
Oxnard Plain Forebay Area	4- 4.02	Colton Basin	8- 2.05
Mound Pressure Area	4- 4.03	Bunker Hill Basin	8- 2.06
Santa Paula Basin	4- 4.04	Lytle Basin	8- 2.07
Fillmore Basin	4- 4.05	Upper Cajon Basin	8- 2.08
Piru Basin	4- 4.06	Lower Cajon Basin	8- 2.09
Eastern Basin	4- 4.07	Devil Canyon Basin	8- 2.10
Santa Maria Valley	9-11	Yucaipa Basin	8- 2.11
Santa Maria River Valley	3-12	Beaumont Basin	8- 2.12
Santa Margarita Valley	9- 4	San Timoteo Basin	8- 2.13
Santa Paula Basin, Santa Clara River Valley	4- 4.04	Reche Canyon Basin	8- 2.14
Santa Rosa Valley	1-18	Riverside Basin	8- 2.15
Santa Ynez River Valley	3-15	Arlington Basin	8- 2.16
Santiago Basin, Coastal Plain, Orange County	8- 1.07	Temescal Basin	8- 2.17
Scott Valley	5-14	Bedford Basin	8- 2.18
Scott River Valley	1- 5	Coldwater Basin	8- 2.19
Searles Valley	6-52	Lee Lake Basin	8- 2.20
Seven Oaks Valley	8- 8	Upper Valley Area, Salinas Valley	3- 4.05
Shasta Valley	1- 4		
Sierra Valley	5-12	Vallecito-Carrizo Valley	7-28
Silver Lake Valley	6-34	Ventura River Valley	4- 3
Simi Valley	4- 9	Verdugo Basin, San Fernando Valley	4-12.07
Smith River Plain	1- 1	Vidal Valley	7-42
Soda Lake Valley	6-33		
Sonoma Valley, Napa-Sonoma Valley	2- 2.02	Walker Basin Creek Valley	5-26
Soquel Valley	3- 1	Ward Valley	7- 3
South Fork Pit River Valley	5- 2	Warner Valley	9- 8
Spadra Basin, San Gabriel Valley	4-13.11	Warren Valley	7-12
Squaw Valley	5-24	Way-Hill Basin, San Gabriel Valley	4-13.08
Suisun-Fairfield Valley	2- 3	West Coastal Plain-North, Coastal Plain Los Angeles	
Sunol Valley	2-11	County	4-11.01
Superior Valley	6-49	West Coast Basin, Coastal Plain, Los Angeles County	4-11.02
Surprise Valley	6- 1	West Salton Sea Basin	7-22
Sweetwater Valley	9-17	Willow Creek Valley	6- 3
Sylmar Basin, San Fernando Valley	4-12.03	Wingate Valley	6-19
Tahoe Valley	6- 5		
Tehachapi Valley East	6-45	Ygnacio Valley	2- 6
Tehachapi Valley West	5-28	Yorba Linda Basin, Coastal Plain, Orange County	8- 1.05
Temecula Valley	9- 5	Yucaipa Basin, Upper Santa Ana Valley	8- 2.11
		Yuma Valley	7-36

## APPENDIX C

### GROUND WATER BASINS IN THE PRINCIPAL SURFACE DRAINAGE BASINS IN CALIFORNIA \*

#### NORTH COASTAL REGION No. 1

1. **Rogue River Basin** (147 square miles)  
No ground water basins yet identified
2. **Winchuck River Group** (18 square miles)  
No ground water basins yet identified
3. **Smith River Basin in California** (631 square miles)  
1-1 Smith River Plain
4. **Elk Creek Group** (75 square miles)  
1-1 Smith River Plain
5. **Klamath River Basin in California** (10,020 square miles)  
1-2 Klamath River Valley  
1-3 Butte Valley  
1-4 Shasta Valley  
1-5 Scott River Valley  
1-6 Hayfork Valley  
1-7 Hoopa Valley
6. **Home Creek Group** (13 square miles)  
No ground water basins yet identified
7. **Redwood Creek Basin** (279 square miles)  
No ground water basins yet identified
8. **Maple Creek Group** (141 square miles)  
No ground water basins yet identified
9. **Mad River Basin** (496 square miles)  
1-8 Mad River Valley
10. **Elk River Group** (219 square miles)  
1-9 Eureka Plain
11. **Eel River Basin** (3,701 square miles)  
1-10 Eel River Valley  
1-11 Round Valley  
1-12 Laytonville Flats  
1-13 Little Lake Valley
12. **Bear River Group** (130 square miles)  
No ground water basins yet identified
13. **Mattole River Basin** (273 square miles)  
No ground water basins yet identified
14. **Four Mile Creek Group** (78 square miles)  
No ground water basins yet identified
15. **Ten Mile River Group** (262 square miles)  
No ground water basins yet identified
16. **Noyo River Basin** (114 square miles)  
No ground water basins yet identified
17. **Big River Group** (290 square miles)  
No ground water basins yet identified
18. **Navarro River Basin** (316 square miles)  
No ground water basins yet identified
19. **Alder Creek Group** (124 square miles)  
No ground water basins yet identified
20. **Garcia River Basin** (114 square miles)  
No ground water basins yet identified
21. **Arena Creek Group** (32 square miles)  
No ground water basins yet identified
22. **Gualala River Basin** (299 square miles)  
No ground water basins yet identified
23. **Stewarts Point Group** (63 square miles)  
No ground water basins yet identified
24. **Russian River Basin** (1,498 square miles)  
1-14 Potter Valley  
1-15 Ukiah Valley  
1-16 Hopland Valley  
1-17 Alexander Valley  
1-18 Santa Rosa Valley
25. **Salmon Creek Group** (253 square miles)  
No ground water basins yet identified

#### SAN FRANCISCO BAY REGION No. 2

1. **Lagunitas Creek Group** (236 square miles)  
No ground water basins yet identified
2. **Petaluma Creek Group** (444 square miles)  
2-1 Petaluma Valley  
2-2.02 Sonoma Valley
3. **Napa River Basin** (417 square miles)  
2-2.01 Napa Valley
4. **Suisun Creek Group** (348 square miles)  
2-3 Suisun-Fairfield Valley
5. **Mt. Diablo Creek Group** (251 square miles)  
2-4 Pittsburg Plain  
2-5 Clayton Valley  
2-6 Ygnacio Valley  
2-7 San Ramon Valley
6. **East Bay Group** (319 square miles)  
2-8 Castro Valley  
2-9 Santa Clara Valley
7. **Alameda Creek Group** (745 square miles)  
2-9 Santa Clara Valley  
2-10 Livermore Valley  
2-11 Sunol Valley
8. **Coyote Creek Basin** (404 square miles)  
2-9 Santa Clara Valley
9. **Guadalupe River Group** (295 square miles)  
2-9 Santa Clara Valley
10. **San Francisquito Creek Group** (73 square miles)  
2-9 Santa Clara Valley
11. **San Mateo Creek Group** (173 square miles)  
2-9 Santa Clara Valley
12. **Pescadero Creek Group** (262 square miles)  
No ground water basins yet identified
13. **San Francisco Bay, including islands** (442 square miles)  
No ground water basins yet identified

\* Drainage basin names and numbers are those used in Bulletin No. 1, Water Resources of California, State Water Resources Board, 1951.

## DIVISION OF WATER RESOURCES

## CENTRAL COASTAL REGION No. 3

1. **Scott Creek Group** (149 square miles)  
No ground water basins yet identified
2. **San Lorenzo River Basin** (137 square miles)  
No ground water basins yet identified
3. **Soquel Creek Group** (91 square miles)  
3-1 Soquel Valley
4. **Pajaro River Basin** (1,303 square miles)  
3-2 Pajaro Valley  
3-3 Gilroy-Hollister Basin
5. **Elkhorn Slough Basin** (53 square miles)  
3-2 Pajaro Valley
6. **Moro Cojo Group** (14 square miles)  
3-4 Salinas Valley
7. **Salinas River Basin** (4,401 square miles)  
3-4 Salinas Valley  
3-5 Cholame Valley  
3-6 San Antonio River Valley
8. **Canyon Del Rey Group** (65 square miles)  
No ground water basins yet identified
9. **Carmel River Basin** (254 square miles)  
3-7 Carmel Valley
10. **Rocky Creek Group** (65 square miles)  
No ground water basins yet identified
11. **Little Sur River Basin** (40 square miles)  
No ground water basins yet identified
12. **Point Sur Group** (4 square miles)  
No ground water basins yet identified
13. **Sur River Basin** (59 square miles)  
No ground water basins yet identified
14. **Morro Creek Group** (670 square miles)  
3-8 Morro Bay Valley  
3-9 San Luis Obispo Valley
15. **Arroyo Grande Basin** (190 square miles)  
3-10 Pismo Creek Valley  
3-11 Arroyo Grande Valley
16. **Santa Maria River Basin** (1,881 square miles)  
3-12 Santa Maria Valley  
3-13 Cuyama Valley
17. **San Antonio Creek Group** (204 square miles)  
3-14 San Antonio Creek Valley
18. **Santa Ynez River Basin** (901 square miles)  
3-15 Santa Ynez River Valley
19. **San Jose Creek Group** (377 square miles)  
3-16 Goleta Basin  
3-17 Santa Barbara Basin  
3-18 Carpinteria Basin
20. **Soda Lake Basin** (426 square miles)  
3-19 Carrizo Plain

## LOS ANGELES REGION No. 4

1. **Padre Juan Canyon Group** (24 square miles)  
No ground water basins yet identified
2. **Ventura River Basin** (226 square miles)  
4-1 Upper Ojai Valley  
4-2 Ojai Valley  
4-3 Ventura River Valley
3. **Santa Clara River Basin** (1,650 square miles)  
4-1 Upper Ojai Valley  
4-4 Santa Clara River Valley  
4-5 Acton Valley
4. **Callegus and Conejo Creeks Group** (417 square miles)  
4-4 Santa Clara River Valley  
4-6 Pleasant Valley  
4-7 Arroyo Santa Rosa Valley  
4-8 Las Posas Valley  
4-9 Simi Valley  
4-10 Conejo Valley
5. **Malibu Creek Group** (389 square miles)  
4-11 Coastal Plain, Los Angeles County
6. **West Coastal Plain Group** (177 square miles)  
4-11 Coastal Plain, Los Angeles County
7. **Los Angeles River Basin** (822 square miles)  
4-11 Coastal Plain, Los Angeles County  
4-12 San Fernando Valley  
4-13 San Gabriel Valley
8. **San Gabriel River Basin** (560 square miles)  
4-11 Coastal Plain, Los Angeles County  
4-13 San Gabriel Valley
9. **Anaheim Creek Group** (112 square miles)  
4-11 Coastal Plain, Los Angeles County
10. **Santa Ana River Basin** (40 square miles)  
4-14 Upper Santa Ana Valley, Los Angeles County

