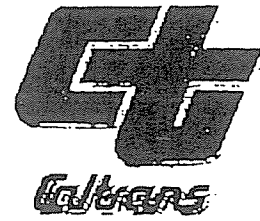


EXHIBIT “17”



California Department of Transportation



Cost of Storm Water Treatment for California Urbanized Areas



DRAFT
OCTOBER 1998

BROWN AND CALDWELL



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WATER CONTROL BOARD
ANGELES REGION

COST OF STORM WATER TREATMENT FOR CALIFORNIA URBANIZED AREAS

October 1998

Prepared for:

**CALIFORNIA DEPARTMENT OF TRANSPORTATION
SACRAMENTO, CALIFORNIA**

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CHAPTER 1

INTRODUCTION

This report summarizes an analysis of the cost of treating storm water runoff from major urbanized areas throughout the state. The analysis was one component of a number of concurrent studies conducted by Caltrans to evaluate costs and other issues associated with storm water compliance. The costs presented herein were prepared as a basis for further analysis of the economic impact of storm water treatment on the residents of California.

This report builds on the storm water treatment cost analysis presented in two previous projects. The *Caltrans Storm Water Retrofit Evaluation* (Caltrans, 1997) evaluated the practicability of retrofitting the storm water drainage system in District 7 (Los Angeles County) roadways. The report analyzed the cost of retrofitting storm water treatment for 434 miles of freeways, 223 miles of highways, 40 interchanges, 56 pumping stations, 37 maintenance stations, and 43 park-and-ride lots within District 7. A detailed assessment was completed for a smaller study area within District 7, which comprised 27.5 miles of freeway, and the storm water treatment costs were extrapolated to all of District 7. *The Analysis of the Cost of Storm Water Treatment for Los Angeles County* (Caltrans, 1998) extended the storm water treatment retrofit cost analysis to the Phase I storm water permit area within Los Angeles County. This subsequent study evaluated the costs of storm water collection and treatment for the entire permit area, which included a variety of land uses in addition to transportation.

Given the scope and time available for this study, a geographic information system (GIS) database was compiled from existing data sources to evaluate the cost of storm water collection and treatment within major urbanized areas throughout California. Data on rainfall, hydrologic drainage basins, urbanized area boundaries, and land use were incorporated into this database so that a uniform statewide approach could be used. The most powerful feature of the GIS database is its ability to perform calculations using several pieces of spatially linked data that would not be possible with any other approach.

The GIS database developed for this study represents a framework for a systematic evaluation of storm water retrofit costs throughout the state. Any of the components of the database, such as land use, can easily be refined with more detailed and/or more recent data from other sources as additional data needs are developed.



CHAPTER 2

AREAS OF INTEREST

This chapter summarizes the urbanized areas of interest analyzed in this study.

Data on the location and extent of urbanized areas were obtained from Teale Data Center through Caltrans and are based on 1990 U.S. Census Bureau data. A description of the urbanized area data (i.e., "metadata") is included in Appendix D. An urbanized area is defined as a place and the adjacent densely settled surrounding territory that together have a population of 50,000 people or more. Therefore, an urbanized area boundary does not necessarily coincide with a city political boundary (i.e., city limit) and or county political boundary. The densely settled surrounding territory consists of an area with continuous residential development and an overall population density of at least 1,000 people per square mile (1.6 people per acre). Based on this definition, there are 36 urbanized areas within California.

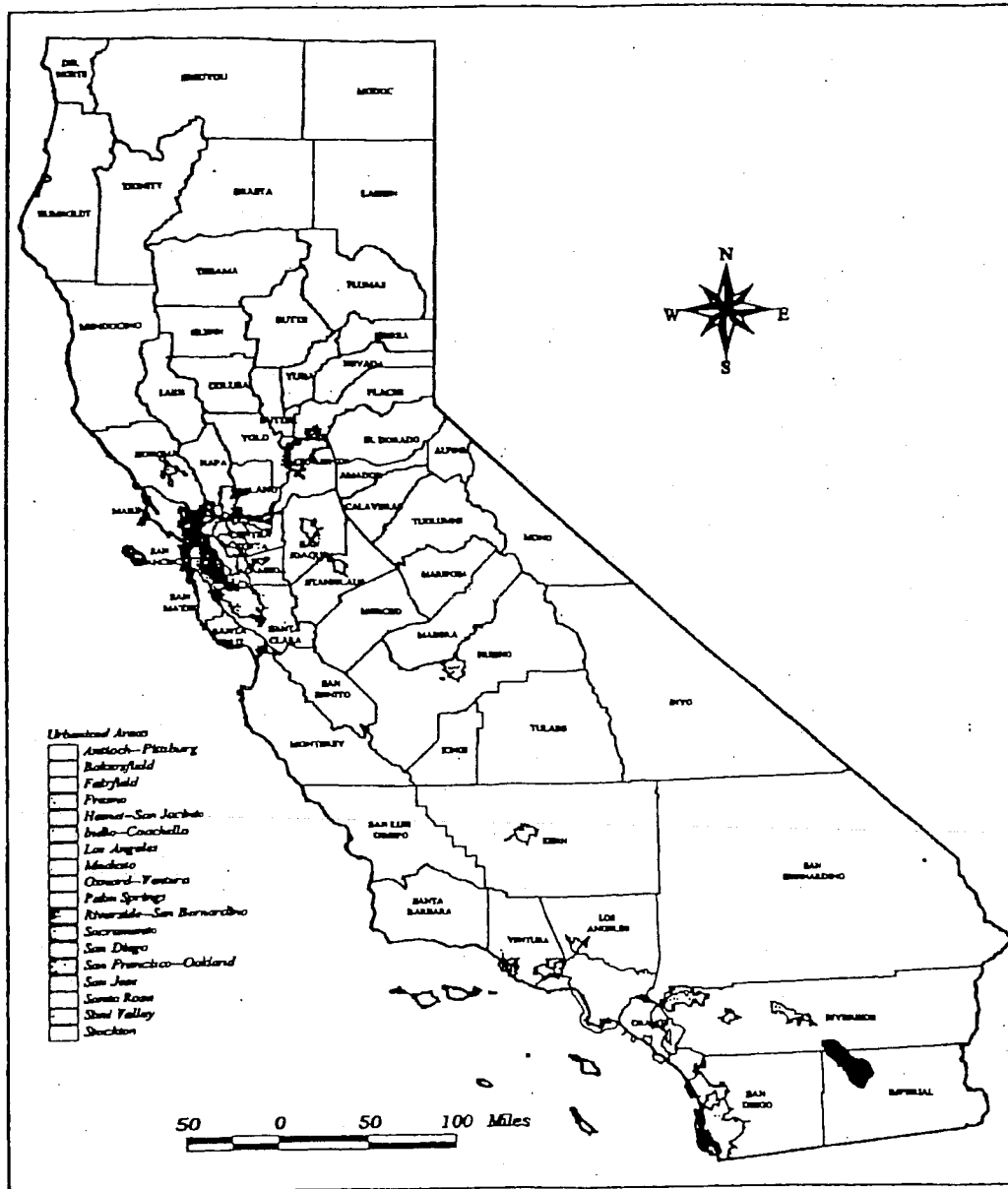
The major urbanized areas of interest for this study were selected based on the Phase I storm water permits issued to counties and municipalities throughout the state. These permitted counties include:

- Alameda
- Contra Costa
- Fresno
- Kern
- Los Angeles
- Marin
- Orange
- Riverside
- Sacramento
- San Bernardino
- San Diego
- San Joaquin
- San Mateo
- Santa Clara

- Solano
- Sonoma
- Stanislaus
- Ventura

Note that Marin County is not a Phase I permittee, but participates in the storm water programs and so was included in this analysis. Eighteen of the urbanized areas defined for California fall within the permitted counties. The urbanized areas of interest within these counties are shown in Figure 2-1 and include:

- Antioch-Pittsburg
- Bakersfield
- Fairfield
- Fresno
- Hemet-San Jacinto
- Indio-Coachella
- Los Angeles
- Modesto
- Oxnard-Ventura
- Palm Springs
- Riverside-San Bernardino
- Sacramento
- San Diego
- San Francisco-Oakland
- San Jose
- Santa Rosa
- Simi Valley
- Stockton



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Cost of Storm Water Treatment for California Urbanized Areas
California Urbanized Areas
Phase I Permits
Figure 2-1

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Individual maps of the 18 counties showing the urbanized areas of interest within each county are included in Appendix B.



CHAPTER 3

DESIGN STORM

The design storm used for runoff calculations in this study is a 24-hour duration, 1-year return period storm, similar to that used in the *Caltrans Storm Water Retrofit Evaluation* (Caltrans, 1997) and *The Analysis of the Cost of Storm Water Treatment for Los Angeles County* (Caltrans, 1998). Statewide design storm rainfall contours were developed as part of this study and were used for runoff calculations as described in Chapter 4.

Historical rainfall data throughout California for a range of storm durations (e.g., 1-hour, 24-hour, 7-day) are compiled by the Department of Water Resources (DWR). Figure 3-1 shows the location of approximately 3,000 rainfall gage locations in the state. Caltrans maintains spreadsheet files of the DWR data for highway drainage calculations and copies of these files were provided for this study (Glenn DeCou, 1998).

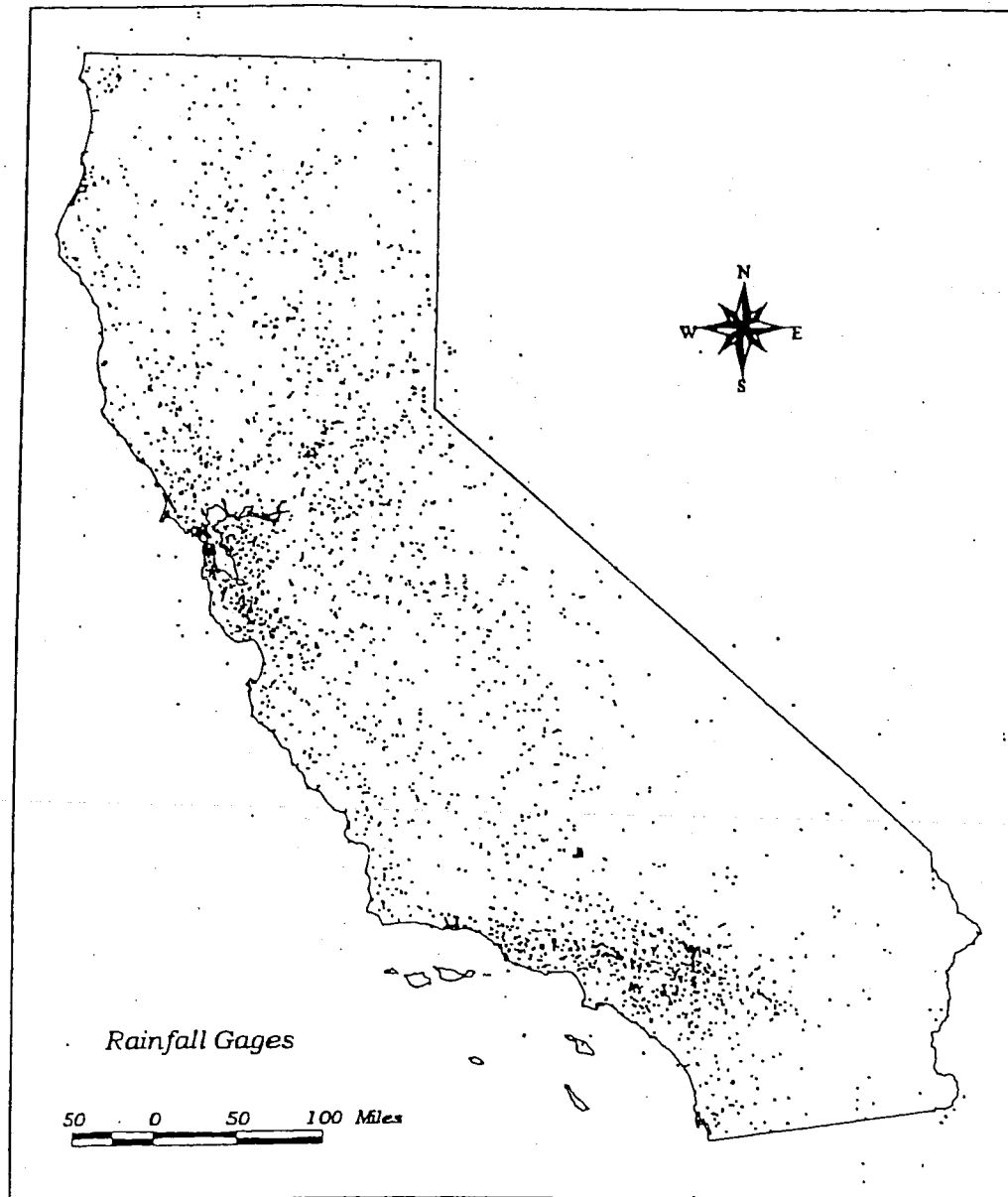
Design storm rainfall amounts were calculated using the approach described in *Rainfall Depth-Duration-Frequency for California* (Department of Water Resources, 1982). The design storm precipitation was calculated using the equation:

$$X_{ji} = X_{\text{mean},i} + K_j S_i \quad [1]$$

where X_{ji} is the precipitation in inches for return period j (i.e., 1-year) and duration i (i.e., 24-hour). $X_{\text{mean},i}$ is the mean maximum annual storm for duration i (i.e., 24-hour), K_j is the frequency factor (in standard deviations) for a return period j (i.e., 1-year), and S_i is the standard deviation of the maximum annual storm for duration i (i.e., 24-hour). Regional values for skew and coefficient of variation as reported in Department of Water Resources (1982) were used in the calculation. Values for the frequency factor for a Pearson Type III distribution, which are a function of skew, were obtained from Department of Water Resources (1982) and Haan (1977).

A summary table of precipitation for a 24-hour, 10-year return interval storm provided by Caltrans was used to calculate precipitation for a 24-hour, 1-year return interval storm for the approximately 3,000 rainfall stations in the state. Equation 1 was rearranged to calculate the mean maximum annual 24-hour storm, $X_{\text{mean},i}$ given the 10-year return interval precipitation. The equation was then used to calculate the design storm precipitation for a 1-year return interval. The rainfall data are included in Appendix Table C-20.

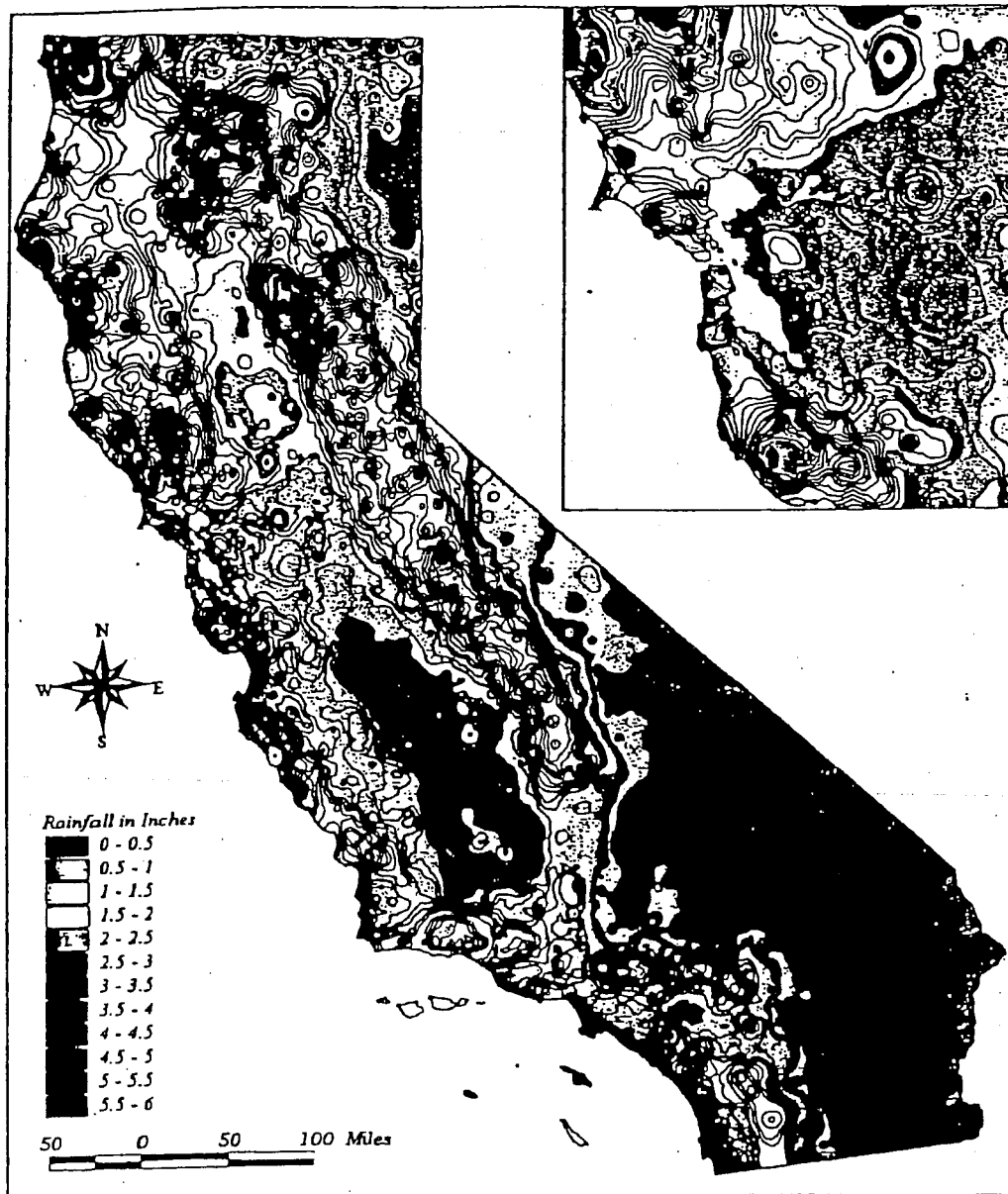
The design storm precipitation data were used to calculate rainfall contours, shown in Figure 3-2. To illustrate rainfall contours on a larger scale, Figure 3-3 shows the rainfall contours for Sacramento County. Maps showing rainfall contours for all the counties of interest are included in Appendix B. Note that the rainfall contour ranges shown in these figures were selected for clarity; rainfall contours of 0.1 inches were used for runoff calculations described in the next chapter.



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Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Gage Locations
Figure 3-1

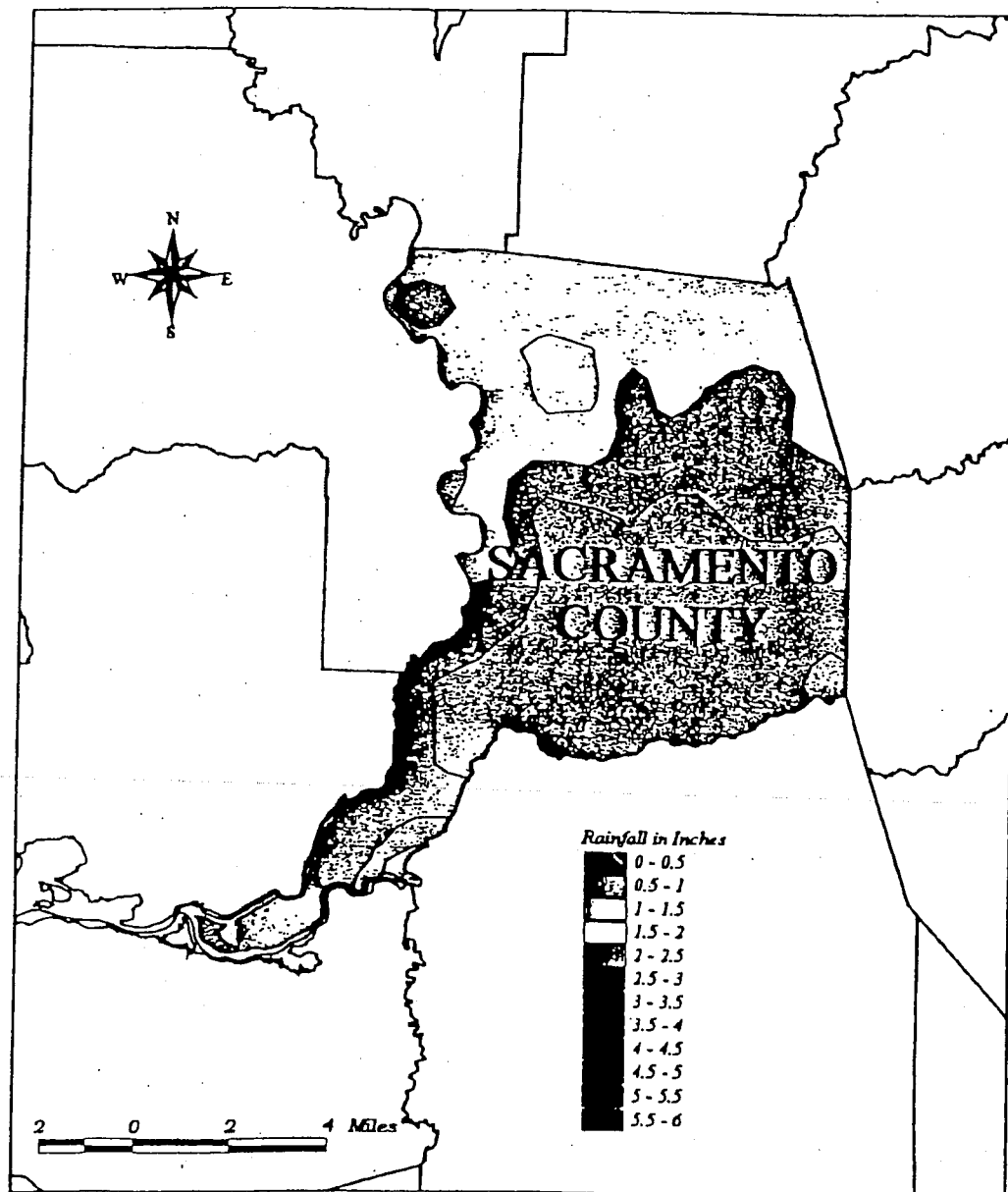
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Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm
 Figure 3-2

R0006209



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Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Sacramento County
 Figure 3-3

R0006210



CHAPTER 4

RUNOFF CALCULATION

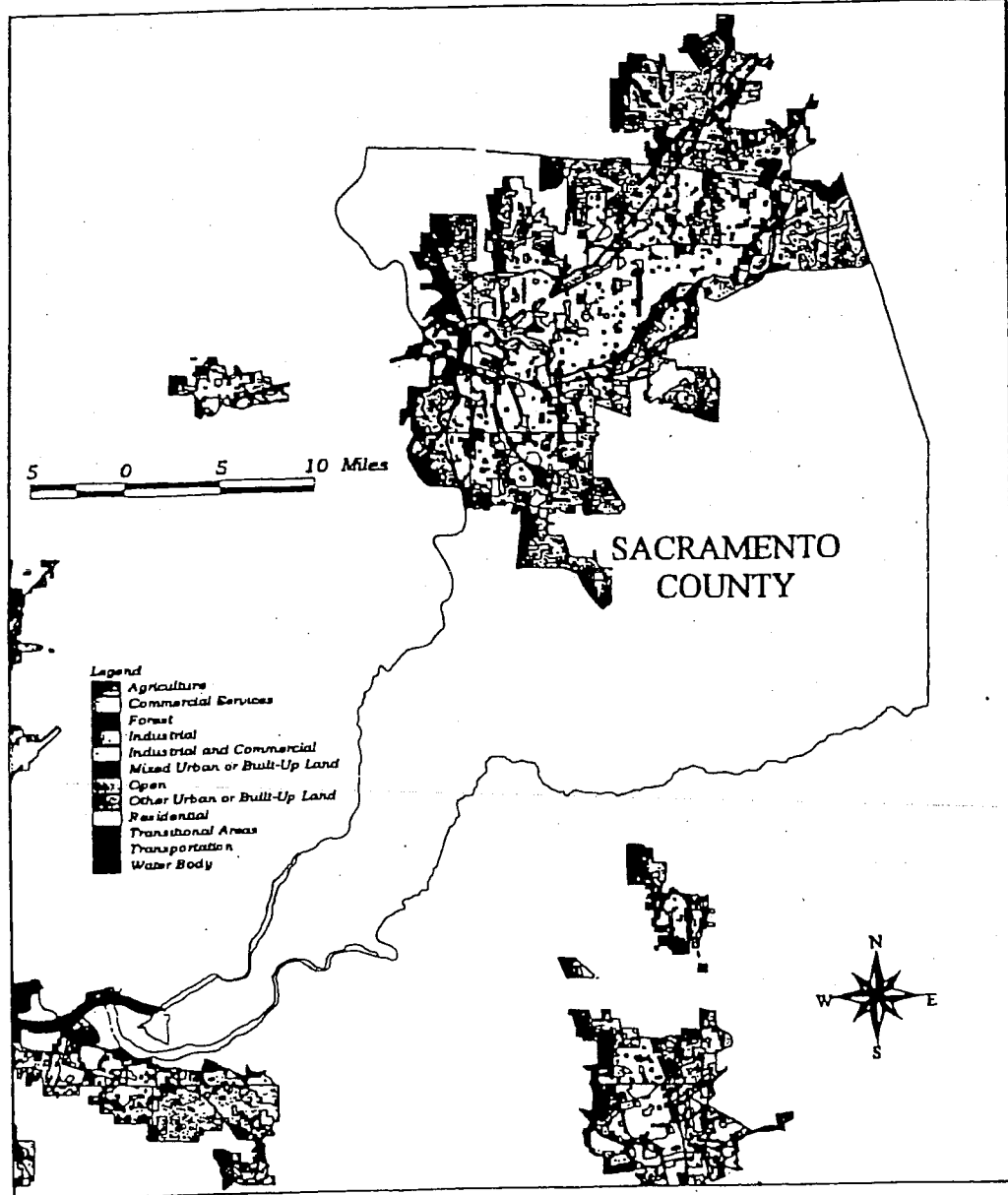
The volume of storm water runoff was calculated similar to the volumes calculated in the previous studies for District 7 and Los Angeles County. Runoff coefficients were used to estimate the fraction of rainfall occurring as runoff from impervious and pervious areas of urbanized areas. The GIS database was a key component in linking landuse (and runoff coefficient) patterns with rainfall patterns to calculate runoff volumes.

4.1 Urbanized Areas

4.1.1 Runoff Coefficients. Runoff coefficients were estimated for urbanized areas based on available land use/landcover data, which were incorporated into the GIS database. The 36 land use/land cover categories within the original land use/land cover data file are based on the Level I and Level II classifications of the Anderson classification scheme (Anderson, et al, 1976). The Anderson classification scheme is based on four levels, with each level providing a more specific definition of a given land use/land cover category. The two classification levels included in the data file used for this analysis provided adequate refinement for calculating urbanized area storm water runoff.

A description of the land use/land cover data file, which typically reflects land use circa the mid- to late-1980s, is included in Appendix D. More recent land use data may be available for certain areas of the state (i.e., Los Angeles County), but the data file used represents the most recent comprehensive compilation of statewide land use/land cover data. Level II classifications were maintained for urban or built-up land use classifications (i.e., land use category codes within the 10 series) for the runoff analysis. These classifications include residential, commercial services, industrial, transportation and communications, industrial and commercial, mixed urban or built-up land, and other urban or built-up land categories. Level II classifications for all other land use/land cover categories were aggregated into their respective Level I classifications for the runoff analysis. These aggregated classifications include agricultural land, rangeland, forest land, water, wetland, and barren land categories. A total of 13 land use/land cover categories were used for the runoff analysis. To illustrate the distribution of land use, Figure 4-1 shows the land use categories within the urbanized area in Sacramento County. Maps showing the land use categories within the urbanized areas of interest in all the counties of interest are included in Appendix B.

Table 4-1 summarizes the urbanized area land use for the 18 counties of interest by land use/landcover category. Note that the area boundaries within Los Angeles County do not strictly correspond to the urbanized area boundaries in the Teale Data Center file. The boundaries within Los Angeles County were set to correspond to the NPDES permit area used for the previous Los Angeles County studies (Caltrans, 1998a; Caltrans, 1998b). The total area represented by these urbanized areas of interest is 6,863 sq mi, which is approximately 4.4 percent of the total land area in the state.



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Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Sacramento County
Figure 4-1

R0006212

Table 4-1
Major Urbanized Area Land Use Summary

County Urbanized Area Land Use Category Code Percent Fraction	Urban or Built-Up Land										Forest Land	Water	Unfilled	Barren Land	Totals
	Residential	Commercial	Industrial	Transportation	Communication	Industrial and Commercial	Urban or Built-Up Land	Other Urban or Built-Up Land	Agriculture Land	Range/Forest					
	11 0.50	12 0.75	13 0.75	14 0.50	15 0.50	16 0.50	17 0.50	18 0.50	19 0.50	20 0.50	21 0.50	22 0.50	23 0.50	24 0.50	25 0.50
Alameda															
San Francisco-Oakland	105.11	35.80	13.39	12.43	3.18	0.18	0.13	0.13	27.65	38.24	10.71	48.59	2.97	3.70	310.42
San Jose (S)	183.18	28.58	10.78	12.43	3.18	0.18	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area:	183.18	28.58	10.78	12.43	3.18	0.18	0.13	0.13	27.65	38.24	10.71	48.59	2.97	3.70	310.42
Weighted Total Area:	66.7%	10.0%	3.9%	4.9%	1.0%	0.1%	0.1%	0.1%	1.1%	1.4%	0.4%	5.6%	0.1%	0.1%	186.9%
Range/Fraction:															
Contra Costa															
Antioch-Pittsburg	11.80	2.88	3.53	0.75	0.25	0.55	1.72	25.34	25.34	0.88	4.84	4.84	4.84	4.84	64.71
San Francisco-Oakland	81.18	18.80	13.31	3.41	0.41	0.31	0.41	0.41	0.00	0.00	0.00	0.00	0.00	0.00	264.79
Total Area:	92.98	21.68	16.84	4.12	0.66	0.82	1.83	25.75	25.34	0.88	4.84	4.84	4.84	4.84	264.79
Weighted Total Area:	33.1%	10.7%	8.9%	2.4%	0.2%	0.3%	0.3%	0.3%	1.0%	0.3%	2.0%	2.0%	2.0%	2.0%	186.9%
Range/Fraction:															
Fresno															
Fresno	53.31	18.72	9.73	9.73	9.73	0.84	3.14	43.54	43.54	1.32	0.10	0.10	0.10	0.10	123.84
Weighted Total Area:	17.0%	5.9%	3.2%	3.2%	3.2%	0.3%	1.0%	1.7%	1.7%	0.4%	0.0%	0.0%	0.0%	0.0%	106.9%
Range/Fraction:															
Kern															
Barstow	23.54	9.35	3.45	2.35	0.15	0.90	2.84	32.48	32.48	0.32	0.00	0.00	0.00	0.00	99.13
Weighted Total Area:	11.0%	4.6%	1.6%	1.1%	0.1%	0.4%	1.1%	1.3%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%	106.9%
Range/Fraction:															
Los Angeles															
Los Angeles (L)	649.84	164.84	103.31	48.00	7.42	10.48	36.35	36.35	36.35	1,301.72	220.32	12.14	4.84	37.00	2,689.36
Total Area:	649.84	164.84	103.31	48.00	7.42	10.48	36.35	36.35	36.35	1,301.72	220.32	12.14	4.84	37.00	2,689.36
Weighted Total Area:	27.1%	6.6%	4.3%	1.7%	0.3%	0.3%	1.1%	1.1%	1.1%	41.0%	7.0%	0.1%	0.1%	0.1%	186.9%
Range/Fraction:															
Martin															
San Francisco-Oakland	54.42	9.50	0.00	1.01	1.01	0.72	2.01	9.30	9.30	0.41	28.11	35.91	1.91	0.00	199.34
Weighted Total Area:	18.0%	3.3%	0.0%	0.3%	0.3%	0.3%	0.8%	0.8%	0.8%	1.4%	10.0%	13.0%	0.6%	0.0%	106.9%
Range/Fraction:															
Orange															
Los Angeles	173.86	69.62	21.79	11.78	4.50	0.12	21.62	76.97	76.97	0.84	0.14	0.32	3.01	14.07	509.42
San Francisco-Oakland	179.89	88.42	31.39	11.78	4.50	0.12	21.62	76.97	76.97	0.84	0.14	0.32	3.01	14.07	509.42
Weighted Total Area:	30.0%	15.0%	5.0%	2.0%	0.8%	0.1%	3.6%	12.0%	12.0%	0.1%	0.1%	0.1%	0.1%	0.1%	186.9%
Range/Fraction:															
San Diego															
San Diego	8.73	1.70	0.37	0.31	0.31	0.30	1.11	15.41	15.41	0.22	0.00	0.00	0.00	0.00	44.88
Weighted Total Area:	3.0%	0.6%	0.1%	0.1%	0.1%	0.1%	0.4%	0.4%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	37.86
Range/Fraction:															
San Francisco															
San Francisco	20.38	19.84	3.04	4.04	1.04	0.14	1.34	1.34	1.34	0.14	0.00	0.00	0.00	0.00	99.92
Weighted Total Area:	8.0%	7.9%	1.2%	1.6%	0.4%	0.0%	0.5%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	272.79
Range/Fraction:															
San Jose															
San Jose	43.69	33.79	3.83	7.84	2.84	1.84	16.64	16.64	16.64	0.14	0.00	0.00	0.00	0.00	186.9%
Weighted Total Area:	18.0%	14.0%	1.6%	3.2%	1.2%	0.8%	6.9%	6.9%	6.9%	0.0%	0.0%	0.0%	0.0%	0.0%	186.9%
Range/Fraction:															

Table 4-1
Major Urbanized Area Land Use Summary

County/ Unincorporated Area	Urban or Built-Up Land										Agricultural/ Land	Recreational Land	Forest Land	Water	Wetland	Barren Land	Totals
	Urban or Built-Up Land																
	Residential	Commercial Services	Industrial	Transportation, Communications	Industrial and Commercial	Mixed Urban or Built-Up Land	Other Urban or Built-Up Land	Other Urban or Built-Up Land	Other Urban or Built-Up Land	Other Urban or Built-Up Land							
Land Use Category Code	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Percent Fraction:	0.16	0.70	0.75	0.80	0.85	0.80	0.80	0.80	0.80	0.80	0.00	0.36	0.36	0.00	0.36	0.36	0.00
Sacramento																	
Antelope Valley (N)	100.76	26.42	9.37	7.51	7.73	9.55	16.20	91.06	9.32	2.79	9.32	12.15	9.32	4.83	9.32	77.05	9.01
Sacramento	164.79	31.43	9.37	7.51	7.73	9.55	16.20	91.06	9.32	2.79	9.32	12.15	9.32	4.83	9.32	77.05	9.01
Weighted Total Area:	86,170	15,440	4,830	3,900	4,000	4,830	8,520	47,100	4,830	1,390	4,830	6,070	4,830	2,410	4,830	39,670	4,830
Percent Fraction:	46.1%	11.7%	6.1%	5.0%	5.1%	5.0%	8.7%	25.0%	5.0%	1.4%	5.0%	6.3%	5.0%	2.5%	5.0%	18.8%	5.0%
San Bernardino																	
Los Angeles	37.76	9.93	2.56	3.44	9.13	9.21	6.44	54.20	13.73	4.36	13.73	2.80	4.36	0.70	13.73	137.33	13.73
Riverside/San Bernardino	73.41	19.07	5.13	6.87	19.07	19.07	13.73	111.77	28.46	8.72	28.46	6.07	8.72	1.40	28.46	284.60	28.46
Weighted Total Area:	106.16	29.00	7.70	10.30	31.20	31.20	20.17	165.97	42.19	12.48	42.19	12.87	12.48	2.10	42.19	421.90	42.19
Percent Fraction:	46.1%	11.7%	6.1%	8.0%	24.0%	24.0%	5.0%	40.0%	10.0%	3.0%	10.0%	3.0%	3.0%	0.5%	10.0%	100.0%	10.0%
San Diego																	
Los Angeles (N)	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Diego	189.27	54.71	11.94	17.94	11.94	23.22	24.73	160.37	24.73	7.42	24.73	5.17	7.42	1.40	24.73	247.30	24.73
Weighted Total Area:	94.63	27.36	5.97	8.97	5.97	11.61	12.37	80.19	12.37	3.71	12.37	2.59	3.71	0.70	12.37	123.70	12.37
Percent Fraction:	31.3%	11.3%	3.7%	5.0%	3.0%	6.0%	6.0%	26.0%	6.0%	3.0%	6.0%	2.0%	3.0%	0.9%	6.0%	100.0%	6.0%
San Jose																	
San Jose	22.26	0.34	2.87	2.87	0.34	3.54	2.40	30.50	2.40	0.71	2.40	0.40	0.71	0.10	2.40	24.00	2.40
Weighted Total Area:	11.13	0.17	1.44	1.44	0.17	1.77	1.20	15.25	1.20	0.35	1.20	0.20	0.35	0.05	1.20	12.00	1.20
Percent Fraction:	44.1%	21.3%	8.0%	8.0%	2.0%	2.0%	1.3%	10.0%	1.3%	0.4%	1.3%	0.2%	0.4%	0.1%	1.3%	100.0%	1.3%
San Mateo																	
San Francisco-Oakland (N)	71.42	17.75	13.16	9.17	9.48	1.54	0.74	3.70	29.86	12.26	29.86	5.86	12.26	1.80	29.86	298.60	29.86
San Jose (N)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weighted Total Area:	71.42	17.75	13.16	9.17	9.48	1.54	0.74	3.70	29.86	12.26	29.86	5.86	12.26	1.80	29.86	298.60	29.86
Percent Fraction:	46.1%	11.7%	10.0%	6.0%	6.0%	0.9%	0.4%	1.9%	10.0%	4.0%	10.0%	2.0%	4.0%	0.6%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
Marin (N)	0.13	0.02	0.03	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
San Francisco-Oakland (N)	101.16	22.73	24.10	7.19	7.84	2.24	0.33	40.06	40.06	8.04	40.06	7.71	8.04	1.10	40.06	400.60	40.06
San Jose	111.26	22.73	24.10	7.19	7.84	2.24	0.33	40.06	40.06	8.04	40.06	7.71	8.04	1.10	40.06	400.60	40.06
Weighted Total Area:	111.26	22.73	24.10	7.19	7.84	2.24	0.33	40.06	40.06	8.04	40.06	7.71	8.04	1.10	40.06	400.60	40.06
Percent Fraction:	44.1%	11.7%	10.0%	6.0%	6.0%	0.9%	0.4%	1.9%	10.0%	4.0%	10.0%	2.0%	4.0%	0.6%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
Alameda-Albany (N)	5.24	0.98	0.50	1.22	0.54	0.34	0.33	19.54	0.68	0.68	0.68	0.11	0.68	0.11	0.68	6.80	0.68
Fairfield	0.79	3.29	2.12	1.19	1.22	0.04	1.22	10.20	1.52	10.20	1.52	0.20	1.52	0.20	1.52	15.20	1.52
San Francisco-Oakland (N)	16.84	16.84	3.19	3.84	3.84	0.38	1.48	16.79	32.97	32.97	32.97	5.48	32.97	5.48	32.97	329.70	32.97
Weighted Total Area:	23.66	23.66	5.81	6.35	6.35	0.76	2.76	36.53	69.74	69.74	69.74	11.36	69.74	11.36	69.74	697.40	69.74
Percent Fraction:	31.3%	31.3%	7.6%	8.0%	8.0%	1.0%	3.7%	47.0%	99.7%	99.7%	99.7%	16.3%	99.7%	16.3%	99.7%	100.0%	99.7%
San Jose																	
San Francisco-Oakland (N)	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
San Jose	89.87	0.76	0.26	0.33	0.33	0.33	1.16	31.97	4.86	7.33	31.97	0.46	7.33	0.46	31.97	319.70	31.97
Weighted Total Area:	109.39	8.74	0.96	0.65	0.66	0.66	2.32	55.64	9.72	14.66	55.64	0.92	14.66	0.92	55.64	556.40	55.64
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Weighted Total Area:	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Weighted Total Area:	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Weighted Total Area:	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Weighted Total Area:	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Weighted Total Area:	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Weighted Total Area:	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Weighted Total Area:	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86	7.33	23.67	0.46	7.33	0.46	23.67	236.70	23.67
Percent Fraction:	46.1%	11.7%	0.7%	0.7%	0.7%	0.7%	1.0%	4.0%	10.0%	12.0%	10.0%	0.9%	12.0%	0.9%	10.0%	100.0%	10.0%
San Francisco-Oakland (N)																	
San Jose	21.57	8.74	0.70	0.32	0.33	0.33	1.16	23.67	4.86</								

Table 4-1
Major Urbanized Area Land Use Summary

County/ Unincorporated Area Land Use Category Code Rural Coefficient	Urban or Built-Up Land										Forest Land	Wetland	Water	Barren Land	Totals
	Residential	Commercial Services	Industrial	Transportation, Communications	Industrial and Commercial	Mixed Urban or Built-Up Land	Other Urban or Built-Up Land	Agricultural Land	Range/Forest	Forest Land					
San Joaquin (N)	73.00 11.50 87.9%	5.12 3.89 16.1%	2.41 1.04 5.4%	1.11 0.96 4.3%	1.11 0.96 4.3%	1.11 0.96 4.3%	1.11 0.96 4.3%	1.11 0.96 4.3%	1.11 0.96 4.3%	1.11 0.96 4.3%	0.11 0.09 0.3%	0.11 0.09 0.3%	0.11 0.09 0.3%	0.11 0.09 0.3%	0.04 0.04 0.04
Yuba	0.01 19.25 48.51 30.70 36.1%	11.71 3.28 16.06 16.06 16.0%	2.32 0.08 2.81 2.81 2.81%	2.32 0.08 2.81 2.81 2.81%	2.32 0.08 2.81 2.81 2.81%	2.32 0.08 2.81 2.81 2.81%	2.32 0.08 2.81 2.81 2.81%	2.32 0.08 2.81 2.81 2.81%	2.32 0.08 2.81 2.81 2.81%	2.32 0.08 2.81 2.81 2.81%	0.11 0.09 0.3%	0.11 0.09 0.3%	0.11 0.09 0.3%	0.11 0.09 0.3%	0.04 0.04 0.04
Grand Total Area:	1,030.00	233.00	244.71	181.97	29.18	31.96	313.36	642.90	2,004.87	372.30	296.34	44.90	161.73	0.00	6,002.02

* Unincorporated area defined as those 1 square mile APN's boundary

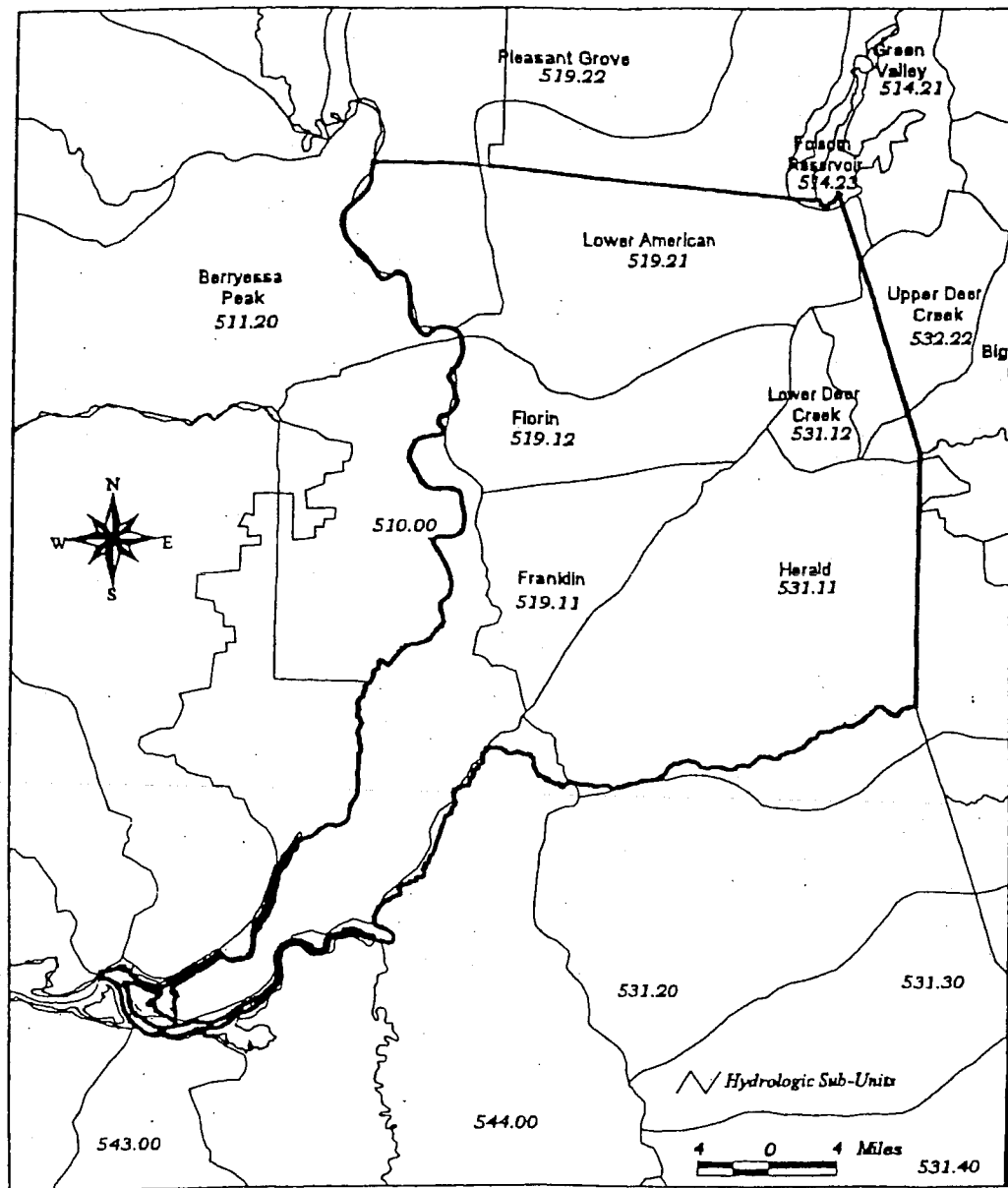
The following runoff coefficients for each land use category were selected for the runoff analysis based on a review of previous studies (Caltrans, 1995; San Jose, 1997; UCLA, 1993):

• Residential	0.50
• Commercial Services	0.70
• Industrial	0.75
• Transportation, Communication	0.80
• Industrial and Commercial	0.65
• Mixed Urban	0.60
• Other Urban	0.60
• Agricultural Land	0.00
• Rangeland	0.38
• Forest Land	0.38
• Water	0.00
• Wetland	0.38
• Barren Land	0.38

Runoff from agricultural land and water areas was not included in this analysis as reflected by their runoff coefficient values of zero. The runoff coefficient of 0.38 selected for the other aggregated, non-urban land use/land cover classifications is based on the median value of pervious area runoff coefficients included in the "Highway Design Manual" (Caltrans, 1995).