## CENTRAL VALLEY REGION No. 5

1. **Goose Lake Basin** (412 square miles)  
5-1 Goose Lake Valley
2. **Sacramento River Basin** (26,548 square miles)  
**Pit River** (5,346 square miles)  
2- 1. **Above gage near Canby** (1,430 square miles)  
5-2 South Fork Pit River Valley  
5-3 Jess Valley  
2- 2. **From gage near Canby to gage near Ydaldom**  
(3,916 square miles)  
5-4 Big Valley  
5-5 Fall River Valley  
2- 3. **McCloud River above gage at Baird** (685 square miles)  
No ground water basins yet identified  
2- 4. **Remainder of Sacramento River above Shasta Dam**  
(618 square miles)  
No ground water basins yet identified  
2- 5. **West side tributaries, Shasta Dam to gage near Red Bluff** (1,322 square miles)  
5-6 Anderson-Cottonwood Valley  
2- 6. **East side tributaries, Shasta Dam to gage near Red Bluff** (1,287 square miles)  
5-6 Anderson-Cottonwood Valley  
**Minor streams above valley floor, west side**  
2- 7. **From gage near Red Bluff to Stony Creek drainage**  
(533 square miles)  
No ground water basins yet identified  
2- 8. **From Stony Creek drainage to Cache Creek drainage** (543 square miles)  
5-21 Sacramento Valley  
2- 9. **From Cache Creek drainage to mouth of Sacramento River** (143 square miles)  
2-10. **Stony Creek above mouth of Canyon** (710 square miles)  
No ground water basins yet identified  
**Cache Creek** (1,150 square miles)

## CENTRAL VALLEY REGION No. 5—Continued

- 2-11. **Above gage near Lower Lake** (492 square miles)  
 5-13 Upper Lake Valley  
 5-14 Scott Valley  
 5-15 Kelseyville Valley  
 5-16 High Valley  
 5-17 Burns Valley
- 2-12. **From gage near Lower Lake to gage near Capay**  
 (560 square miles)  
 5-21 Sacramento Valley
- 2-13. **From gage near Capay to gage at Yolo** (98 square miles)  
 5-21 Sacramento Valley
- 2-14. **Putah Creek (including Berryessa Valley) above gage near Winters** (577 square miles)  
 5-18 Coyote Valley  
 5-19 Collayomi Valley  
 5-20 Berryessa Valley  
**Minor streams above valley floor, east side**
- 2-15. **From gage near Red Bluff to Feather River drainage** (1,054 square miles)  
 5-21 Sacramento Valley
- 2-16. **From Feather River drainage to American River drainage** (613 square miles)  
 5-21 Sacramento Valley  
**Feather River** (3,611 square miles)  
**Feather River, North Fork** (1,945 square miles)
- 2-17. **Above gage near Prattville** (507 square miles)  
 5-7 Lake Almanor Valley  
 5-8 Mountain Meadows Valley
- 2-18. **Indian Creek above gage near Crescent Mills**  
 (746 square miles)  
 5-9 Indian Valley
- 2-19. **Remainder of North Fork above gage at Big Bar**  
 (692 square miles)  
 5-10 American Valley  
**Feather River, Middle Fork** (1,353 square miles)
- 2-20. **Above gage near Clio** (699 square miles)  
 5-11 Mohawk Valley  
 5-12 Sierra Valley
- 2-21. **From gage near Clio to gage at Bidwell Bar**  
 (654 square miles)  
 5-11 Mohawk Valley
- 2-22. **Remainder of Feather River above gage near Oroville** (313 square miles)  
 No ground water basins yet identified
- 2-23. **Yuba River above gage at Smartville** (1,194 square miles)  
 No ground water basins yet identified
- 2-24. **Bear River above gage near Wheatland** (295 square miles)  
 No ground water basins yet identified  
**American River** (1,921 square miles)
- 2-25. **North Fork above gage near Colfax** (343 square miles)  
 No ground water basins yet identified
- 2-26. **Middle Fork above gage near Auburn** (619 square miles)  
 No ground water basins yet identified
- 2-27. **South Fork above gage at Coloma** (632 square miles)  
 No ground water basins yet identified
- 2-28. **Remainder of American River above gage at Fair Oaks** (327 square miles)  
 5-21 Sacramento Valley
- 2-29. **Sacramento Valley floor** (4,946 square miles)  
 5-21 Sacramento Valley
3. **San Joaquin River Basin** (32,464 square miles)  
**San Joaquin River Basin—area tributary to Tulare Lake** (16,518 square miles)  
**Minor streams above valley floor, east side** (2,301 square miles)
- 3- 1. **Including Grapevine Creek to Kern River drainage** (904 square miles)  
 5-22 San Joaquin Valley  
 5-26 Walker Basin Creek Valley  
 5-27 Cummings Valley  
 5-28 Tehachapi Valley West  
 5-29 Castaic Lake Valley
- 3- 2. **From Kern River drainage to Tule River drainage** (793 square miles)  
 5-22 San Joaquin Valley
- 3- 3. **From Tule River drainage to San Joaquin River drainage** (604 square miles)  
 5-22 San Joaquin Valley
- 3- 4. **Kern River above gage near Bakersfield** (2,420 square miles)  
 5-25 Kern River Valley
- 3- 5. **Tule River above Pioneer Ditch diversion**  
 (390 square miles)  
 No ground water basins yet identified
- 3- 6. **Kaweah River above gage near Three Rivers**  
 (520 square miles)  
 No ground water basins yet identified
- 3- 7. **Kings River above gage at Piedra** (1,694 square miles)  
 5-24 Squaw Valley
- 3- 8. **Above valley floor, west side, tributary to Tulare Lake** (1,582 square miles)  
 5-22 San Joaquin Valley
- 3- 9. **Valley floor, tributary to Tulare Lake** (7,611 square miles)  
 5-22 San Joaquin Valley  
**San Joaquin River Basin—area tributary to San Joaquin River** (11,792 square miles)  
**Minor streams above valley floor, east side** (6,808 square miles)
- 3-10. **From San Joaquin River drainage to Stanislaus River drainage** (1,109 square miles)  
 5-22 San Joaquin Valley
- 3-11. **San Joaquin River above Friant Dam** (1,633 square miles)  
 No ground water basins yet identified
- 3-12. **Fresno River above gage near Daulton** (270 square miles)  
 No ground water basins yet identified
- 3-13. **Chowchilla River above gage at Buchanan Damsite** (238 square miles)  
 No ground water basins yet identified
- 3-14. **Merced River above gage at Exchequer**  
 (1,035 square miles)  
 No ground water basins yet identified
- 3-15. **Tuolumne River above gage near La Grange**  
 (1,540 square miles)  
 No ground water basins yet identified
- 3-16. **Stanislaus River above gage near Knight's Ferry**  
 (983 square miles)  
 No ground water basins yet identified
- 3-17. **Above valley floor, west side, tributary to San Joaquin River** (1,310 square miles)  
 5-23 Panoche Valley

## DIVISION OF WATER RESOURCES

## CENTRAL VALLEY REGION No. 5—Continued

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| <p>3-18. Valley floor, tributary to San Joaquin River<br/>(3,674 square miles)<br/>5-22 San Joaquin River<br/>San Joaquin River Basin—area tributary to Delta<br/>(4,154 square miles)<br/>Minor streams above valley floor, east side<br/>(2,224 square miles)</p> <p>3-19. From Stanislaus River drainage to American<br/>River drainage (662 square miles)<br/>5-22 San Joaquin Valley</p> <p>3-20. Calaveras River above gage at Jenny Lind<br/>(395 square miles)<br/>No ground water basins yet identified</p> | <p>3-21. Mokelumne River above gage near Clements<br/>(630 square miles)<br/>No ground water basins yet identified</p> <p>3-22. Cosumnes River above gage at Michigan Bar<br/>(537 square miles)<br/>No ground water basins yet identified</p> <p>3-23. Above valley floor, west side San Joaquin Valley,<br/>tributary to Delta (170 square miles)<br/>5-22 San Joaquin Valley</p> <p>3-24. San Joaquin Valley floor tributary to Delta<br/>(1,760 square miles)<br/>5-22 San Joaquin Valley</p> |
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## LAHONTAN REGION No. 6

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|---|---|
| <p>1. Twelve Mile Creek Basin in California (19 square miles)<br/>No ground water basins yet identified</p> <p>2. Alkali Lake Basin in California (707 square miles)<br/>6-1 Surprise Valley</p> <p>3. Duck Flat Basin (63 square miles)<br/>No ground water basins yet identified</p> <p>4. Madeline Plains Basin in California (759 square miles)<br/>6-2 Madeline Plains</p> <p>5. Smoke Creek Group (290 square miles)<br/>No ground water basins yet identified</p> <p>6. Eagle Lake Group (399 square miles)<br/>No ground water basins yet identified</p> <p>7. Honey Lake Basin in California (1,653 square miles)<br/>6-3 Willow Creek Valley<br/>6-4 Honey Lake Valley</p> <p>8. Truckee River Basin in California (805 square miles)<br/>6-5 Tahoe Valley</p> <p>9. Carson River Basin in California (449 square miles)<br/>6-6 Carson Valley</p> <p>10. Walker River Basin in California (910 square miles)<br/>6-7 Topaz Valley<br/>6-8 Bridgeport Valley</p> <p>11. Mono Lake Basin in California (685 square miles)<br/>6-9 Mono Valley</p> <p>12. Huntoon Valley Basin in California (22 square miles)<br/>No ground water basins yet identified</p> <p>13. Adobe Valley Basin in California (272 square miles)<br/>6-10 Adobe Lake Valley</p> <p>14. Owens River Basin in California (3,133 square miles)<br/>6-11 Long Valley<br/>6-12 Owens Valley<br/>6-13 Black Springs Valley</p> <p>15. Cottonwood Creek Group (285 square miles)<br/>6-14 Fish Lake Valley</p> <p>16. Deep Springs Group (1,649 square miles)<br/>6-15 Deep Springs Valley<br/>6-16 Eureka Valley<br/>6-17 Saline Valley</p> <p>17. Amargosa River Basin in California (6,442 square miles)<br/>6-18 Death Valley<br/>6-19 Wingate Valley</p> | <p>6-20 Middle Amargosa Basin</p> <p>6-21 Lower Kingston Valley</p> <p>6-22 Upper Kingston Valley</p> <p>6-23 Riggs Valley</p> <p>6-24 Red Pass Valley</p> <p>6-25 Bicycle Valley</p> <p>6-26 Awawatz Valley</p> <p>6-27 Leach Valley</p> <p>18. Ivanpah Valley Group in California (855 square miles)<br/>6-28 Pahrump Valley<br/>6-29 Mesquite Valley<br/>6-30 Ivanpah Valley</p> <p>19. Mojave River Basin (4,906 square miles)<br/>6-31 Kelso Valley<br/>6-32 Broadwell Valley<br/>6-33 Soda Lake Valley<br/>6-34 Silver Lake Valley<br/>6-35 Cronise Valley<br/>6-36 Langford Valley<br/>6-37 Coyote Lake Valley<br/>6-38 Caves Canyon Valley<br/>6-39 Troy Valley<br/>6-40 Lower Mojave River Valley<br/>6-41 Middle Mojave River Valley<br/>6-42 Upper Mojave River Valley</p> <p>20. Antelope Valley Basin (2,416 square miles)<br/>6-43 El Mirage Valley<br/>6-44 Antelope Valley</p> <p>21. Searles Lake Group (6,188 square miles)<br/>6-45 Tehachapi Valley East<br/>6-46 Fremont Valley<br/>6-47 Harper Valley<br/>6-48 Goldstone Valley<br/>6-49 Superior Valley<br/>6-50 Cuddleback Valley<br/>6-51 Pilot Knobe Valley<br/>6-52 Searles Valley<br/>6-53 Salt Wells Valley<br/>6-54 Indian Wells Valley<br/>6-55 Coso Valley<br/>6-56 Rose Valley<br/>6-57 Darwin Valley<br/>6-58 Panamint Valley</p> |
|---|---|