4.1.2 Runoff Calculation. Urbanized area runoff from a given parcel of land was calculated by multiplying the rainfall, land area, and runoff coefficient. Runoff was totaled by hydrologic sub-unit (or sub-area) to reflect storm water runoff within natural drainage areas. To illustrate the natural drainage area boundaries, Figure 4-2 shows the hydrologic sub-unit boundaries in Sacramento County. Maps showing the hydrologic sub-unit boundaries in all the counties of interest are included in Appendix B. The runoff calculation results are summarized in a series of tables in Appendix C.

Runoff contributions by land use/land cover categories for each county of interest are summarized in Table 4-1. These contributions are approximate in that they assume a constant rainfall across the urbanized area(s) of interest within each county. The fractional runoff contribution was calculated as the fractional land area weighted by the runoff coefficient. The table shows that the residential land use category contributes a large fraction of the runoff within each county.



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Sacramento County
Figure 4-2

R0006217



CHAPTER 5

STORM WATER TREATMENT FACILITIES

The objective of this study was to establish the basic tools necessary to estimate the total cost of storm water treatment for urbanized areas within California. As discussed in the previous chapters, hydrologic sub-units (or sub-areas) in California were defined, and the associated runoff volume from rainfall for each area was calculated using a geographic information system (GIS) database. In this chapter, the types of treatment facilities proposed to treat storm water to meet water quality objectives, the collection system requirements, and assumptions for treatment facility siting are described. Based on these assumptions, storm water treatment cost estimates are developed in Chapter 6.

5.1 Water Quality Objectives

Water quality objectives and permitting in California are designated and controlled by nine Regional Water Quality Control Boards (RWQCBs) pursuant to the Porter-Cologne Act (the basic California water quality act) and its subsequent amendments. The State Water Resources Control Board (SWRCB) has oversight and appeal functions concerning actions of the local RWQCBs. Federal law (i.e., Clean Water Act) authority also rests with the SWRCB and the RWQCBs through acceptance of federal pass-through authority and the close similarity of federal and state environmental laws. There are some exceptions, but in general, each RWQCB sets water quality objectives and issues water quality-related discharge permits, including storm water discharge permits.

Each RWQCB has designated specific beneficial uses for water bodies within its jurisdiction. The RWQCBs have been very aggressive in describing benefits, and, therefore, all water bodies have beneficial uses attributed to them that require stringent water quality objectives that, in turn, seek to insure high water quality. Beneficial uses and their associated water quality objectives were used as the basis for defining the level of storm water treatment.

At the time this study was prepared, Brown and Caldwell was preparing a separate study that summarizes the specific water quality objectives for particular water bodies in the State. The results of that study, taken together with the storm water quality data being developed by Larry Walker and Associates, will allow a more quantitative assessment of water quality and treatment goals for all water bodies in California. This study addresses the level of storm water treatment necessary to meet water quality objectives by associating beneficial uses with three storm water treatment levels on a qualitative basis. This study assumes no dilution of treated storm water nor concentration time averaging, so treated storm water discharge requirements were assumed equal to the receiving water quality objective.

Beneficial uses have been aggregated into six categories to simplify the qualitative assessment of the level of storm water treatment required. The groupings of the beneficial use categories are based on potential end use at the receiving water body. The six categories are:

- Potable water (MUN, GWR, FRSH, AGR)
- Body contact recreation (REC1)
- Non-body contact recreation (REC2)
- Human consumption (COMM, SHELL)
- Commercial use (PROC, IND, NAV)
- Habitat (WARM, COLD, BIOL, SAL, EST, WET, MAR, MIGR, WILD, RARE, SPWN)

5.1.1 Potable water. Water bodies with this classification are potential potable water sources. Water should be free of pollutants that would impair its use as a potable water source.

5.1.2 Body contact recreation. Water bodies with this classification are used for recreational activities involving proximity to water or direct contact with water where ingestion of water is reasonably possible. For this category, water should be free from bacteria and nutrients that would promote algae growth.

5.1.3 Non-body contact recreation. Water bodies with this classification are used for non-body contact recreational activities involving proximity to water, but not normally involving contact with water where water ingestion is reasonably possible. For this category, water should be free from bacteria.

5.1.4 Human consumption. Water bodies in this classification are used for collection of fish, shellfish, or other organisms in oceans, bays, and estuaries, including, but not limited to, uses involving organisms intended for human consumption or bait purposes. For this category, water should be free from pollutants that would impair human consumption of fish or shellfish (e.g., pathogenic bacteria).

5.1.5 Commercial use. Water bodies in this classification are used for shipping, travel, or industrial activities. For shipping or travel, direct contact with water is unlikely. For industrial activities, subsequent treatment is assumed water to meet specific process water requirements. Water for commercial use should be free from particulates.

5.1.6 Habitat. Water bodies in this classification support habitats necessary for the preservation, enhancement, survival and successful maintenance of plant or animal species. Water for habitat should be free from pollutants that would impair plant and animal species' activities.

5.2 Storm Water Treatment Methods

Storm water collection, storage, and treatment techniques were evaluated in the *Caltrans District 7 Storm Water Retrofit Plan* (Caltrans, May 1997). In anticipation of the need to conduct design, cost, and benefit evaluation, various management practices were subdivided into categories based on the general level of treatment provided. At present, there is limited regulatory experience for establishing treatment levels of storm water discharges. Several generalized treatment categories representing successively more stringent levels of treatment were considered for this analysis. The treatment categories were selected based on an evaluation of the types of pollutants removed by treatment systems and the types of beneficial uses that the treatment would support. Increasing levels of treatment, i.e., combining the lower categories of treatment with higher ones, could potentially meet higher levels of water quality objectives that are required to preserve potential beneficial uses of receiving waters. The division points between treatment categories are basically the ability to remove sediment, bulk solids and trash; the ability to kill bacteria; the ability to remove fine particulates that are associated with bacterial and algae growth; and the ability to remove soluble metals. The treatment alternative for each category was chosen as a representative management practice that achieves "greater or substantially the same pollution control benefits" as the other management practices within that category.

Level 1 treatment includes screening and detention of storm water to remove floating debris and settle bulk solids picked up by storm water. Screening is an important step to remove large debris that could interfere with subsequent pumping operations. Level 1 treatment is commonly recommended and represents a treatment technology that could be implemented for a large drainage area. The Level 1 detention facilities were sized to capture the 24-hour design storm and allow the solids to settle and clarify the water. Level 1 treatment will reduce concentrations of constituents of concern through sedimentation, but is unlikely meet the objectives for any beneficial use. Detention basins have been successful at removing up to 89 percent of total suspended solids and up to 66 percent of carbonaceous oxygen demand (COD) in a study performed by the University of Texas and the Texas Department of Transportation (Kebblin, et. al., 1995). As a consequence of suspended solids removed, metals that are adsorbed to particles or occur as insoluble precipitates (i.e., particulate metals) are removed to some degree as well. Level 1 treatment is an important initial step for effective subsequent performance of Levels 2 and 3 treatment.

Level 2 treatment includes filtration and disinfection in addition to screening and detention. Storm water runoff is often contaminated with coliform bacteria, which are indicator organisms used to indicate the potential for the presence of human pathogens. Coliform levels can be high in urban storm water, and may cause the receiving water to exceed levels considered safe for recreational contact, a designated beneficial use of most waters within the state. High-rate filtration physically removes a large fraction of the coliform organisms. Subsequent chlorine disinfection inactivates a large fraction of the remaining coliform bacteria. Dechlorination protects receiving water organisms from residual chlorine toxicity. Level 2 treatment using high-rate filtration and chlorine disinfection following screening and detention will likely meet the requirements for non-contact and body contact recreational beneficial use.

Level 3 treatment is a highly sophisticated treatment process to remove very low concentrations of toxic and soluble constituents that are typically found in urban runoff. Many of the waters in California are designated as potential drinking water sources which may require advanced treatment to meet water quality objectives. The standards for toxicity, as they relate to sensitive species that could potentially exist in the receiving waters, are even more restrictive than the drinking water standards. Most waters have a beneficial use designation that describes aquatic environment and have objectives to protect that beneficial use. Meeting these objectives with structural treatment units would require advanced treatment beyond what is normally expected of water treatment facilities. Reverse osmosis, following screening, detention, filtration, and disinfection, is included as the typical technology representing advanced toxics removal to achieve the required low concentrations. Storm water treated by Level 3 would be free of almost all constituents of concern and likely would be suitable for all beneficial uses.

Brine is a concentrate of dissolved salts and solids from reverse osmosis treatment process. In southern California, brine is typically disposed into the Pacific Ocean. In other areas, where ocean disposal is not possible (i.e., inland areas like the Central Valley) or where brine poses potential environmental impacts, additional brine treatment and/or transport will be required.

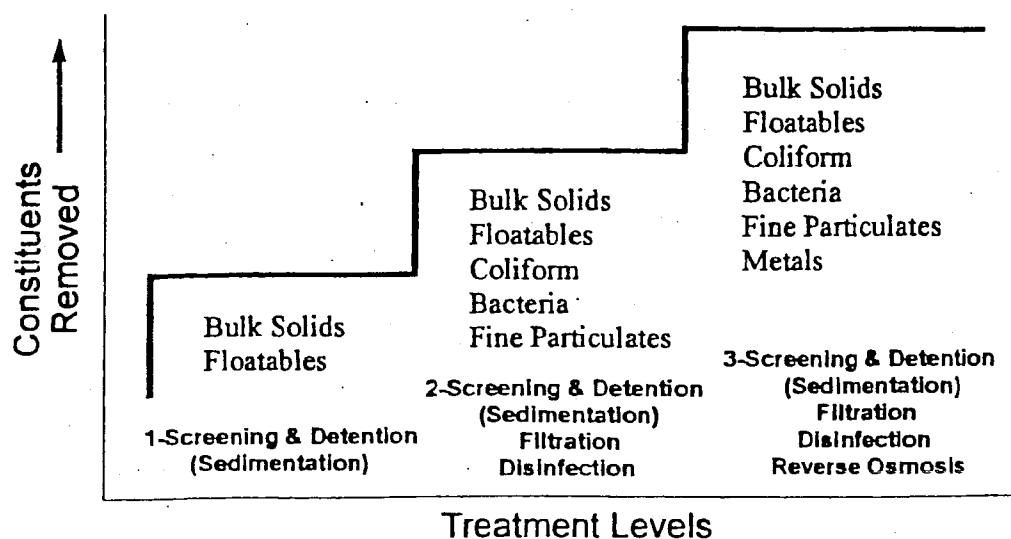
5.3 Collection System

Urbanized area storm water collection system requirements were analyzed by natural drainage basin boundaries (i.e., hydrographic sub-units) within the counties of interest. It was assumed that storm water collection systems exist within the urbanized areas of interest analyzed for this study to collect and transport storm water to natural or constructed drainage channels. Therefore, new interceptor systems to route the runoff to one or more treatment units within each hydrographic sub-unit were identified for this study.

5.4 Treatment Facility Description

Three levels of storm water treatment were developed to treat storm water to meet specific benefit use criteria for water bodies. Figure 5-1 shows a schematic of examples of constituents removed at progressively higher levels of treatment.

Figure 5-1 – Storm Water Treatment Constituent Removal



Level 1 – this level of treatment consists of sedimentation achieved through detention. This level of treatment would be effective at removing bulk solids and floatable materials. Level 1 treatment would most likely meet the water quality for commercial use (PROC, IND, NAV).

Level 2 – this level of treatment combines sedimentation (i.e., Level 1) with filtration and chlorine disinfection. Level 2 treatment would most likely meet the water quality criteria for non-body contact recreational use (REC2) and body contact recreational use (REC1).

Level 3 – this level of treatment combines sedimentation (i.e., Level 1), filtration and disinfection (i.e., Level 2), and reverse osmosis. This highest level of treatment would be effective in removing metals and soluble materials in addition to removing residual solids, floatable materials, and bacteria remaining after Level 1 and Level 2 treatment. Level 3 treatment would most likely meet the water quality for drinking water sources (MUN, GWR, FRSH, AGR), human consumption (COMM, SHELL), and habitat uses (WARM, COLD, BIOL, SAL, EST, WET, MAR, MIGR, WILD, RARE, SPWN).



CHAPTER 6

STORM WATER TREATMENT COSTS

Capital and annual operations and maintenance costs were estimated for urbanized area storm water treatment facilities using information generated from the GIS database. Runoff volume within natural drainage basins (i.e., hydrologic sub-units) in the counties of interest and other criteria were used to estimate the number and size of treatment units. Cost curves were used to estimate capital and operations and maintenance costs for varying levels of treatment. Specific levels of treatment for specific urbanized areas may be refined in the future based on ongoing projects addressing water quality objectives and storm water quality.

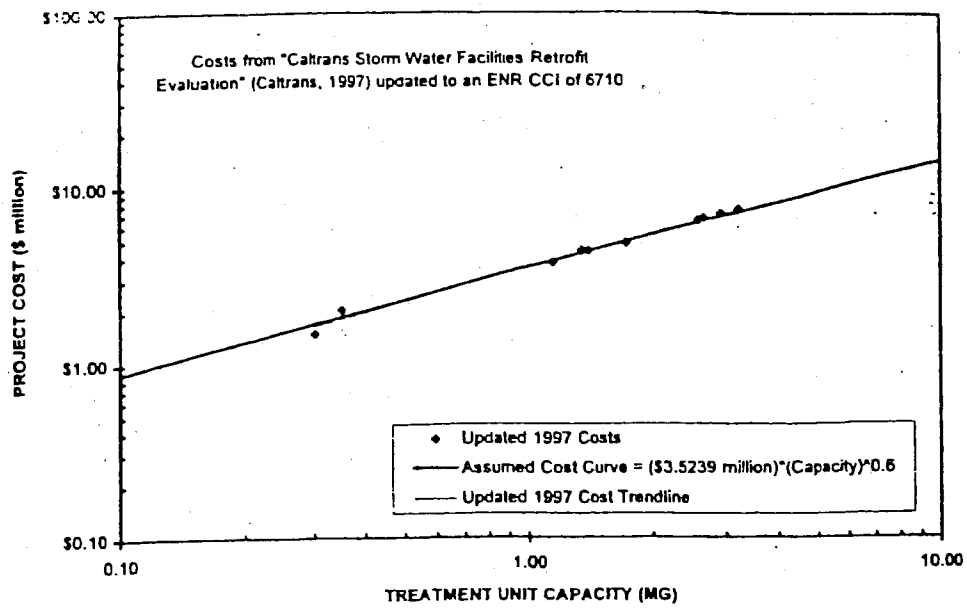
6.1 Cost Estimating Approach

The costs of storm water collection and treatment facilities were estimated using an approach similar to that in two previous studies (Caltrans, 1997; Caltrans, 1998). The following sections summarize how cost curves were developed for capital and operations and maintenance.

6.1.1 Capital Costs. Project costs from the *Storm Water Facilities Retrofit Evaluation* (Caltrans, 1997) were updated and analyzed for this study to derive a series of project cost curves. Project costs include a 30 percent construction cost contingency and a 20 percent allowance for engineering, legal, and administration. Project costs do not include any costs for property acquisition. Project costs from the 1997 report were updated to an Engineering News Record Construction Cost Index (ENR CCI) of 6710, which represents the average of the Los Angeles and San Francisco ENR CCIs for March 1998.

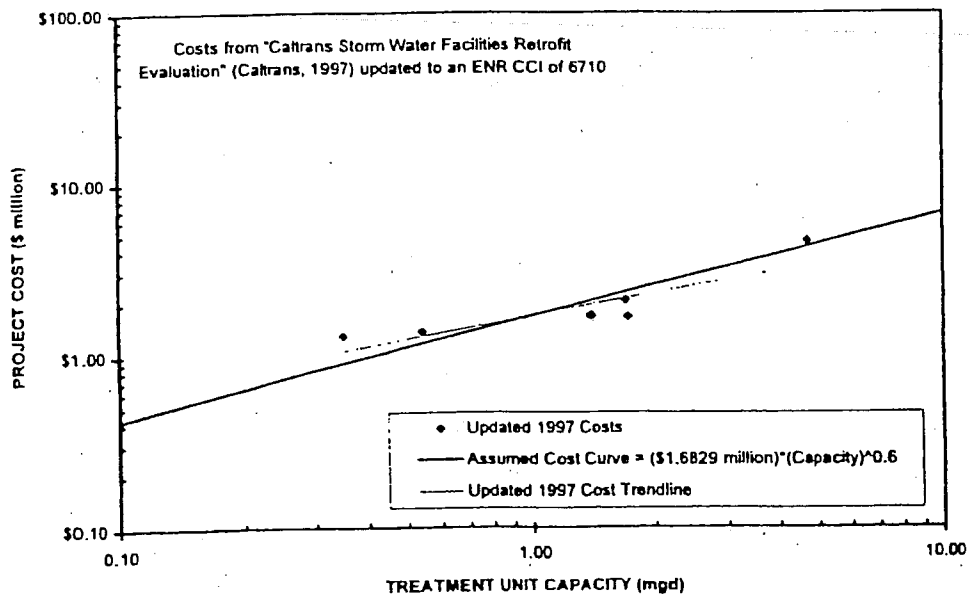
Figures 6-1 through 6-3 show the project costs as a function of treatment unit size for three storm water treatment levels. The relationship between the treatment unit size and the project cost can be represented as a power function, as shown in the figures. The individual treatment unit costs are plotted in each figure and a best-fit line was determined to estimate the cost of a 1.0 mil gal treatment facility. A power function with an exponent of 0.6, a typical value reflecting treatment facility "economy of scale", was developed for each treatment level as shown in the figures.

6.1.2 Operations and Maintenance Cost. Operations and maintenance costs were also derived from the *Storm Water Facilities Retrofit Evaluation* (Caltrans, 1997). Annual operations and maintenance costs per MG treated for each of the three treatment levels were calculated from the total analytical study area cost and volume treated per rainfall event. Annual operations and maintenance costs were estimated based on ten rainfall events per year.



Cost of Storm Water Treatment for California Urbanized Areas
Level 1 Treatment Project Costs

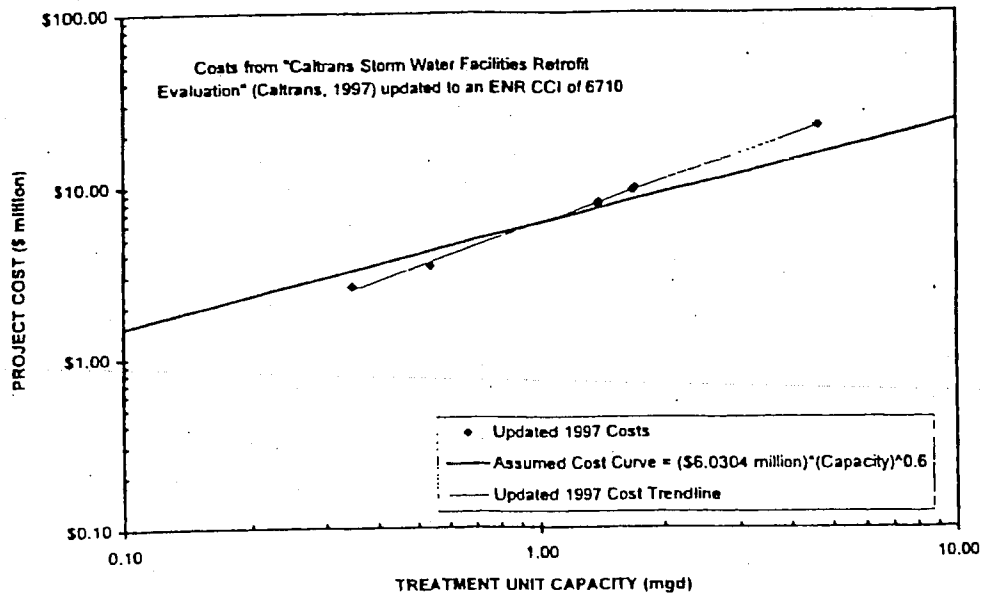
Figure 6-1



Cost of Storm Water Treatment for California Urbanized Areas
Level 2 Treatment Incremental Project Costs

Figure 6-2

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Cost of Storm Water Treatment for California Urbanized Areas
Level 3 Treatment Incremental Project Costs

Figure 6-3

R0006225

Operations and maintenance costs were calculated for this study as a function of volume treated using a power function, similar to the approach used for calculating capital costs. Operations and maintenance cost relationships for primary sedimentation, dual-media filtration, chlorination, dechlorination, and reverse osmosis treatment systems were evaluated to identify a range of power function exponents (EPA, 1980; AWWARF, *et al*, 1996). The median of the range of values, 0.67, was selected for scaling annual operations and maintenance costs.

6.2 Urbanized Areas

Capital and operations and maintenance cost calculations for urbanized areas are summarized by county in a series of tables in Appendix C. The capital costs include an interceptor system for each treatment unit to capture the storm water runoff. The total volume of runoff per rainfall event is 45,205 MG from 6,864 sq mi of urbanized area.

The number of treatment units per hydrologic sub-unit within each urbanized area was calculated based on a maximum Level 1 treatment unit size. A number of calculations were performed to evaluate the total number of treatment units required over a range of maximum treatment unit sizes. A maximum Level 1 treatment unit size of 50 MG was used for the cost calculations summarized in the tables in Appendix C. The Level 2 and Level 3 treatment unit sizes were based on a three-day period to treat and discharge captured storm water. That is; if a 3.0 MG basin was required to capture the 24-hour design storm for a given area, the filtration, disinfection, and reverse osmosis treatment systems were sized for 1.0 million gallons per day (mgd) capacity. The capital costs include county-specific land costs, which were provided by Stanley R. Hoffman Associates.

Statewide storm water collection and treatment capital costs range from \$70.5 billion for Level 1 to \$113.7 billion for Level 3. Annual operations and maintenance costs range from \$145.2 million/year for Level 1 to \$423.9 million/year for Level 3. The present worth of the treatment cost was calculated at an interest rate of 4 percent and a period of 20 years, similar to the values used in previous Caltrans studies. The present worth ranges from \$72.5 billion for Level 1 to \$119.5 billion for Level 3 assuming that a uniform treatment level is used for all urbanized area storm water throughout the State.

APPENDIX A

REFERENCES



APPENDIX A

REFERENCES

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APPENDIX B

**URBANIZED AREA BOUNDARY, RAINFALL CONTOUR,
LAND USE, AND HYDROLOGIC SUB-UNIT BOUNDARY MAPS**

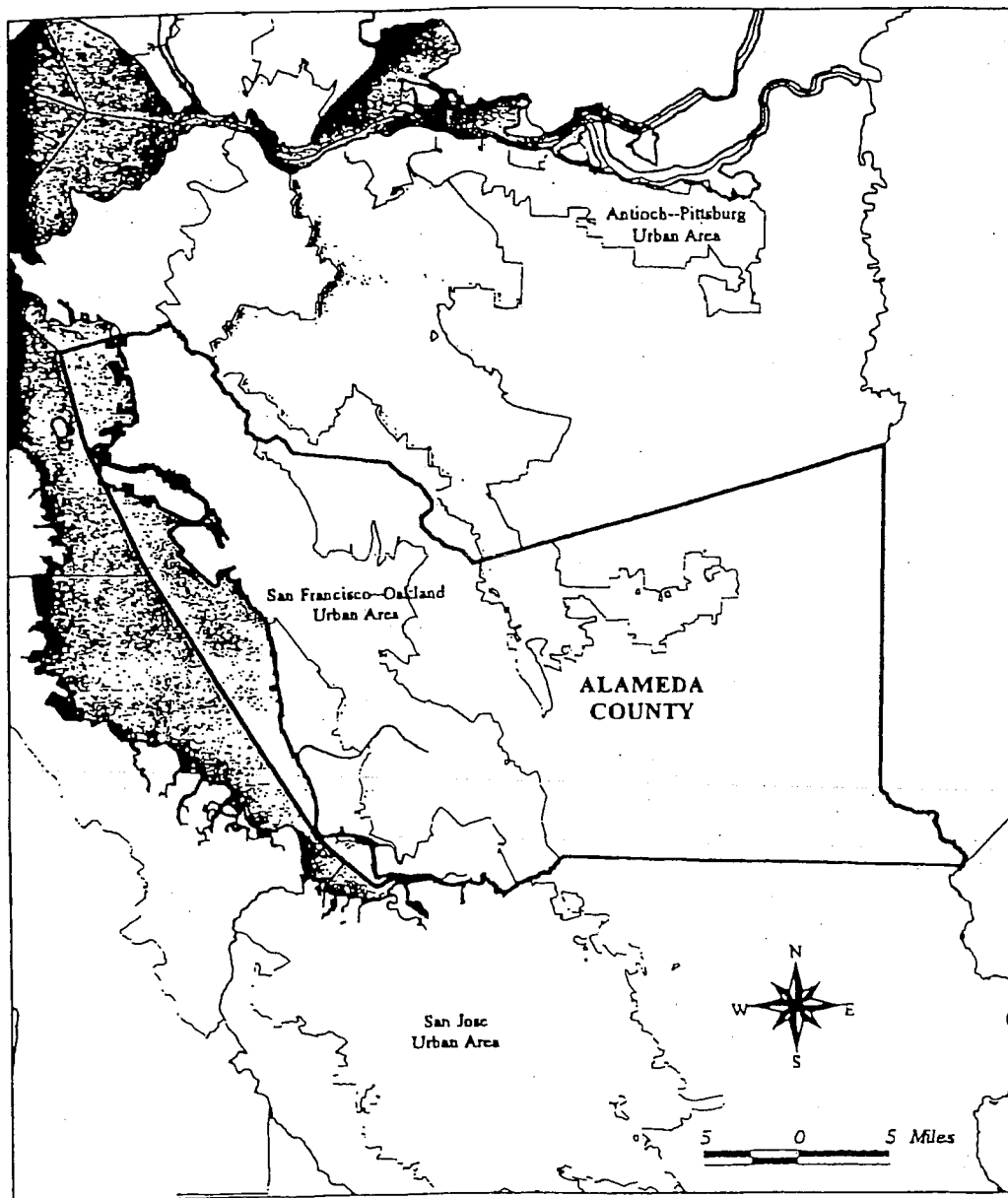
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APPENDIX B

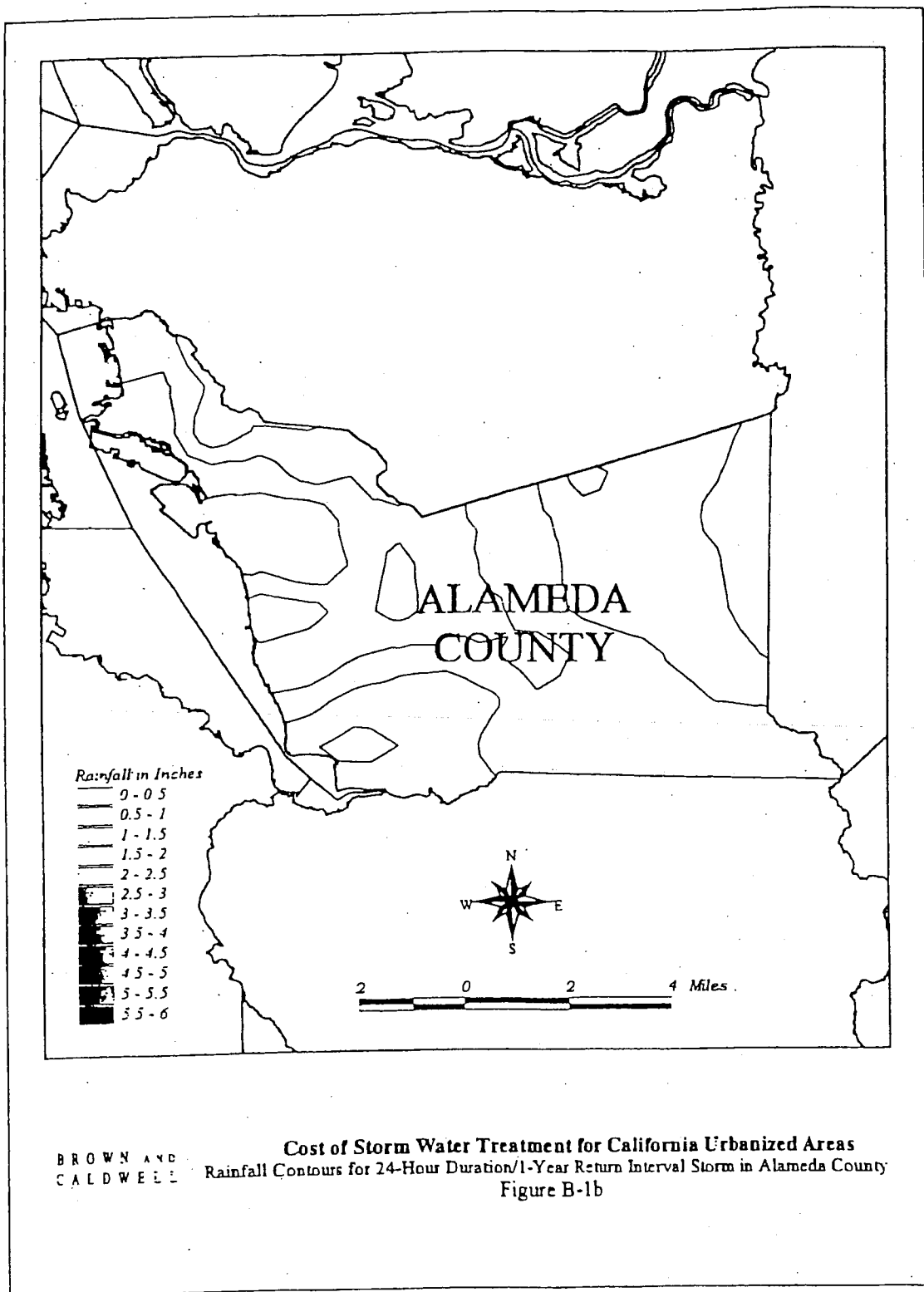
URBANIZED AREA BOUNDARY, RAINFALL CONTOUR, LAND USE, AND HYDROLOGIC SUB-UNIT BOUNDARY MAPS



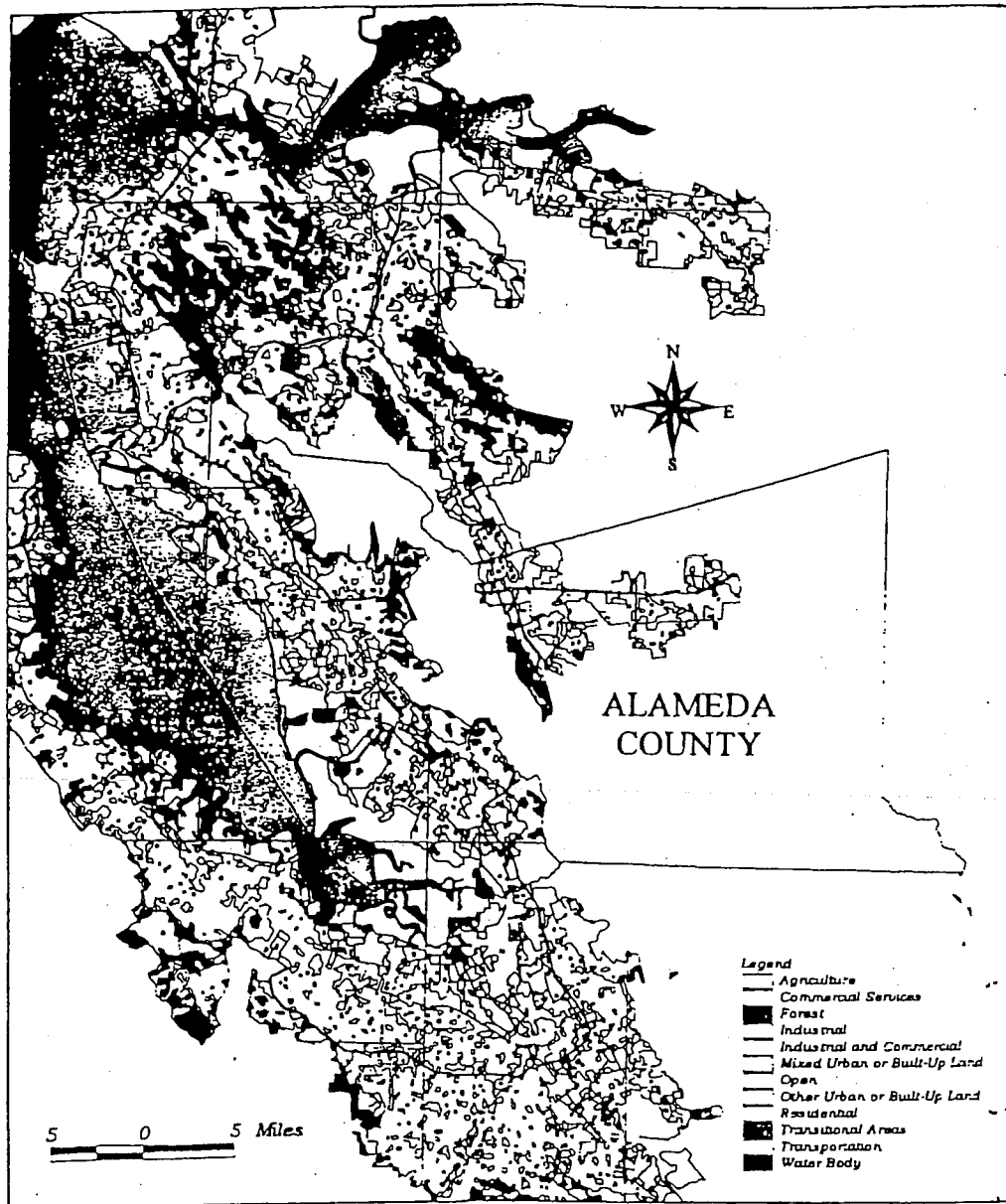
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Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Alameda County
Figure B-1a

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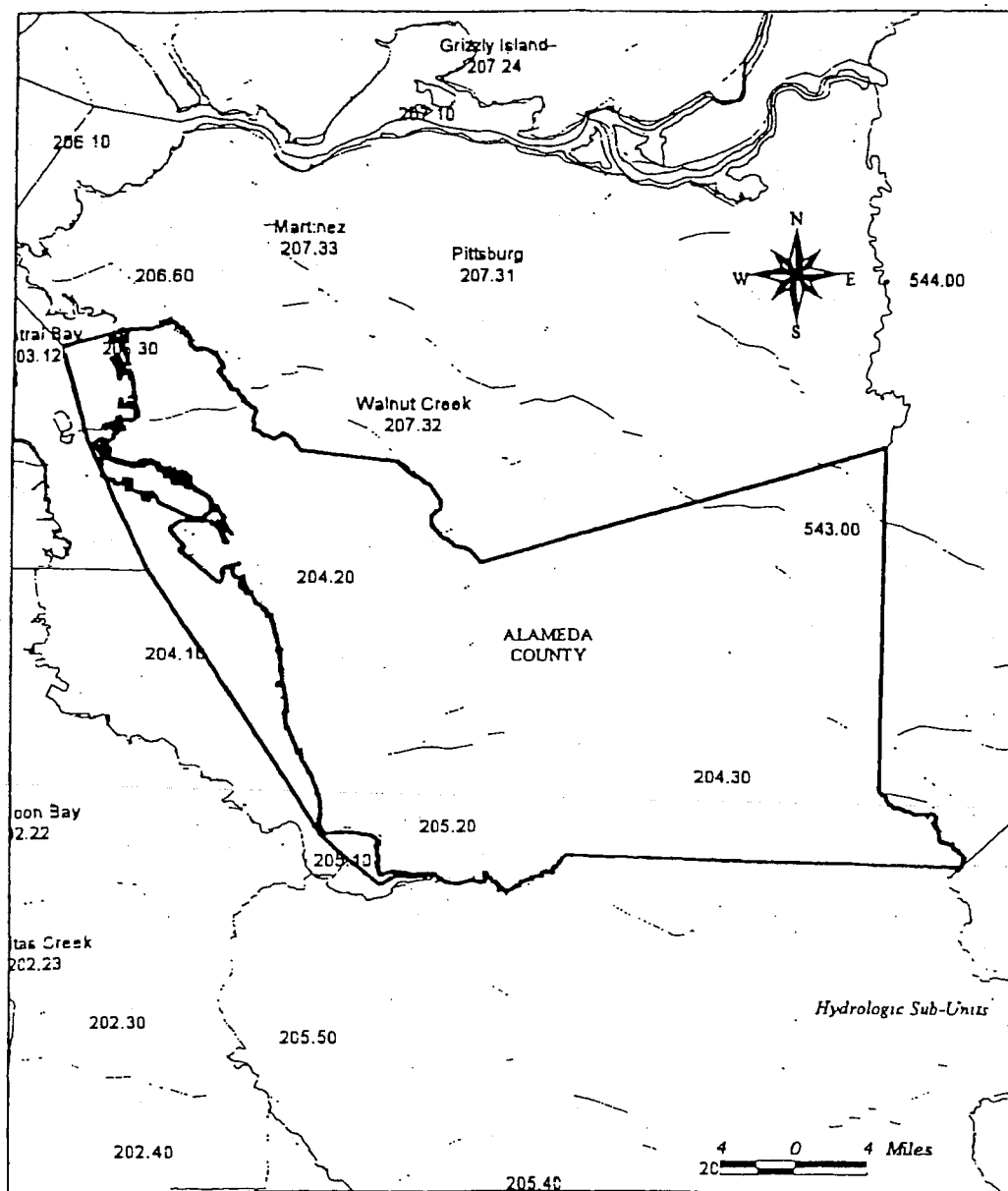
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Alameda County
Figure B-1c

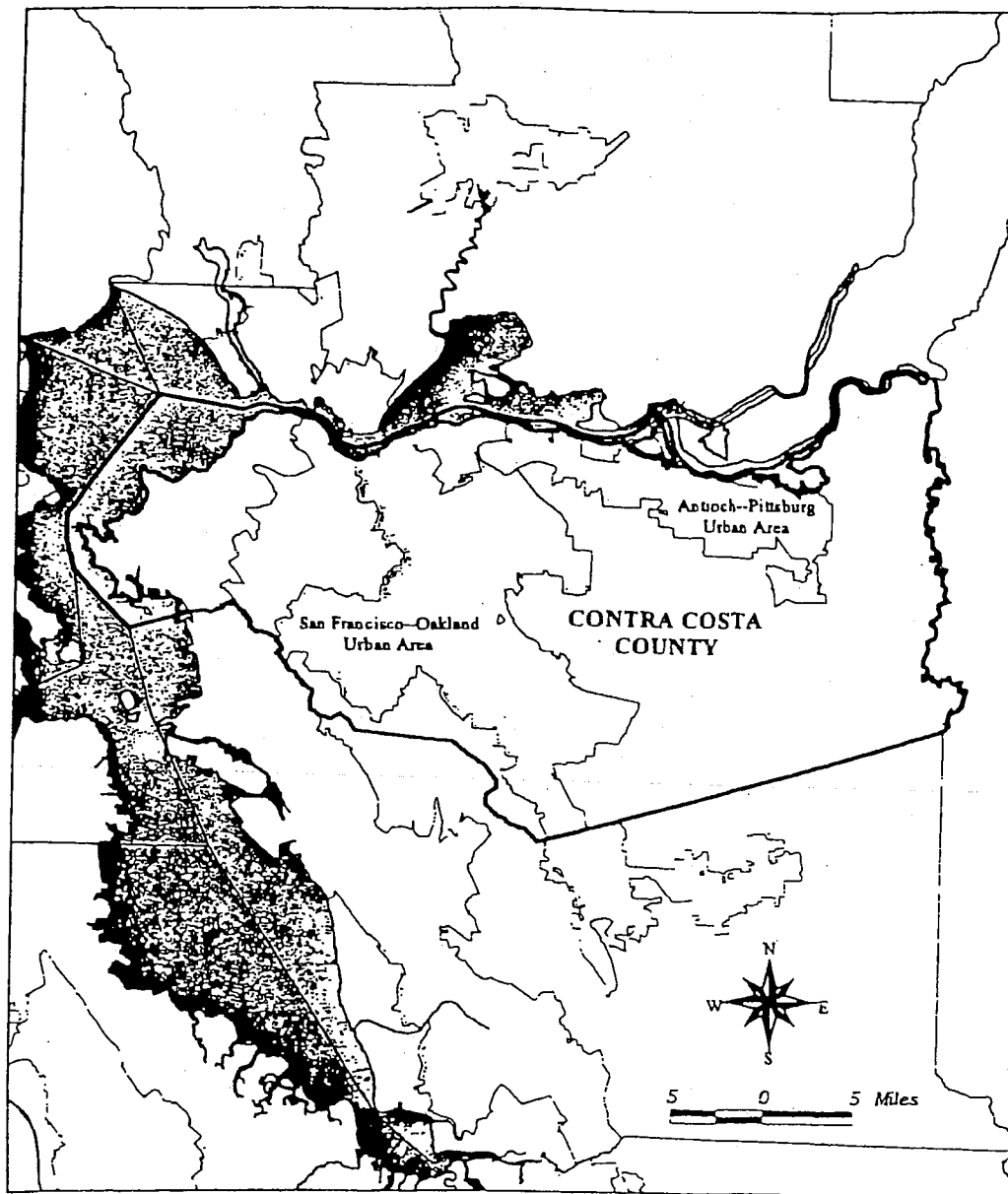
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Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Alameda County
Figure B-1d