## COLORADO RIVER BASIN REGION No. 7

1. **Mojave Desert Group** (8,597 square miles)
  - 7-1 Lanfair Valley
  - 7-2 Fenner Valley
  - 7-3 Ward Valley
  - 7-4 Rice Valley
  - 7-5 Chuckawalla Valley
  - 7-6 Pinto Basin
  - 7-7 Cadiz Valley
  - 7-8 Bristol Valley
  - 7-9 Dale Valley
  - 7-10 Twentynine Palms Valley
  - 7-11 Copper Mountain Valley
  - 7-12 Warren Valley
  - 7-13 Deadman Valley
  - 7-14 Lavic Valley
  - 7-15 Bessemer Valley
  - 7-16 Ames Valley
  - 7-17 Means Valley
  - 7-18 Johnson Valley
  - 7-19 Lucerne Valley
2. **Whitewater River Basin** (1,574 square miles)
  - 7-20 Morongo Valley
  - 7-21 Coachella Valley
3. **West Salton Sea Group** (425 square miles)
  - 7-22 West Salton Sea Basin
4. **Carrizo Creek Group** (1,458 square miles)
  - 7-23 Clark Valley
5. **Coyote Wash Group** (278 square miles)
  - 7-24 Borrego Valley
  - 7-25 Ocotillo Valley
  - 7-26 Terwilliger Valley
  - 7-27 San Felipe Valley
  - 7-28 Vallecito-Carrizo Valley
6. **Imperial Irrigation District Group** (1,694 square miles)
  - 7-29 Coyote Wells Valley
  - 7-30 Imperial Valley
7. **East Salton Sea Group** (1,408 square miles)
  - 7-31 Orcopia Valley
  - 7-32 Chocolate Valley
  - 7-33 East Salton Sea Basin
  - 7-34 Amos Valley
8. **Colorado River drainage** (4,296 square miles)
  - 7-35 Ogilby Valley
  - 7-36 Yuma Valley
  - 7-37 Arroyo Seco Valley
  - 7-38 Palo Verde Valley
  - 7-39 Palo Verde Mesa
  - 7-40 Quien Sabe Point Valley
  - 7-41 Calzona Valley
  - 7-42 Vidal Valley
  - 7-43 Chemehuevis Valley
  - 7-44 Needles Valley
  - 7-45 Piute Valley

## SANTA ANA REGION No. 8

8. **San Gabriel River Basin** (35 square miles)
  - 8-1 Coastal Plain, Orange County
9. **Anaheim Creek Group** (60 square miles)
  - 8-1 Coastal Plain, Orange County
10. **Santa Ana River Basin** (2,378 square miles)
  - 8-1 Coastal Plain, Orange County
  - 8-2 Upper Santa Ana Valley
  - 8-3 Cajalco Valley
11. **Newport Bay Group** (252 square miles)
  - 8-4 Elsinore Basin
  - 8-5 San Jacinto Basin
  - 8-6 Hemet Lake Valley
  - 8-7 Big Meadows Valley
  - 8-8 Seven Oaks Valley
  - 8-9 Bear Valley

## SAN DIEGO REGION No. 9

12. **San Juan Creek Group** (274 square miles)
  - 9-1 San Juan Valley
13. **Arroyo San Onofre Group** (241 square miles)
  - 9-2 San Mateo Valley
  - 9-3 San Onofre Valley
14. **Santa Margarita River Basin** (741 square miles)
  - 9-4 Santa Margarita Valley
  - 9-5 Temecula Valley
  - 9-6 Coahuila Valley
15. **San Luis Rey River Basin** (565 square miles)
  - 9-7 San Luis Rey Valley
  - 9-8 Warner Valley
16. **San Marcos Creek Group** (215 square miles)
  - 9-9 Escondido Valley
17. **San Dieguito River Basin** (327 square miles)
  - 9-10 San Pasqual Valley
18. **Los Penasquitos Creek Group** (178 square miles)
  - 9-11 Santa Maria Valley
  - 9-12 San Dieguito Valley
  - 9-13 Poway Valley
19. **San Diego River Basin** (435 square miles)
  - 9-14 Mission Valley
  - 9-15 San Diego River Valley
  - 9-16 El Cajon Valley
20. **San Diego Bay Group** (165 square miles)
  - 9-17 Sweetwater Valley
  - 9-18 Otay Valley
21. **Sweetwater River Basin** (181 square miles)
 

No ground water basins yet identified
22. **Otay River Basin** (99 square miles)
  - 9-19 Jamul Valley
23. **Tia Juana River Basin in California** (448 square miles)
  - 9-19 Tia Juana Basin

## APPENDIX D

### PRIOR INVESTIGATIONS AND REPORTS

#### SELECTED BIBLIOGRAPHY OF PUBLISHED REPORTS PERTAINING TO GROUND WATER RESOURCES IN CALIFORNIA

1. Brown, J. S., The Salton Sea Region, California: U. S. Geol. Survey, WSP 497, 1923.
2. Bryan, K., Geology and Ground Water Resources of Sacramento Valley, California: U. S. Geol. Survey, WSP 495, 1923.
3. Calif. Dept. Nat. Res., Div. Mines, Geologic Map of California: 1938.
4. Calif. Dept. Nat. Res., Div. Mines, Geologic Formations and Economic Development of the Oil and Gas Fields of California: Bull. No. 118, March 1943.
5. Calif. Dept. of Engineering, Report on the Utilization of Mojave River for Irrigation in Victor Valley, California: Bull. No. 5, 1918.
6. Calif. Dept. of Engineering, Water Resources of Kern River and Adjacent Streams and Their Utilization: Bull. No. 9, 1920.
7. Calif. Dept. Pub. Wks., Div. of Irrigation and Engineering, Water Resources of Tulare County and Their Utilization: Bull. No. 3, 1922.
8. Calif. Dept. Pub. Wks., Div. of Irrigation and Engineering, Water Resources of California: Bull. No. 4, 1923.
9. Calif. Dept. Pub. Wks., Div. of Water Rights, San Gabriel Investigation, Basic Data, Analysis and Conclusions: Bull. Nos. 5, 6, 7, 1923-1929.
10. Calif. Dept. Pub. Wks., Div. of Irrigation and Engineering, Ground Water Resources of Southern San Joaquin Valley: Bull. No. 11, 1927.
11. Calif. Dept. Pub. Wks., Div. of Irrigation and Engineering, Santa Ana Investigation, Flood Control and Conservation: Bull. No. 19, 1928.
12. Calif. Dept. Pub. Wks., Div. of Water Resources, Sacramento River Basin: Bull. No. 26, 1931.
13. Calif. Dept. Pub. Wks., Div. of Water Resources, Economic Aspects of a Salty Water Barrier Below Confluence of Sacramento and San Joaquin Rivers: Bull. No. 28, 1931.
14. Calif. Dept. Pub. Wks., Div. of Water Resources, San Joaquin River Basin: Bull. No. 29, 1931.
15. Calif. Dept. Pub. Wks., Div. of Water Resources, Santa Ana River Basin: Bull. No. 31, 1930.
16. Calif. Dept. Pub. Wks., Div. of Water Resources, South Coastal Basin, a Cooperative Symposium: Bull. No. 32, 1930.
17. Calif. Dept. Pub. Wks., Div. of Water Resources, South Coastal Basin Investigation, Quality of Irrigation Waters: Bull. No. 40, 1933.
18. Calif. Dept. Pub. Wks., Div. of Water Resources, Santa Clara Investigation: Bull. No. 42, 1933.
19. Calif. Dept. Pub. Wks., Div. of Water Resources, South Coastal Basin Investigation, Geology and Ground Water Storage Capacity of Valley Fill: Bull. No. 45, 1934.
20. Calif. Dept. Pub. Wks., Div. of Water Resources, Ventura County Investigation: Bull. No. 46, 1933.
21. Calif. Dept. Pub. Wks., Div. of Water Resources, Mojave River Investigation: Bull. No. 47, 1934.
22. Calif. Dept. Pub. Wks., Div. of Water Resources, San Diego Investigation: Bull. 48, 1935.
23. Calif. Dept. Pub. Wks., Div. of Water Resources, San Luis Rey Investigation: Bull. No. 48-A, 1936.
24. Calif. Dept. Pub. Wks., Div. of Water Resources, Report of Referee, City of Pasadena vs. City of Alhambra: March 1943.
25. Calif. Dept. Pub. Wks., Div. of Water Resources, Salinas Basin Investigation: Bull. No. 52, 1946.
26. Calif. Dept. Pub. Wks., Div. of Water Resources, South Coastal Basin Investigation, Overdraft on Ground Water Basins: Bull. No. 53, 1947.
27. Calif. Dept. Pub. Wks., Div. of Water Resources, Sea-Water Intrusion into Ground Water Basins Bordering the California Coast and Inland Bays: Water Quality Invest. Report No. 1, Dec. 1950.
28. Calif. State Water Resources Board, Water Resources of California: Bull. No. 1, 1951.
29. Calif. State Water Resources Board, Report on Central Basin: Bull. No. 8, 1952.
30. Calif. Dept. Pub. Wks., Div. of Water Resources, Preliminary Draft of Report of Referee, California Water Service Company, a Corporation, et al., vs. City of Compton, et al., and Alexander Abercromby, et al., Feb. 1952.
31. Clark, W. O., Ground Water in Santa Clara Valley, California: U. S. Geol. Survey, WSP 519, 1924.
32. Ellis, A. J., and Lee, C. H., Geology and Ground Waters of the Western Part of San Diego County, California: U. S. Geol. Survey, WSP 446, 1919.
33. Johnson, H. R., Water Resources of Antelope Valley, California: U. S. Geol. Survey, WSP 278, 1911.
34. Jordan, L. W., and Thayer, W. N., 1937-1938 Report on San Antonio Spreading Grounds Investigations and Ground Water Fluctuations in the San Antonio Basins: Los Angeles County Flood Control District, April 14, 1939.
35. Laverty, F. B., 1936-1937 Report on San Antonio Spreading Grounds Investigation and Ground Water Fluctuations and Movements in the San Antonio Basins: Los Angeles County Flood Control District, October 1937.
36. Lee, C. H., An Intensive Study of the Water Resources of a Part of Owens Valley, California: U. S. Geol. Survey, WSP 294, 1912.
37. Lee, W. T., Geology and Water Resources of Owens Valley, California: U. S. Geol. Survey, WSP 181, 1906.
38. Mendenhall, W. C., and others, Ground Water in San Joaquin Valley, California: U. S. Geol. Survey, WSP 398, 1916.
39. Piper, A. M., Gale, H. S., Thomas, H. E., and Robinson, T. W., Geology and Ground Water Hydrology of the Mokelumne Area, California: U. S. Geol. Survey, WSP 780, 1939.
40. Poland, J. F., Ground Water in California: Trans. AIME, Vol. 187, Feb. 1950.
41. Thompson, D. G., The Mojave Desert Region, California: U. S. Geol. Survey, WSP 578, 1929.
42. Waring, G. A., Ground Water in the San Jacinto and Temecula Basin, California: U. S. Geol. Survey, WSP 429, 1919.



## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS

Completed Subsequent to January, 1937 \*

- A**
- Agnew, H. W.  
X † Geology of a Part of the Ravenna Quadrangle, Calif.: Calif. Inst. Tech., Masters Thesis, 1948.
- Akman, M. S.  
Am A Map Area South of Spadra, Pomona, Calif.: Calif. Inst. Tech., Masters Thesis, 1943.
- Allen, C. W.  
Ac Structure of the Northwestern Puente Hills, Los Angeles County, Calif.: Calif. Inst. Tech., Masters Thesis, 1949.
- Allen, Harry B.  
Ah Geology of Devils Den District, Northwest Kern Co.: Masters Thesis, 1941, Univ. Calif. at Los Angeles.
- Angel, L. H.  
Al The Geology of a Portion of the St. Helena Quadrangle: Univ. Calif. Masters Thesis, June 1948.
- Arnestad, K. H.  
Ak The Geology of a Portion of the Lompoc Quadrangle: Univ. Calif. Los Angeles, Masters Thesis, 1950.
- B**
- Bailey  
B Geology of New Almaden Quadrangle: U. S. Geol. Survey, Unpublished Report. Date Unknown.
- Bailey, E. H.  
Beh Mineralogy, Petrology, and Geology of Santa Catalina Island: Stanford Univ., Ph. D. Thesis, 1941.
- Barnard, Ralph M.  
Geology of the Ricardo Beds in the Western Portion of Saltdale Quadrangle, Kern County, Calif.: Univ. Southern California, Masters Thesis, 1950.
- Baudino, F. J.  
Bf The Geology of the Glendale Quadrangle, Los Angeles County: Univ. South. Calif. Masters Thesis, Date Unknown.
- Bettinger, Charles E.  
Bc The Geology of Portions of Beartrap Canyon and Quail Quadrangles: Univ. South. Calif., Masters Thesis, June 1948.
- Birman, J. H.  
X Geology of the Upper Tick Canyon Area: Calif. Inst. Tech., Masters Thesis, 1950.
- Bishop, William C.  
Bw Geology of the Southern Flank of the Santa Susana Mountains: Univ. Calif. Los Angeles, Masters Thesis, 1950.
- Booth, C. V.  
Bc Geology of the West Central Portion of the Orestimba Quadrangle: Univ. Calif., Masters Thesis, Jan. 1950.
- Bowen, O. E.  
Bo-1 Geology of Barstow 30' Quadrangle: Calif. Div. Mines, Unpublished Report. Date unknown.
- Bowen, O. E., Jr.  
Bo-2 Geology of the Sidewinder and Granite Mountains: Univ. Calif., Masters Thesis, June 1950.
- Boyd, H. A.  
Eocene Foraminifera from the Vacaville Shale: Univ. of Calif., Masters Thesis, September 1949.
- Boyd  
B Geology of the Capay Quadrangle: Calif. Div. Mines, Unpublished Report. Date unknown.
- Bradbury, Albert Edward  
Bae Geology of Part of the Parkfield Syncline, Monterey Co.: Stanford Univ., Masters Thesis, 1941.
- Brice, J. C.  
Bj Geology of a Portion of the Lower Lake Quadrangle: Univ. Calif., Masters Thesis, June 1948.
- Brice, J. C.  
Bj Geology of the Lower Lake Quadrangle: Univ. Calif., Ph. D. Thesis, Sept. 1950.
- Briggs, L. I.  
Bl The Geology of the Ortigalita Peak Quadrangle: Univ. Calif., Ph.D. Thesis, Sept. 1950.
- Burnham, W. L.  
Bw Geology and Water Resources of the Etiwanda-Dry Canyon Area, Southeast San Gabriel Mountains, California: Pomona College pamphlet No. 6154, 1951.
- Buwalda, John P.  
Bj-1 Geologic Map of the Mojave Quadrangle: Calif. Inst. Tech. Unpublished Report. Date unknown.
- Buwalda, John P.  
Bj-2 Geologic Map of the Tehachapi Quadrangle: Calif. Inst. Tech. Unpublished Report. Date unknown.
- C**
- Cabeen, W. R.  
X Geology of the Aliso and Browns Canyons Area, Santa Susana Mts.: Calif. Inst. Tech., Masters Thesis. Date unknown.
- Calif. Dept. of Nat. Res., Div. Mines  
DM San Fernando Quadrangle: Unpublished Report. Date unknown.
- Calif. Dept. Public Works, Div. Water Resources  
DWR-1 Geology of Elsinore Basin: Unpublished Report, 1949.
- DWR-2 Geology of Santa Clara Valley: Unpublished Report, 1950.
- DWR-3 Geology of Southern Alameda County, Santa Clara Valley: Unpublished Report, 1950.
- DWR-4 Geology and Well Locations of Farmington-Collegeville Area: Unpublished Report, 1950.
- DWR-5 Geology of Livermore Valley: Unpublished Report, 1950.
- DWR-6 Geology of Sutter-Yuba Counties: Unpublished Report, 1949.
- DWR-7 Geology West Coast Basin, Los Angeles County: Draft of Report of Referee, West Coast Basin Reference, February 1952.
- DWR-8 Geology Tia Juana Basin, San Diego County: Unpublished Report, 1951.
- DWR-9 Geology El Cajon Valley: Unpublished Report, 1951. Report to the Assembly of the State Legislature on Water Supply of Antelope Valley in Los Angeles and Kern Counties Pursuant to House Resolution No. 101 of February 16, 1946: Mimeographed Report, February 16, 1946.
- Report on the Water Supply, Sewage Disposal, Flood Control and Foundation Problems at the California Institution for Women Near Tehachapi, Kern County: Mimeographed Report, July 1950.
- Report to San Francisco Bay Regional Water Pollution Control Board on Disposal of Surface Drainage by Means of Wells, Hayward Area, Alameda County: Letter Report, July 1950.

\* See Calif. Dept. Nat. Res., Div. of Mines, Geologic Formations and Economic Development of the Oil and Gas Fields of California: Bull. 118, March 1943, for reports prior to January 1937.

† Bibliographic reference identifies area covered by report on Plate 3. If bibliographic reference is omitted, the reference does not appear on index map. (Plate 3).

## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS—Continued

- Report to San Francisco Bay Regional Water Pollution Control Board on Disposal of Surface Drainage by Means of Wells, Shinn Tract No. 623, Alameda County: Letter Report, August 1950.
- Report to San Francisco Bay Regional Water Pollution Control Board on Disposal of Surface Drainage by Means of Wells, Centerville Area, Alameda County: Letter Report, January 16, 1951.
- Report to San Francisco Bay Regional Water Pollution Control Board on Disposal of Surface Drainage by Means of Wells, Mountain View Area, Santa Clara County: Letter Report, February 13, 1951.
- Report to San Francisco Bay Regional Water Pollution Control Board on Disposal of Septic Tank Effluent by Means of Wells, Fanslow Subdivision, Napa County: Letter Report, April 17, 1951.
- Report to North Coastal Regional Water Pollution Control Board on Boron Pollution in Ground Water, Regina Heights Area, Ukiah Valley, Mendocino County: Letter Report, April 26, 1951.
- First Progress Report to Santa Ana Regional Water Pollution Control Board on Survey of Oil Industry Wastes in Orange County: Mimeographed 1951.
- Report to Central Coastal Regional Water Pollution Control Board on Geology and Hydrology of the Santa Margarita Formation, San Lorenzo River, Santa Cruz County: Mimeographed Report, June 1951.
- Report to State Water Resources Board on Proposed Investigational Work for Control and Prevention of Sea-Water Intrusion into Ground Water Basins: Mimeographed Report, August 1951.
- Report to Central Coastal Regional Water Pollution Control Board on Influence of Industrial Waste Discharges Upon Ground Waters in Lower Valley of Salinas River, Monterey County: Mimeographed Report, October 1951.
- First Progress Report to Central Coastal Regional Water Pollution Control Board on Survey of Oil Industry Waste Disposal Practices in Central Coastal Region: Mimeographed Report, January 1952.
- Report to Central Valley Regional Water Pollution Control Board on Marsh Creek Investigation: Mimeographed Report, January 1952.
- First Progress Report to Los Angeles Regional Water Pollution Control Board on Investigation of Safe Dump Sites in South Coastal Basin Within Los Angeles Region: Mimeographed Report, January 1952.
- Report to Central Valley Regional Water Pollution Control Board on Pollution Survey of Tehachapi Creek Spring Area: Mimeographed Report, February 1952.
- Report to Central Coastal Regional Water Pollution Control Board on Effect of Waste Discharge from Union Sugar Refinery on Ground Water, Betteravia, Santa Barbara County: Mimeographed Report, March 1952.
- Report to Los Angeles Regional Water Pollution Control Board on Laguna Wash Investigation, Los Angeles County: Mimeographed Report, March 1952.
- Report to San Diego Regional Water Pollution Control Board on Investigation of Possible Boron Pollution From Orange Packing Plants at Escondido, San Diego County: Mimeographed Report, March 1952.
- Report to Central Coastal Regional Water Pollution Control Board on Effect of Waste Discharge From Spreckels Sugar Refinery on Ground Water, Spreckels, Monterey County: Mimeographed Report, April 1952.
- Report to Santa Ana Regional Water Pollution Control Board on Geology, Hydrology and Water Quality of Warm Creek, San Bernardino County: Mimeographed Report, April 1952.
- First Progress Report to Los Angeles Regional Water Pollution Control Board on Ventura County Oil Waste Investigation: Mimeographed Report, May 1952.
- Report to North Coastal Regional Water Pollution Control Board on Effect of Winery Waste Disposal on Ground Water, Sonoma County: Mimeographed Report, June 1952.
- Report to Santa Ana Regional Water Pollution Control Board on Lake Elsinore Salinity Investigation, Riverside County: Mimeographed Report, June 1952.
- Report to North Coastal Regional Water Pollution Control Board on Ground Water Conditions, Smith River Plain, Del Norte County: Letter Report, June 1952.
- Report to Los Angeles Regional Water Pollution Control Board on Investigation of Los Angeles River, Los Angeles County: Mimeographed Report, September 1952.
- Preliminary Memorandum Report on Ventura County Water Plan With Particular Reference to Proposed Water Conservation Developments on Sespe and Piru Creeks: September 1952.
- Carter, W. H.  
Cw The Geology of the Northeast Corner of the Calistoga Quadrangle: Univ. Calif., Masters Thesis, Feb. 1948.
- Cebeci, A.  
The Study of Quartz Deposits near Highway Highlands, Los Angeles, Calif.: Calif. Inst. Tech., Masters Thesis, 1944.
- Chambers, Earl F.  
Ce Geology of Portions of the Whitaker Peak and Beartrap Canyon Quadrangles: Univ. South. Calif., Masters Thesis, June 1947.
- Church, Victor  
Cv The Structure and Stratigraphy of the Upper Cretaceous near Redding: Calif. Inst. Tech., Masters Thesis, 1937.
- Clark, A. W.  
Ca Geology of a Portion of the St. Helena Quadrangle: Univ. Calif., Masters Thesis, Feb. 1948.
- Clements  
C The Geology of the Branch Mt. Quadrangle: Calif. Div. Mines, Unpublished Report.
- Collins, D. F.  
Cd The Geology of the Southern Third of the Crestimba Quadrangle: Univ. Calif., Masters Thesis, June 1950.
- Conrad, Stanley D.  
Cs Eastern Portion of the Simi Hills: Univ. Calif. Los Angeles, Masters Thesis, 1949.
- Conrey, B. L., Jr.  
Cb Geology of a Southern Portion of the Morgan Valley Quadrangle: Univ. Calif., Masters Thesis, June 1948.
- Cooper, J. C. and Kelly, R. B.  
Cje Geology of a Portion of the Santa Susanna Quadrangle: Univ. Calif. Los Angeles, Masters Thesis, 1941.
- Crowell, J. C.  
Cj Geology of the Tejon Pass Region: Univ. Calif. Los Angeles, Ph. D. Thesis, 1947.

## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS—Continued

- Crume, Robert W.  
Cr The Arenal Sandstone (Middle Eocene) of Reef Ridge: Stanford Univ., Masters Thesis, 1940.
- Curran, John Franklin  
Cjf Eocene Stratigraphy of Chico Martinez Creek Area, Kern Co.: Stanford Univ., Masters Thesis, 1942.
- Curtis, G. M.  
Cg Geology of the Topaz Lake and Western Part of Ebbets Pass Quadrangle: Univ. Calif., Ph. D. Thesis, June 1951.
- Cutsforth, D. H.  
Geology of a Portion of the San Jose Hills: Calif. Inst. Tech., Masters Thesis, 1942.
- D**
- Daley, A. C. and Poole, D. M.  
Da A Geologic Section in East-Central Calif. Eastward from Donner Pass: Univ. Calif., Masters Thesis, June 1951.
- Darrow, R. L.  
Drl The Geology of the Northwest Part of the Montana Mt. Quadrangle: Univ. Calif., Masters Thesis, June 1951.
- Davies, Stephen N.  
Contact Relationship Between Mint Canyon Formation and Upper Miocene Marine Beds in Eastern Ventura Basin, Los Angeles County, California: Univ. Calif. Los Angeles, Masters Thesis, 1942.
- Day, David W.  
Dd The Geology of a part of the Mt. Vaca Quadrangle: Univ. Calif., Masters Thesis, 1948.
- Dehlinger, P.  
A Magnetic Survey of Sand Canyon, for Placer Deposits, San Gabriel Mtns., Calif.: Calif. Inst. Tech., Masters Thesis, 1943.
- Delinger, P.  
The Relationship of the Modelo and Ridge Route Formations in the Southern Ridge Basin: Calif. Inst. Tech., Ph. D. Thesis, 1950.
- De Long, James H.  
Dj The Paleontology and Stratigraphy of the Pleistocene at Signal Hill: California. Inst. Tech., Masters Thesis, 1939.
- Dibblee, T. W.  
Dt-1 The Geology of Breckenridge Mt. Quadrangle: Calif. Div. Mines, Unpublished Report. Date unknown.
- Dibblee, T. W.  
Dt-2 The Geology of the Saltdale Quadrangle: Calif. Div. Mines, Unpublished Report. Date unknown.
- Dibblee, T. W.  
Dt-3 Geology of Opal Mountain Quadrangle: U. S. Geological Survey, Unpublished Report, 1950.
- Dibblee, T. W.  
Dt-4 Geology of Opal Mountain Quadrangle: Calif. Div. of Mines, Publication Date Unknown.
- Dibblee, T. W.  
Dt-5 Geology of Fremont Peak Quadrangle: Calif. Div. of Mines, Publication Date Unknown.
- Dolton, G. L.  
Dg Geology of the Dana Point Region, Orange County, Calif.: Pomona College pamphlet No. 6150, 1951.
- Dort, W., Jr.  
X Geology of a Portion of Eastern Ventura Basin, Calif.: Calif. Inst. Tech., Masters Thesis, 1948.
- Drouillard, Kieth  
Dk The Geology of the Packwood Quadrangle: Univ. Calif. Masters Thesis, 1950.
- Dunn, James R.  
Geology of the Western Mono Lake Area; Div. of Mines, Publication Date Unknown. Univ. of Calif. Ph.D. Thesis.
- E**
- Edmundson, J. W.  
X A Study of the Subsurface Conditions Prevailing in the Newhall-Potrero Oil Field: Calif. Inst. Tech., Masters Thesis, 1947.
- Edwards, C. D.  
Ec Geology of the Del Valle Area, Los Angeles Co., Calif.: Calif. Inst. Tech., Masters Thesis, 1947.
- Elam, Jack G.  
Ej Geology of the Seminole Quadrangle: Univ. Calif., at Los Angeles, Masters Thesis, 1948.
- Evans, M. H.  
Em The Geology and Ore Deposits of the Manzana Quadrangle, Los Angeles County; Calif. Inst. Tech., Masters Thesis, Date Unknown.
- F**
- Fielder, Wm. M.  
Fw Structure and Stratigraphy of a Section Across the White Mts.: Calif. Inst. Tech., Masters Thesis, 1937.
- Ford, Waldo E.  
X Geology and Oil Resources of a Portion of the Newhall District: Univ. Calif. Los Angeles, Masters Thesis, 1941.
- Frederick and Chesterman, C. W.  
F, Cc The Geology of Masonic Mt. Quadrangle: Calif. Div. Mines, Unpublished Report. Date unknown.
- G**
- Gallihier, E. Wayne  
Geology of Carbona Quadrangle: Stanford Univ., Masters Thesis, date unknown.
- Goss, C. R.  
Gc Geology of the Southwest Corner of the Calistoga Quadrangle: Univ. Calif., Masters Thesis, Feb. 1948.
- Graham, D. H.  
Gd Geology and Petroleum Possibilities of a Part of the Huasana District: Univ. Calif. Los Angeles, Masters Thesis, date unknown.
- Graham, Joseph J.  
The Stratigraphy and Micropaleontology of the Type Meganos Formation (Eocene), Contra Costa County, California: Calif. Div. of Mines, Publication Date Unknown, Ph.D. Thesis, Univ. of California.
- Gray, C. H.  
Gc Geology of Northeast Santa Ana Mountains: Pomona College, 1951.
- Green, Charles Frederick  
Gc Eocene and Cretaceous Stratigraphy of the Laguna Seca Hills, Merced Co.: Stanford Univ., Masters Thesis, 1942.
- Greenwood, R.  
Gr Geology of the Sugar Pine Area, Madera Co., Calif.: Calif. Inst. Tech., Masters Thesis, 1943.
- Guillou, Robert Barton  
Gr The Geology of the Johnston Grade Area, San Bernardino Mts.; Univ. Calif. Los Angeles, Masters Thesis, date unknown.
- H**
- Hacker, R. W.  
Hr The Geology of the Northwest Corner of the Orestimba Quadrangle: and the Northeast Corner of the Mt. Boardman Quadrangle: Univ. Calif., Masters Thesis, Jan. 1950.
- Halsey, J.  
Hj Geology of Wheeler Pk. and Desert Creek Pk.: Univ. Calif., Ph.D. Thesis, 1950.

## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS—Continued

- Ham, C. K.  
Hc Geology of Las Trampas Ridge Quadrangle: Univ. Calif., Masters Thesis, June 1951.
- Hamilton, Warren B.  
Granitic Rocks of the Huntington Lake Area, Fresno County, California: Univ. Calif. Los Angeles, Ph.D. Thesis 1951.
- Handin, John Walter  
The Source, Transportation, and Deposition of Beach Sediments in Southern California: Univ. Calif. Los Angeles, Ph.D. Thesis, 1949.
- Harris, Herbert  
Hh Geology of Palomas Canyon—Castaic Creek Area, Los Angeles Co.: Univ. Calif. Los Angeles, Masters Thesis, 1950.
- Harris, P. B.  
Hp Geology of the Tunis-Pastoria Creek Area, Kern County, Calif.: Calif. Inst. Tech., Masters Thesis, 1950.
- Hays, W. H.  
Hw Geology of Cottonwood Springs and Part of Coachella Quadrangles: Yale University, Ph.D. Thesis, 1951.
- Hazenbush, George C.  
Hg The Geology of Dry Creek Canyon: Univ. Calif. Los Angeles, Masters Thesis, 1950.
- Hedden, A. H., Jr.  
X Geology of the Upper Tick Canyon Area, Los Angeles County, Calif.: Calif. Inst. Tech., Masters Thesis, 1948.
- Hendry, N. W., and Wilson, H. D. B.  
Hn, Wh Geology and Quicksilver Deposits of the Coso Hot Springs Area: Calif. Inst. Tech., Masters Thesis, 1939.
- Henshaw, P. C.  
Hpc Geology and Mineral Deposits of the Cargo Muchacho Mountains, Imperial County, Calif.: Calif. Inst. Tech., Masters Thesis, 1940.
- Herrera, Leo J.  
Hl The Geology of the Tent Hills Quadrangle: Univ. Calif., Masters Thesis, 1949.
- Herron, Robert F.  
Geology of the Highland-San Juan Creek Region, San Luis Obispo County: Calif. Dept. Nat. Res. Div. of Mines (publication date unknown).
- Hewett, D. F.  
Hd Geologic Maps of Tecopa Pass Quadrangle and Kingston Pk. Quadrangle: U. S. Geologic Survey, Unpublished Report, date unknown.
- Higgins, C. G.  
Hc The Geology of the Lower Russian River: Univ. Calif., Masters Thesis, June 1950.
- Higgs, Donald V.  
Hd Anorthosite and Related Rocks of the Western San Gabriel Mountains, Southern California: Univ. Calif. Los Angeles, Ph.D. Thesis 1950.
- Hill, H. S.  
Petrography of the Pelona Schists: Pomona College, Masters Thesis, 1939.
- Hollister, Walter F.  
Geology and Ore Deposits of the Shasta Gold District: Calif. Dept. Nat. Res., Div. of Mines, (publication date unknown).
- Holloway, J. M.  
X Areal Geology and Contact Relations of the Basement Complex and Later Sediments, West end of the San Gabriel Mountains: Calif. Inst. Tech., Masters Thesis, 1940.
- Holser, W. T.  
X Geology of the Mint Canyon Area, Los Angeles County, California: Calif. Inst. Tech., Masters Thesis, 1946.
- Hurlbut, E. M., Jr.  
He The Geology of the Calistoga Quadrangle: Univ. Calif., Masters Thesis, Feb. 1948.
- I
- Irwin, W. P.  
X The Vasquez Series in Upper Tick Canyon Area, Los Angeles County: Calif. Inst. Tech., Masters Thesis, 1950.
- Isaacs, K. N.  
Ik Geology of the Northern Portions of the Commatti Canyon and Grant Lake Quadrangles: Univ. Calif., Masters Thesis, Feb. 1951.
- J
- Jahns, R. H.  
X Stratigraphy of the Easternmost Ventura Basin: Calif. Inst. Tech., Ph.D. Thesis, 1943.
- Johnson, Robert F.  
Geology of the Masonic Mining District, Mono County, Calif.: Calif. Dept. Nat. Res., Div. of Mines, (publication date unknown). Univ. Calif., Masters Thesis, 1951.
- Johnson, Robert L.  
Jrl Geology of a Portion of the Western Verdugo Mountains: Univ. Calif. Los Angeles, Masters Thesis, date unknown.
- Johnston, S.  
Js The Geology of a Portion of the Calistoga Quadrangle: Univ. Calif., Masters Thesis, Feb. 1948.
- Jordan, J. T.  
Jj Geology of the Cactus Mines, Rosamond, Kern County, California: Calif. Inst. Tech., Masters Thesis, 1941.
- K
- Karubian, R. Y.  
Kr Surface and Subsurface Geology of Montebello Hills: Calif. Inst. Tech., Masters Thesis, 1939.
- Kelley, V. C.  
Kv Geology and Ore Deposits of the Darwin Silver-Lead Mining District, Inyo County, Calif.: Calif. Inst. Tech., Masters Thesis, 1937.
- Kemnitzer, L. E.  
Kl Structural Studies in the Whipple Mountains, Southeast Calif.: Calif. Inst. Tech., Ph.D. Thesis, 1937.
- Kupfer, Donald H.  
Kd-1 Geology of the Colemanite District near Stauffer, Ventura Co.: Univ. Calif. Los Angeles, Masters Thesis, 1942.
- Kupfer, Donald  
Kd-2 Eastern Half of Silurian Hills Quadrangle: Div. of Mines, Unpublished Report, date unknown.
- L
- Lemmon, Dwight M.  
Ld Geology of the Andalusite Deposits in Northern Inyo Range: Stanford Univ., Ph.D. Thesis, 1937.
- Levet, M. A.  
Lm Geology of the San Juan Canyon Area: Calif. Inst. Tech., Masters Thesis, 1940.
- Lvorsen, Robert D.  
Geology of the Las Lajas Canyon Region: Univ. Calif. Los Angeles, Masters Thesis, 1947.

## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS—Continued

- Lewis, L. A.  
Ll Geology of the Northern Part of the Santa Ana Mountains, Orange County, Calif.: Calif. Inst. Tech., Masters Thesis, 1941.
- Lewis, W. D.  
X The Geology of the Upper Las Llayas Canyon Area, Santa Susana Mountains, Calif.: Calif. Inst. Tech., Masters Thesis, 1940.
- Loof-bourow, John S.  
Lj Geology of a Portion of the Santa Paula Quadrangle: Univ. Calif. Los Angeles, Masters Thesis, 1941.
- M
- Martin, J. S.  
X Geology of the Dry Canyon Area in the Eastern Section of the Ventura Basin, Calif.: Calif. Inst. Tech., Masters Thesis, 1947.
- Masson, P. H.  
Mp Geology of the Gunsight Peak District, Siskiyou County: Univ. Calif., Masters Thesis, June 1949.
- McAllister, J. F.  
Rocks and Structure of the Quartz Spring Area, Northern Panamint Range, California: Calif. Dept. Nat. Res., Div. of Mines (publication date unknown).
- McCulloh, T. H.  
Mt-1 Geology of Lane Mountain Quadrangle: Univ. Calif. at Los Angeles, Ph.D. Thesis, 1952.
- McCulloh, T. H.  
Mt-2 Geology of a Portion of the Lane Mountain Quadrangle: Pomona College Pamphlet, 4718, 1949.
- McCulloh, T. H.  
Mt-3 Geology of the Vicinity of Buzzard Peak, San Jose Hills, Calif.: Pomona College Geology Pamphlet, 4660, 1948.
- McGill, John T.  
Mj-1 Geology of a Portion of Las Flores and Dry Canyon Quadrangles: Univ. Calif. Los Angeles, Masters Thesis, 1948.
- McGill, John T.  
Mj-2 Quaternary Geology of the North Central San Emiyocho Mountains: Univ. Calif., Los Angeles, Ph.D. Thesis, 1951.
- Mann, John F.  
Late Cenozoic Geology of a Portion of the Elsinore Fault Zone, Southern California: Univ. of Southern Calif., Ph.D. Thesis, 1951.
- Maynard, Robert G.  
Geology of the Tropic Mine, Rosamond, California: Univ. Calif., Los Angeles: Masters Thesis, 1947.
- Menard, H. W.  
Geology of the Aqua Dulce Canyon Area, Los Angeles County: Calif. Inst. Tech., Masters Thesis, 1947.
- Merriam, Patricia D.  
Geology of the El Segundo Sand Hills: Univ. Southern California, Masters Thesis, 1949.
- Moore, R. F.  
Geology of the Pre-Cretaceous Rocks in a Portion of the Santa Ana Mountains: Calif. Inst. Tech., Masters Thesis, 1948.
- N
- Nelson, Graham  
Geology of the Northwestern Portion of Soledad Mountain, Kern County, Calif.: Univ. Southern California, Masters Thesis, 1940.
- Neuerburg, George J.  
Petrology of the Pre-Cretaceous Rocks of the Santa Monica Mountains, California: Univ. California, Los Angeles. Ph.D. Thesis, 1951.
- Newton, R. J.  
Nr The Geology Northwest of Dublin, Calif., in the Vicinity of Divide Range: Univ. Calif., Masters Thesis. Sept. 1948.
- Norris, Robert M.  
The Geology of a Portion of the Western Santa Ynez Range, Santa Barbara County, California. Univ. Calif., Los Angeles, 1949.
- O
- O'Bert, Lawrence Kay  
Ol Geology of a Portion of the Dry Canyon and Las Flores Quadrangles Santa Monica Mountains: Univ. South. Calif., Masters Thesis, Jan. 1948.
- Ogle, B. A.  
Ob The Geology of Ferndale and Fortuna Quadrangles: Calif. Div. Mines, Unpublished Report, 1951.
- Oliver, Garnet W.  
Ogw Geology of a Part of the Santa Paula Quadrangle: Univ. Calif. Los Angeles, Masters Thesis, 1940.
- Ortalda, R. A.  
Or Geology of the Northern Part of the Morgan Hill Quadrangle: Univ. Calif., Masters Thesis, Jan. 1950.
- Otte, C., Jr.  
X Geology of the Upper Tick Canyon Area, Los Angeles County, Calif.: Calif. Inst. Tech., Masters Thesis, 1950.
- P
- Paguirigan, Francisco  
Pf Geologic Investigation of the San Pedro Point Area: Stanford Univ., Masters Thesis, 1941.
- Pampeyan, E. H.  
Pe Geology and Mineralogy of the Northeastern Juropa Mountains: Pomona College Pamphlet No. 6155, 1951.
- Parsons, J. H.  
Pj Geology and Paleontology of Repetto Hills, California: Pomona College Pamphlet, 5007, 1950.
- Parsons, Robert L.  
Geology and Ore Deposits of the Neenach Mining District of California: Univ. Southern California: Masters Thesis, 1937.
- Pelline, J. E.  
Pje Geology of the Adjacent Parts of Las Flores and Topanga Quadrangles: Univ. Calif. Los Angeles, Masters Thesis, 1951.
- Peryam, Richard C.  
Pr The Geology of the Annette Quadrangle: Univ. Calif., Masters Thesis, 1949.
- Pfaffman, George A.  
The Geology of the Martinez Formation of the Tejon and Elizabeth Lake Quadrangles, California: Univ. Southern California, Masters Thesis, 1941.
- Pierce, Jack Williams  
Salt Water Infiltration into the Alameda County Water District; Stanford Univ., Masters Thesis, 1948.
- Poland, J. F.  
Ground Water Conditions in Ygnacio Valley, California: Stanford Univ. Masters Thesis, March, 1935.
- Putnam, W. C.  
Geology of the Mono Craters, Calif.: Calif. Inst. Tech., Ph. D. Thesis, 1937.

## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS—Continued

- Q**
- Quarles, M., Jr.  
Qm Geology of the Repetto and Montebello Hills: Calif. Inst. Tech., Masters Thesis, 1941.
- R**
- Regan, L. J.  
The Composition, Texture, Structure and Probable Origin of the Gatchell Sand: Calif. Inst. Tech., Masters Thesis, 1941.
- Roberts, William B.  
Geology of a Part of the Rosamond Hills Area, Kern County, California: Calif. Inst. Tech., Masters Thesis, 1951.
- Rupnik, J. J.  
Rjj Geology of the Wiley Canyon Area, Oak Ridge Anticline, Ventura Co., Calif.: Calif. Inst. Tech., Masters Thesis, 1941.
- S**
- Samsel, H. S.  
Geology of the Cross Mountain Quadrangle: Div. of Mines, Unpublished Report, 1951.
- Shultz, J. R.  
Geology of the White Point Outfall Sewer Tunnel: Calif. Inst. Tech., Ph. D. Thesis, 1937.
- Simonson, Russell R.  
Conglomerates of the Sespe and Topanga Formations of Dry Canyon Quadrangle: Univ. Calif. Los Angeles. Date unknown.
- Stemmons, B.  
Sb Geology of Dardanelles Cone and Sonora Pass Quadrangles: Univ. Calif., Ph. D. Thesis, 1951.
- Smith, George I.  
The Geology of the Cache Creek Region, Kern County, California: Calif. Inst. Tech., Masters Thesis, 1951.
- Smith, R. J.  
Geology of Portions of the Humphreys and Sylmar Quadrangles, Los Angeles Co.: Calif. Inst. Tech., Masters Thesis, 1948.
- Smith, Victor M.  
Geology of the Upper Castaic Creek Region, Los Angeles County, California: Univ. Calif. Los Angeles, Masters Thesis, 1951.
- Stark, Howard  
Geology and Paleontology of Northern Whittier Hills: Pomona College, Masters Thesis, 1949.
- Stevenson, E.  
The Cretaceous Stratigraphy of the Southern Santa Ana Mountains, Calif.: Univ. Calif. Los Angeles: Masters Thesis, 1948.
- Sullwold, H. H.  
Shh Geology of a Portion of the San Joaquin Hills, Orange County: Univ. Calif. Los Angeles, Masters Thesis, 1940.
- Susuki, Takeo  
Stratigraphic Paleontology of the Topanga Formation at the Type Locality, Santa Monica Mountains: Univ. Calif. Los Angeles, Masters Thesis, 1951.
- Swinney, C. M.  
Sc Geology and Petrology of the Sonora Quadrangle: Stanford Univ., Ph. D. Thesis, Aug. 1949.
- T**
- Taliaferro, N. L.  
Tn-1 Geology of the Adelaida Quadrangle: Univ. of Calif., Unpublished report, date unknown.
- Taliaferro, N. L.  
Tn-2 Geology of the Cholame Quadrangle: Univ. of Calif., Unpublished report, date unknown.
- Taliaferro, N. L.  
Tn-3 Geology of the Lodoga Quadrangle: Univ. of Calif., Unpublished report, date unknown.
- Taliaferro, N. L.  
Tn-4 Geology of Morgan Valley Quadrangle: Univ. of California Unpublished report, date unknown.
- Taliaferro, N. L.  
Tn-5 Geology of Nipoma Quadrangle: Univ. of California Unpublished report, date unknown.
- Taliaferro, N. L.  
Tn-6 Geology of Paso Robles Quadrangle: Univ. of California Unpublished report, date unknown.
- Taliaferro, N. L.  
Tn-7 Geology of St. Helena Quadrangle: Univ. of California Unpublished report, date unknown.
- Taliaferro, N. L.  
Tn-8 Geology of Wilbur Springs Quadrangle: Univ. of California Unpublished report, date unknown.
- Taylor, James C.  
Tj Geology of Camp Pendleton Area, San Diego County: Pomona College, 1950.
- Terpening, John N.  
Tj Geology of Part of Eastern Santa Monica Mountains: Univ. of California, Los Angeles, Masters Thesis, June 1951.
- Tovell, W. M.  
Geology of the Nodular Shale of the Middle and Upper Miocene of the Western Los Angeles Basin: Calif. Inst. Tech., Masters Thesis, 1942.
- Townsend, James R.  
X The Newhall Quadrangle: Univ. of Calif. Los Angeles, Master's Thesis, 1940.
- Travis, R. B.  
Tr The Geology of the Sebastopol Quadrangle: Univ. Calif., Ph.D. Thesis, 1951.
- Traxler, J. D.  
Tjd Geology of the East Central Santa Monica Mountains: Univ. Calif. Los Angeles, Masters Thesis, 1948.
- Truex, John N.  
Tjn Geology of the Northern Part of the Santa Monica Mountains: Univ. Calif. Los Angeles, Masters Thesis, 1950.
- U**
- U. S. Dept. of Interior, Bureau of Reclamation  
USBR-1 Annual Report on Upper Sacramento Valley Ground Water Conditions: 1948.
- USBR-2 Geologic Study of Tranquillity Irrigation District: 1951.
- USBR-3 Geologic Study of the Orange Grove Irrigation District: Mimeographed Report, Aug. 15, 1947.
- USBR-4 Technical Studies in Support of Factual Report—Stone Coral Irrigation District: Mimeographed Report, Nov. 1950.
- USBR-5 Technical Studies in Support of Factual Report—Ivanhoe Irrigation District: Mimeographed Report, April 1949.
- USBR-6 Technical Studies in Support of Factual Report—Tulare Irrigation District: Mimeographed Report. Date unknown.
- USBR-7 Technical Studies in Support of Factual Report—Exeter Irrigation District: Mimeographed Report. Nov. 1949.
- USBR-7 Geologic Study of the Lindmore Irrigation District: Mimeographed Report, June 1948.

## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS—Continued.

- USBR-7 Geologic Study of Lindsay Strathmore Irrigation District: Date unknown.
- USBR-8 Geologic Study of Porterville Irrigation District: 1951.
- USBR-9 Technical Studies in Support of Factual Report—Terra Bella Irrigation District: Mimeographed Report, July 1950.
- USBR-9 Technical Studies in Support of Factual Report, Delano-Earlimart Irrigation District: Mimeographed Report, Dec. 1950.
- USBR-9 Geologic Study of Saucelito Irrigation District: Date unknown.
- USBR-10 Alpaugh Irrigation District: Date unknown.
- USBR-11 Technical Studies in Support of Factual Report, Delano-Earlimart Irrigation District: Dec. 1950.
- USBR-11 Geologic Study of the Southern San Joaquin Municipal Utility District: Mimeographed Report, Feb. 1948.
- USBR-12 Geologic Study of Shafter Wasco Area: 1951.  
Ground Water Investigations in the Central Valley: July 1950.  
Summary of Basic Data Collected During Sacramento River Seepage Investigations: September 1949.  
Water Supply in the Tehama Area: March 1952.  
Survey of Seepage Along the Sacramento River: June 1952.
- U. S. Dept. of Interior, Geological Survey, Ground Water Branch  
GS-1 Hydrology of the Long Beach-Santa Ana Area, Calif., with Special Reference to the Water Tightness of the Newport-Inglewood Structural Zone: Unpublished Water Supply Paper, June 1946.
- GS-2 Geology and Ground Water Resources of the South-Coast Basins of Santa Barbara Co.: Unpublished Water Supply Paper, Dec. 1947.
- GS-3 Ground Water Outflow from the Chino Basin, Calif., and the Controlling Geologic and Hydrographic Conditions: Mimeographed report, August 1949.
- GS-4 Geology, Hydrology, and Chemical Character of the Ground Waters in the Torrance-Santa Monica Area, Los Angeles County: Unpublished Water Supply Paper, May 1948.
- GS-5 Geology and Water Resources of the Santa Ynez River Valley, Santa Barbara County: Water Supply Paper 1107, June 1947.
- GS-6 Geology and Ground Water Resources of the Santa Maria Valley Area, Santa Barbara County: Water Supply Paper 1000, Apr. 1948.
- GS-7 Ground Water in the Cuyama Valley: Unpublished Water Supply Paper, Dec. 1949.
- GS-8 Geologic Map of Sacramento Valley: Unpublished Report, 1951.  
Water Levels in Observation Wells in Santa Barbara County in 1942: Mimeographed Report, July 1943.  
Water Levels in Santa Barbara County in 1944: U. S. Geol. Survey Report, Feb. 1945.  
Withdrawals of Ground Water from the Long Beach-Santa Ana Area, 1932-1941: Mimeographed Report, Nov. 1945.  
Water Levels in Observation Wells in Santa Barbara County in 1945: Mimeographed Report, May 1946.  
Chemical Character of Native and Contaminated Ground Water in the Long Beach-Santa Ana Area: Mimeographed Report, Aug. 1946.  
Water Levels in Observation Wells in Santa Barbara County in 1946: Mimeographed Report, Nov. 1947.
- Report on Water-Power Possibilities of Lower Trinity River: April 1949.
- Water Levels in Observation Wells in Santa Barbara County in 1947: Mimeographed Report, Aug. 1949.
- Water Levels in Observation Wells in Santa Barbara County in 1948: Mimeographed Report, Dec. 1949.
- New Well for Water Supply at Veterans Administration Hospital, Livermore, Calif.: Unpublished Report, 1949.
- Water Levels in Observation Wells in Santa Barbara County in 1949: Mimeographed Report, Nov. 1950.
- Progress Report on the Ground Water Investigation in Solano Co.: Mimeographed Report.
- Geology of Sutter-Yuba Area. Unpublished Report.
- U. S. Dept. of Interior, Geological Survey  
GS-9 East Half of French Gulch, N. W. Quarter of Redding, South Half of Lamoine, S. W. Quarter of Bollibokka Quadrangles: Unpublished Report, date unknown.
- GS-10 N. W., N. E., S. E., Quarters of San Andreas 15' Quadrangle: Unpublished Report, date unknown.
- GS-11 Geologic Maps of Mt. Humphreys, Bishop, Mt. Goddard, and Big Pine Quadrangles: Unpublished Report, date unknown.
- GS-12 Geologic Maps of New York, Butte, and Ubehebe Pk. Quadrangles: Unpublished Report, date unknown.
- GS-13 Geologic Map of the Northern  $\frac{3}{4}$  of Kaiser 30' Quadrangle and NW. Quarter of Mt. Goddard 30' Quadrangle: Unpublished Report, date unknown.
- GS-14 N. W. Quarter of Sonora 30' Quadrangle: Unpublished Report, date unknown.
- V
- Vedder, John G.  
The Eocene and Paleocene of the Northwest Santa Ana Mountains: Pomona College, Masters Thesis, 1950.
- W
- Wagner, Jay  
Wj The Geology of the Sawtooth Ridge Quadrangle: Univ. Calif., Masters Thesis, 1950.
- Wahrhaftig, Clyde  
We Geology of the Southeast Portion of Mt. Lowe Quadrangle: Calif. Inst. Tech., Masters Thesis, 1941.
- Wallace, R. E.  
X Volcanic Tuff Beds of the Mint Canyon Formation: Calif. Inst. Tech., Masters Thesis, 1940.
- Watson, Edward Basset  
We The Geology of a Part of the Metz Quadrangle: Stanford Univ., Masters Thesis, 1948.
- Weise, John H.  
Wj Geology of a Portion of the Santa Paula Quadrangle: Univ. Calif. Los Angeles, Masters Thesis, 1947.
- Welby, C. W.  
We The Geology of the Central Part of the La Panza Quadrangle: Univ. Calif., Masters Thesis, June 1949.
- Wells  
W The Geology of Gasquet Quadrangle: U. S. Geol. Survey, Unpublished Report, date unknown.

## BIBLIOGRAPHY OF UNPUBLISHED GEOLOGIC REPORTS—Continued

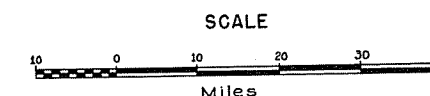
- Wells, J. C.  
Petrology and Structure of the Crystal Lake Area, Los Angeles Co., Calif.: Calif. Inst. Tech., Masters Thesis, 1938.
- Whaley, Harry M.  
Wh - Geology of a Part of the Rock Creek Quadrangle: Univ. Calif. Los Angeles, Masters Thesis, 1937.
- White, R. C.  
X Age of the Modelo in Haskell Canyon, Easternmost Ventura Basin: Calif. Inst. Tech., Masters Thesis, 1947.
- White, W. S.  
X Geology of the Pacoima, Little Tujunga Area, Los Angeles Co., Calif.: Calif. Inst. Tech., Masters Thesis, 1937.
- Wilson, Harry D. B.  
Stratigraphy of the Cretaceous and Eocene Rocks of the Santa Monica Mountains: Calif. Inst. Tech., Ph.D. Thesis. Date unknown.
- Wright, L. A.  
Wl Geology of the Mint Canyon Series and Its Relation to the Modelo Formation and to Other Adjacent Formations: Univ. South. Calif., Masters Thesis, Jan. 1943.
- Y
- Yerkes, R. F.  
Yr Geology of a Portion of the Cajon Pass Area, San Bernardino Co., Calif.: Pomona College, Masters Thesis, 1951.
- Yungul, S.  
Magnetic Survey of the San Gabriel Wash, Los Angeles County, Calif.: Calif. Inst. Tech., Masters Thesis, 1944.
- Z
- Zebal, G. P.  
The Upper Cretaceous Paleontology and Stratigraphy of the Simi Hills, Los Angeles and Ventura Counties, Calif.: Calif. Inst. Tech., Masters Thesis, 1943.
- Zimmerman, John, Jr.  
Zj The Origin of the Tumey Sandstone (Tertiary): Stanford Univ., Masters Thesis, 1942.