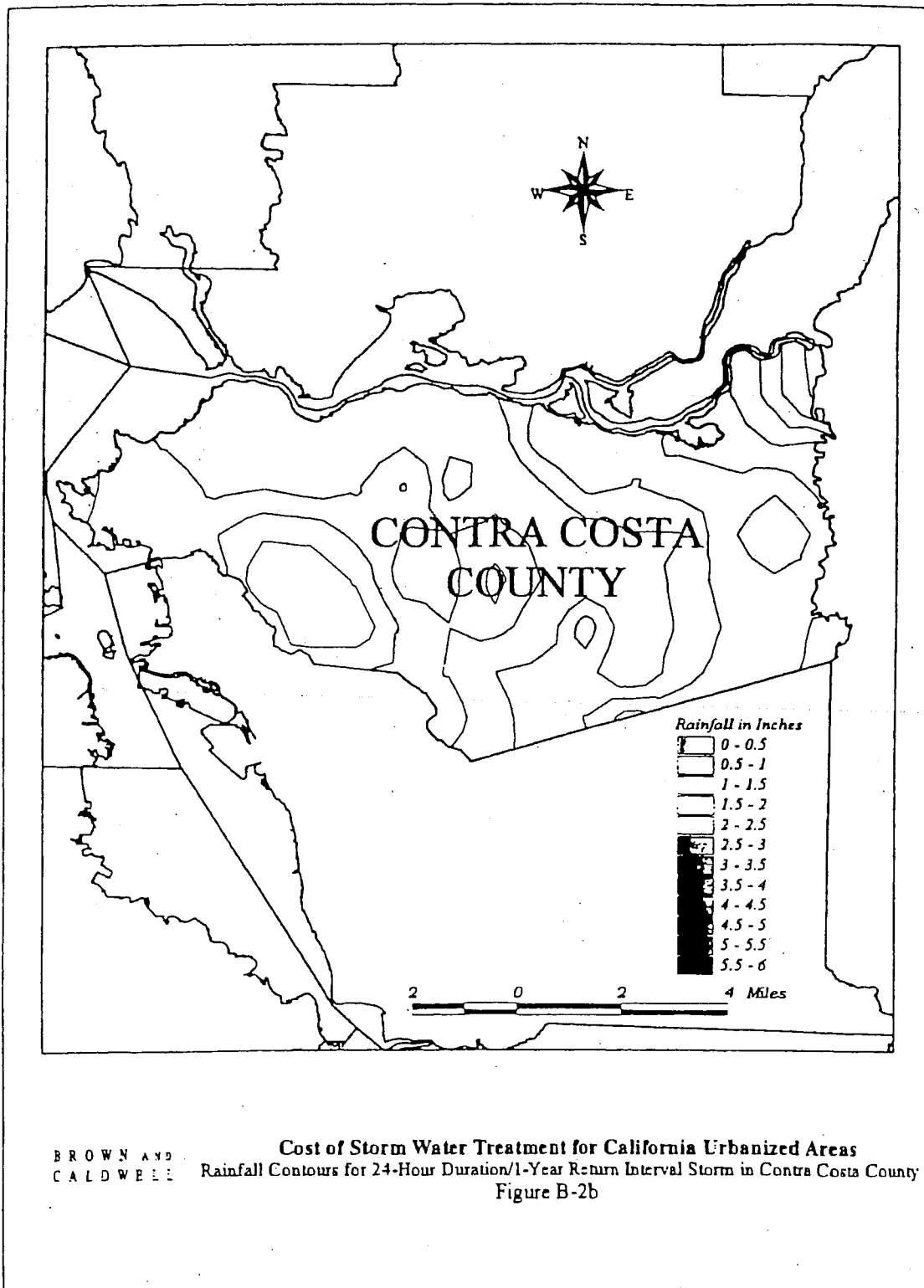
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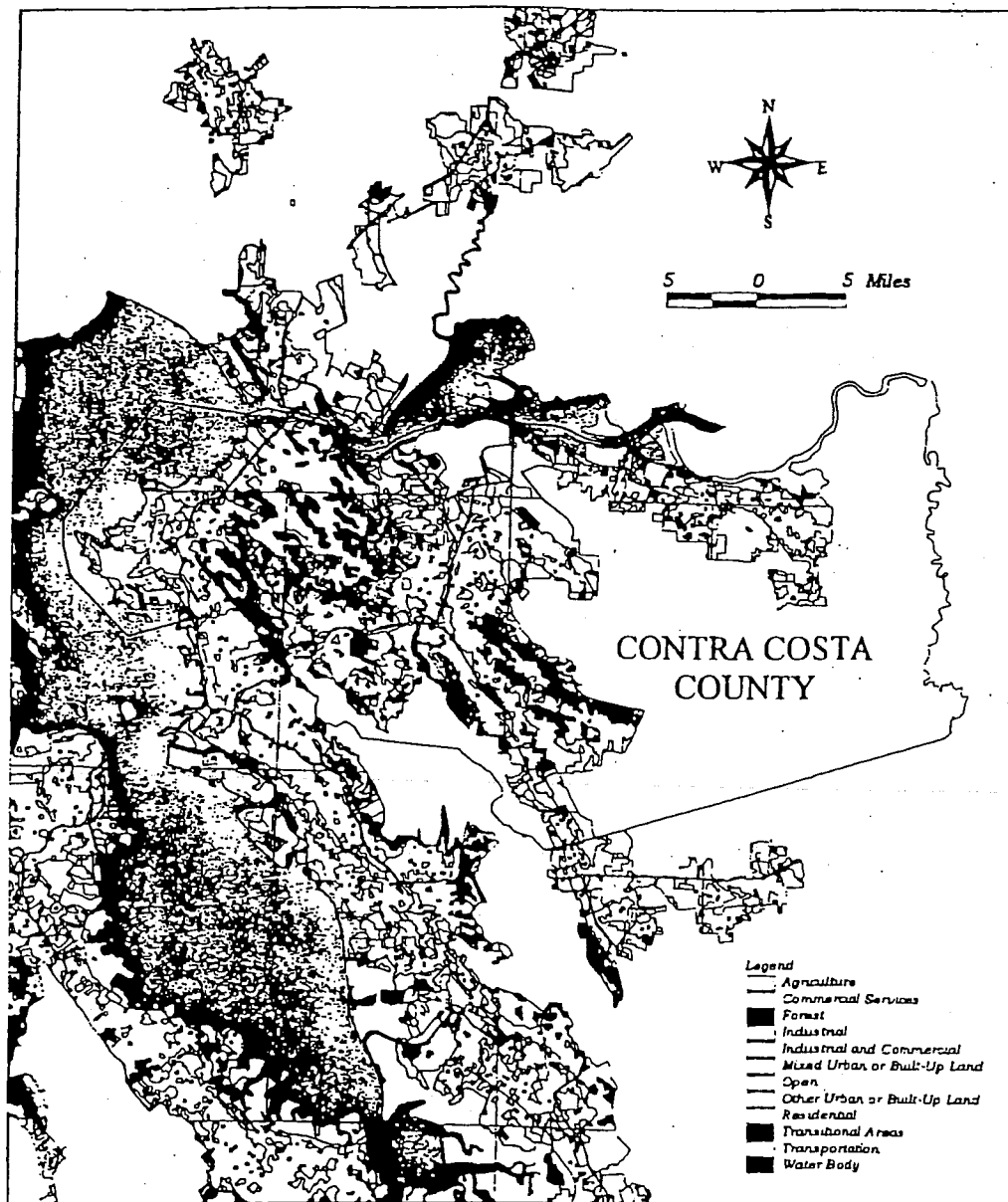
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Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Contra Costa County
Figure B-2a

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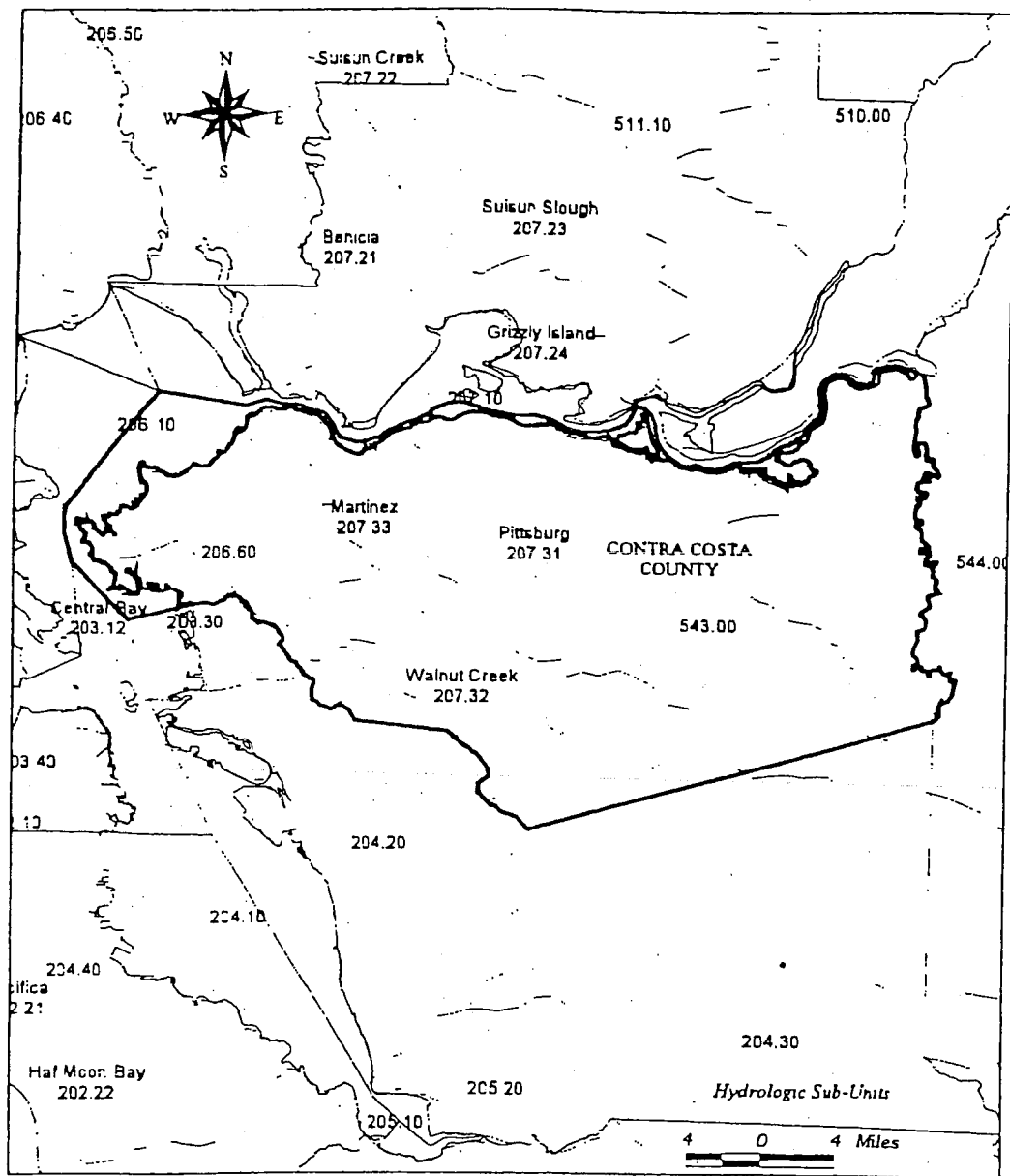
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Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Contra Costa County
Figure B-2c

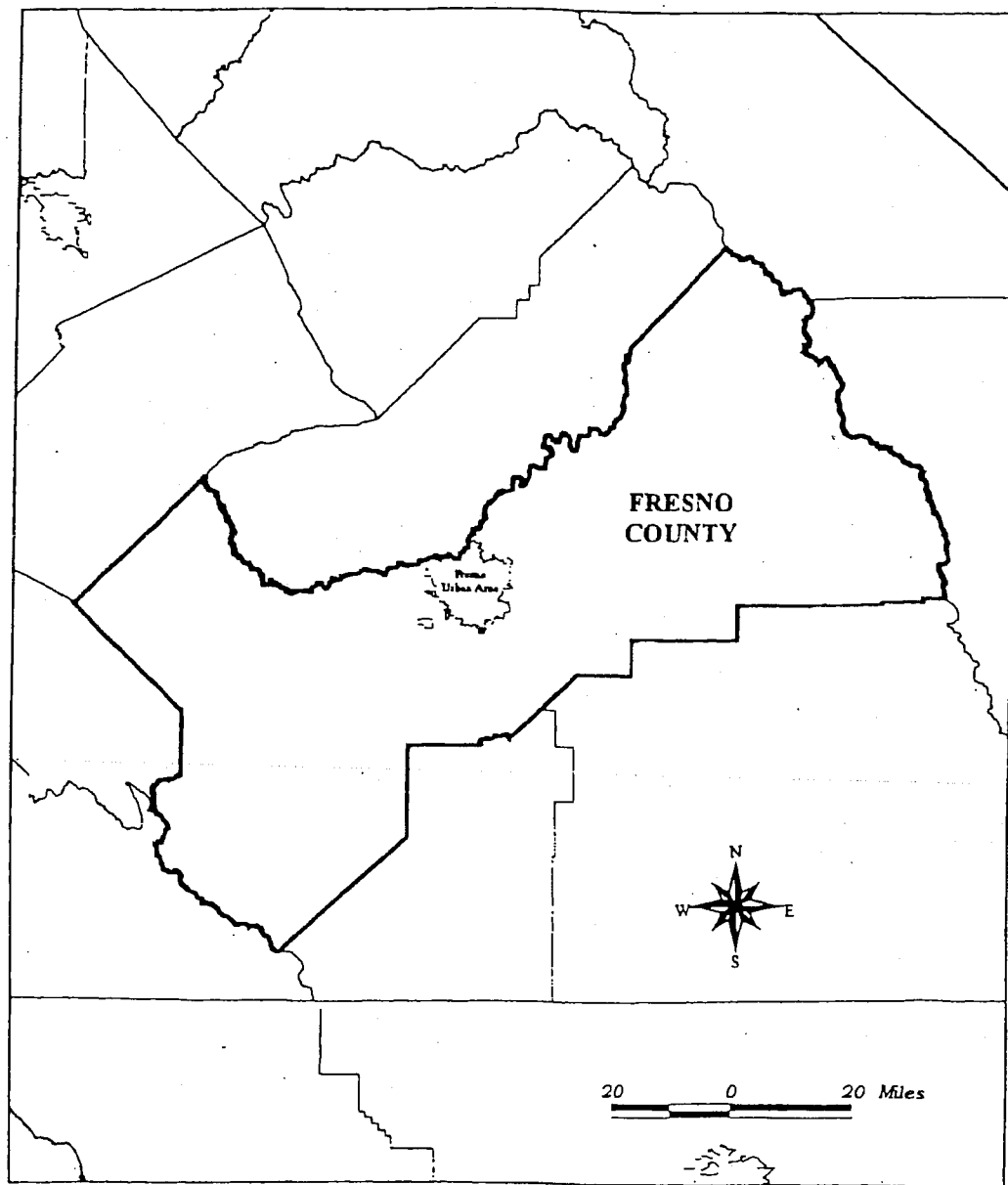
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Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Contra Costa County
Figure B-2d

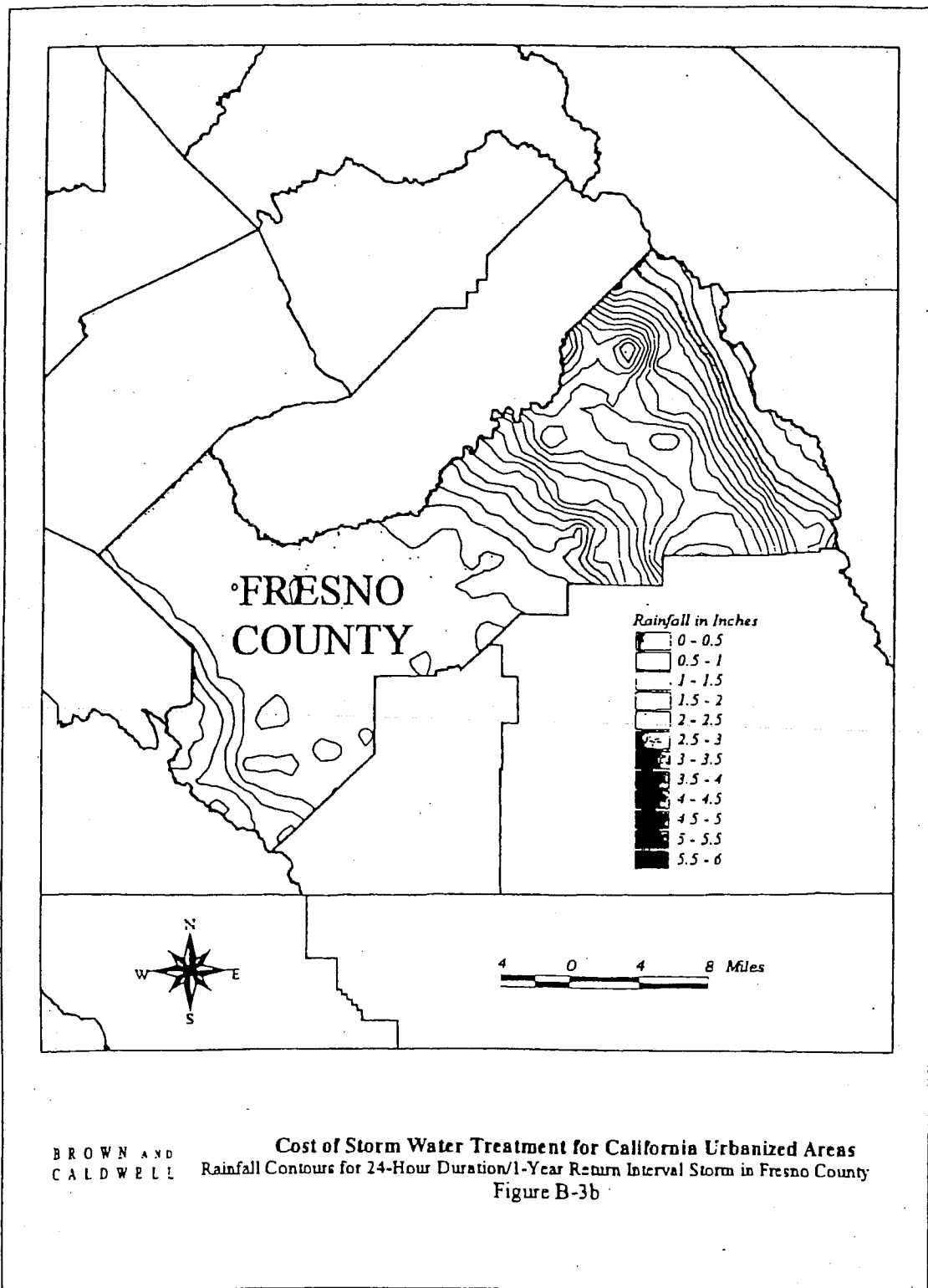
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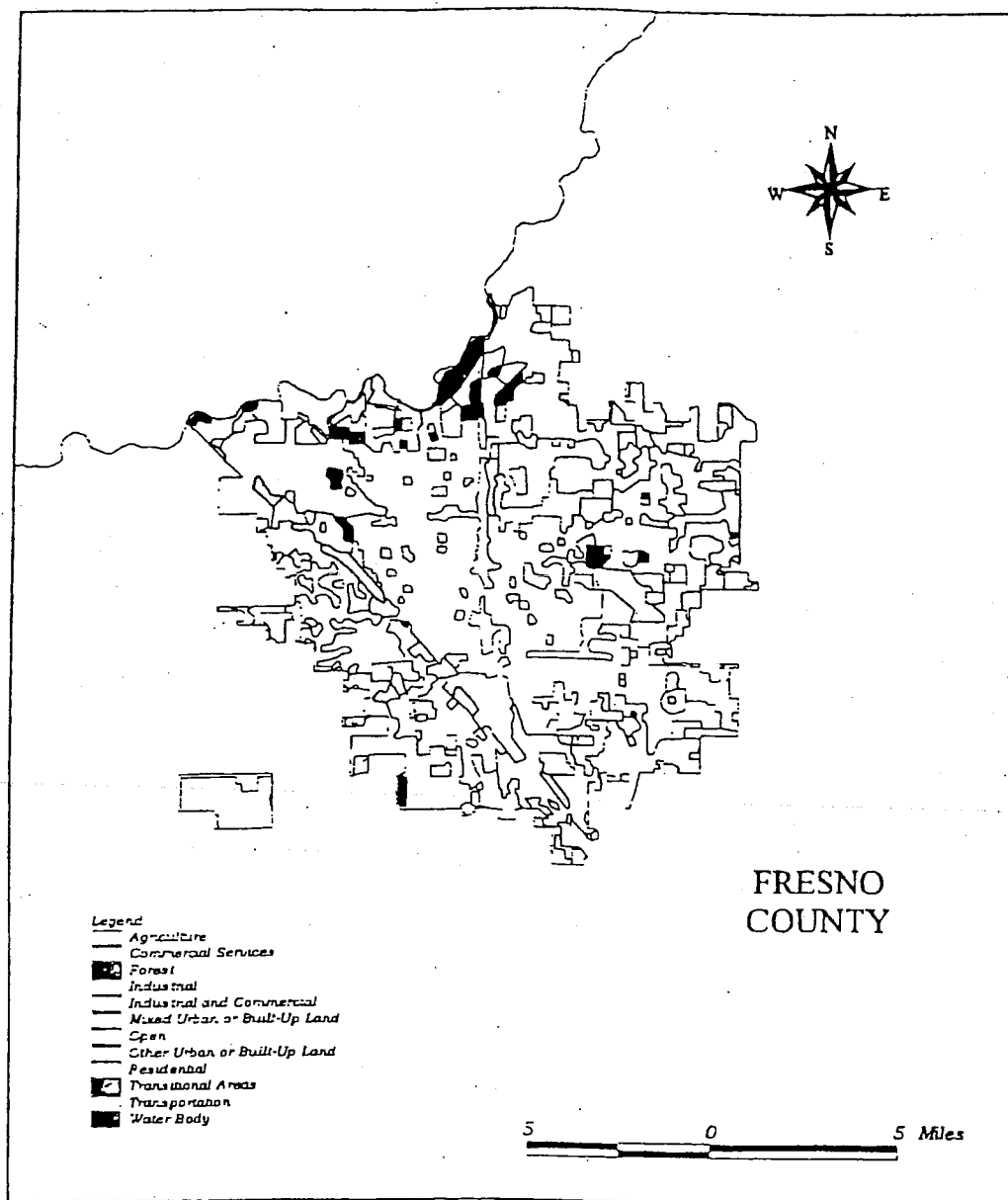
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Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Fresno County
Figure B-3a

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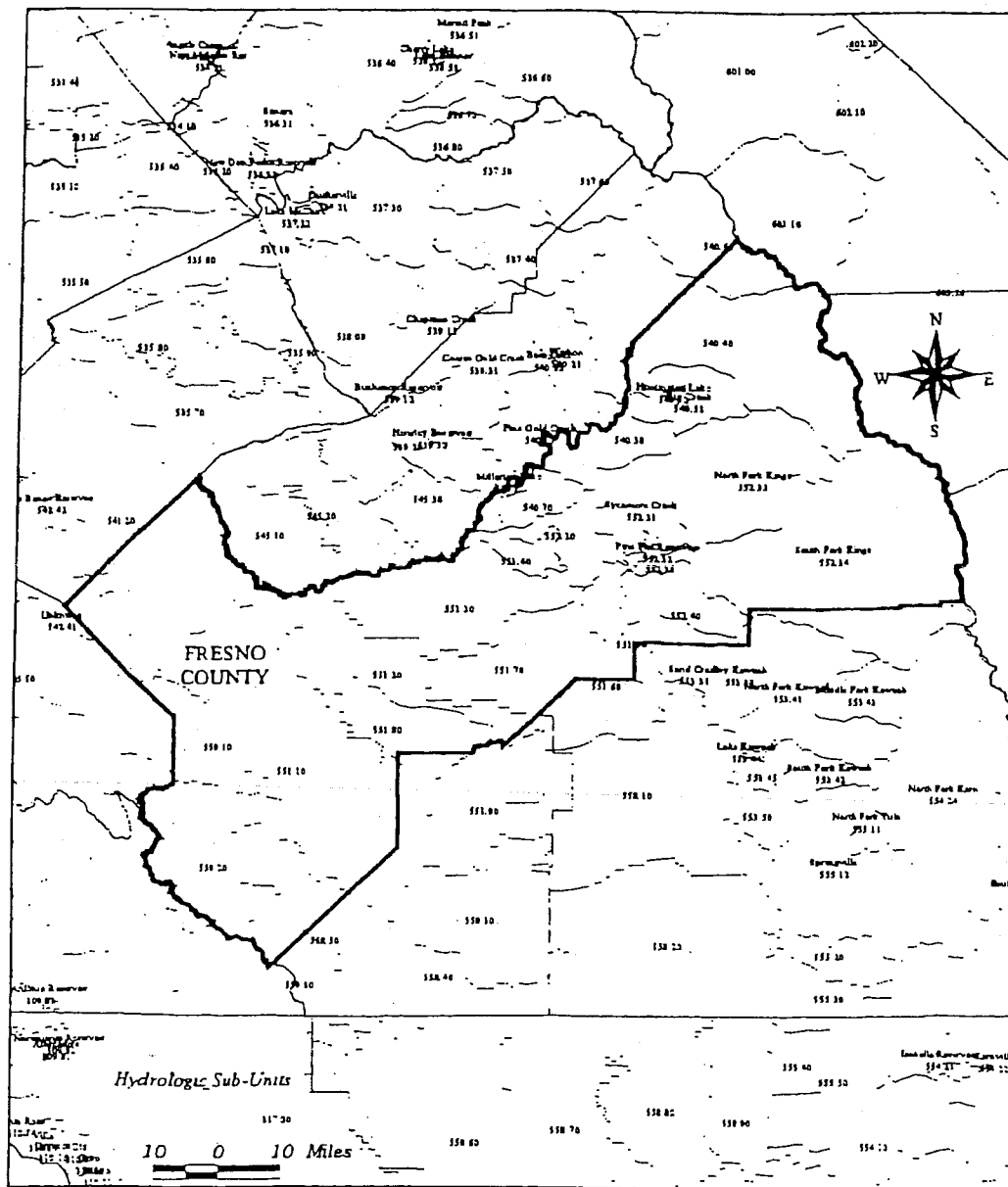
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Fresno County
Figure B-3c

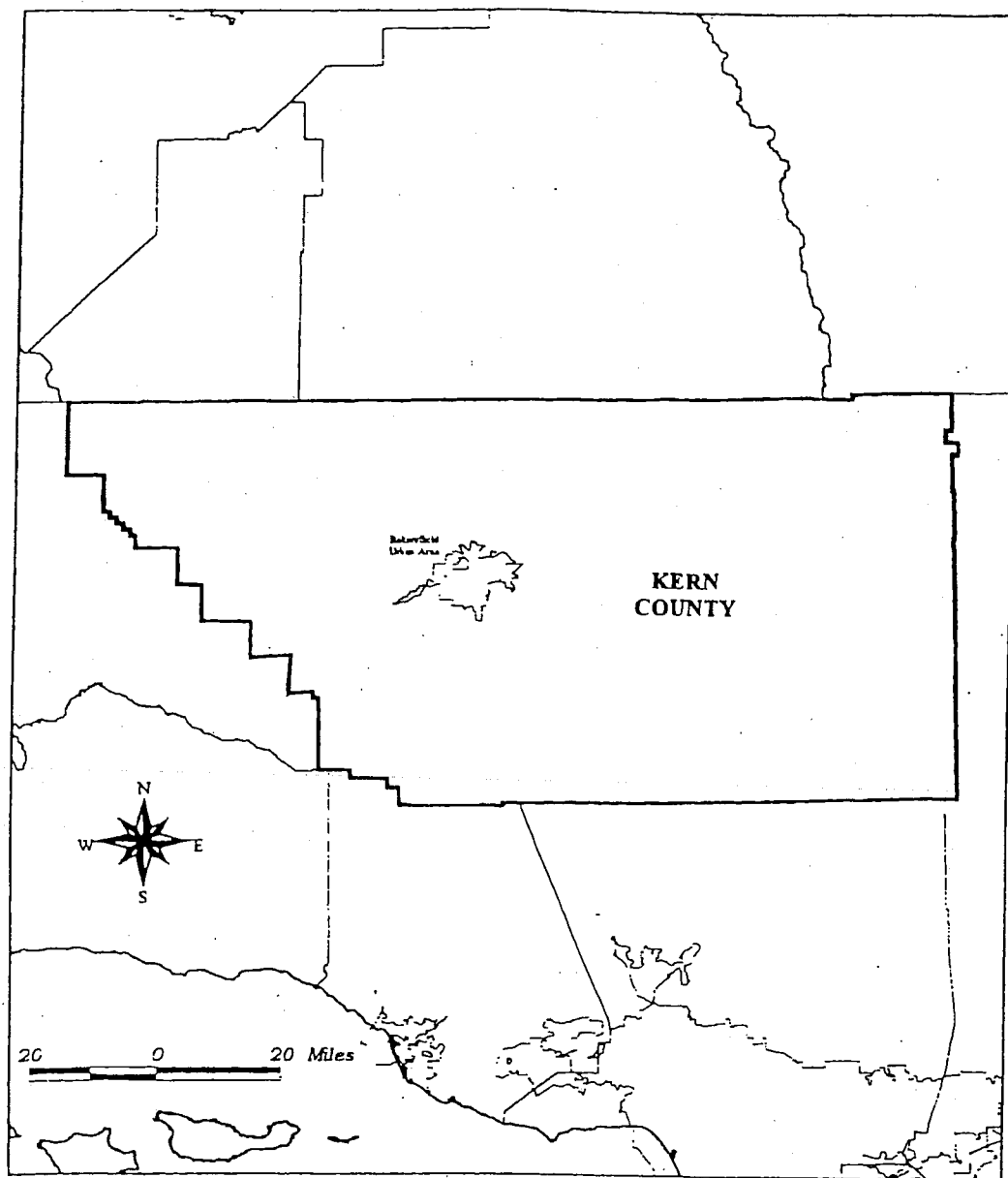
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Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Fresno County
Figure B-3d

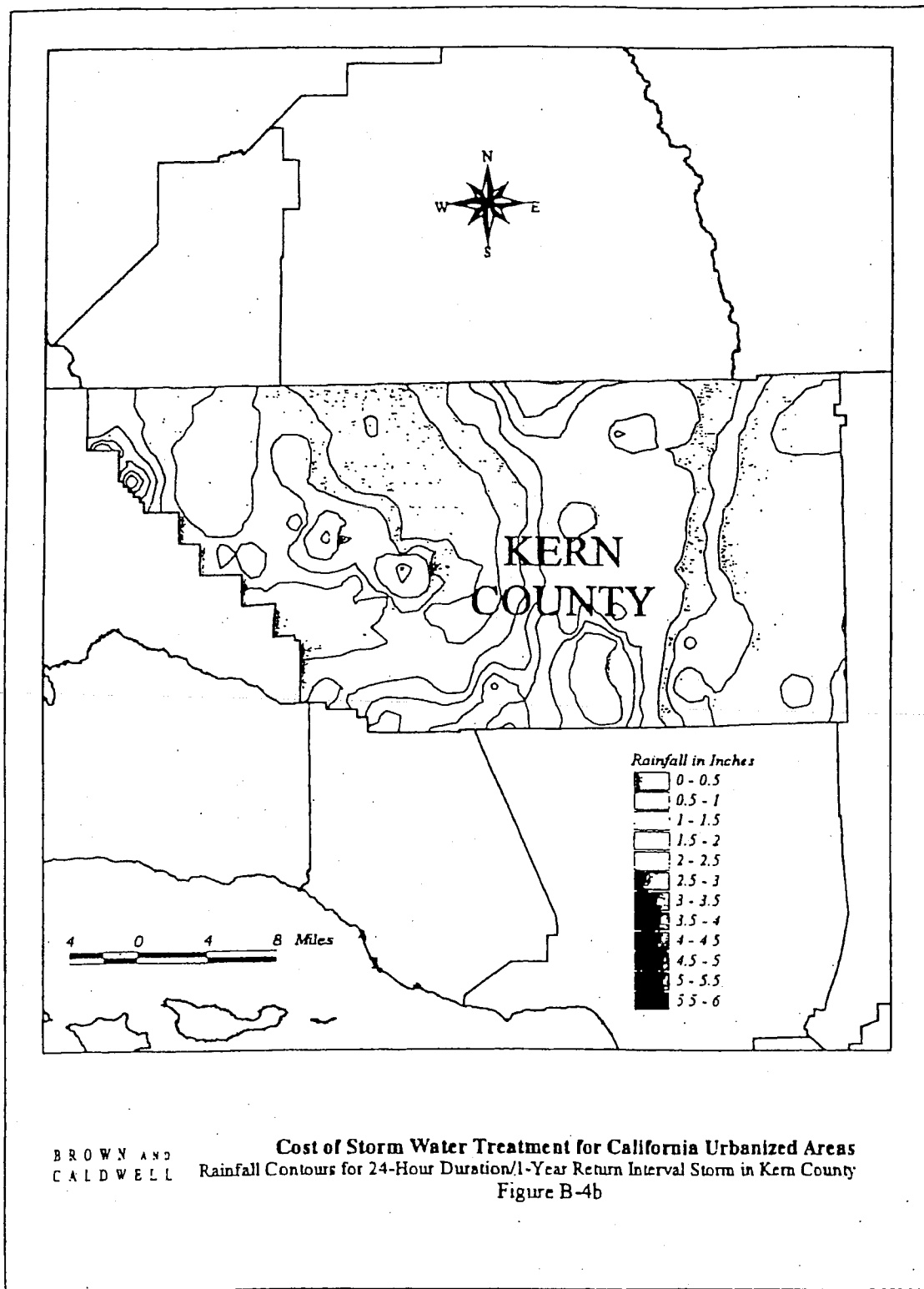
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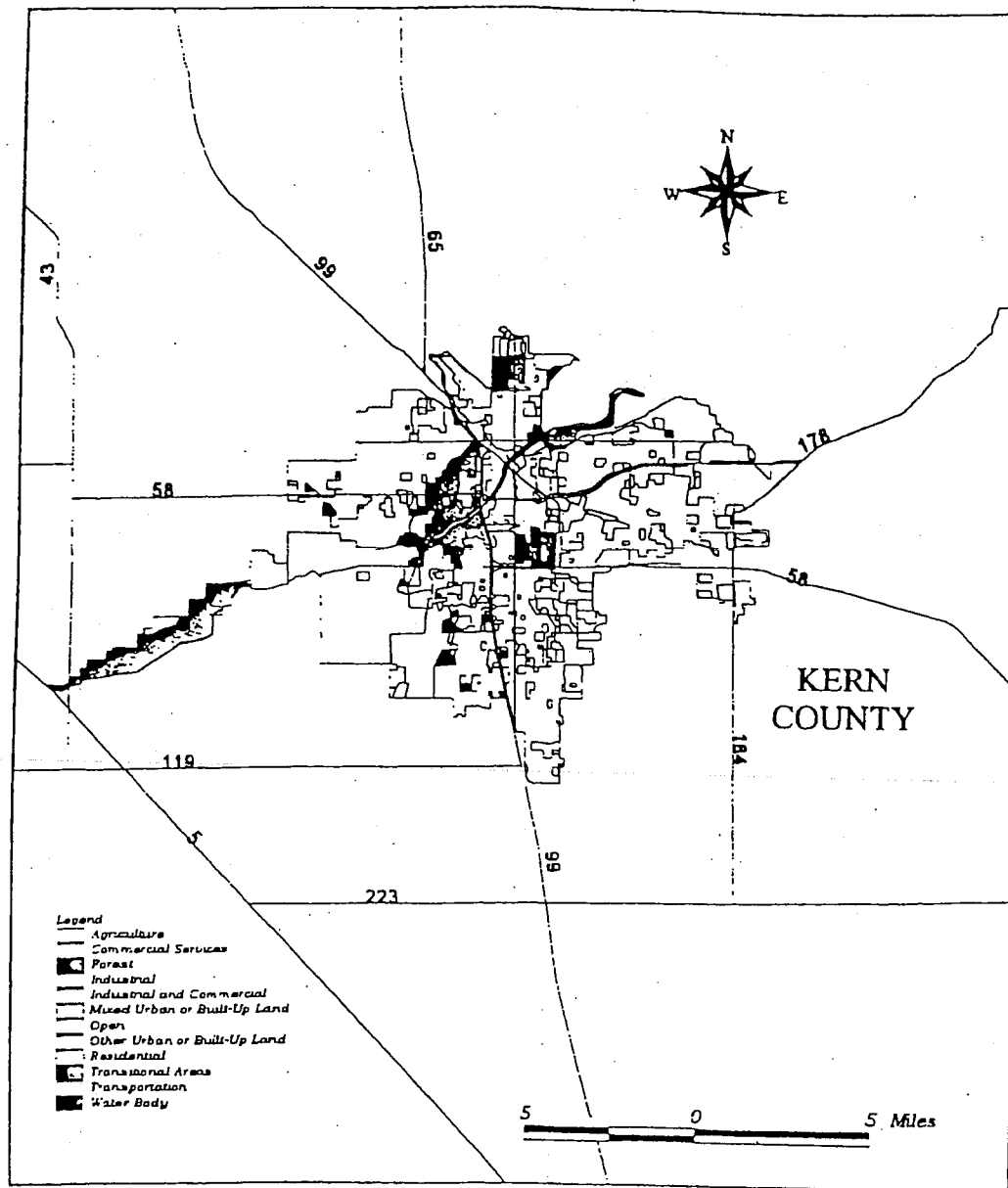
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CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Kern County
Figure B-4a

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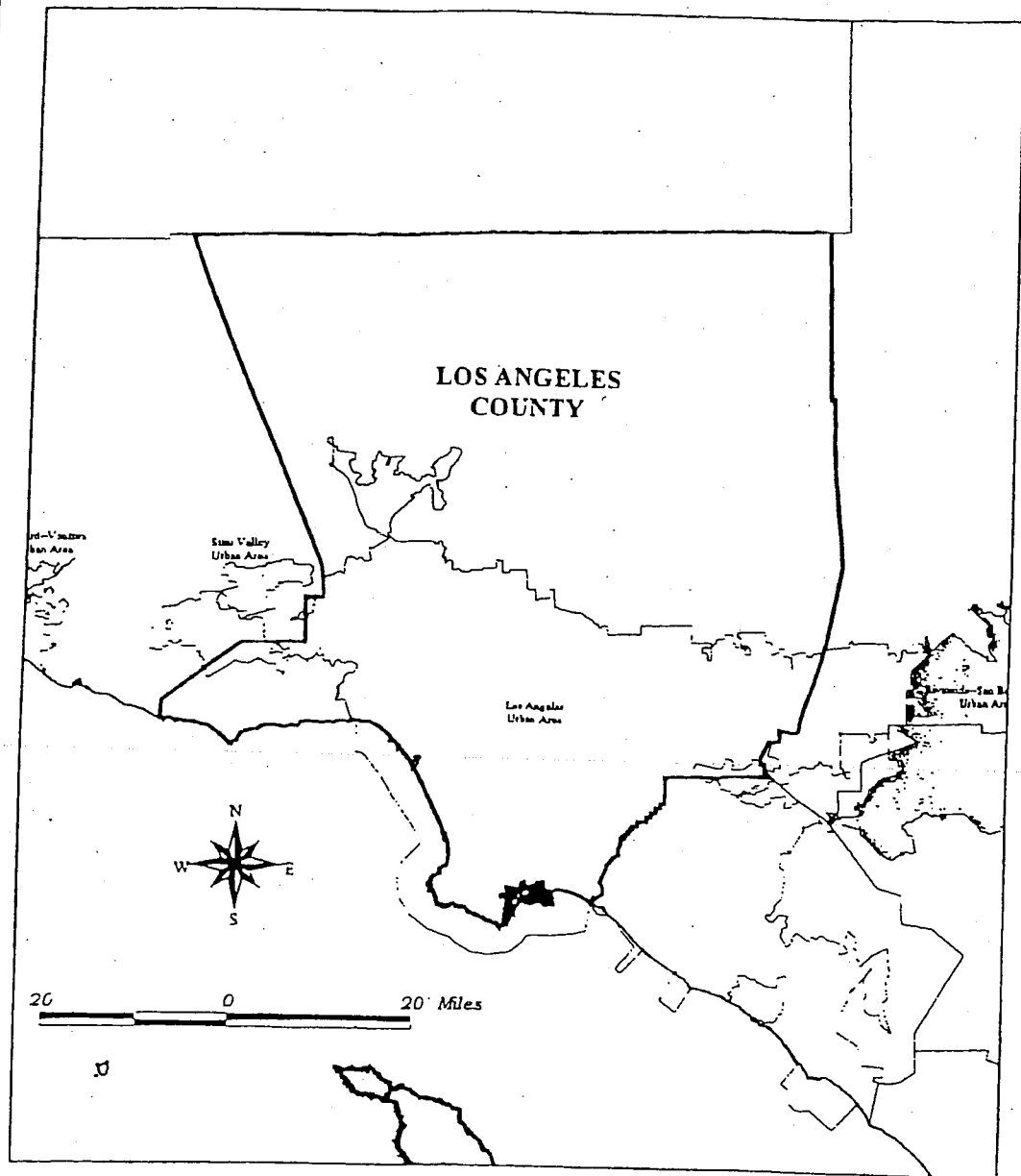
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Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Kern County
Figure B-4c