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# VALLEY FILL AREAS



Valley areas depicted are those filled with unconsolidated alluvial material which may contain fresh ground water.

## LEGEND

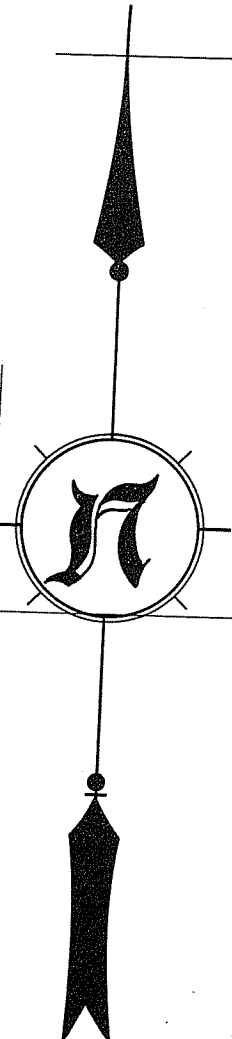
Valley Fill Area & Ground Water Basin Number

Drainage Basin Boundary & Basin Number  
 (Drainage basin numbers conform to the numbering system in Bulletin No. 1 "Water Resources of California" State Water Resources Board 1951.)

### WATER POLLUTION CONTROL REGIONS

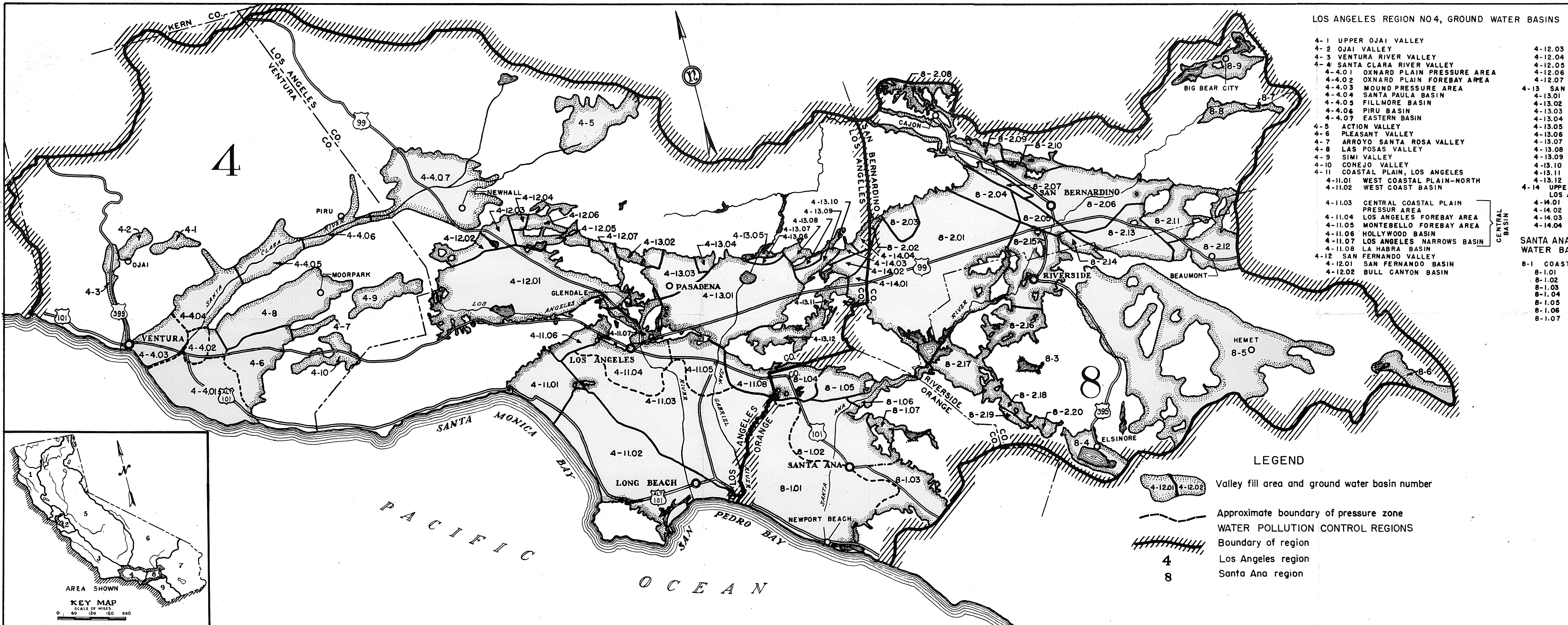
Boundary of Region

- 1 North Coastal Region
- 2 San Francisco Bay Region
- 3 Central Coastal Region
- 4 Los Angeles Region
- 5 Central Valley Region
- 6 Lahontan Region
- 7 Colorado River Basin Region
- 8 Santa Ana Region
- 9 San Diego Region



SEE PLATE 2 FOR DETAIL OF REGIONS 4 & 8





LOS ANGELES REGION NO 4, GROUND WATER BASINS

- 4-1 UPPER OJAI VALLEY
- 4-2 OJAI VALLEY
- 4-3 VENTURA RIVER VALLEY
- 4-4 SANTA CLARA RIVER VALLEY
  - 4-4.01 OXNARD PLAIN PRESSURE AREA
  - 4-4.02 OXNARD PLAIN FOREBAY AREA
  - 4-4.03 MOUND PRESSURE AREA
  - 4-4.04 SANTA PAULA BASIN
  - 4-4.05 FILLMORE BASIN
  - 4-4.06 PIRU BASIN
  - 4-4.07 EASTERN BASIN
- 4-5 ACTION VALLEY
- 4-6 PLEASANT VALLEY
- 4-7 ARROYO SANTA ROSA VALLEY
- 4-8 LAS POSAS VALLEY
- 4-9 SIMI VALLEY
- 4-10 CONEJO VALLEY
- 4-11 COASTAL PLAIN, LOS ANGELES
  - 4-11.01 WEST COASTAL PLAIN-NORTH
  - 4-11.02 WEST COAST BASIN
  - 4-11.03 CENTRAL COASTAL PLAIN PRESSURE AREA
  - 4-11.04 LOS ANGELES FOREBAY AREA
  - 4-11.05 MONTEBELLO FOREBAY AREA
  - 4-11.06 HOLLYWOOD BASIN
  - 4-11.07 LOS ANGELES NARROWS BASIN
  - 4-11.08 LA HABRA BASIN
- 4-12 SAN FERNANDO VALLEY
  - 4-12.01 SAN FERNANDO BASIN
  - 4-12.02 BULL CANYON BASIN

- 4-12.03 SYLMAR BASIN
- 4-12.04 PAGOIMA BASIN
- 4-12.05 TUJUNGA BASIN
- 4-12.06 LITTLE TUJUNGA BASIN
- 4-12.07 VERDUGO BASIN
- 4-13 SAN GABRIEL VALLEY
  - 4-13.01 MAIN SAN GABRIEL BASIN
  - 4-13.02 MONK HILL BASIN
  - 4-13.03 PASADENA SUB-AREA
  - 4-13.04 SANTA ANITA SUB-AREA
  - 4-13.05 UPPER CANYON BASIN
  - 4-13.06 LOWER CANYON BASIN
  - 4-13.07 GLENDORA BASIN
  - 4-13.08 WAY-HILL BASIN
  - 4-13.09 SAN DIMAS BASIN
  - 4-13.10 FOOTHILL BASIN
  - 4-13.11 SPADRA BASIN
  - 4-13.12 PUENTE BASIN
- 4-14 UPPER SANTA ANA VALLEY, LOS ANGELES CO
  - 4-14.01 CHINO BASIN
  - 4-14.02 POMONA BASIN
  - 4-14.03 LIVE OAK BASIN
  - 4-14.04 CLARIMONT HEIGHTS BASIN

- 8-2 UPPER SANTA ANA VALLEY
  - 8-2.01 CHINO BASIN
  - 8-2.02 CLAREMONT HEIGHTS BASIN
  - 8-2.03 CUCAMONGA BASIN
  - 8-2.04 RIALTO BASIN
  - 8-2.05 COLTON BASIN
  - 8-2.06 BUNKER HILL BASIN
  - 8-2.07 LYTLE BASIN
  - 8-2.08 UPPER CAJON BASIN
  - 8-2.09 LOWER CAJON BASIN
  - 8-2.10 DEVIL CANYON BASIN
  - 8-2.11 YUCAIPA BASIN
  - 8-2.12 BEAUMONT BASIN
  - 8-2.13 SAN TIMOTEO BASIN
  - 8-2.14 RECHE CANYON BASIN
  - 8-2.15 RIVERSIDE BASIN
  - 8-2.16 ARLINGTON BASIN
  - 8-2.17 TEMESCAL BASIN
  - 8-2.18 BEDFORD BASIN
  - 8-2.19 COLDWATER BASIN
  - 8-2.20 LEE LAKE BASIN
- 8-3 CAJALCO VALLEY
  - 8-3.01 EL SINORE BASIN
  - 8-3.02 SAN JACINTO BASIN
  - 8-3.03 HEMET LAKE VALLEY
  - 8-3.04 BIG MEADOWS VALLEY
  - 8-3.05 SEVEN OAKS VALLEY
  - 8-3.06 BEAR VALLEY

SANTA ANA REGION NO 8, GROUND WATER BASINS

- 8-1 COASTAL PLAIN, ORANGE COUNTY
  - 8-1.01 EAST COASTAL PLAIN PRESSURE AREA
  - 8-1.02 SANTA ANA FOREBAY AREA
  - 8-1.03 IRVINE BASIN
  - 8-1.04 LA HABRA BASIN
  - 8-1.05 YORBA LINDA BASIN
  - 8-1.06 SANTA ANA NARROWS BASIN
  - 8-1.07 SANTIAGO BASIN

LEGEND

- Valley fill area and ground water basin number
- Approximate boundary of pressure zone
- WATER POLLUTION CONTROL REGIONS
- Boundary of region
- Los Angeles region
- Santa Ana region



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## GROUND WATER BASINS IN LOS ANGELES REGION AND SANTA ANA REGION

SCALE OF MILES  
0 5 10 15 20

DECEMBER 1952

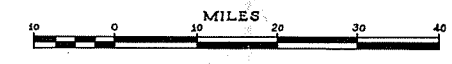


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# INDEX MAP OF UNPUBLISHED GEOLOGIC MAPPING IN CALIFORNIA






FROM JAN. 1937 TO JUNE 1951

SCALE



DECEMBER 1952

## LEGEND

-  STATE DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF MINES
-  STATE DEPARTMENT OF PUBLIC WORKS  
DIVISION OF WATER RESOURCES
-  U.S. GEOLOGICAL SURVEY
-  U.S. BUREAU OF RECLAMATION
-  PUBLICATIONS OF UNIVERSITIES  
UNIVERSITY OF CALIFORNIA  
UNIVERSITY OF CALIFORNIA AT LOS ANGELES  
UNIVERSITY OF SOUTHERN CALIFORNIA  
STANFORD UNIVERSITY  
CALIFORNIA INSTITUTE OF TECHNOLOGY  
POMONA COLLEGE  
YALE UNIVERSITY