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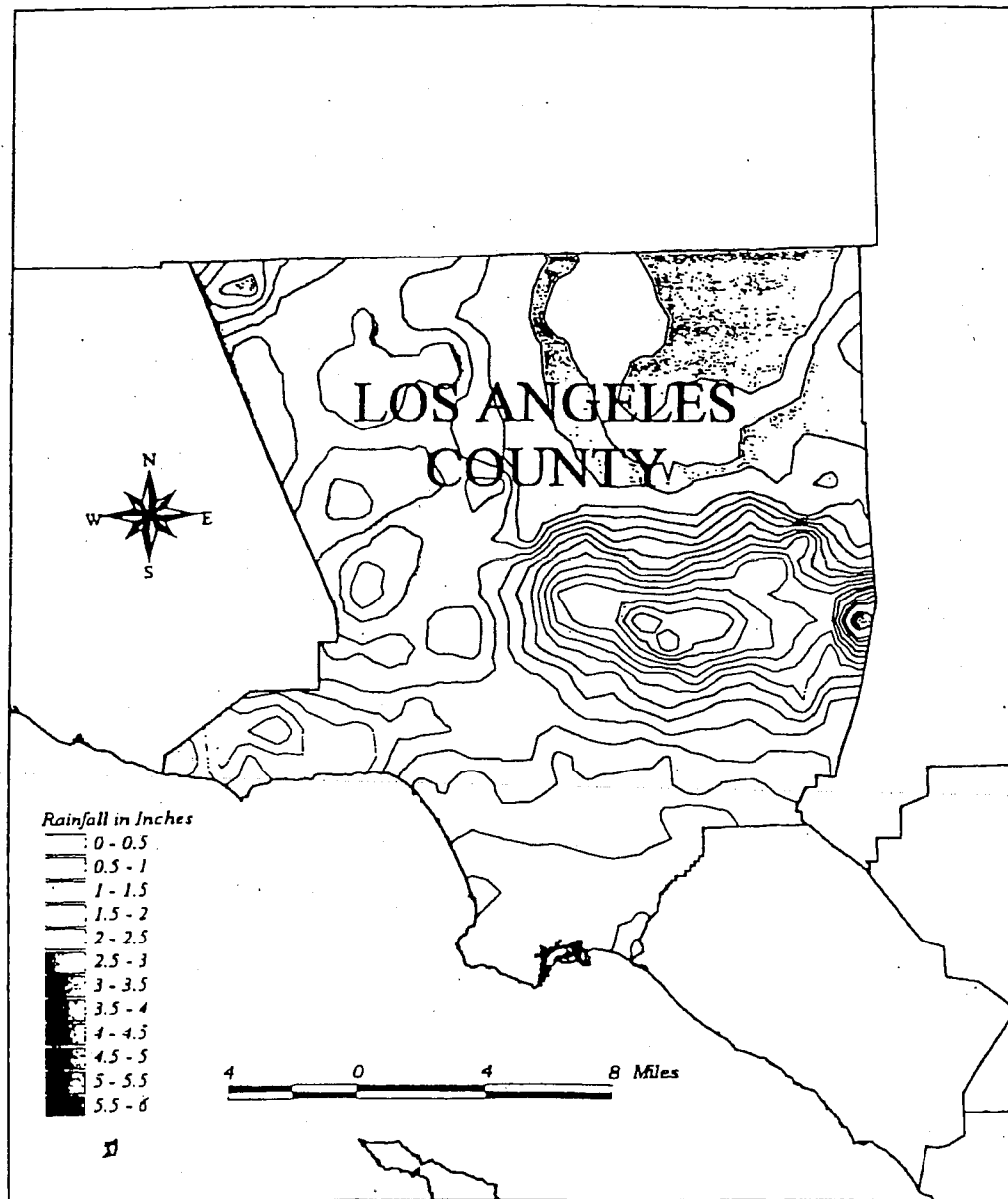


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Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Los Angeles County

Figure B-5a

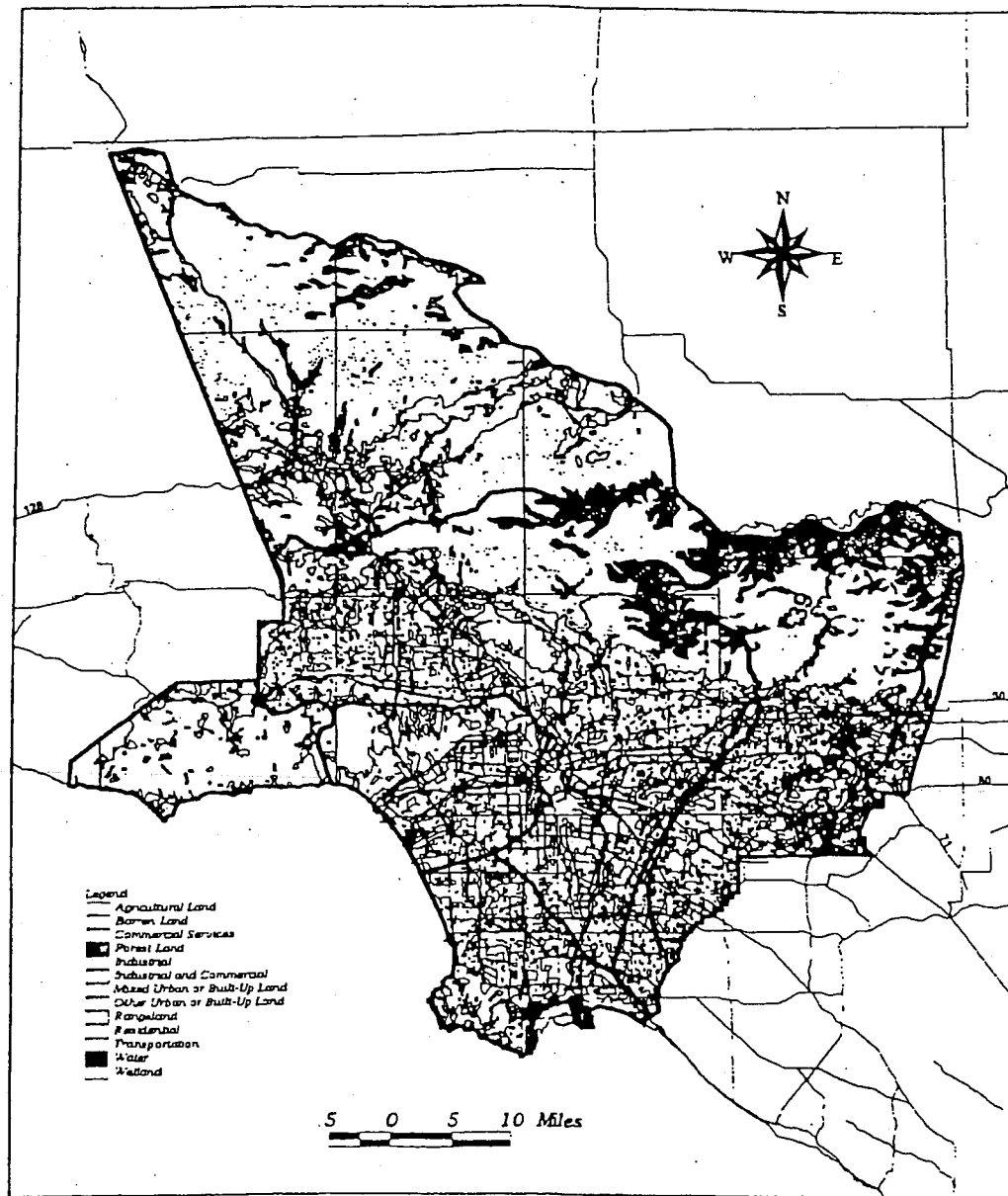
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Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Los Angeles County
Figure B-5b

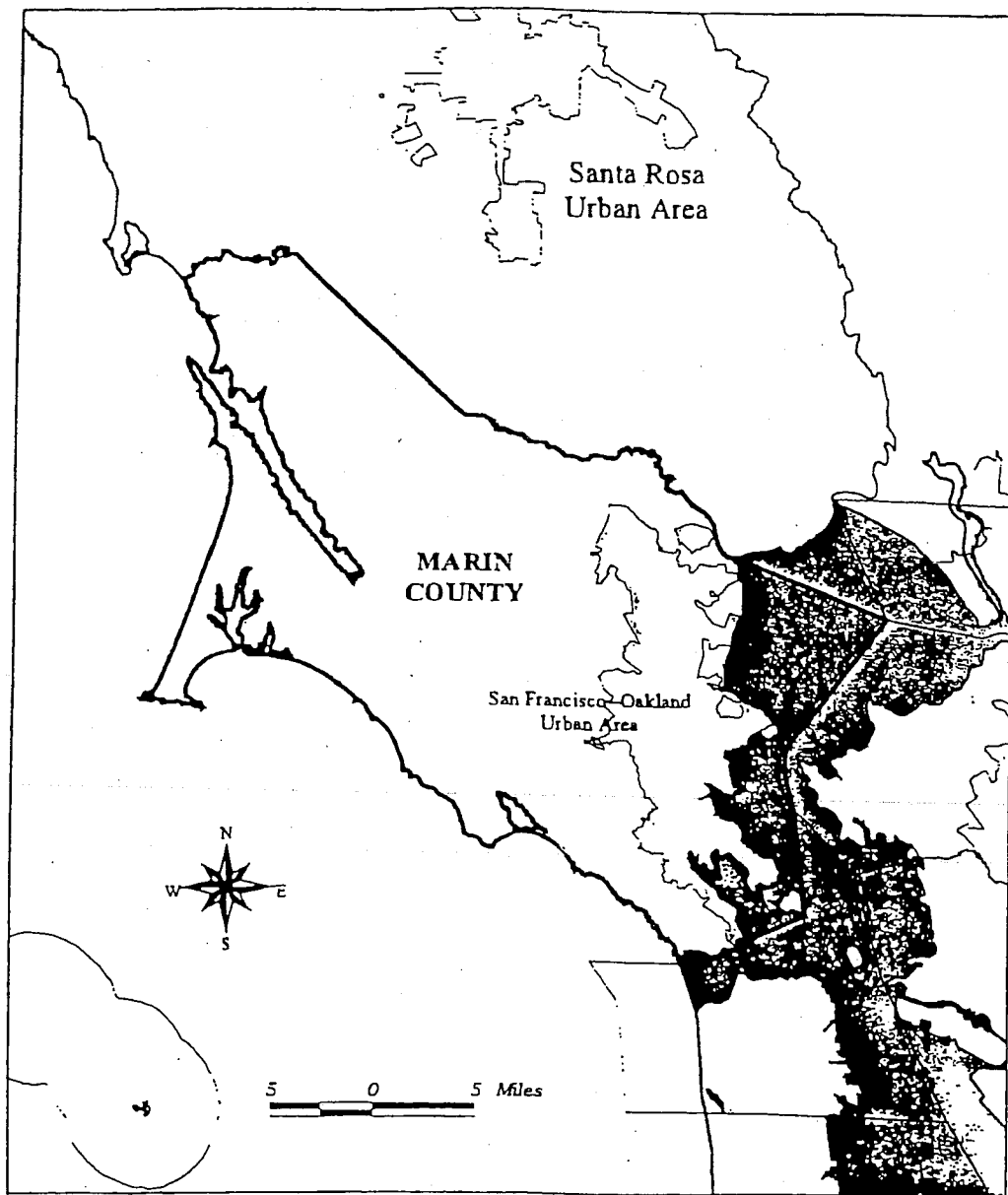
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CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Los Angeles Drainage Basins
Figure B-5c

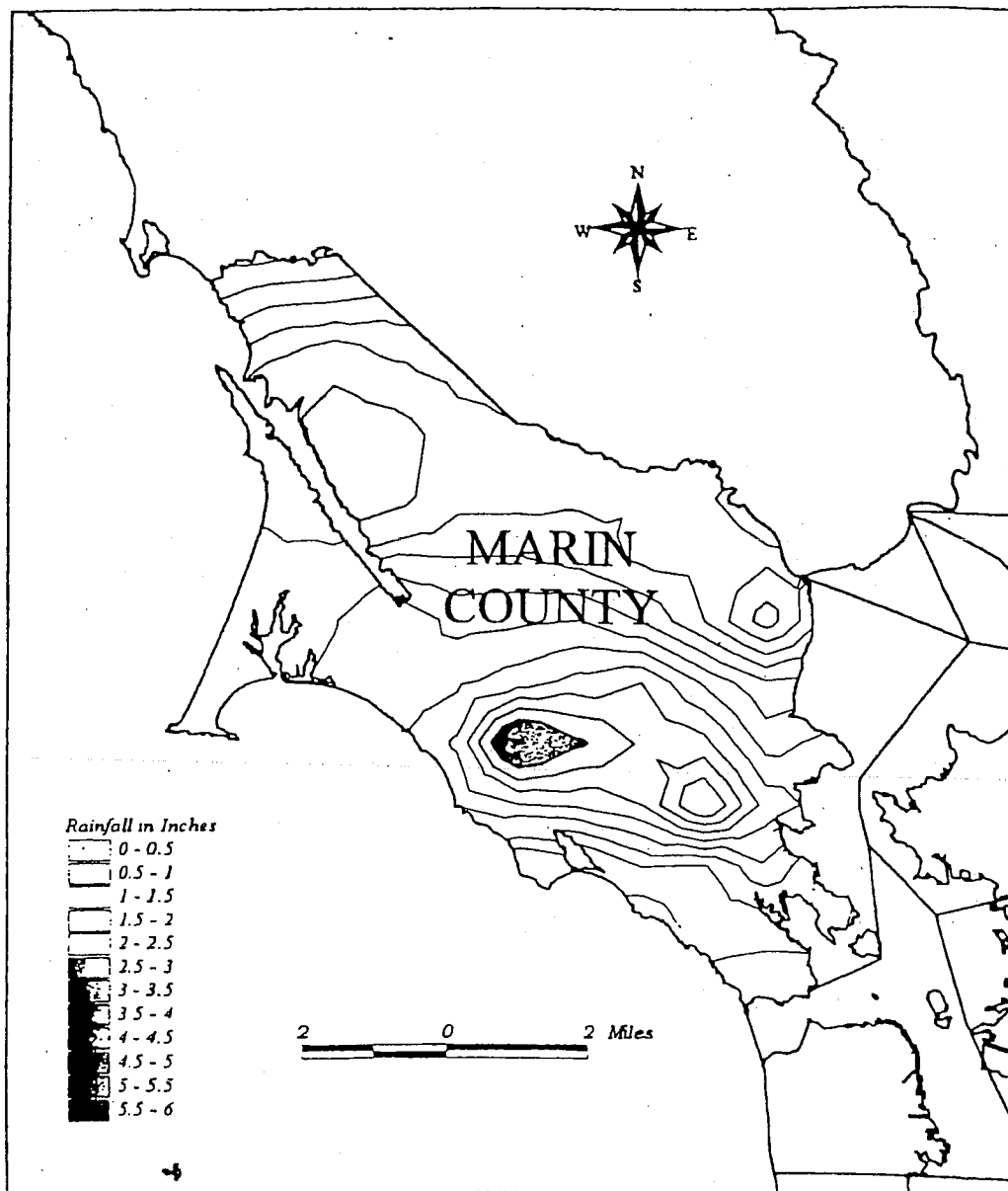
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CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Marin County
Figure B-6a

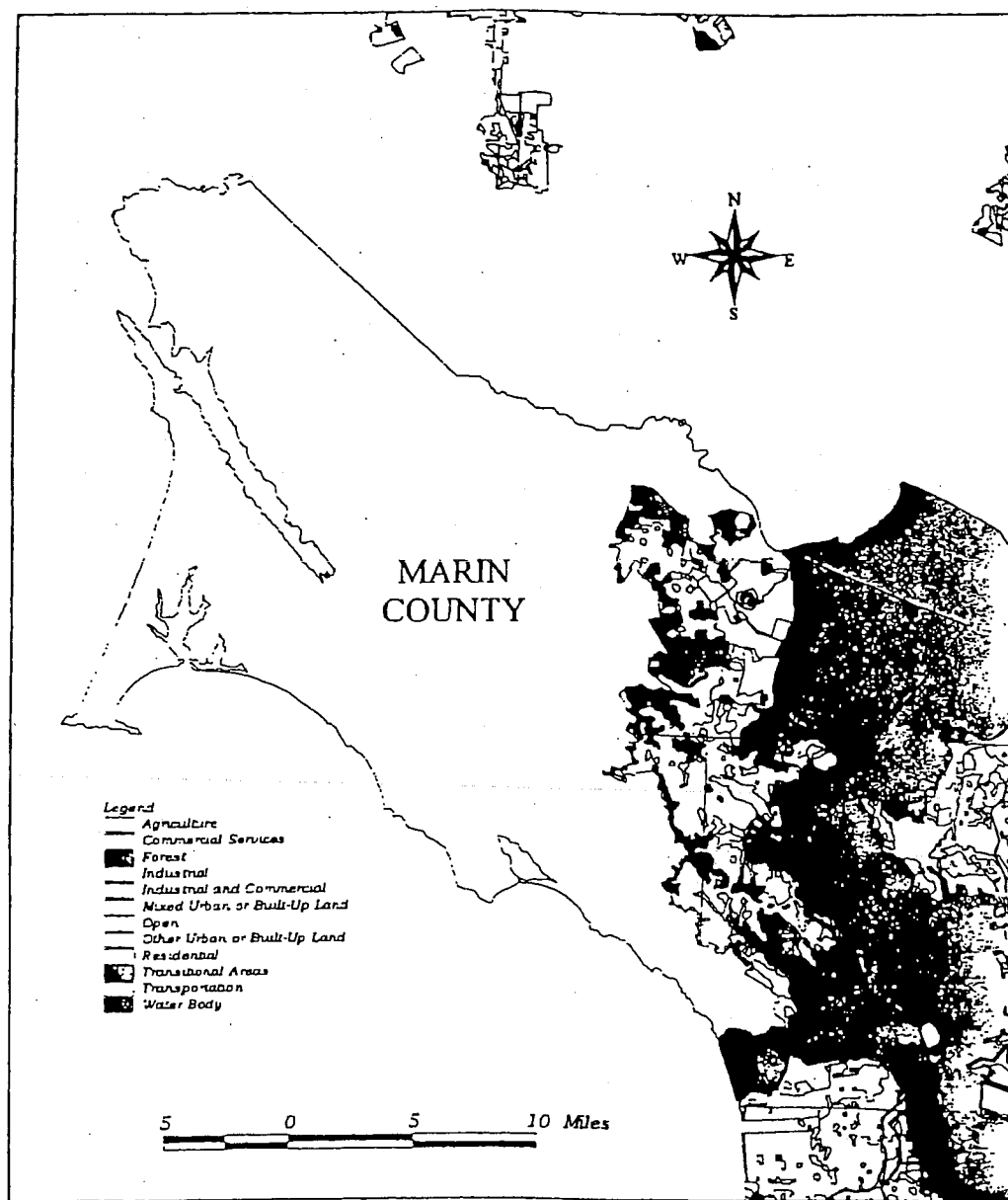
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Marin County
Figure B-6b

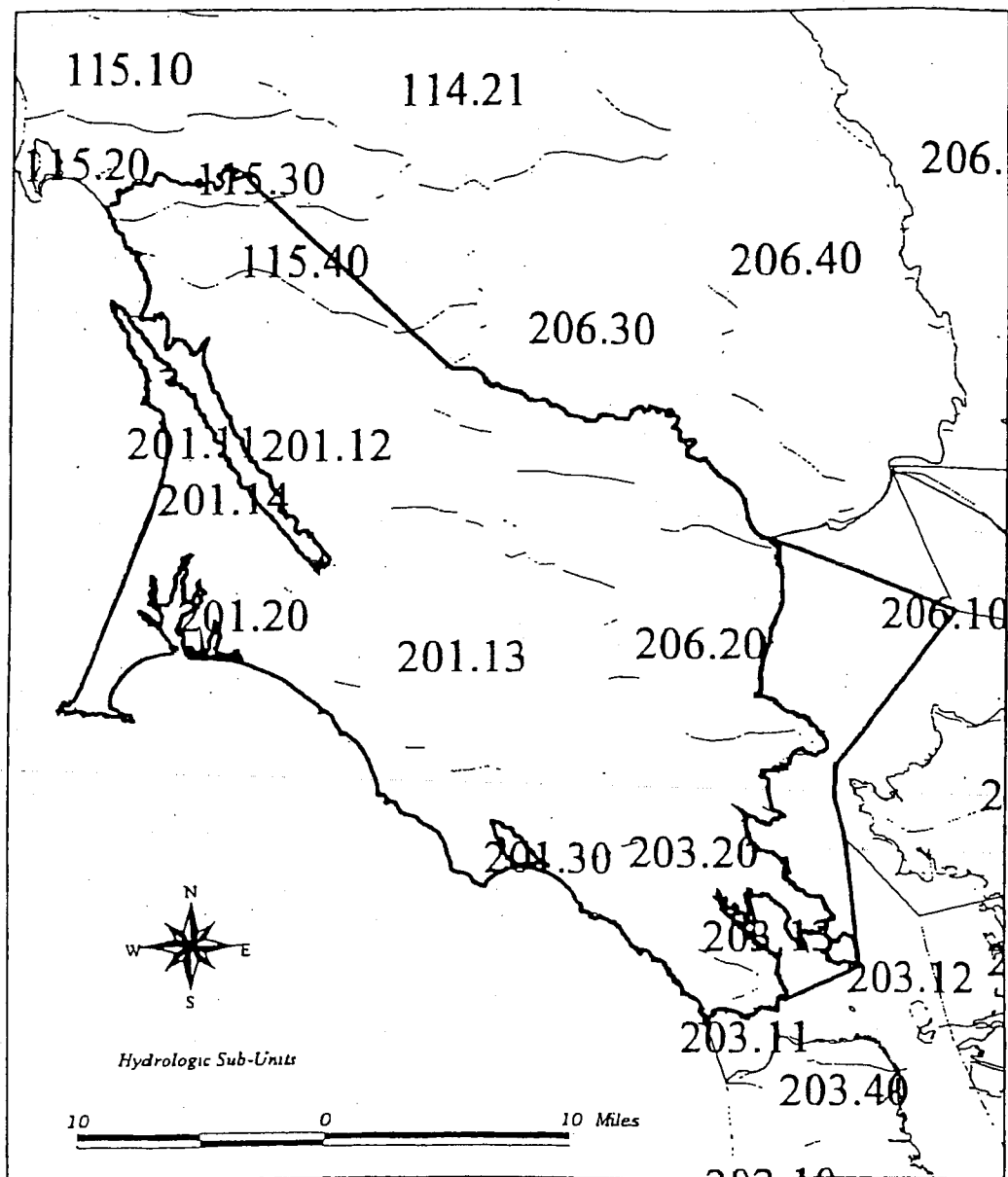
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Marin County
Figure B-6c

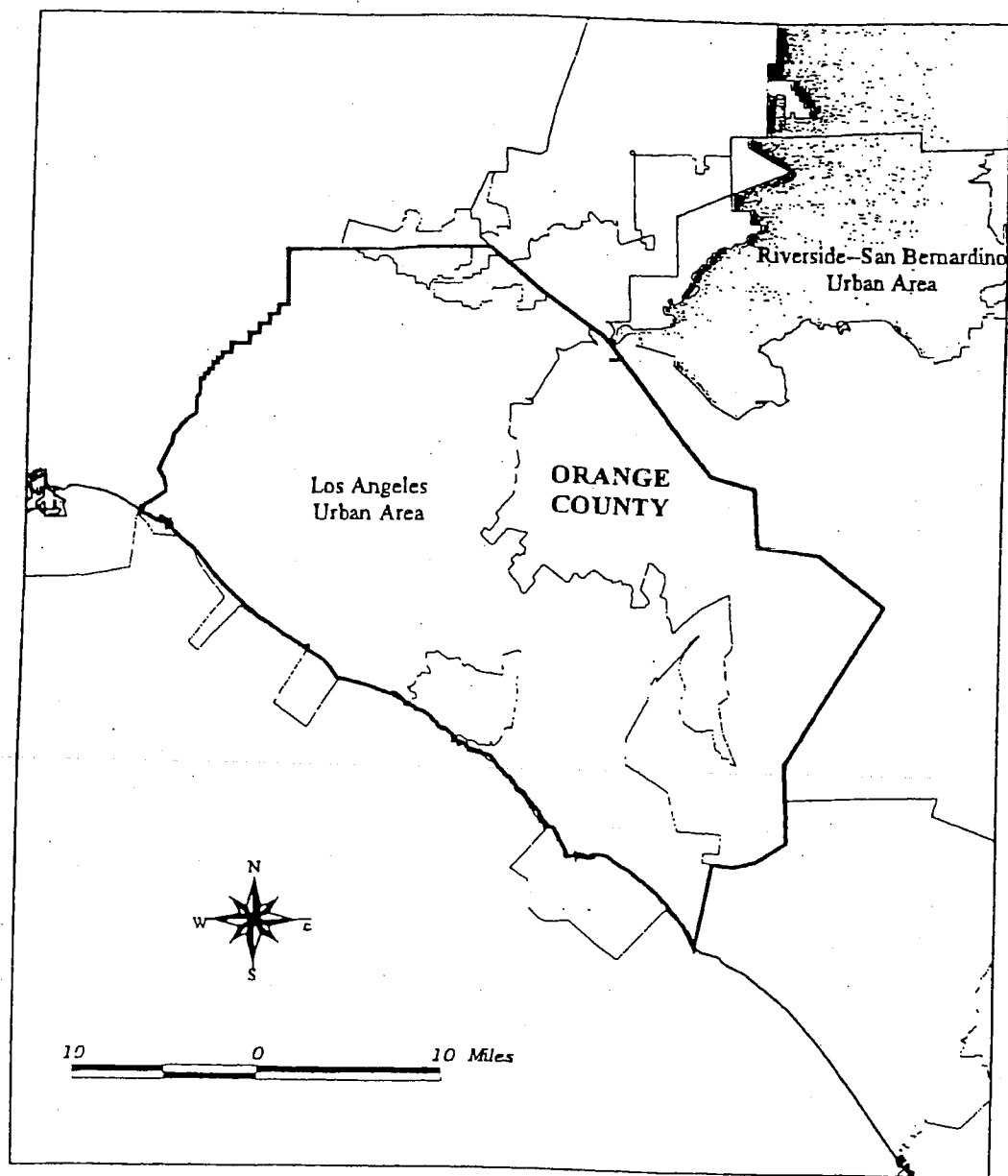
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CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Hydrologic Sub-Units in Marin County
 Figure B-6d

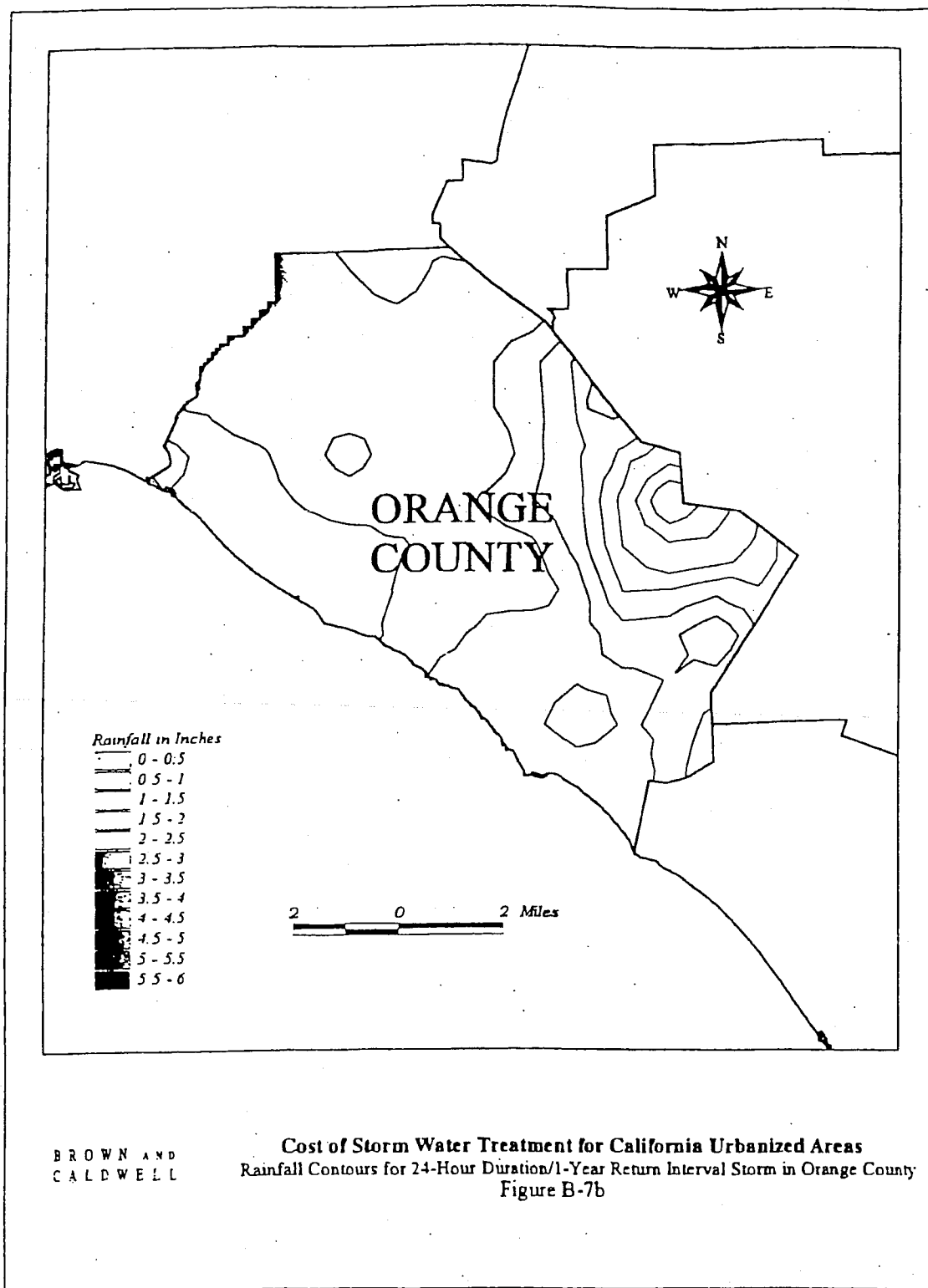
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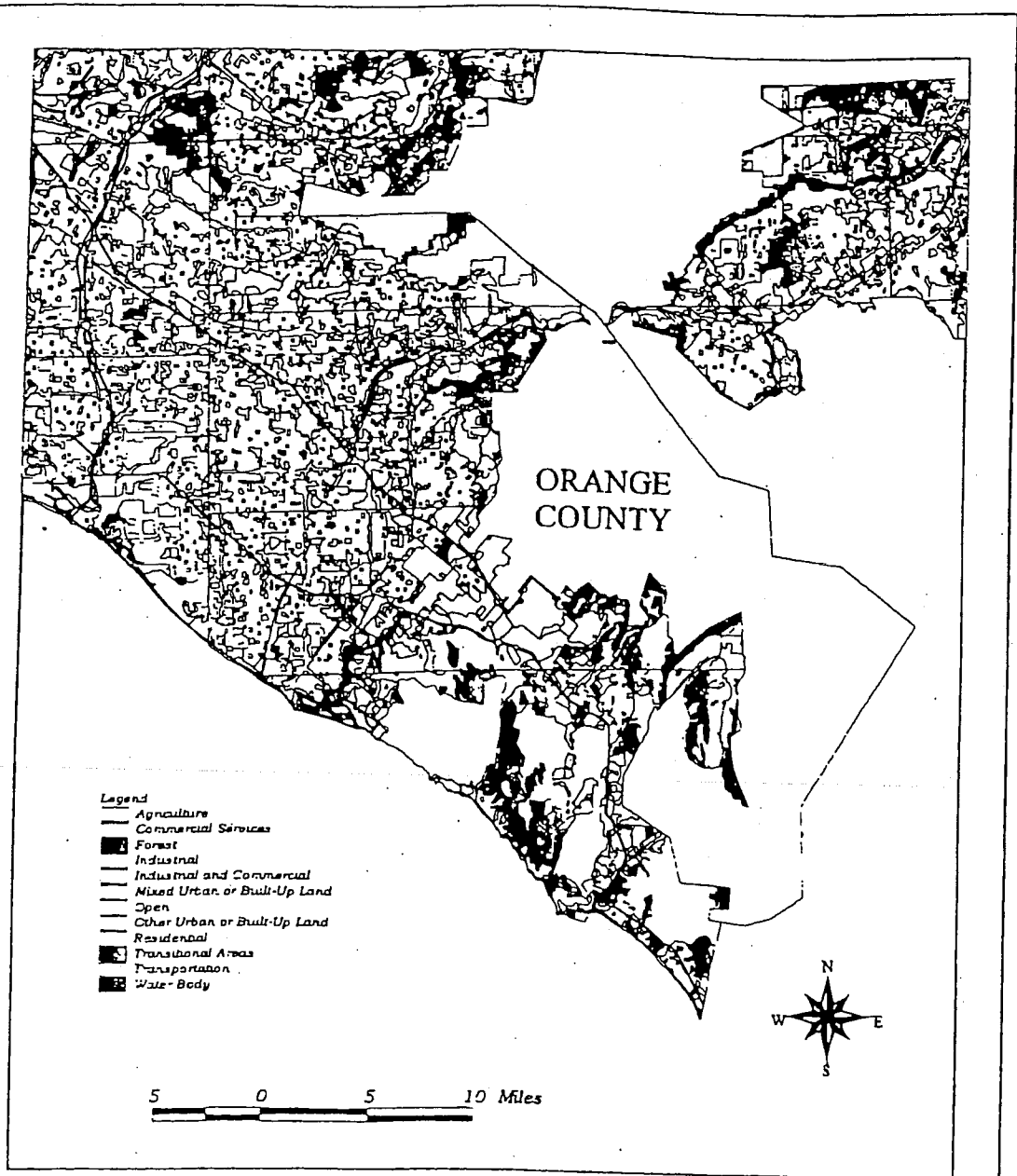
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CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Orange County
Figure B-7a

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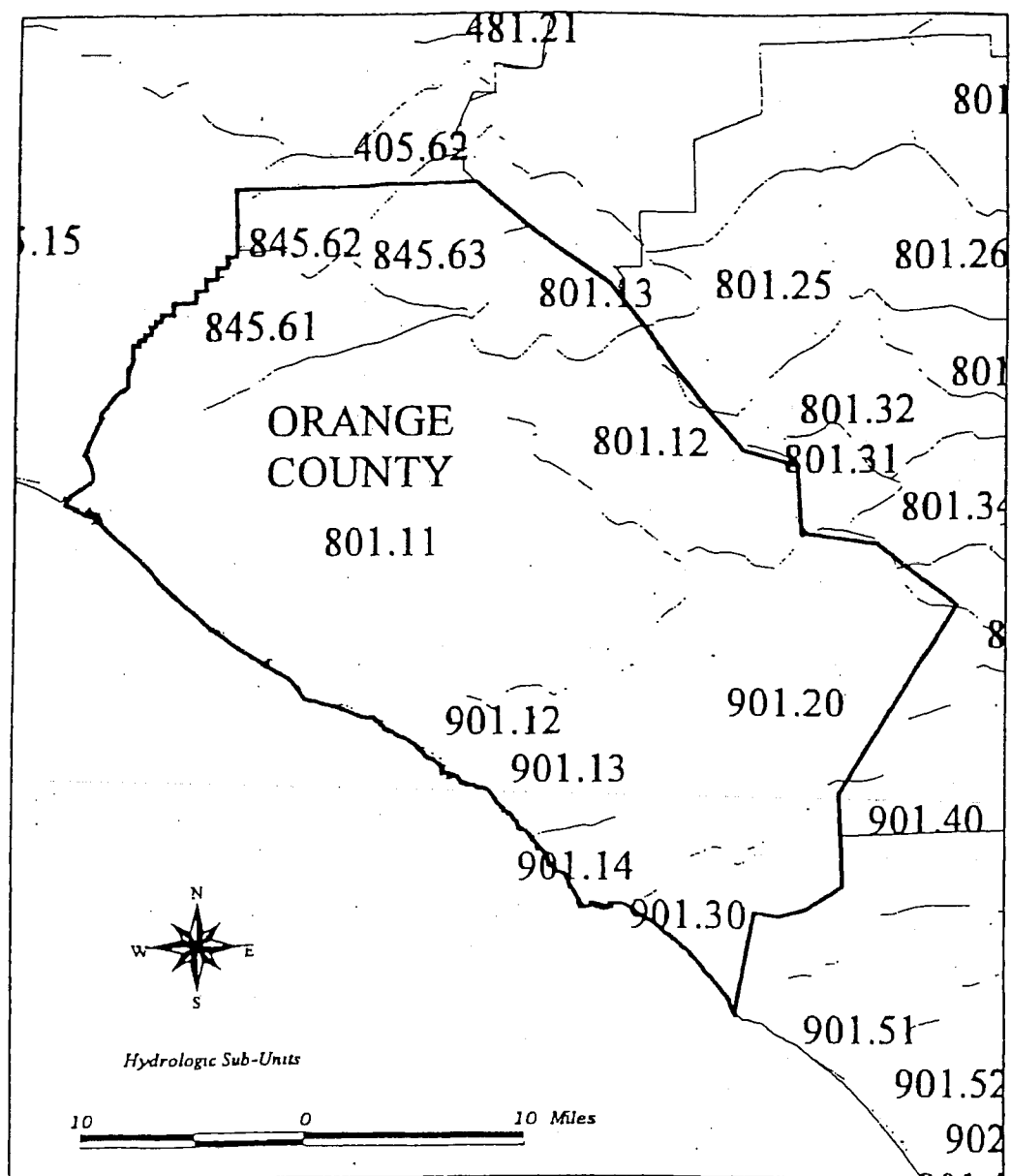
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Orange County
Figure B-7c

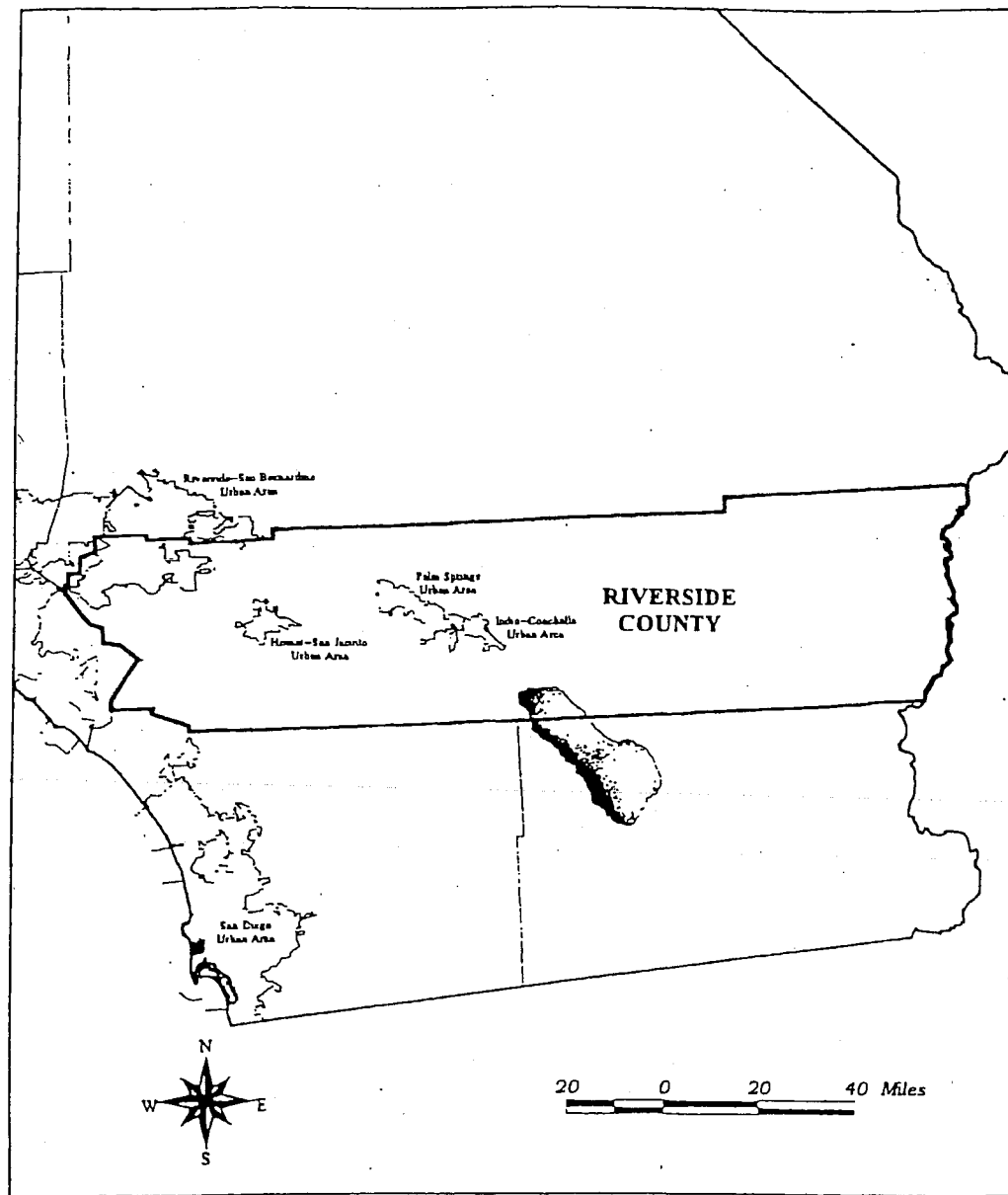
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Orange County
Figure B-7d

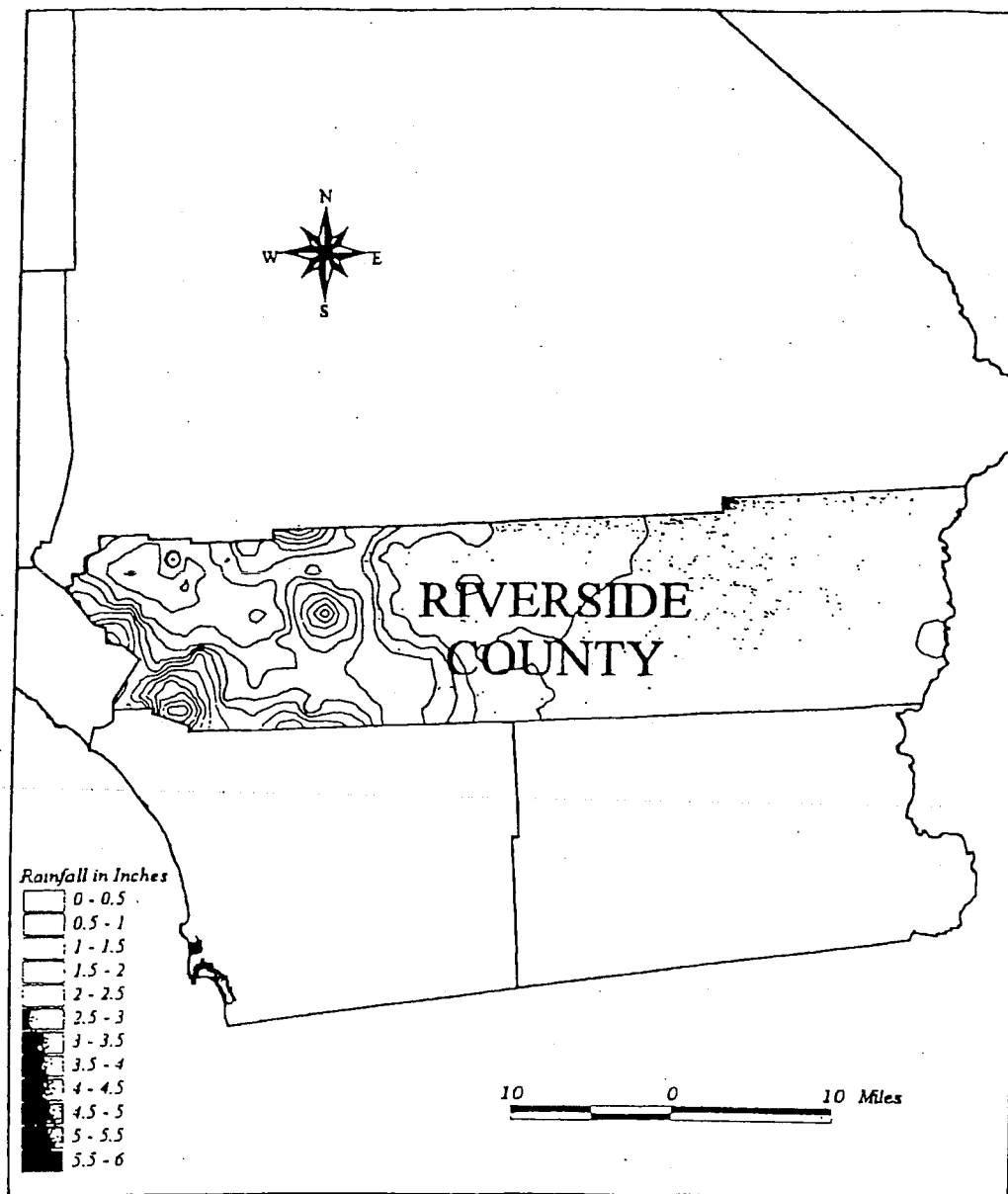
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CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Riverside County
Figure B-8a

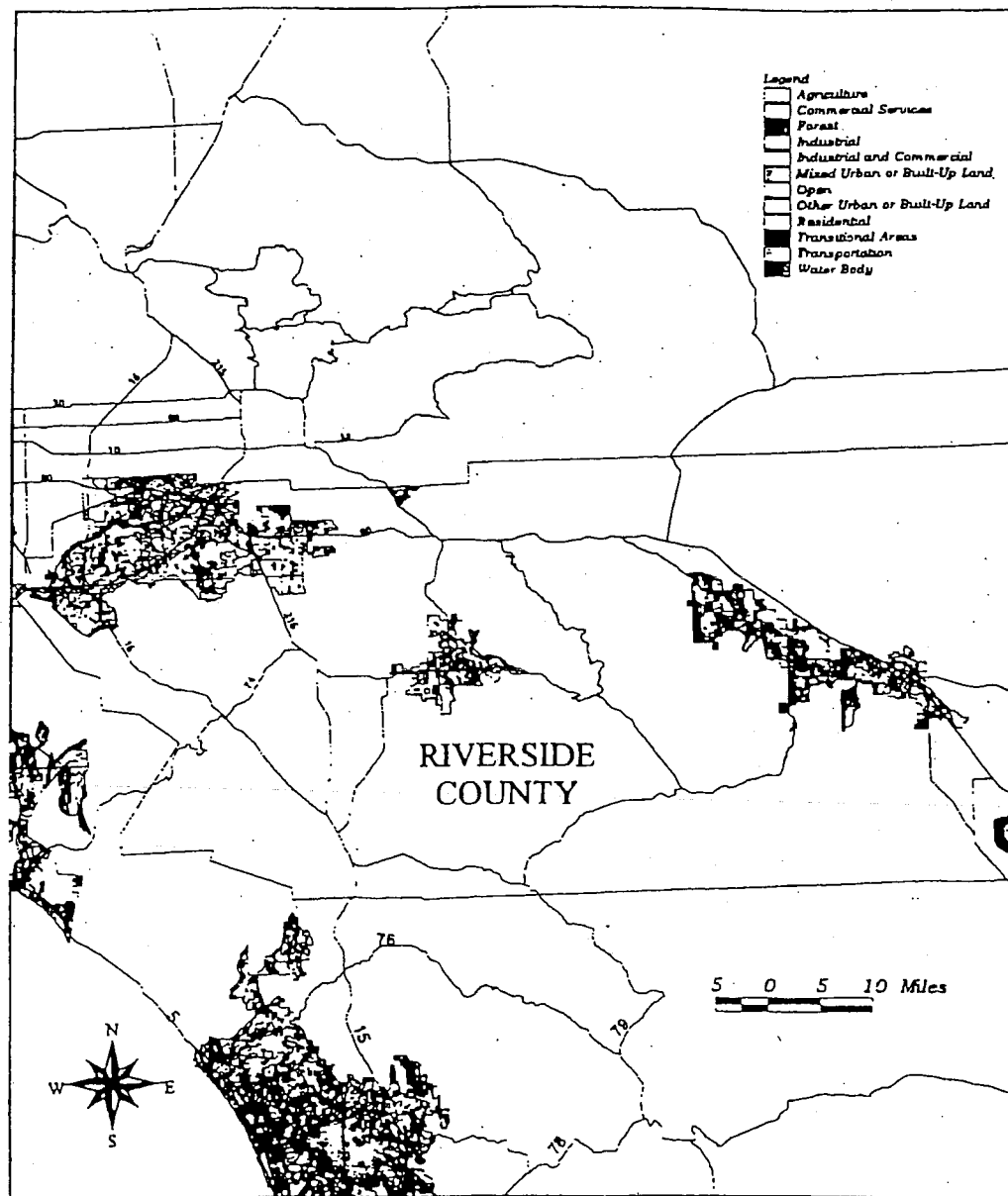
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Riverside County
Figure B-8b

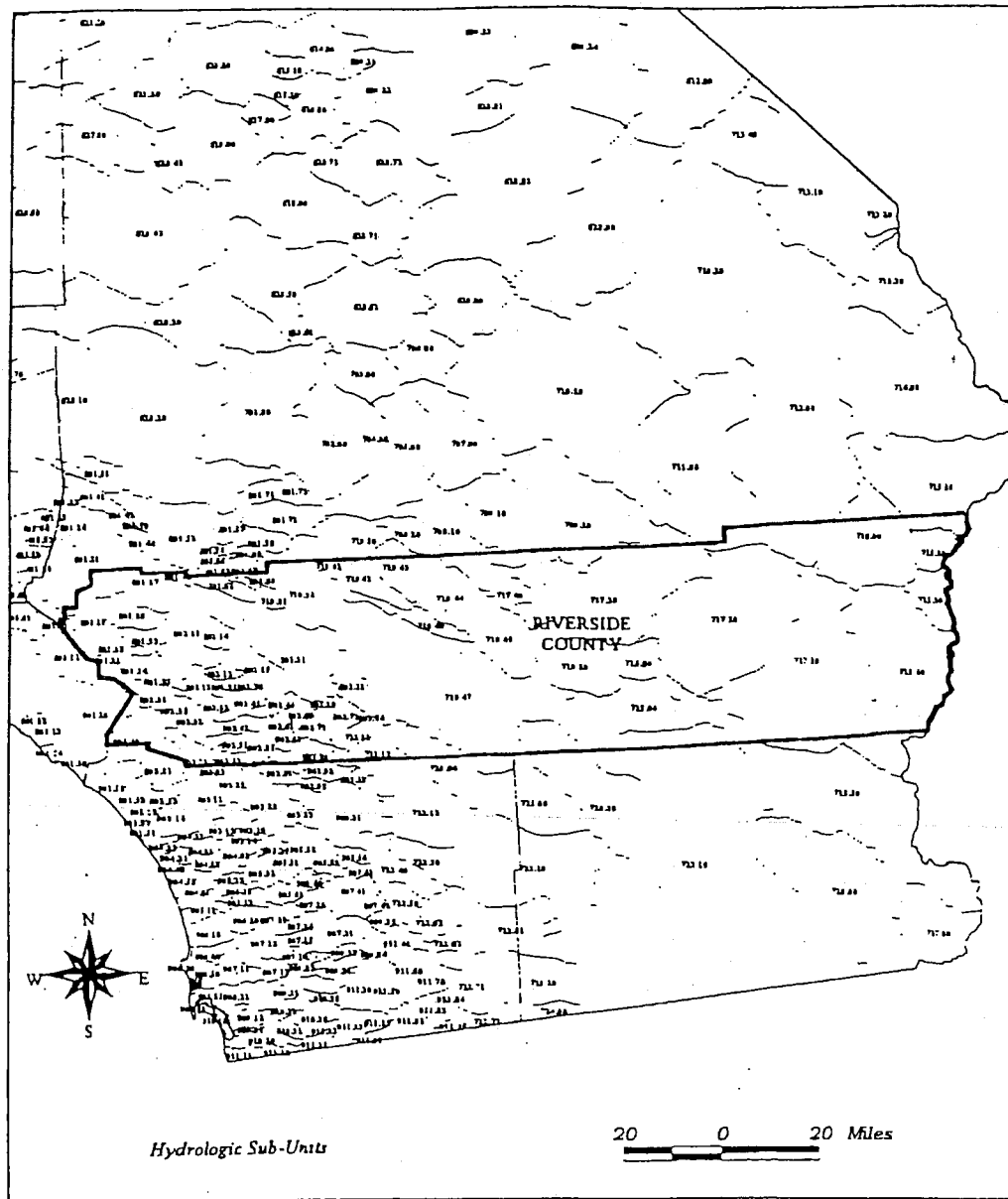
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Riverside County
Figure B-8c

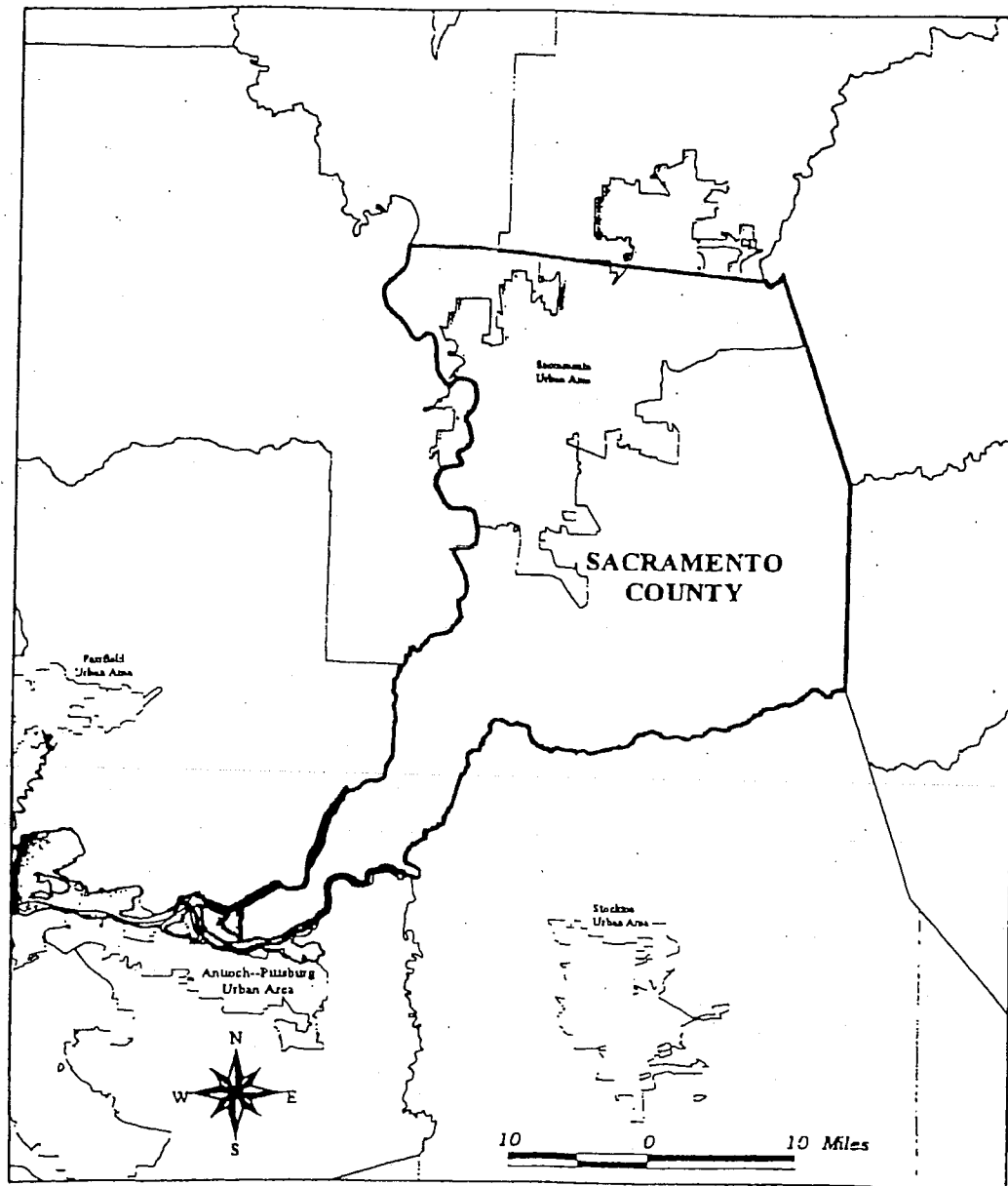
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Riverside County
Figure B-8d

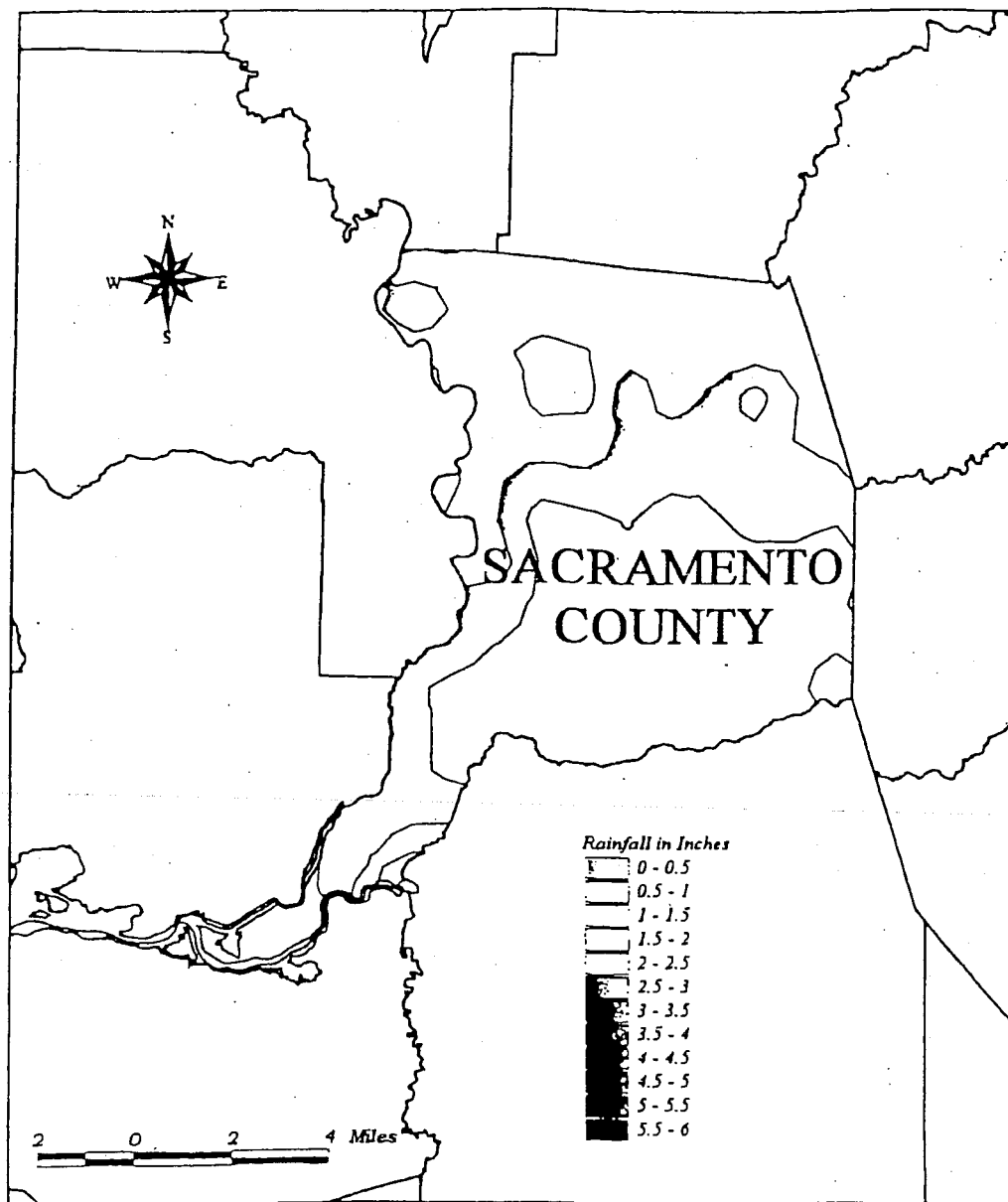
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Sacramento County
Figure B-9a

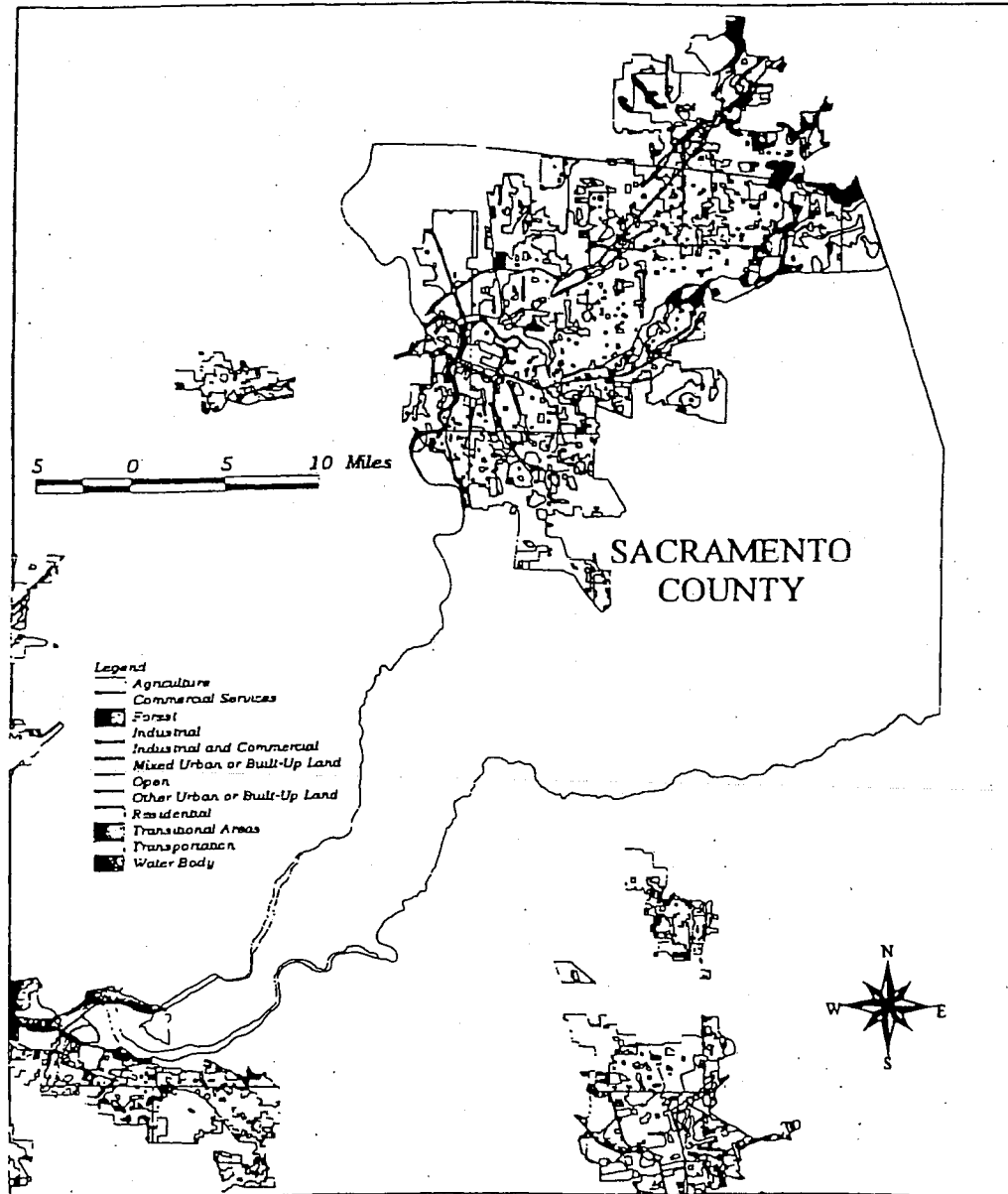
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Sacramento County
Figure B-9b

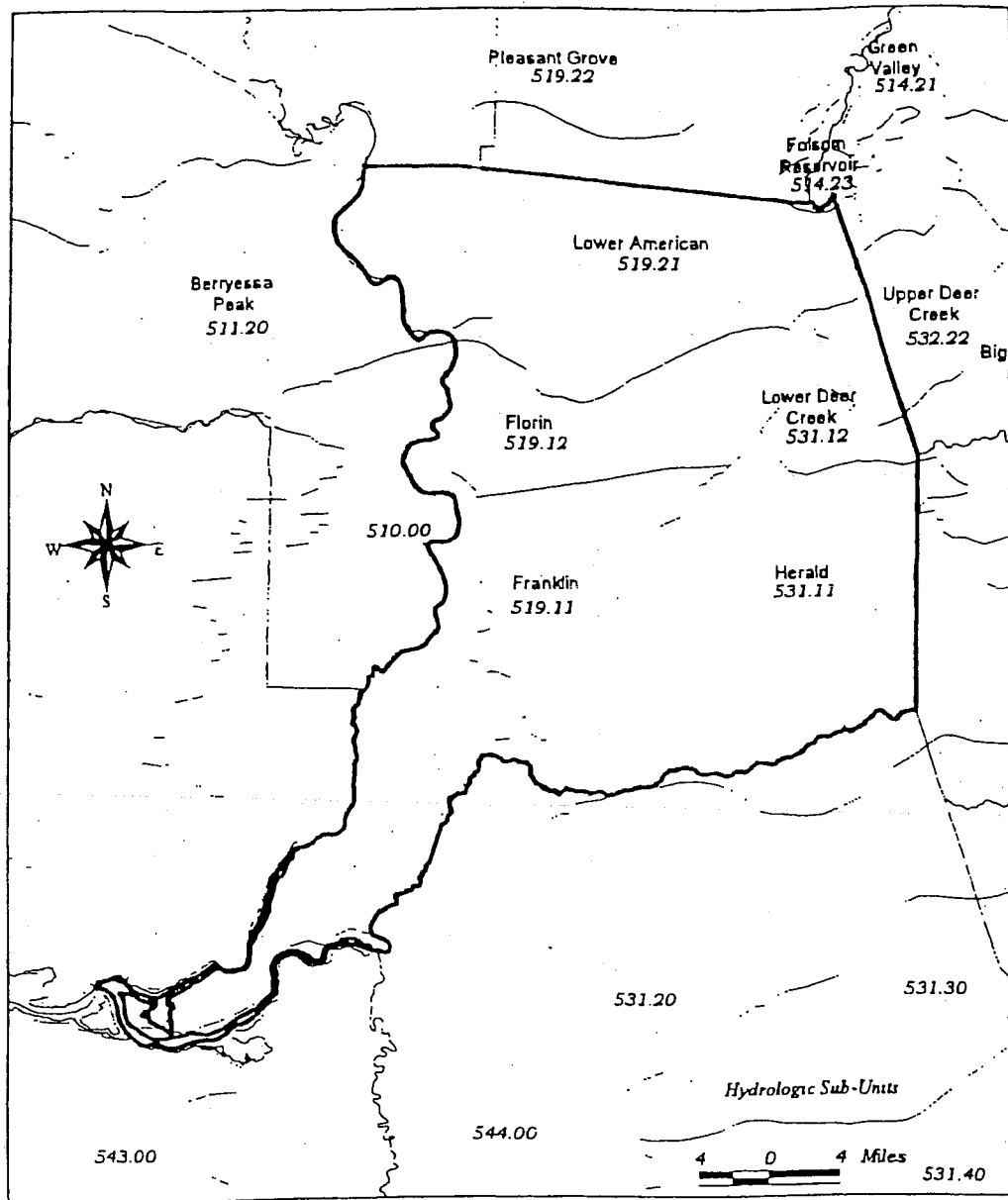
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Sacramento County
 Figure B-9c

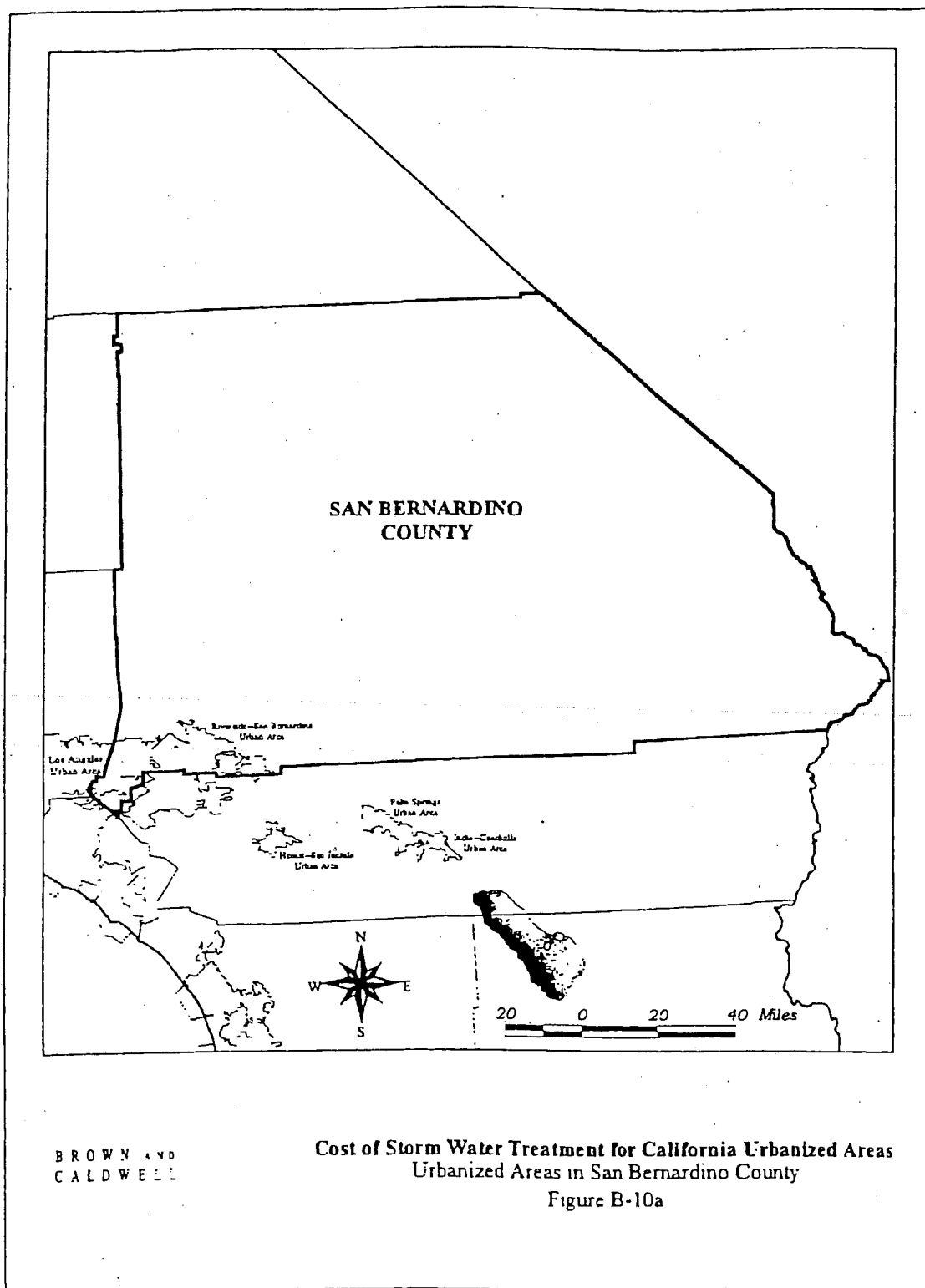
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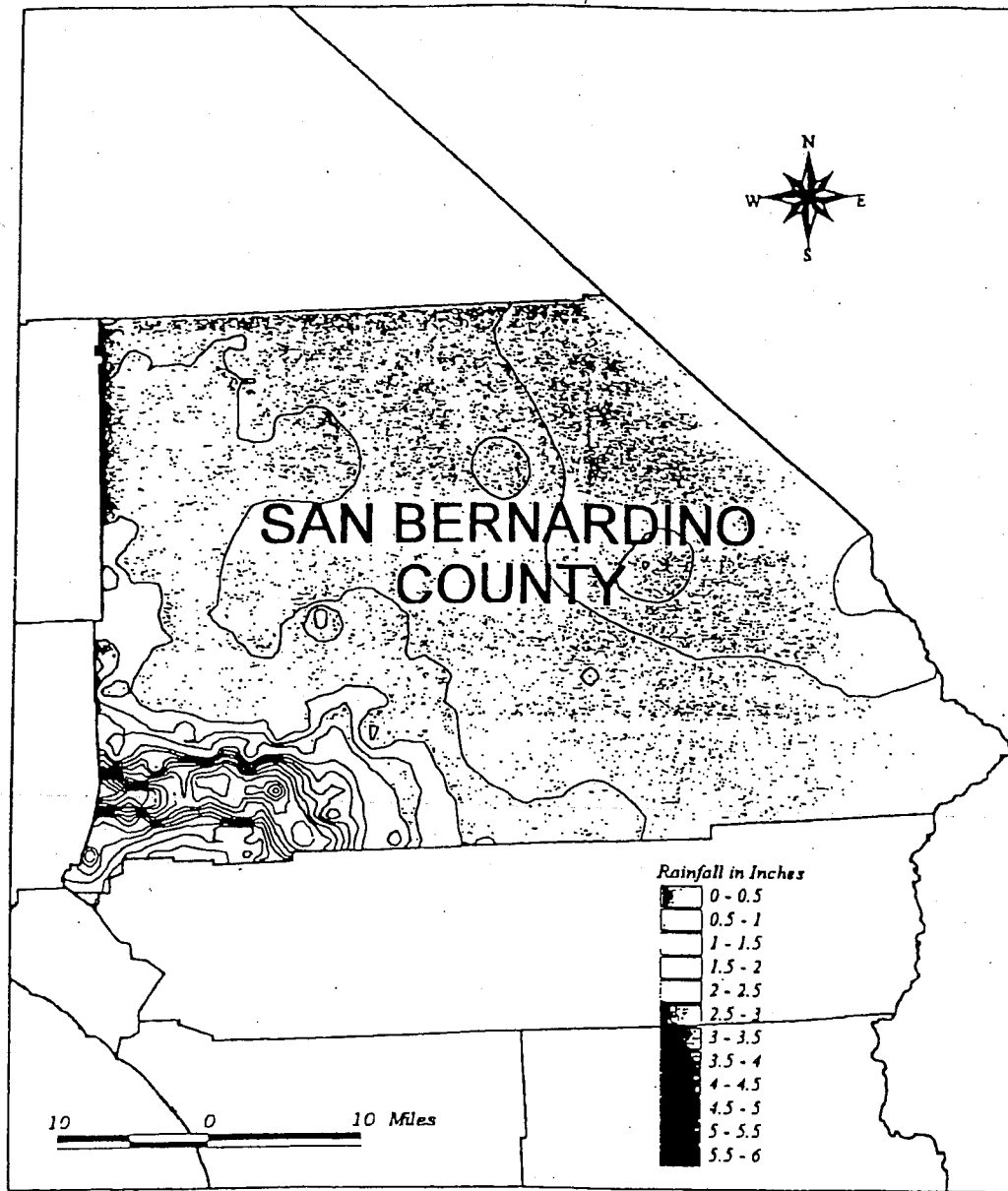
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Sacramento County
Figure B-9d

R0006266



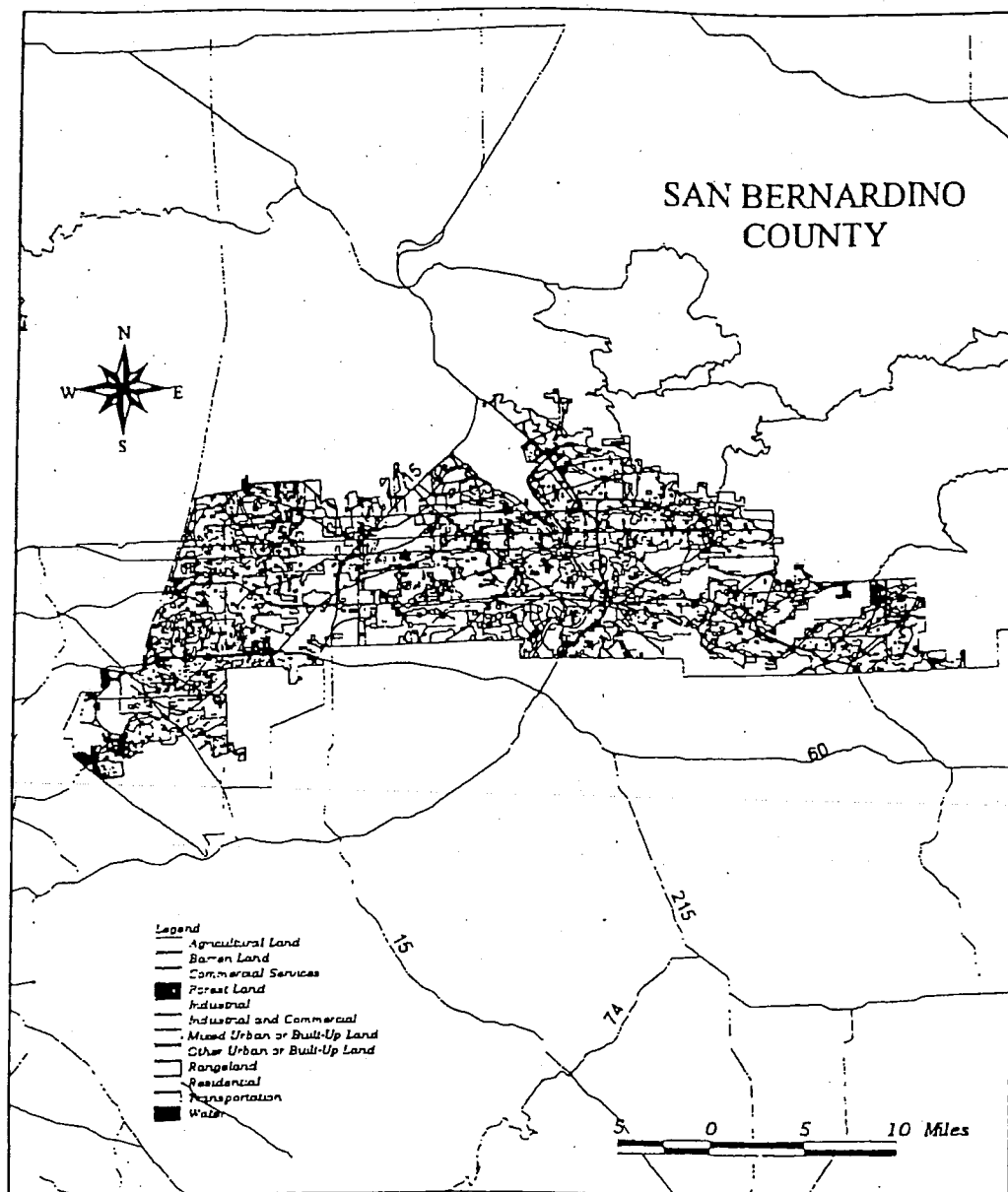
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in San Bernardino County
Figure B-10b

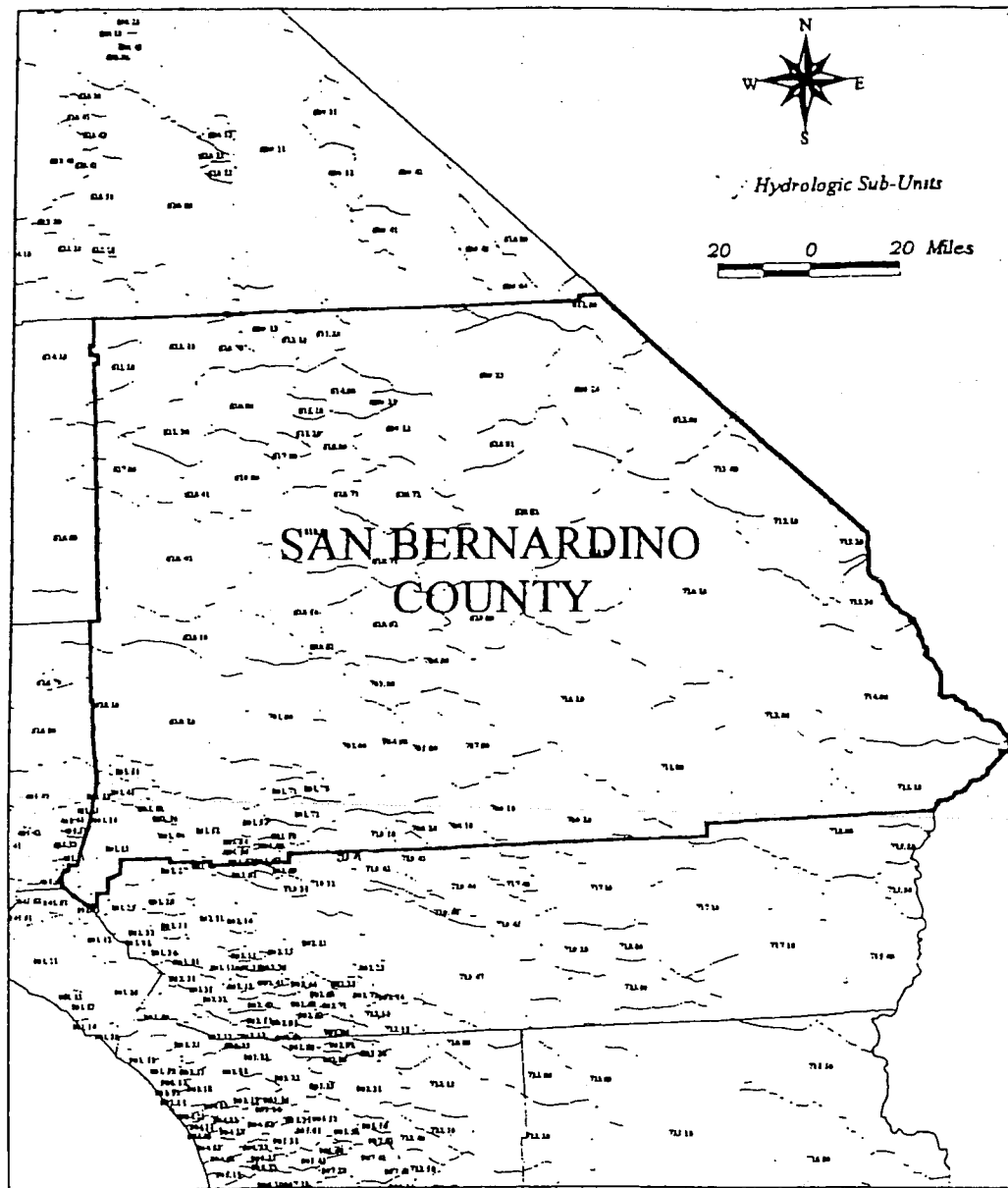
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in San Bernardino County
Figure B-10c

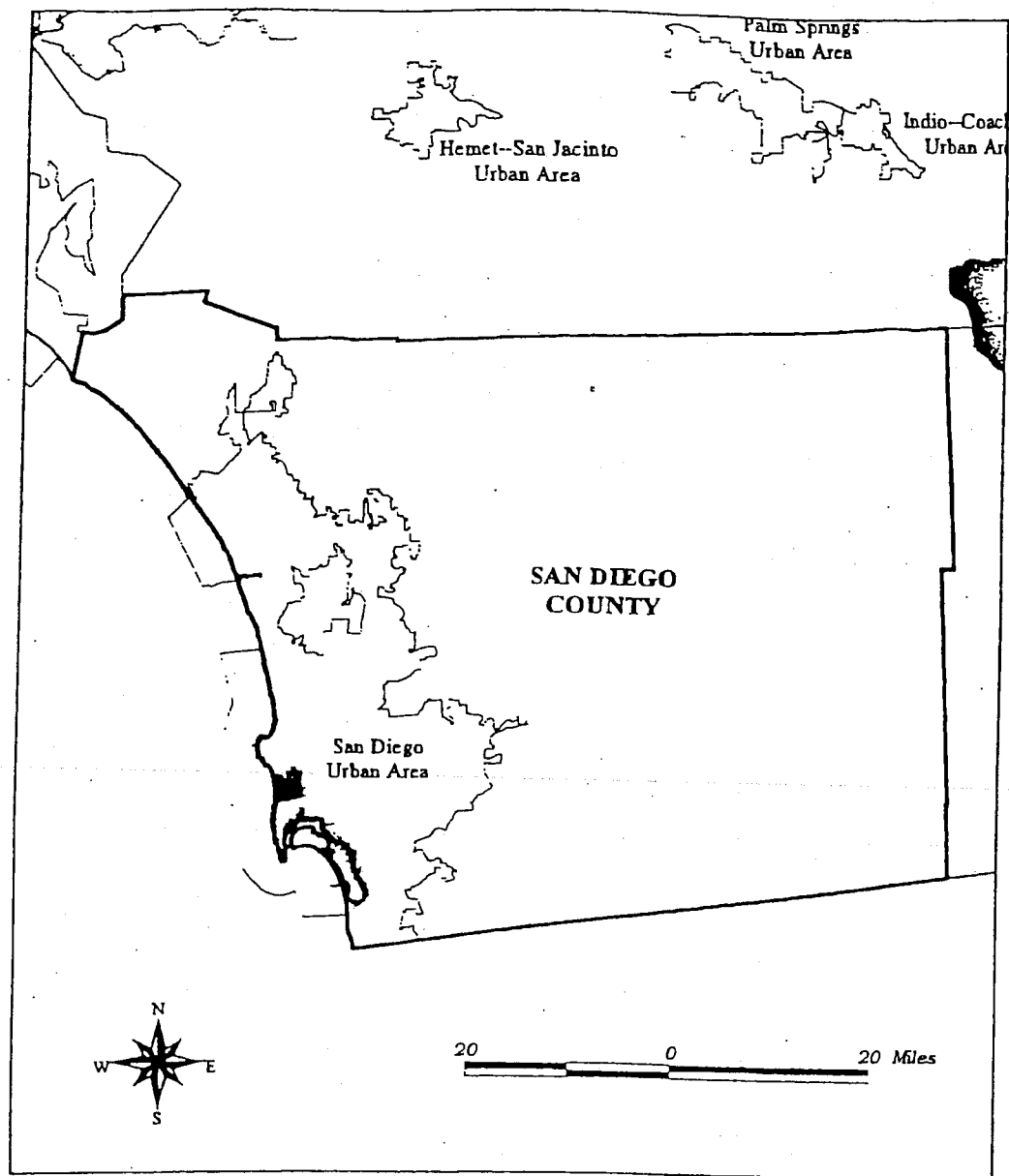
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in San Bernardino County
Figure B-10d

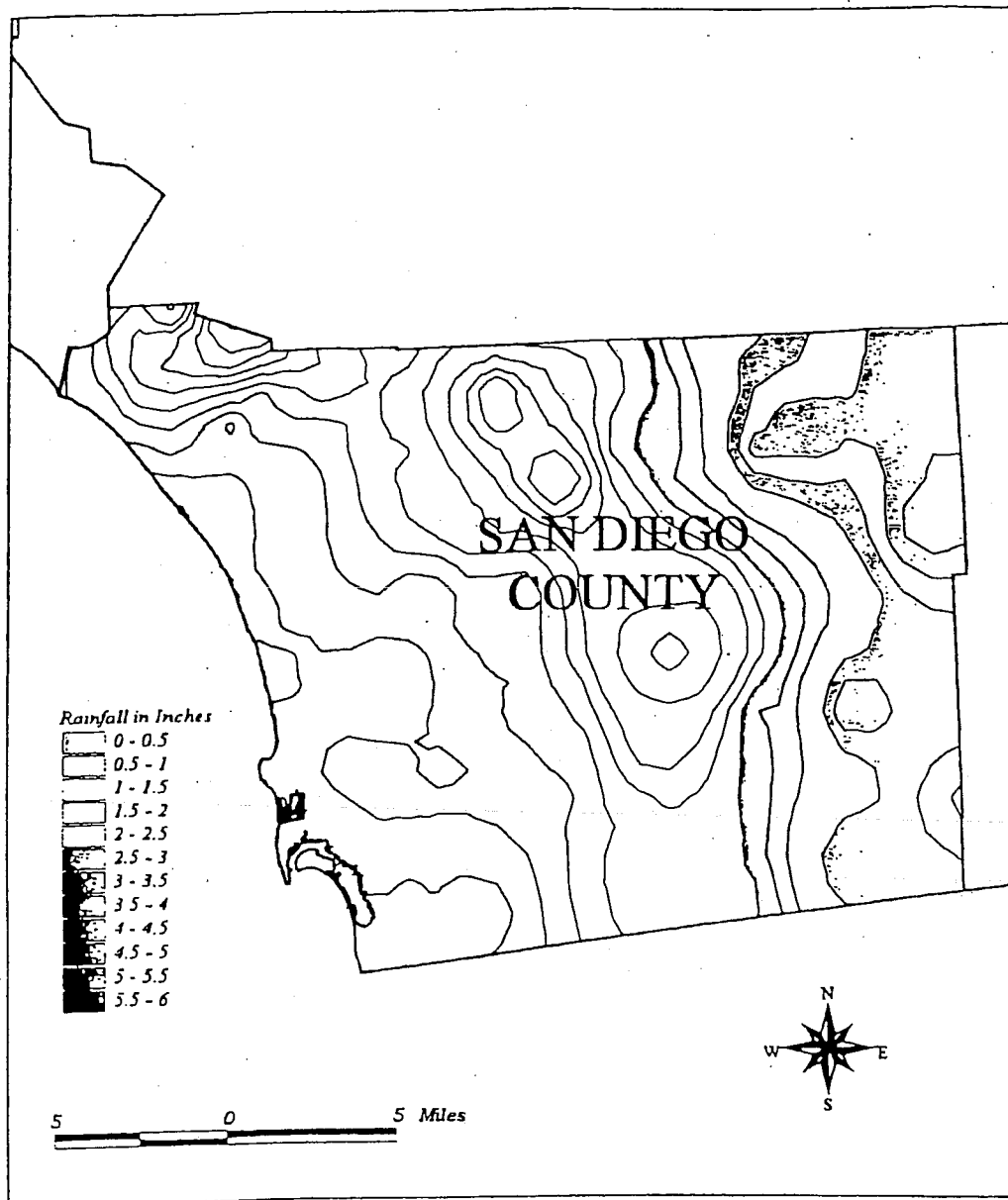
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in San Diego County
Figure B-11a

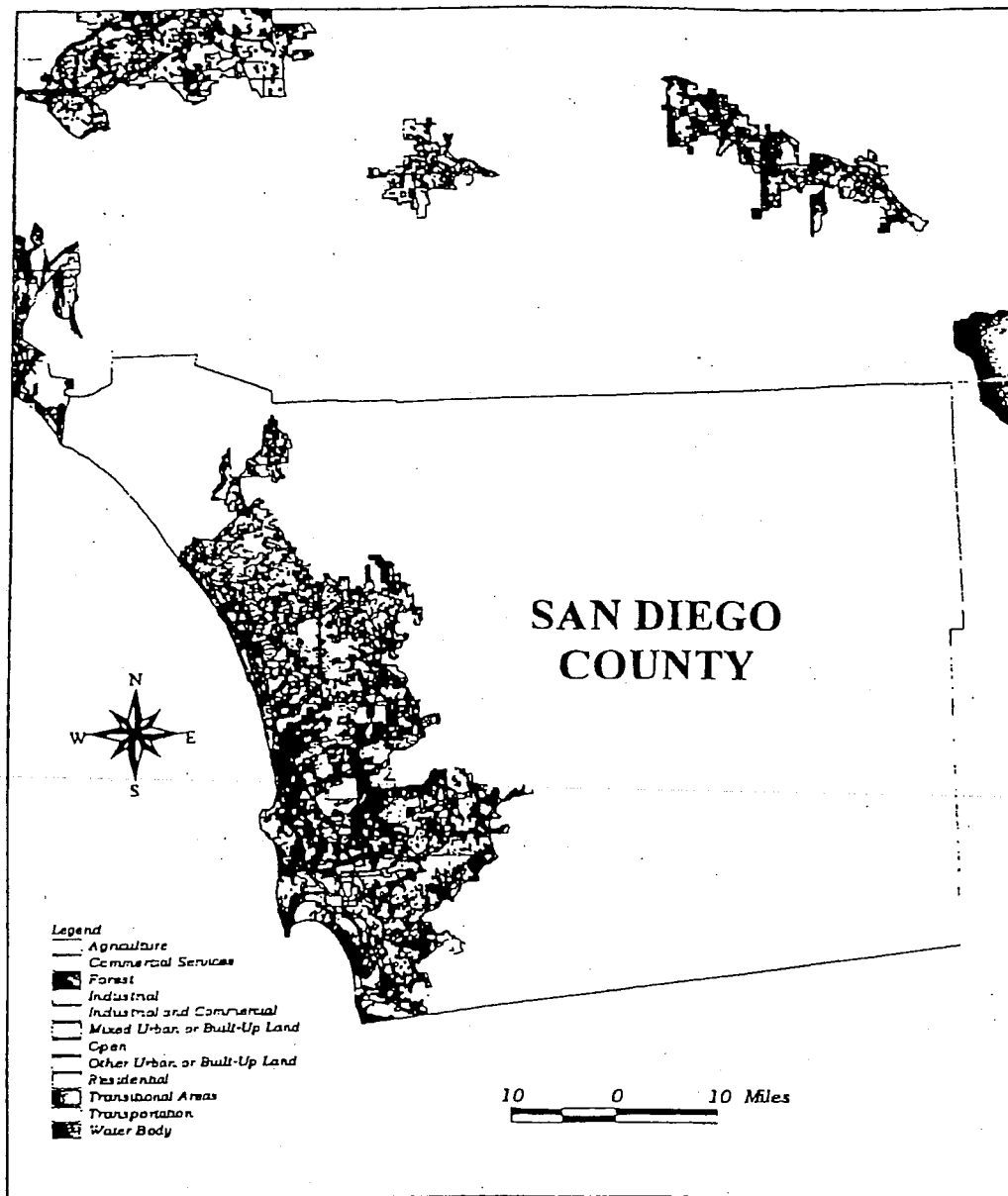
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in San Diego County
 Figure B-11b

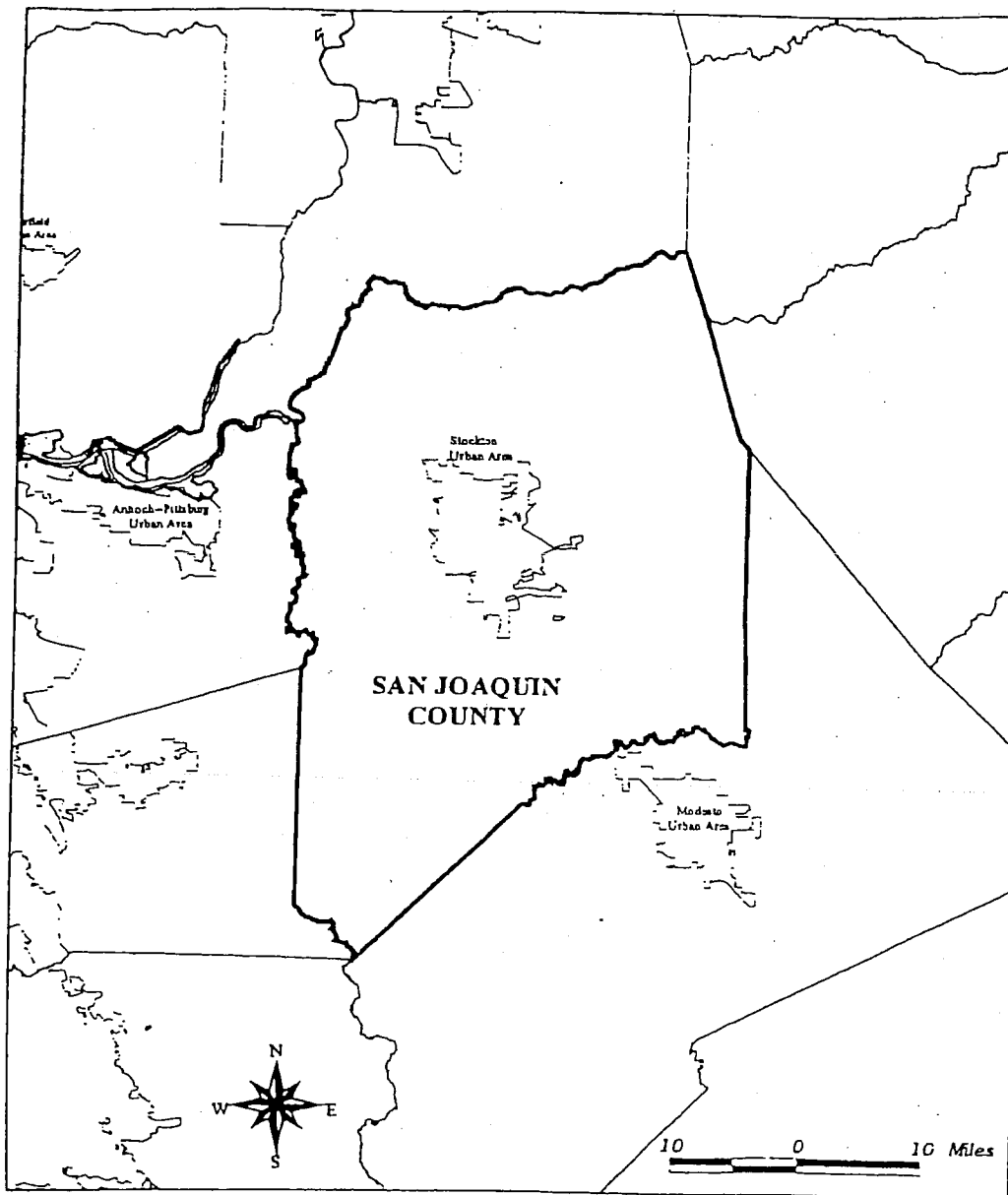
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in San Diego County
Figure B-11c

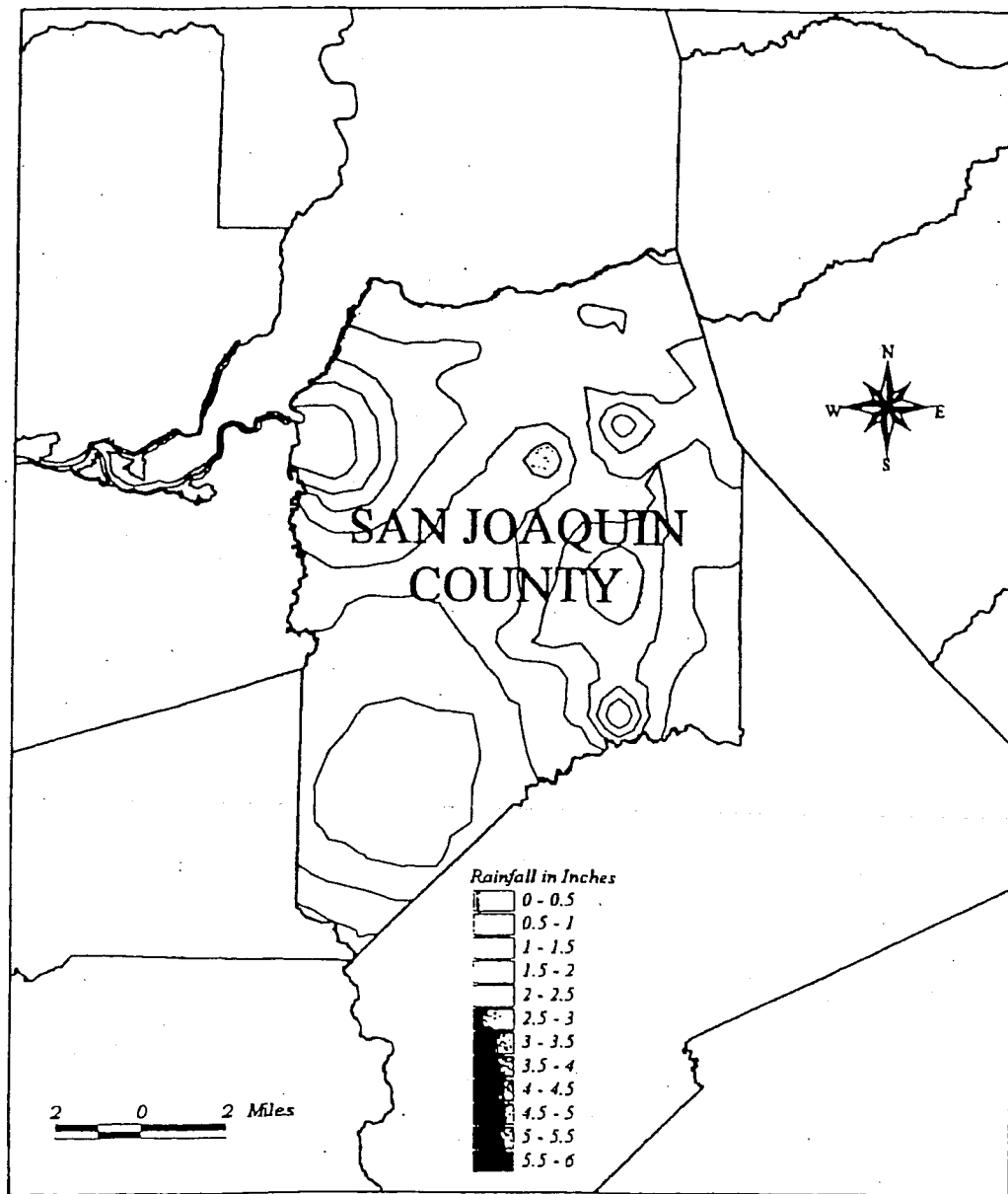
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CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in San Joaquin County
Figure B-12a

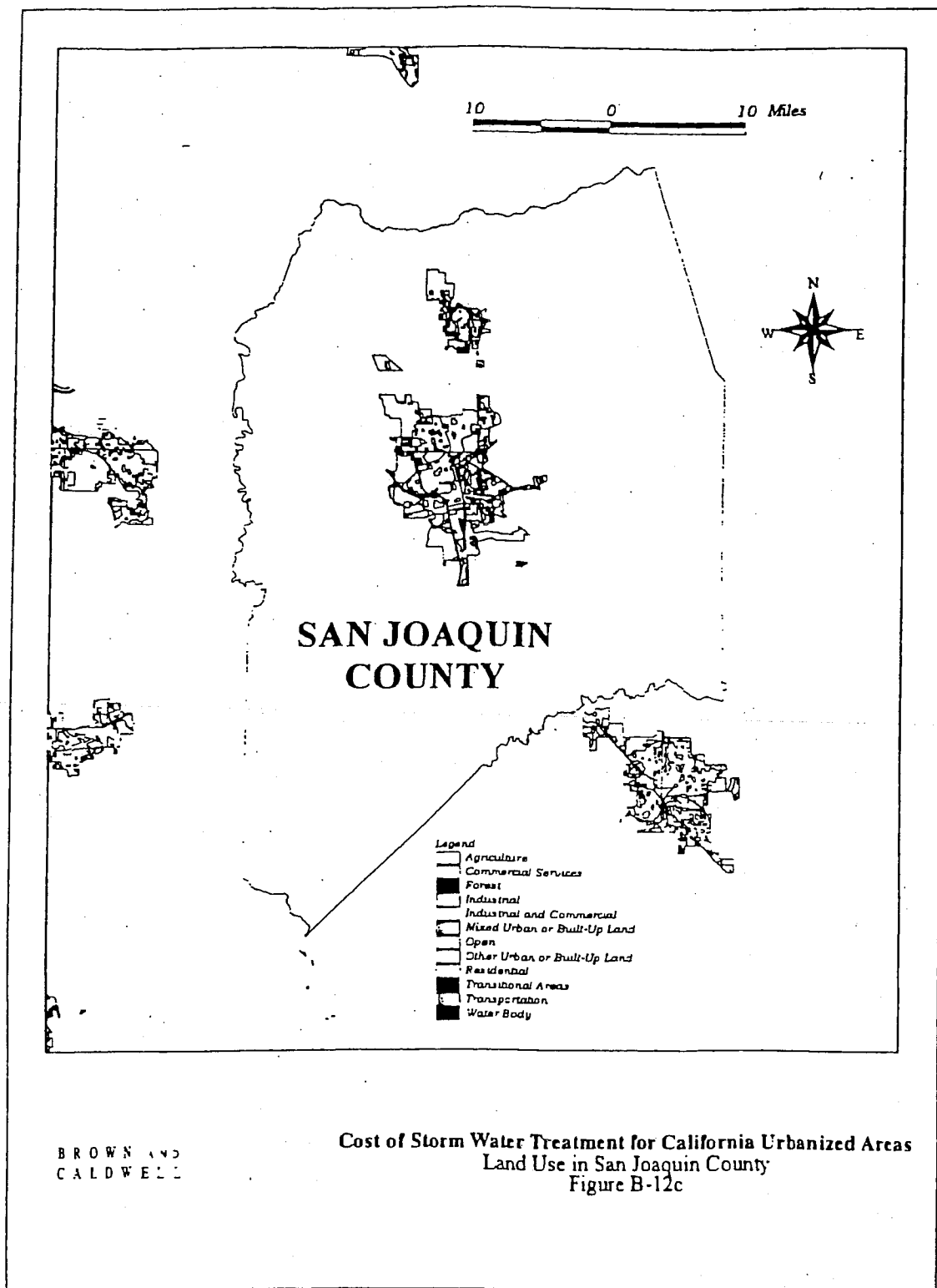
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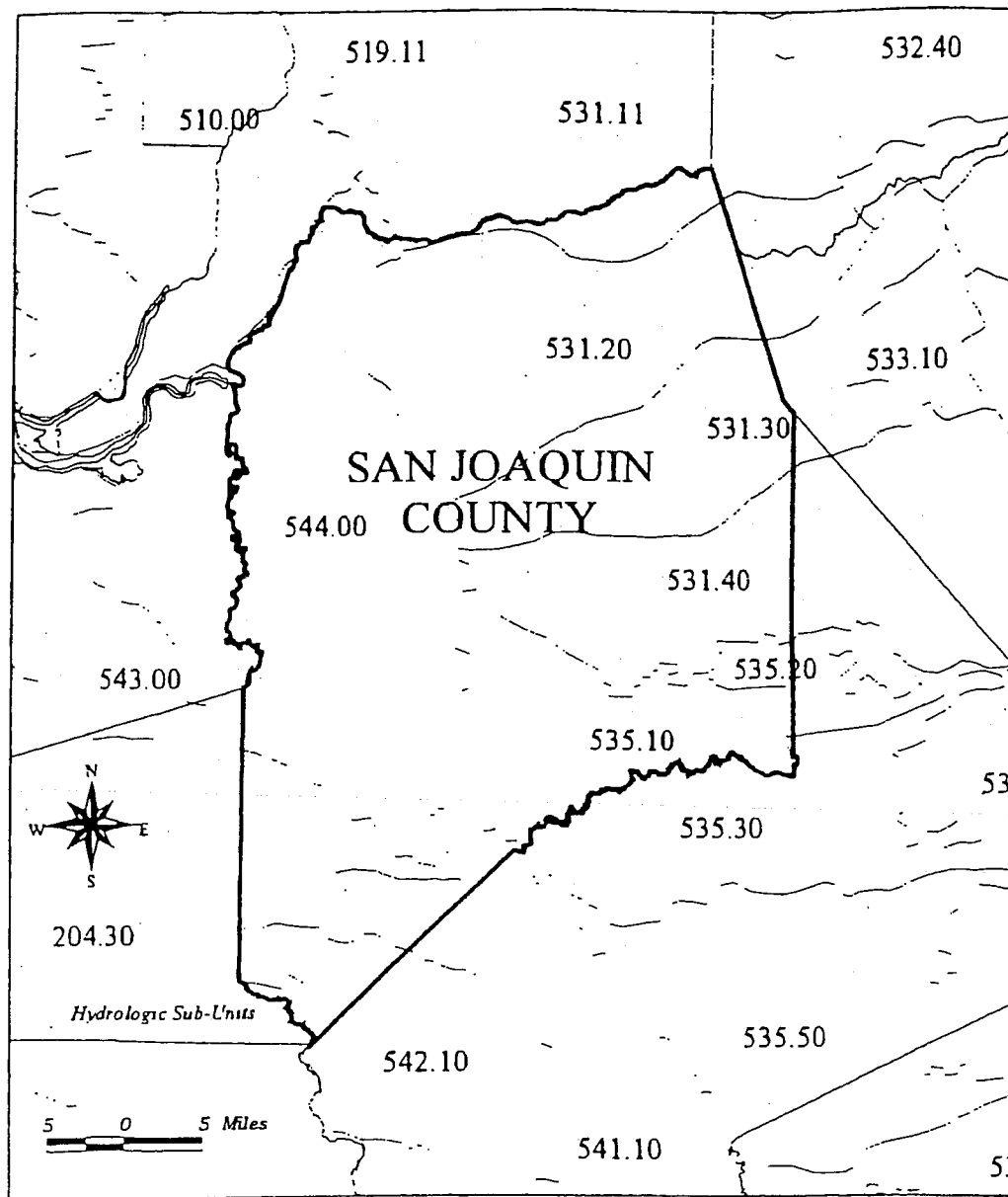
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in San Joaquin County
 Figure B-12b

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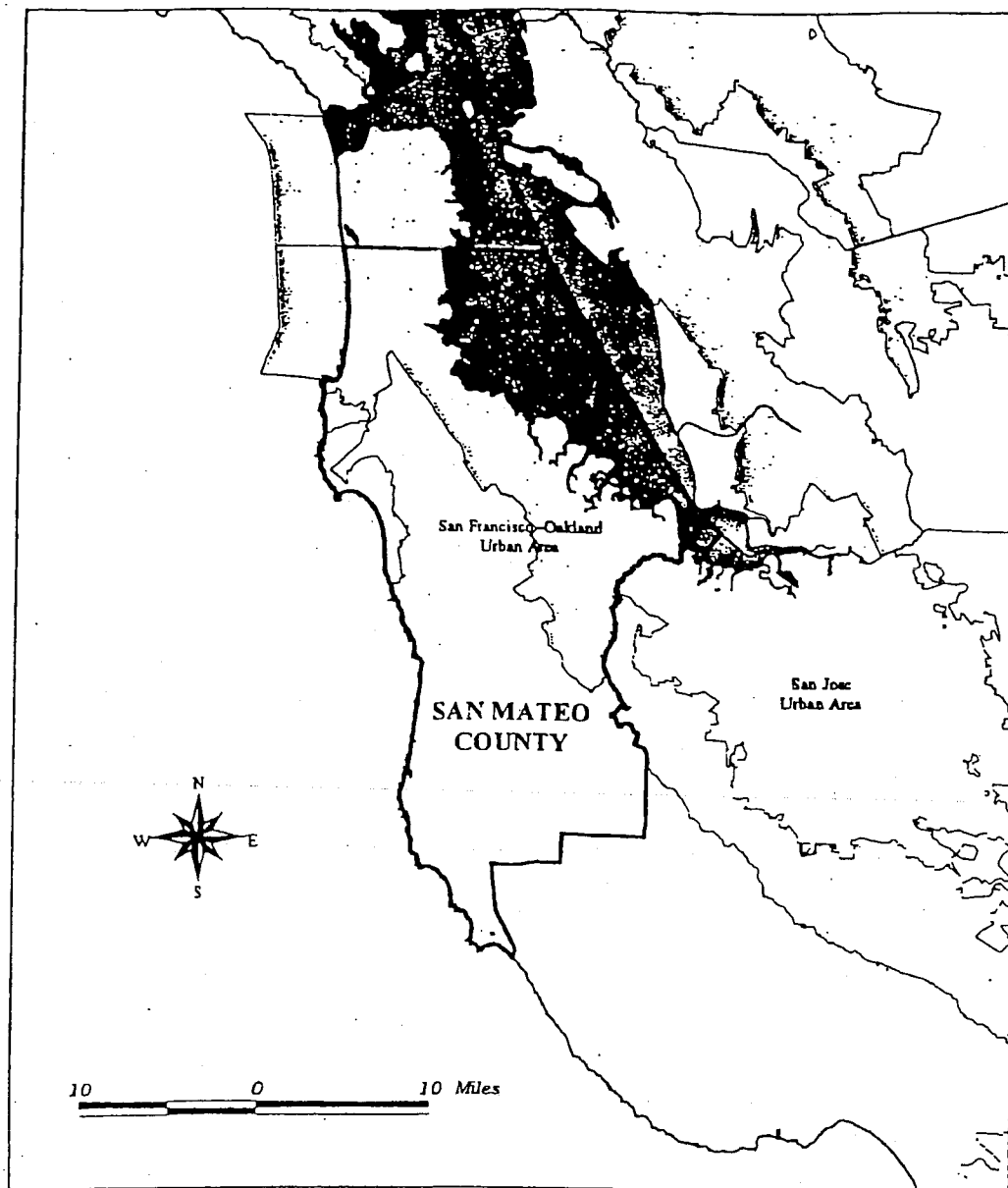
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in San Joaquin County
Figure B-12d

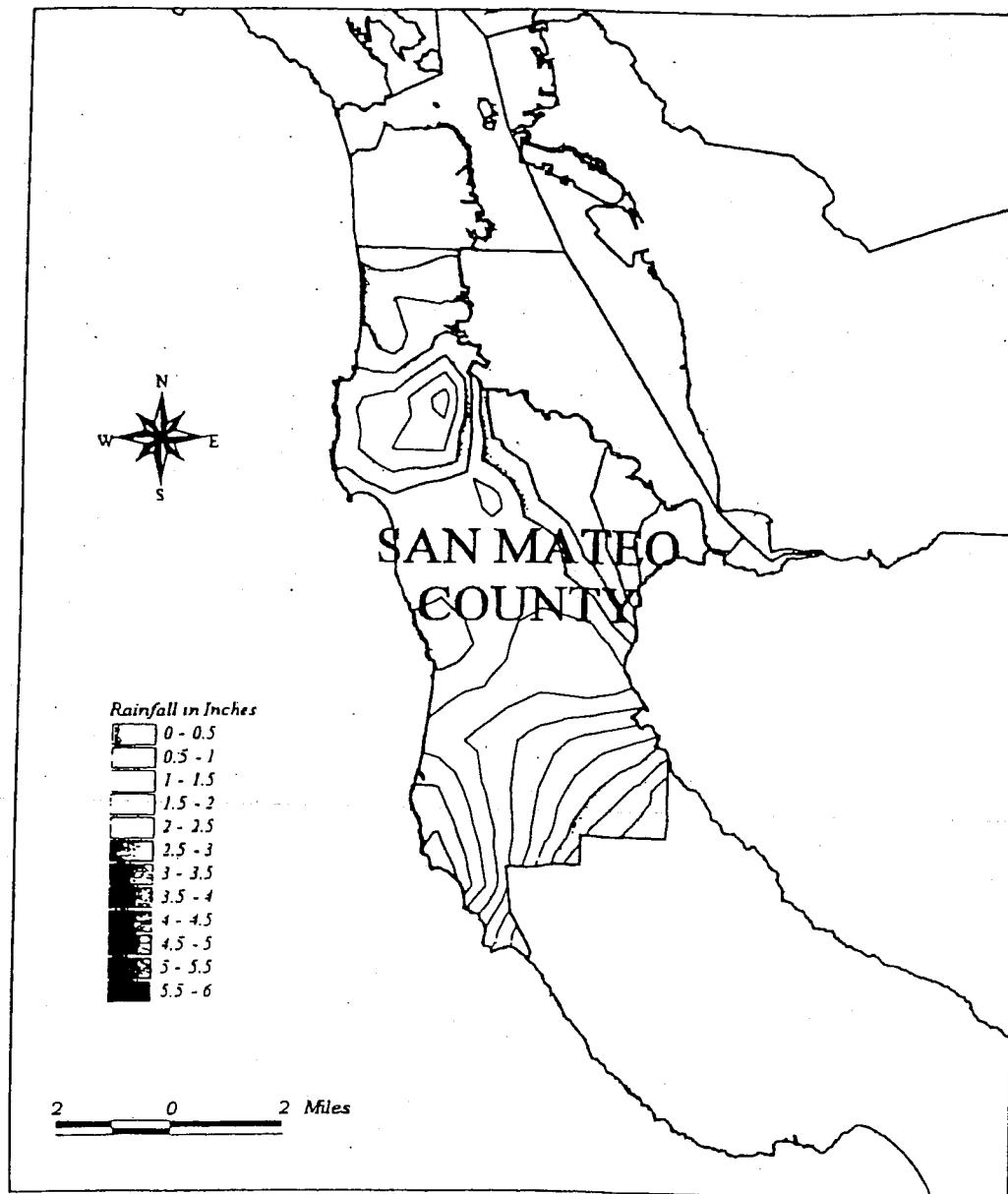
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in San Mateo County
Figure B-13a

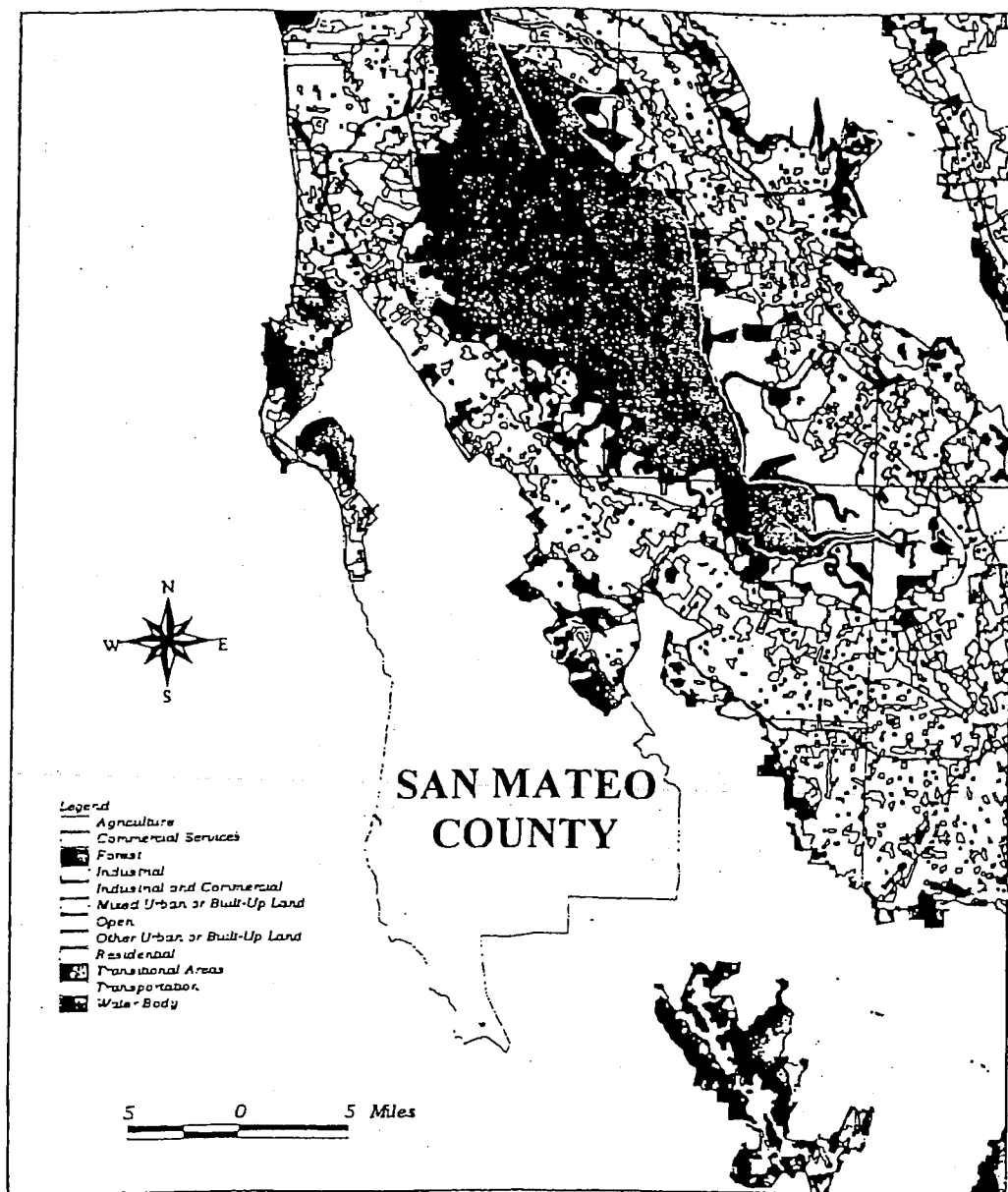
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in San Mateo County
Figure B-13b

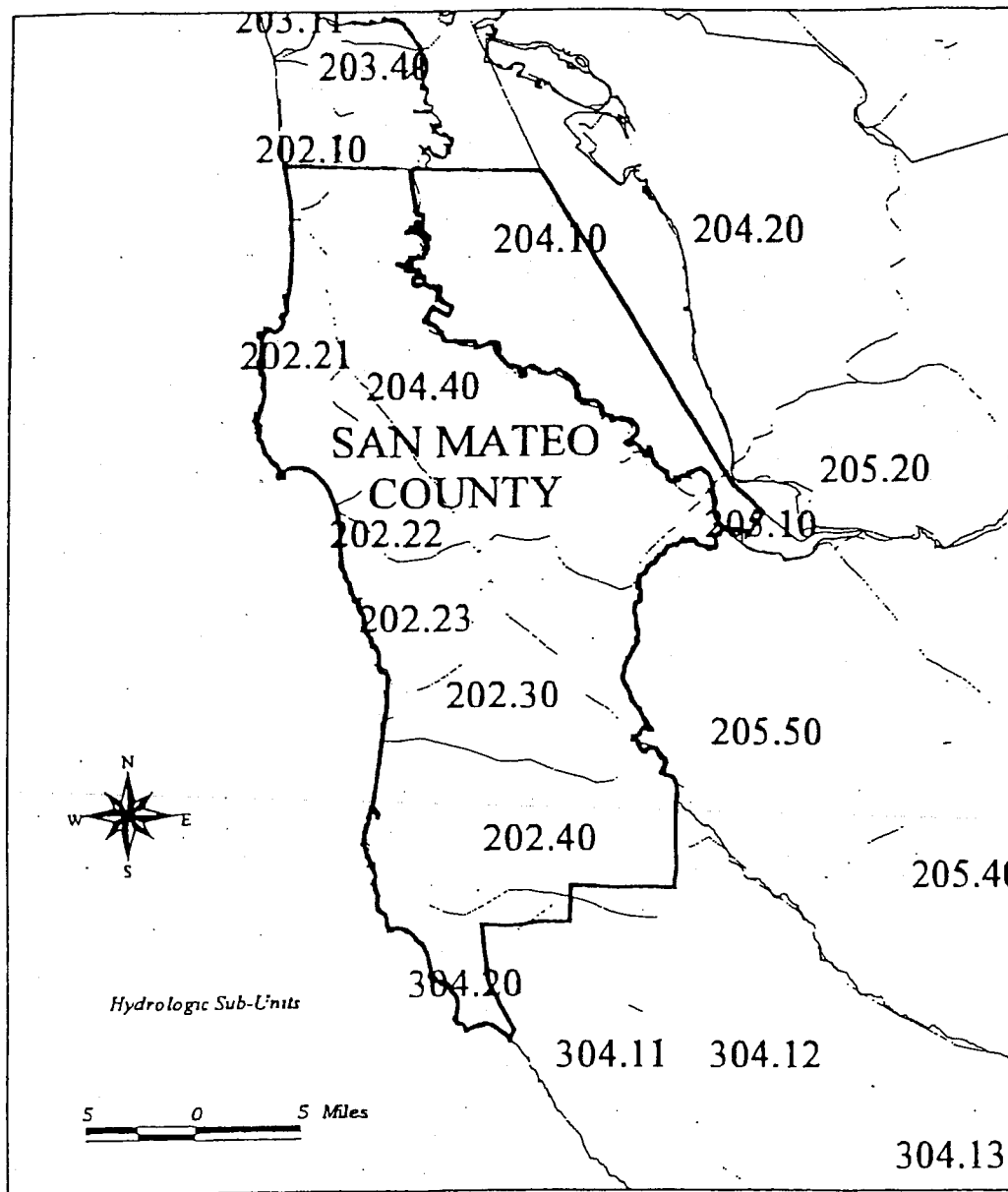
R0006280



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in San Mateo County
Figure B-13c

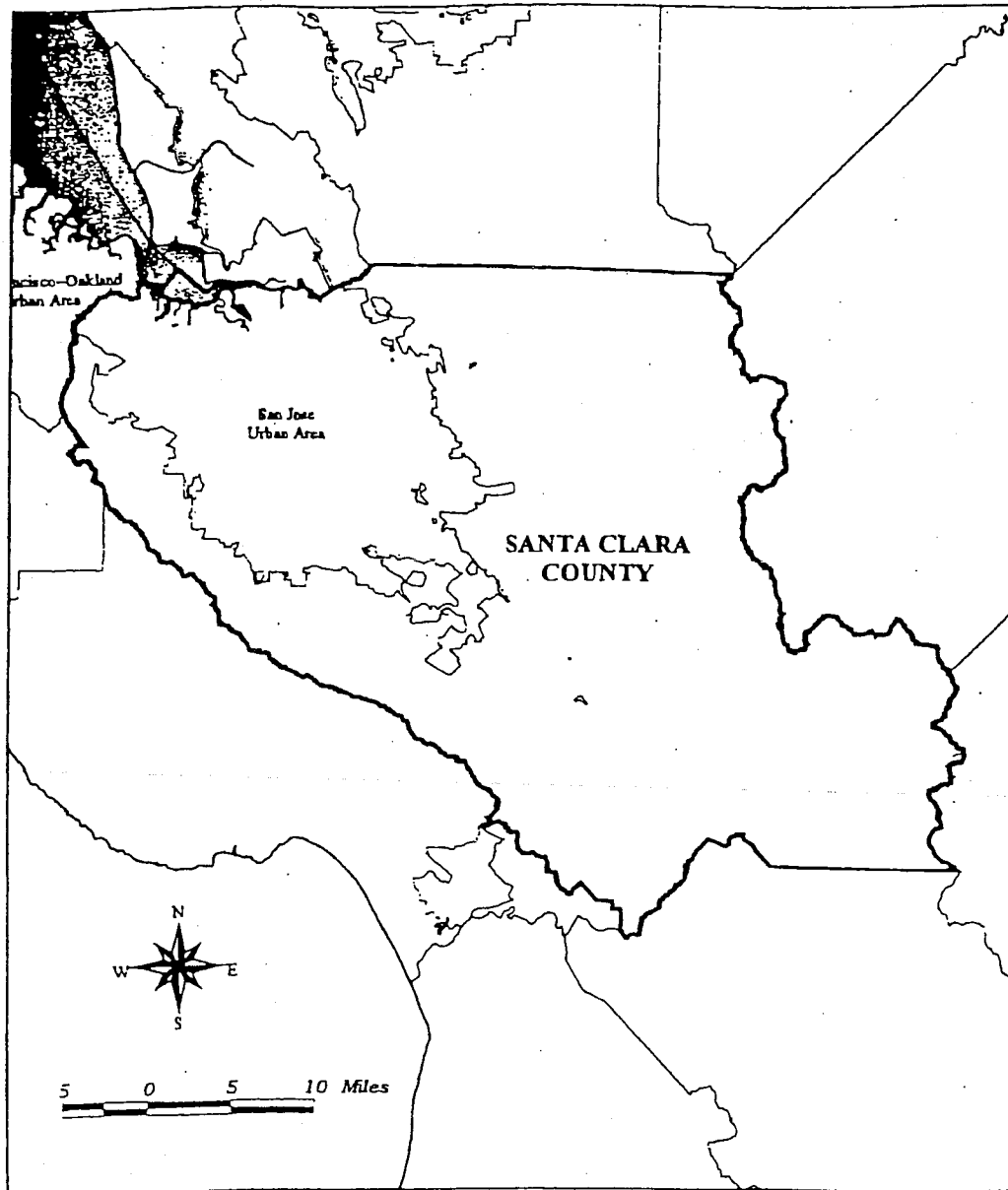
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in San Mateo County
Figure B-13d

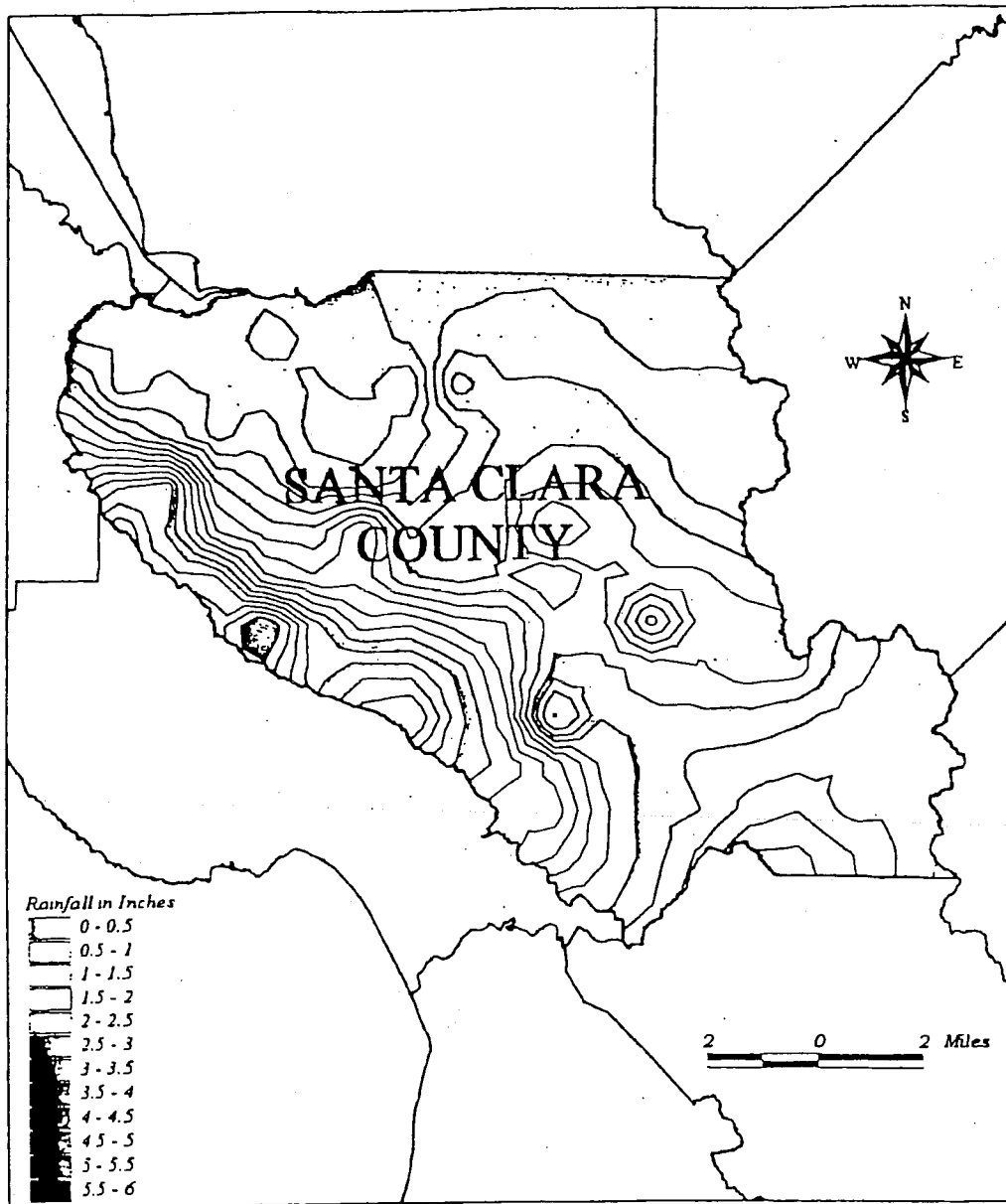
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Santa Clara County
Figure B-14a

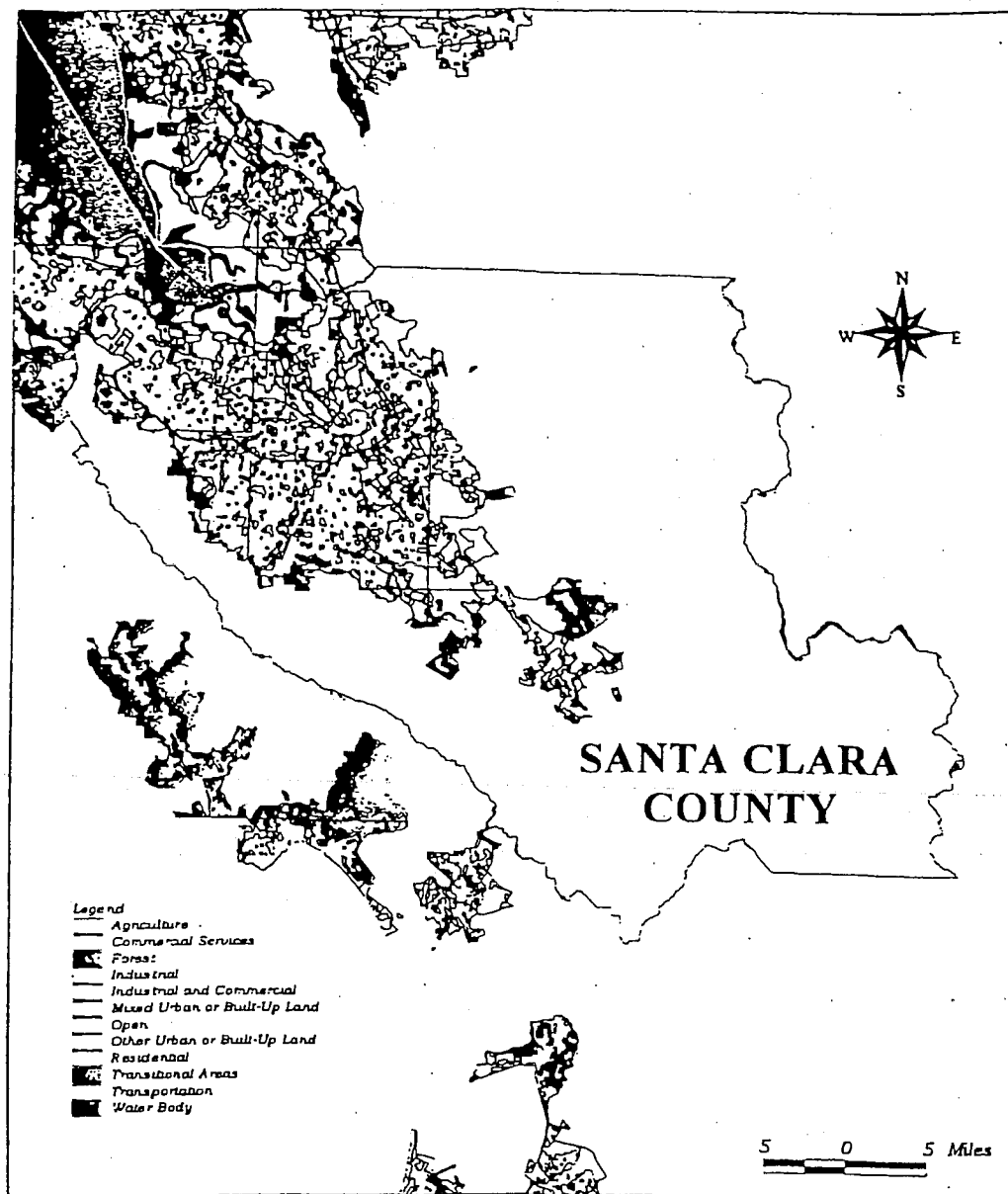
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Santa Clara County
 Figure B-14b

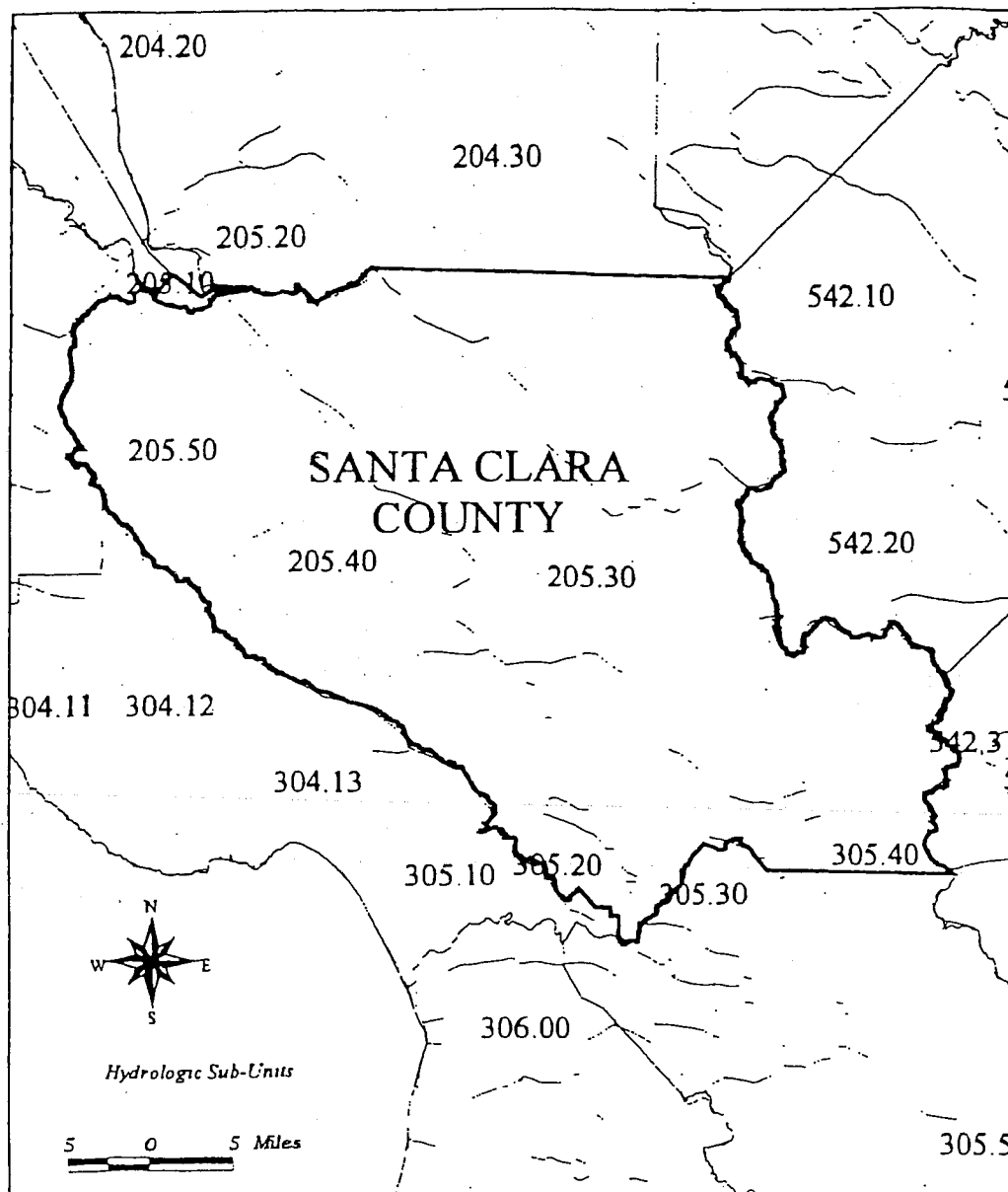
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Santa Clara County
Figure B-14c

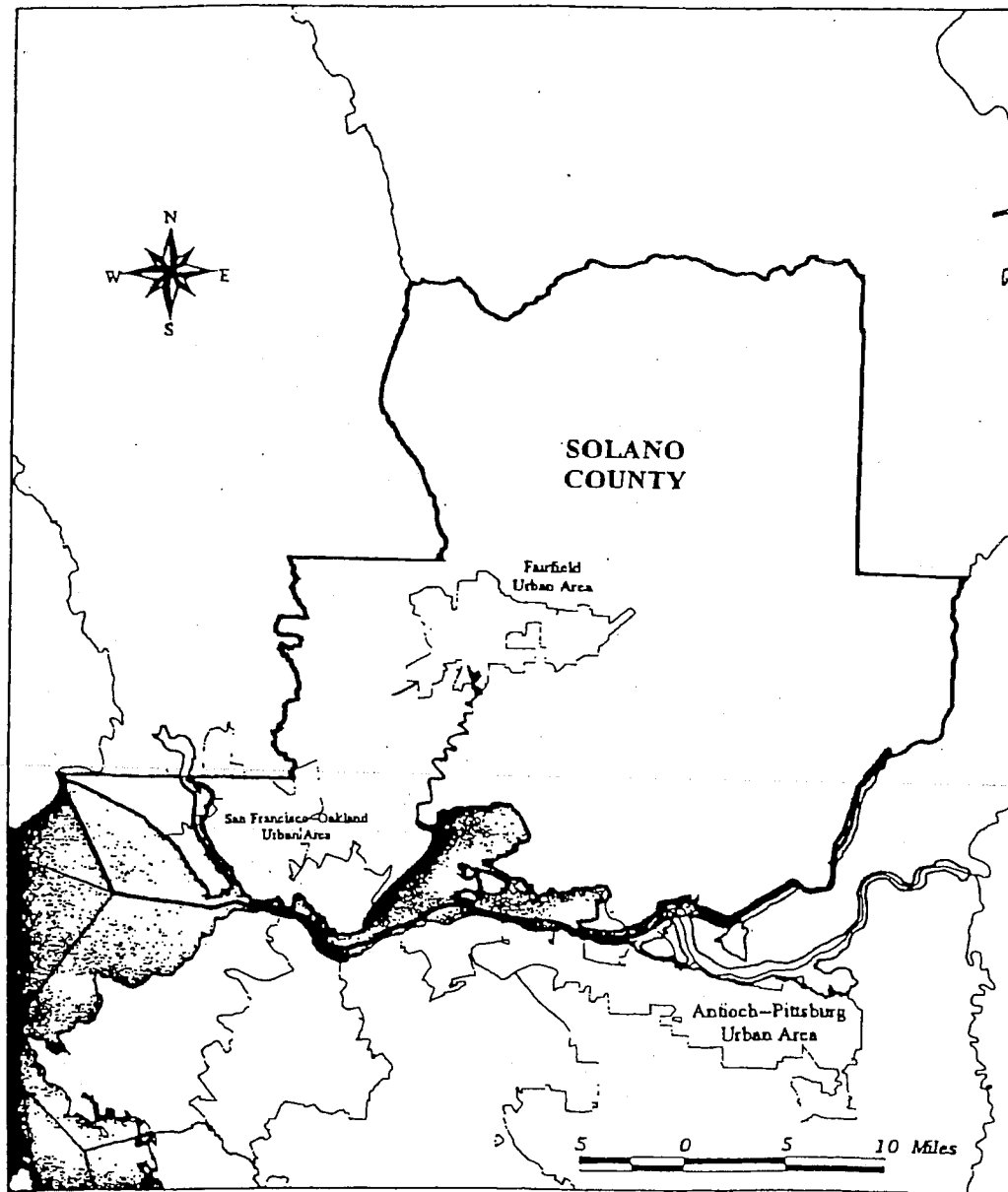
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Santa Clara County
Figure B-14d

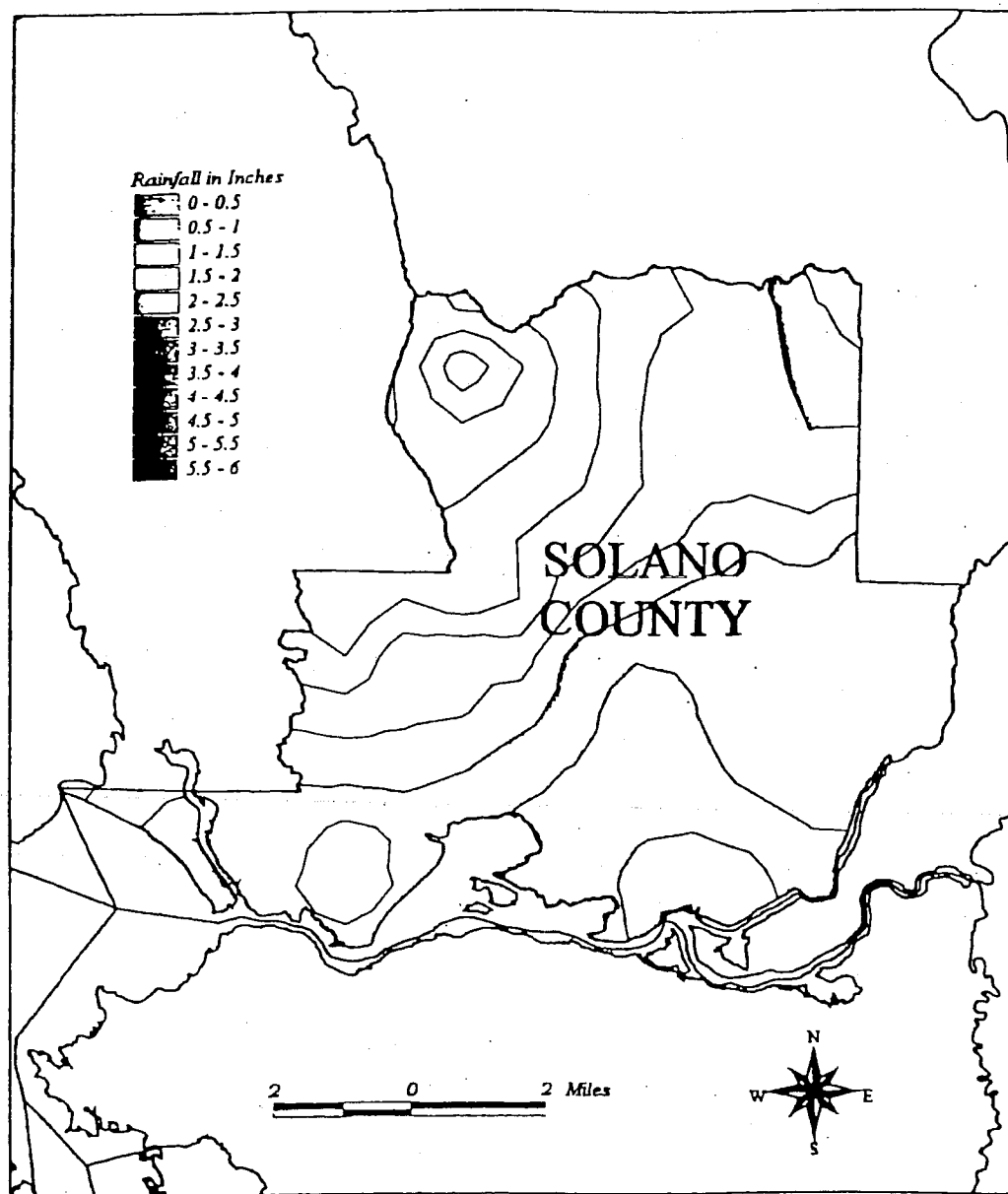
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Solano County
Figure B-15a

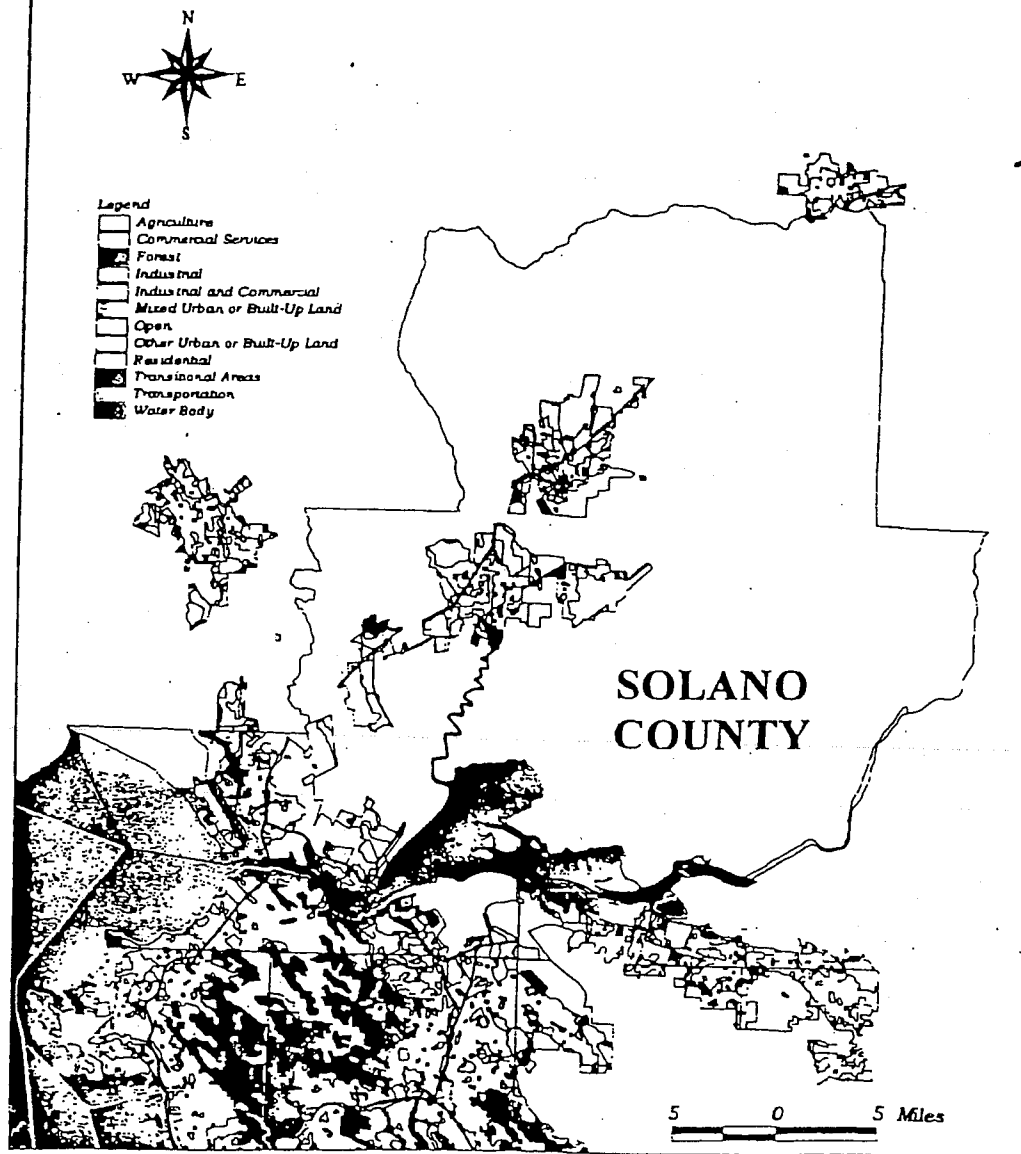
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Solano County
Figure B-15b

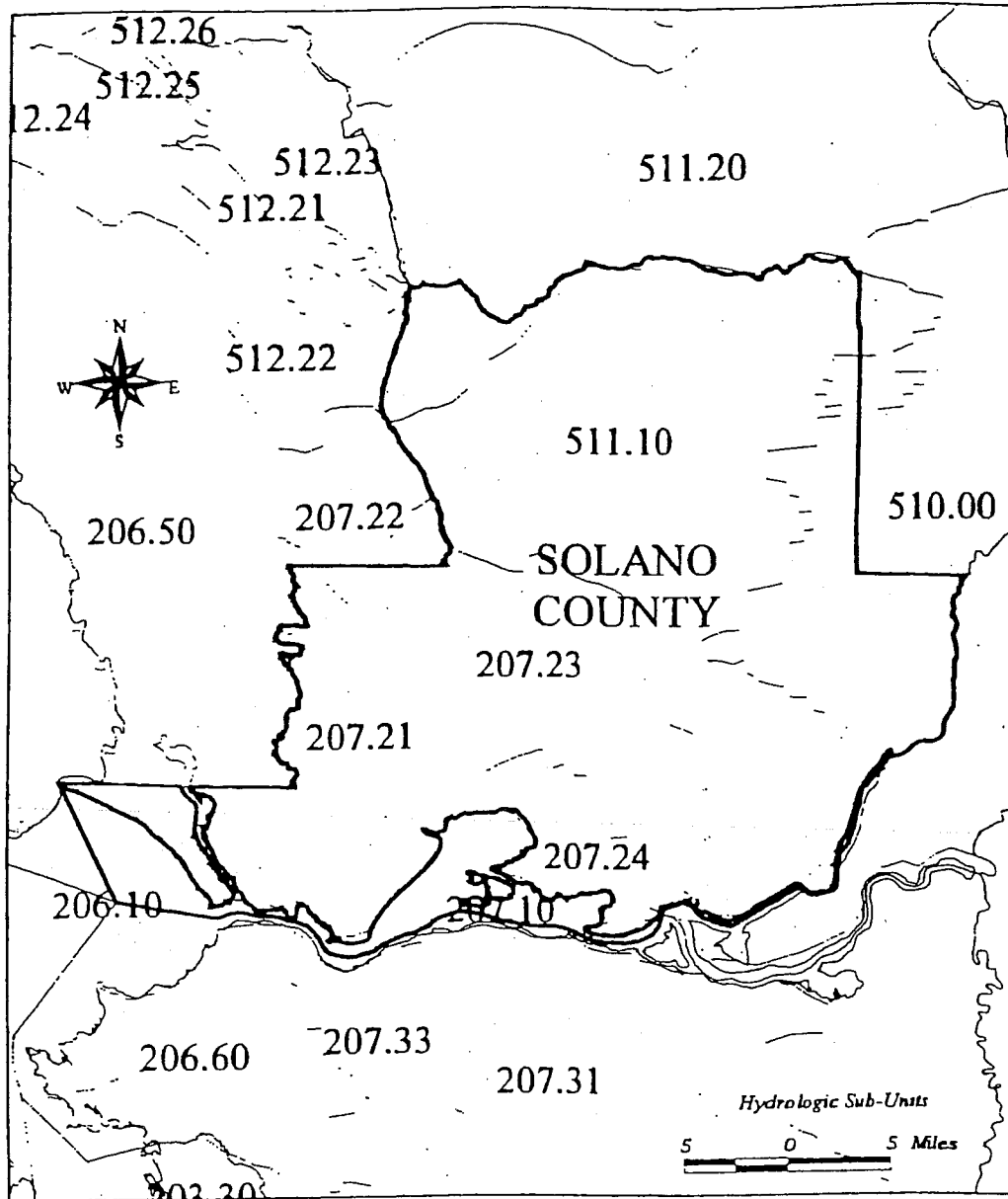
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Solano County
Figure B-15c

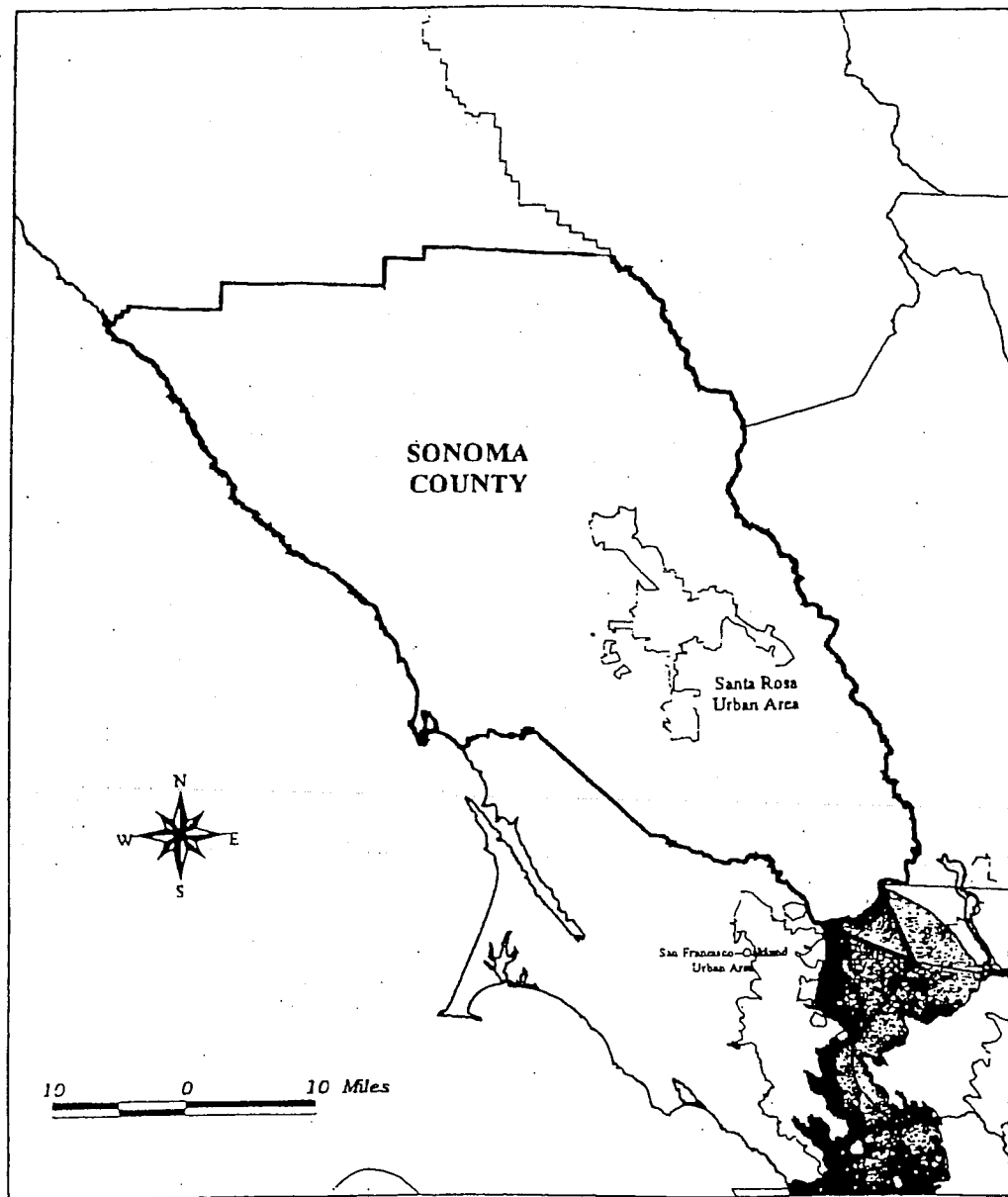
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Solano County
Figure B-15d

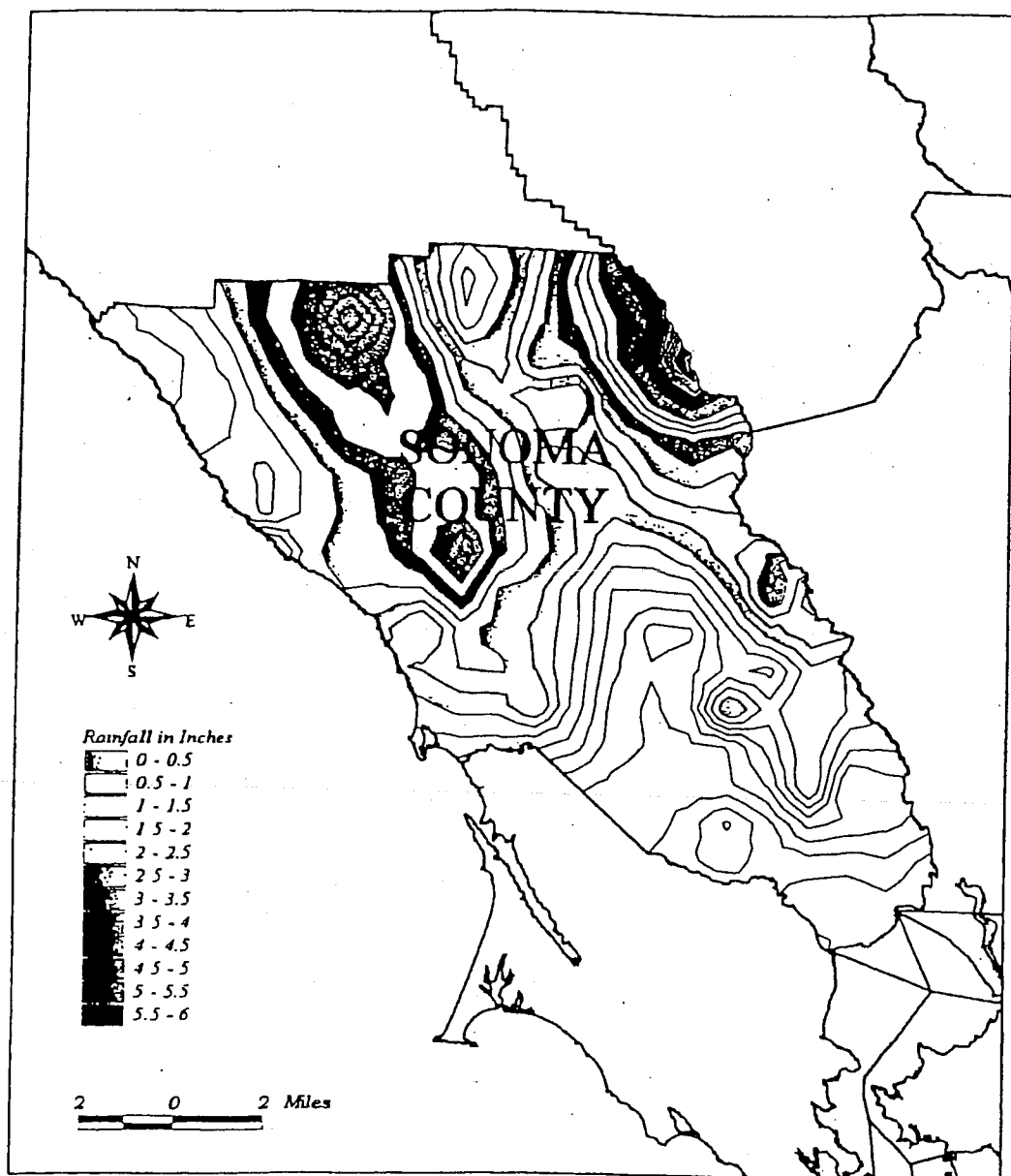
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Sonoma County
Figure B-16a

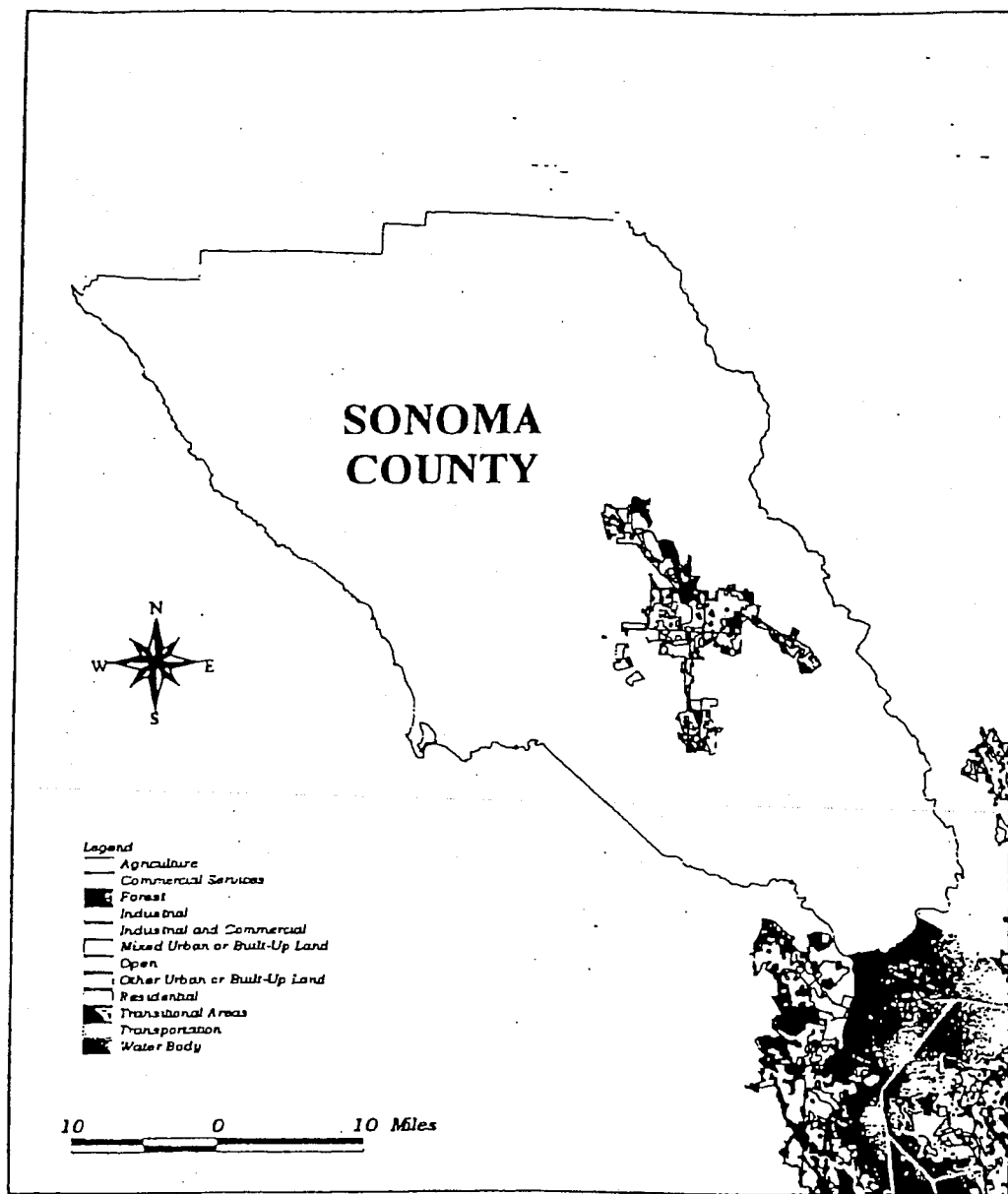
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Sonoma County
Figure B-16b

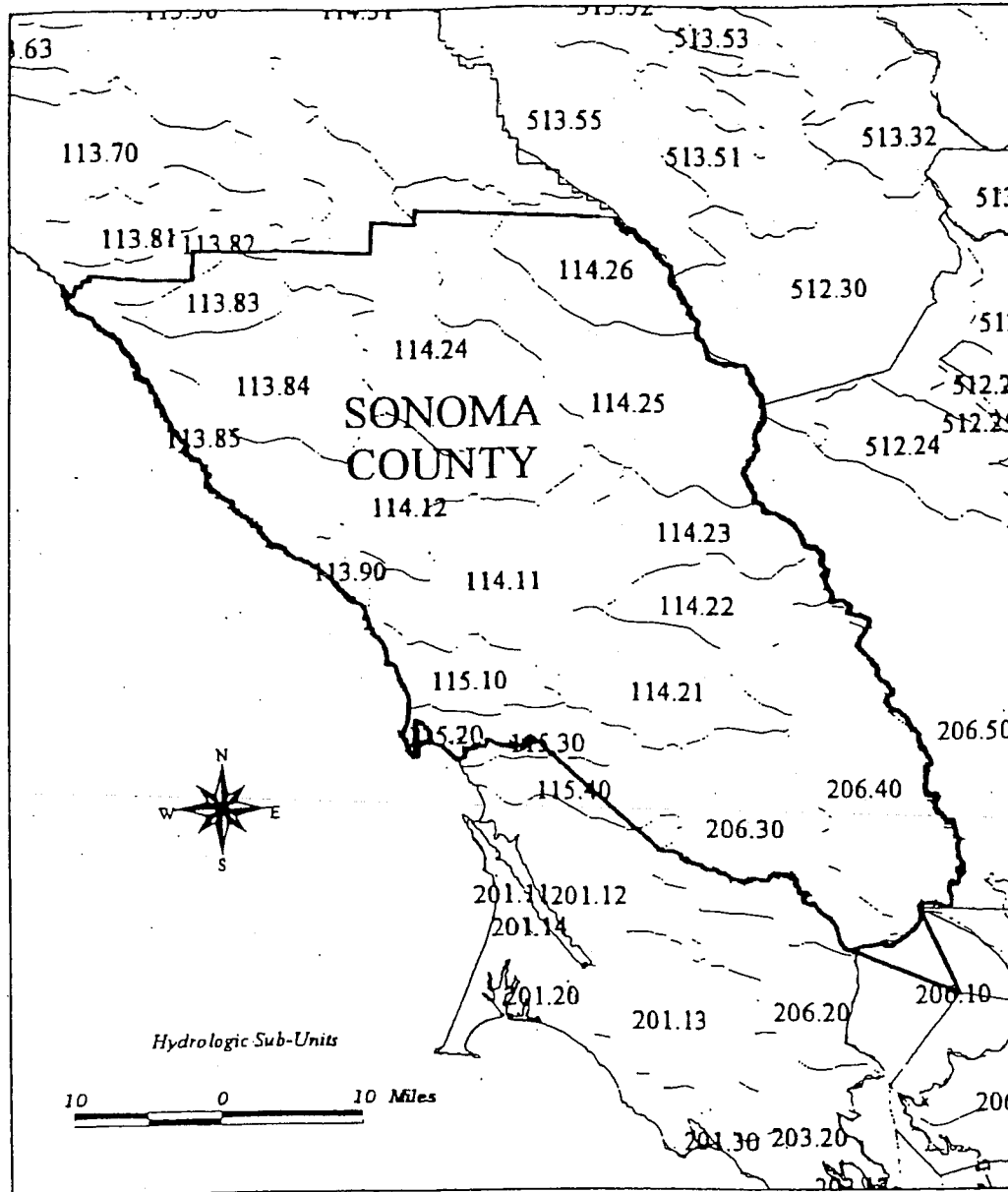
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BROWN AND
CALDWELL

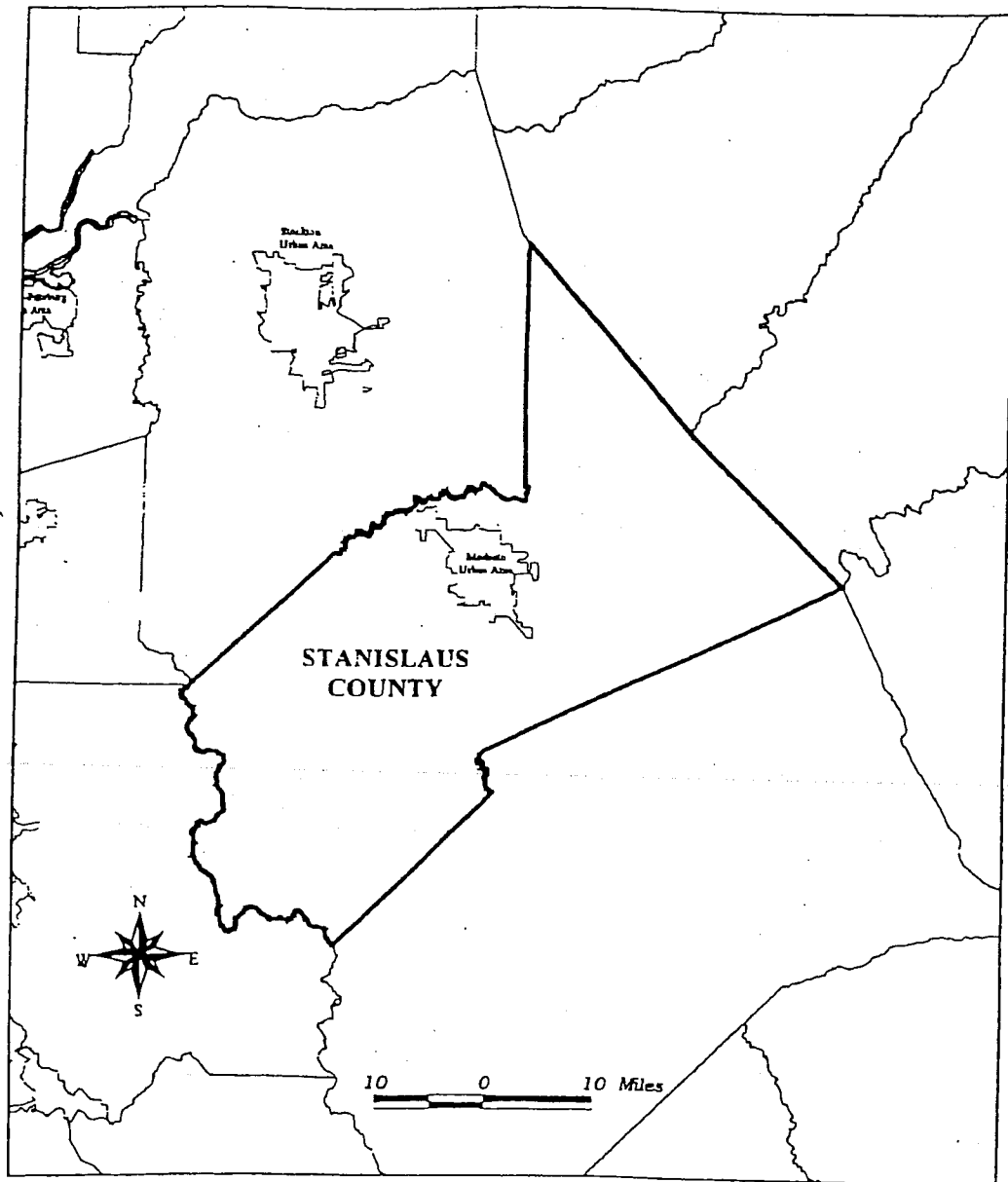
Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Sonoma County
Figure B-16c

R0006293



BROWN AND
CALDWELL

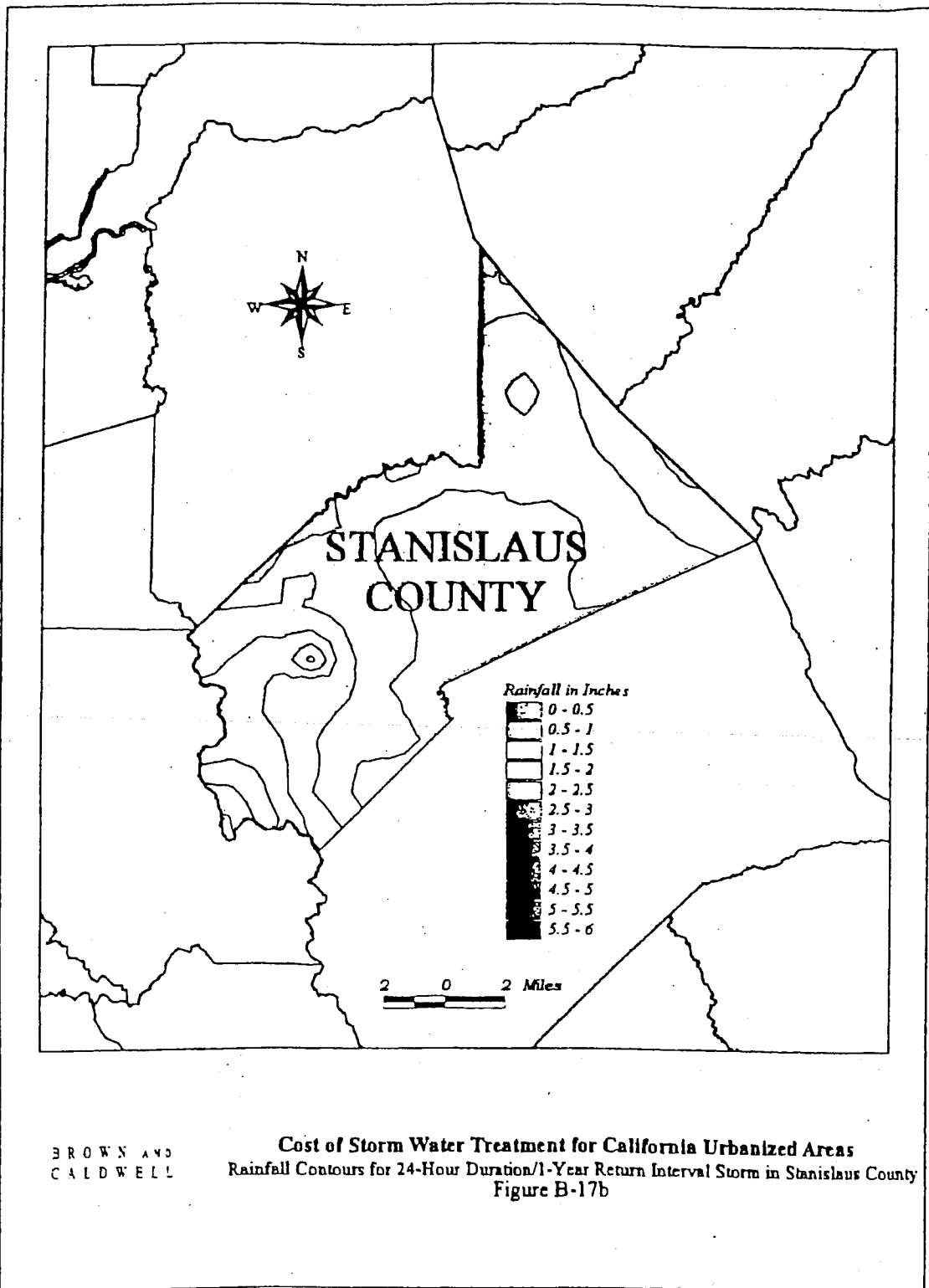
Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Sonoma County
Figure B-16d



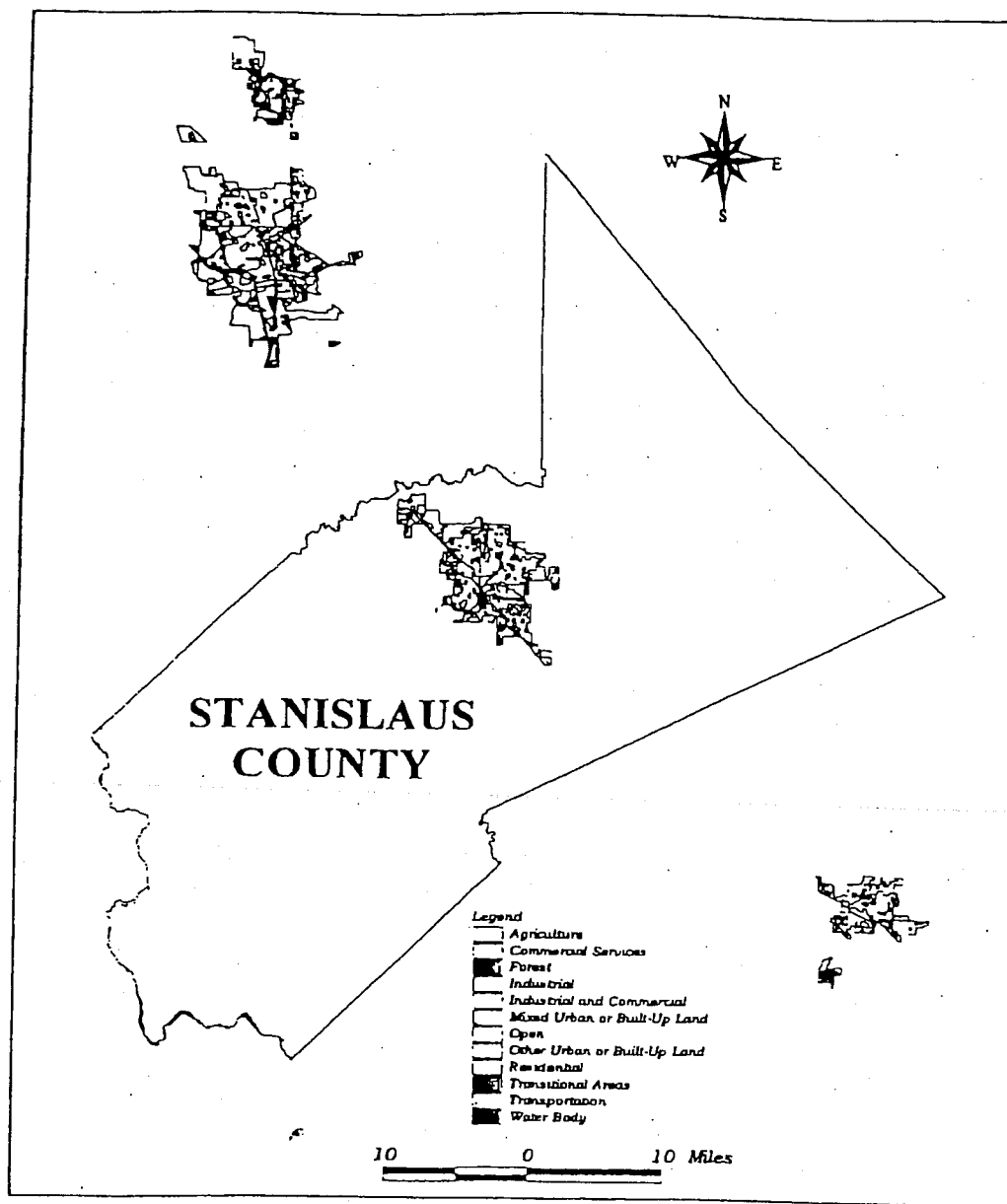
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Stanislaus County
Figure B-17a

R0006295



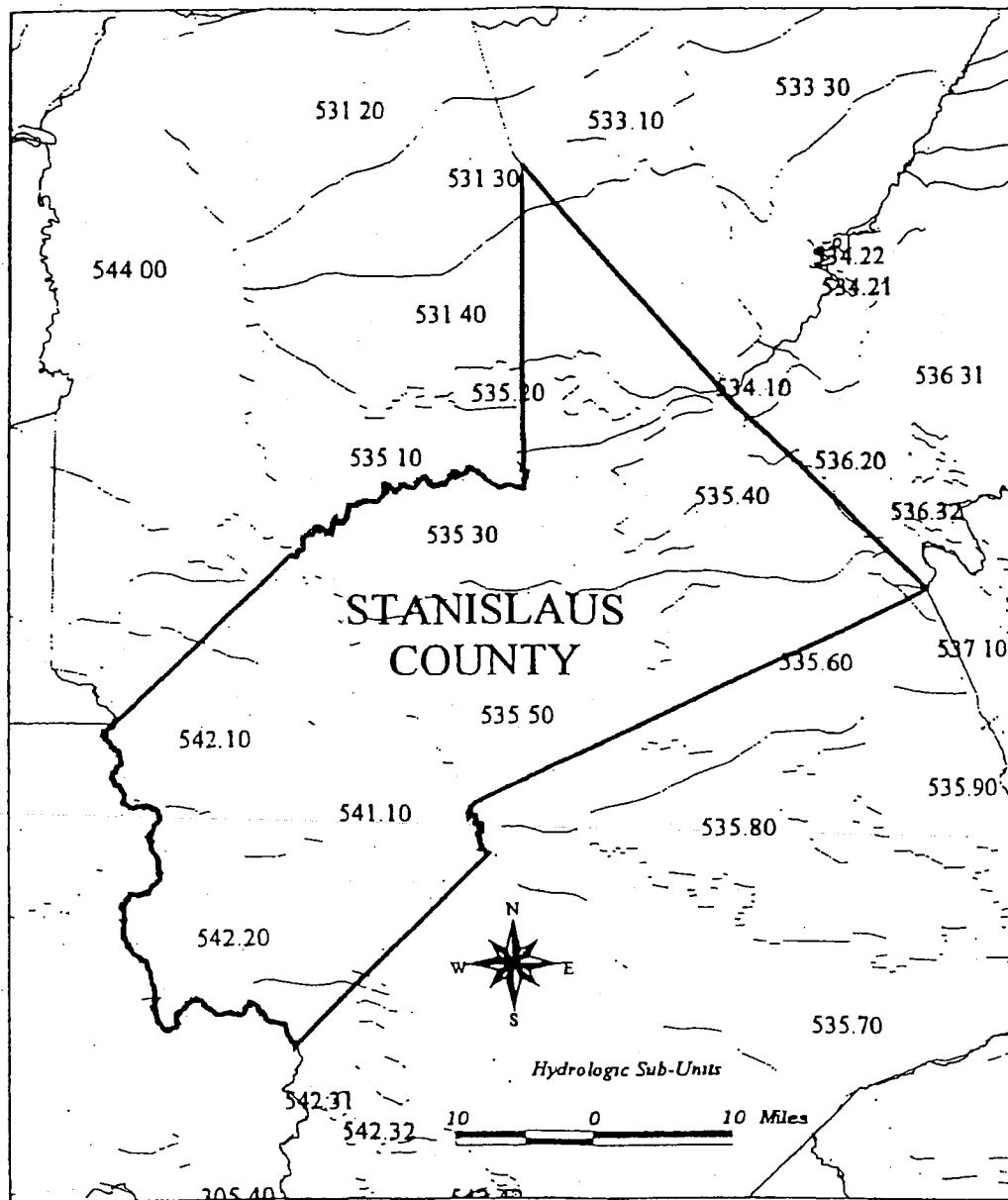
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Stanislaus County
Figure B-17c

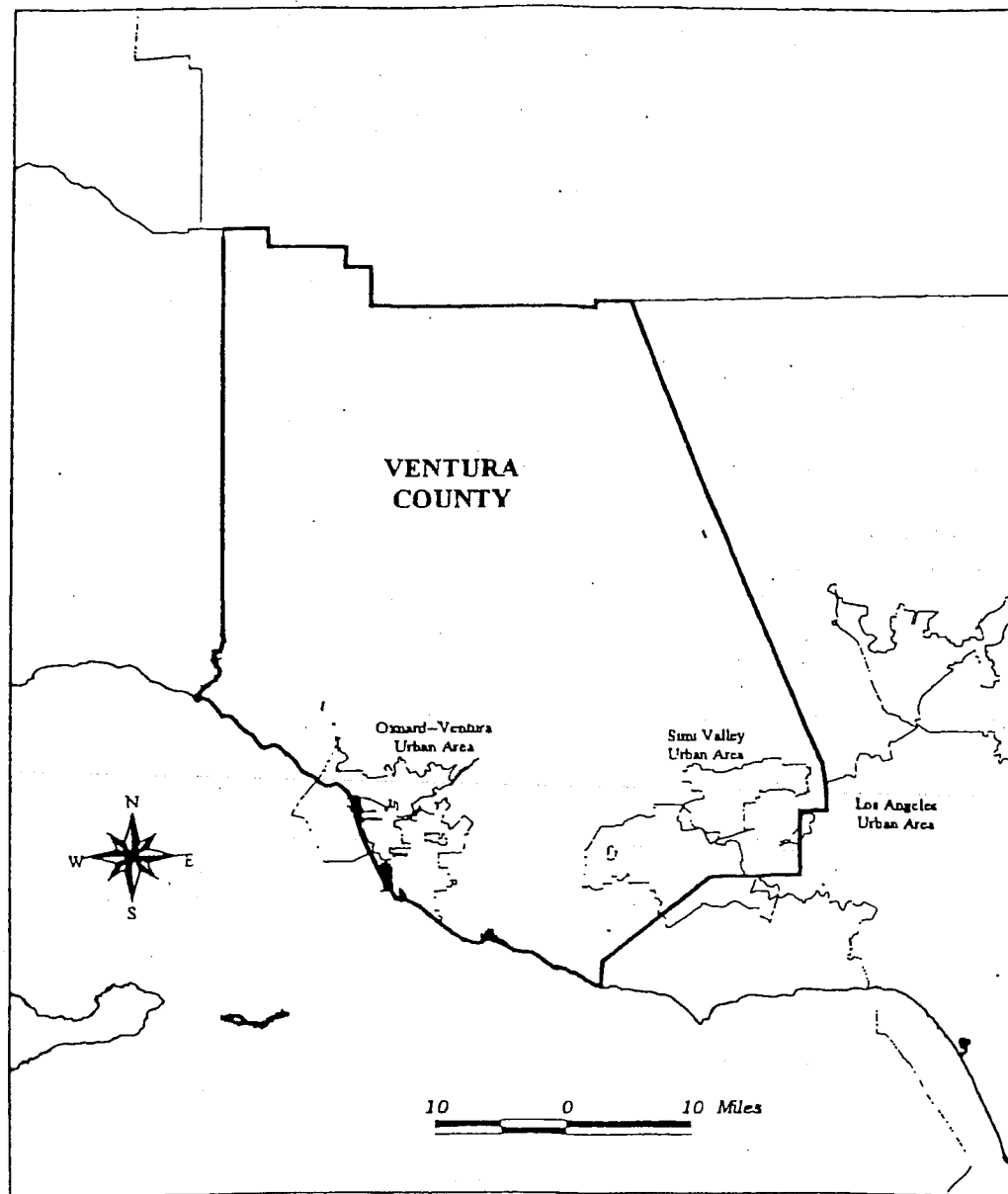
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Stanislaus County
Figure B-17d

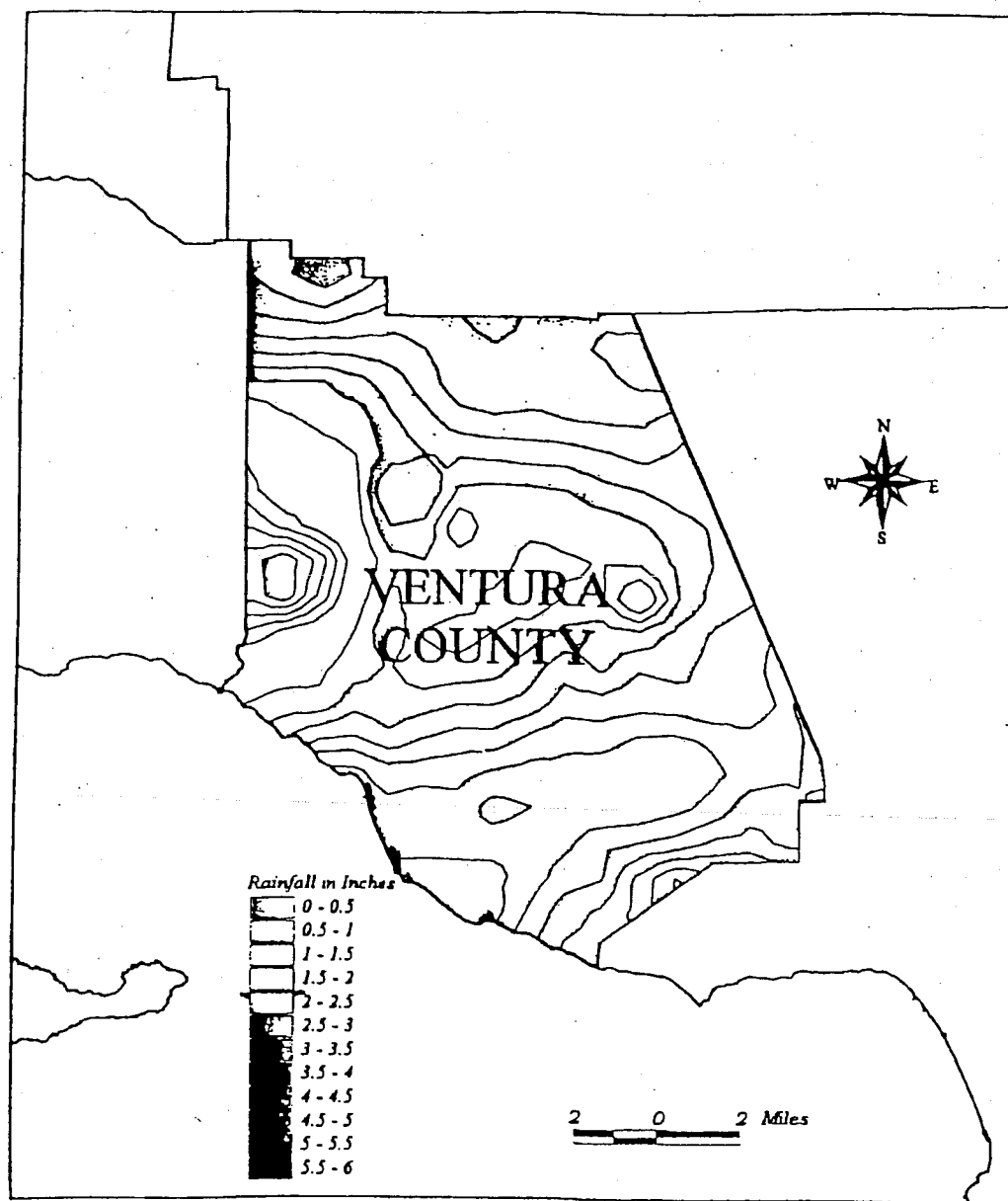
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Ventura County
Figure B-18a

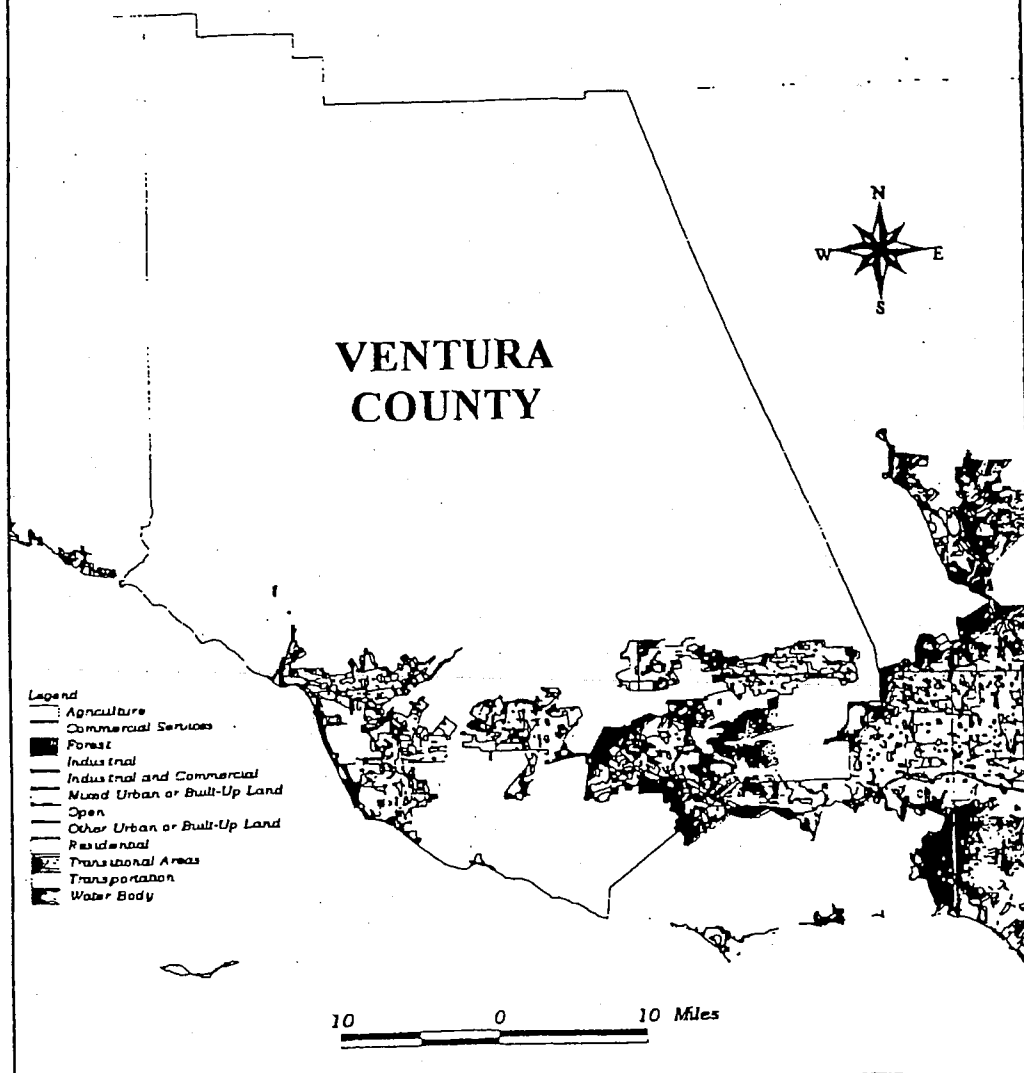
R0006299



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Ventura County
Figure B-18b

R0006300



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Ventura County
Figure B-18c

R0006301

APPENDIX A
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R0006303



APPENDIX A

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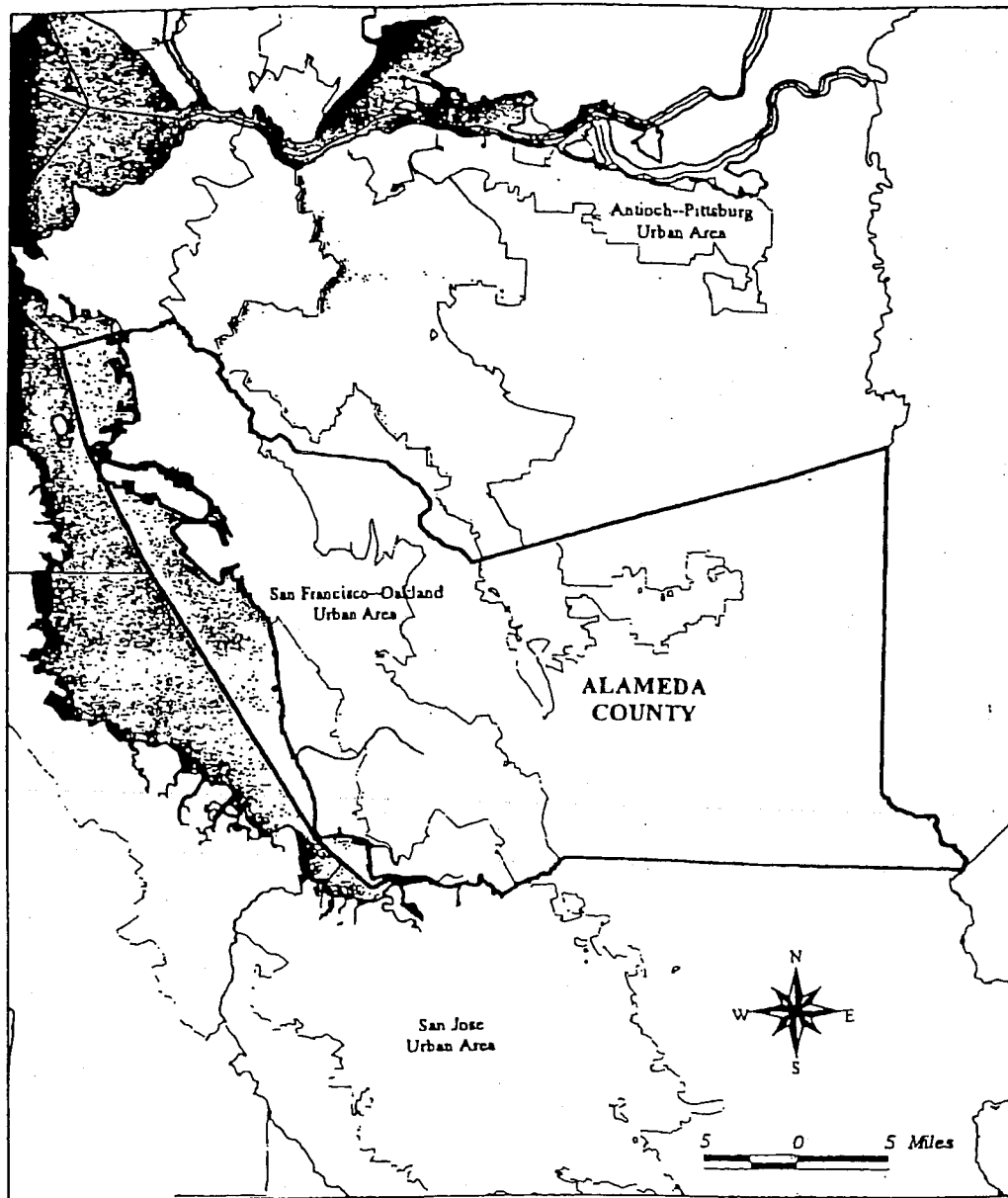
APPENDIX B

**URBANIZED AREA BOUNDARY, RAINFALL CONTOUR,
LAND USE, AND HYDROLOGIC SUB-UNIT BOUNDARY MAPS**



APPENDIX B

URBANIZED AREA BOUNDARY, RAINFALL CONTOUR, LAND USE, AND HYDROLOGIC SUB-UNIT BOUNDARY MAPS

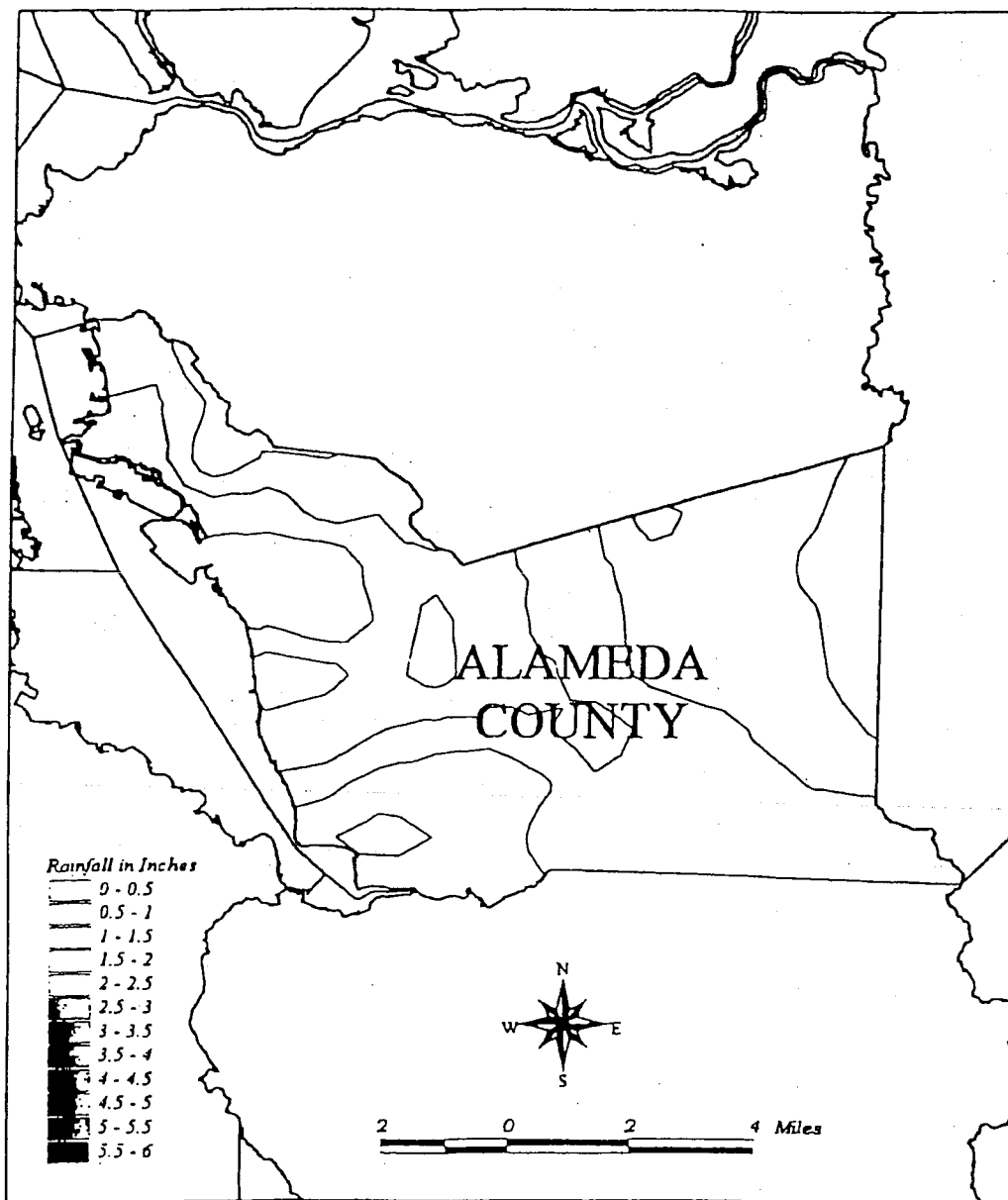


BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Alameda County

Figure B-1a

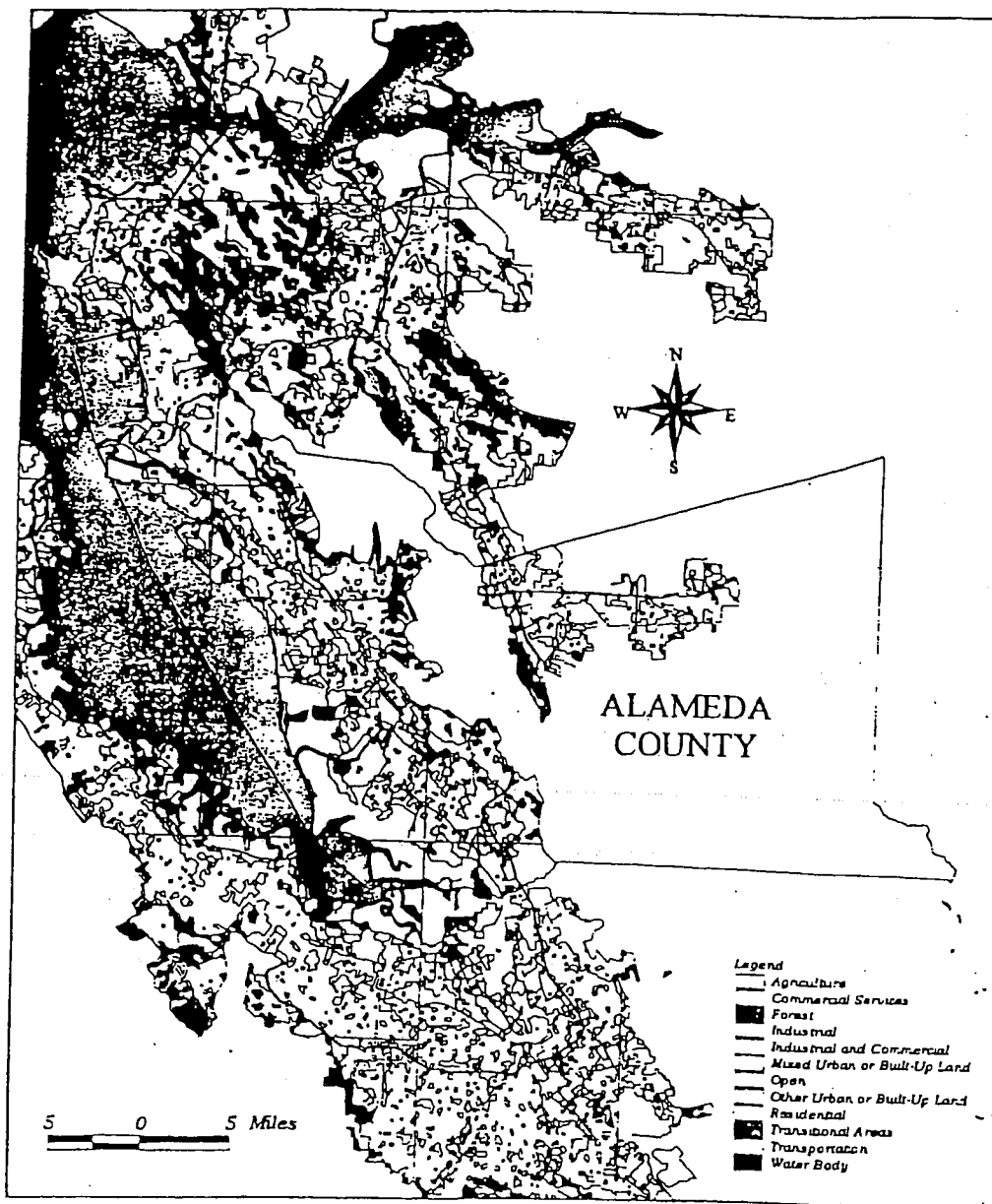
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Alameda County
Figure B-1b

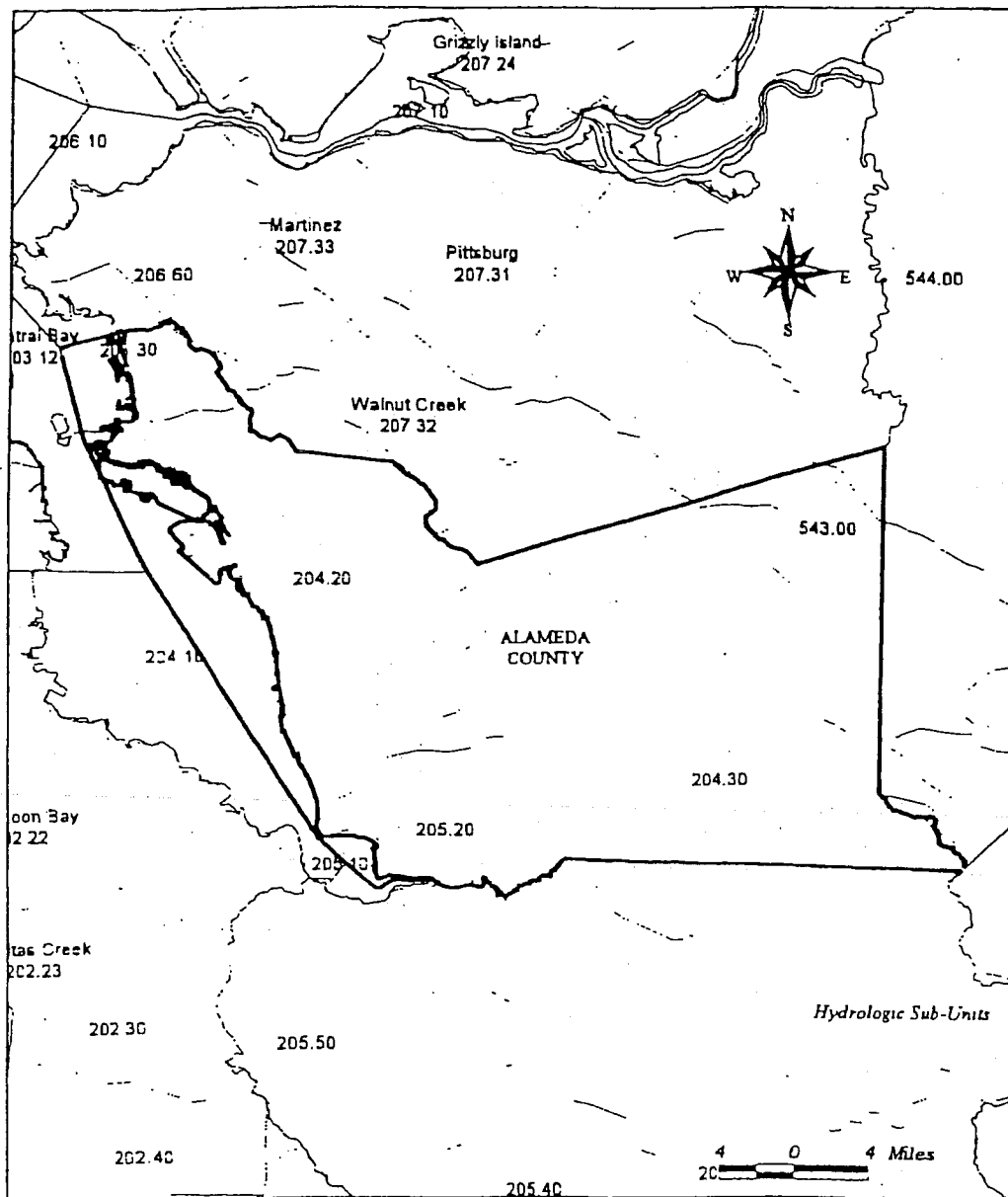
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Alameda County
Figure B-1c

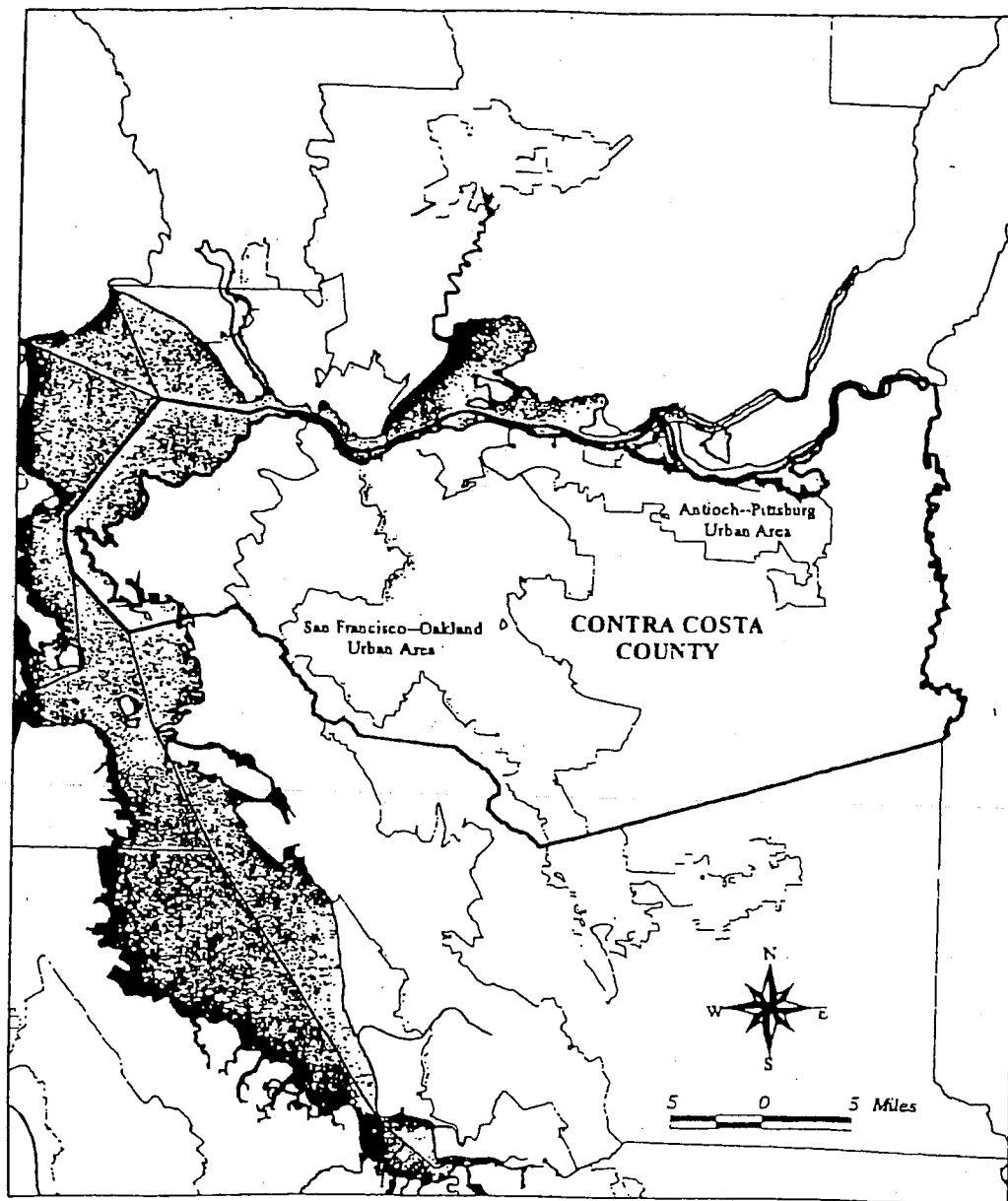
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Alameda County
Figure B-1d

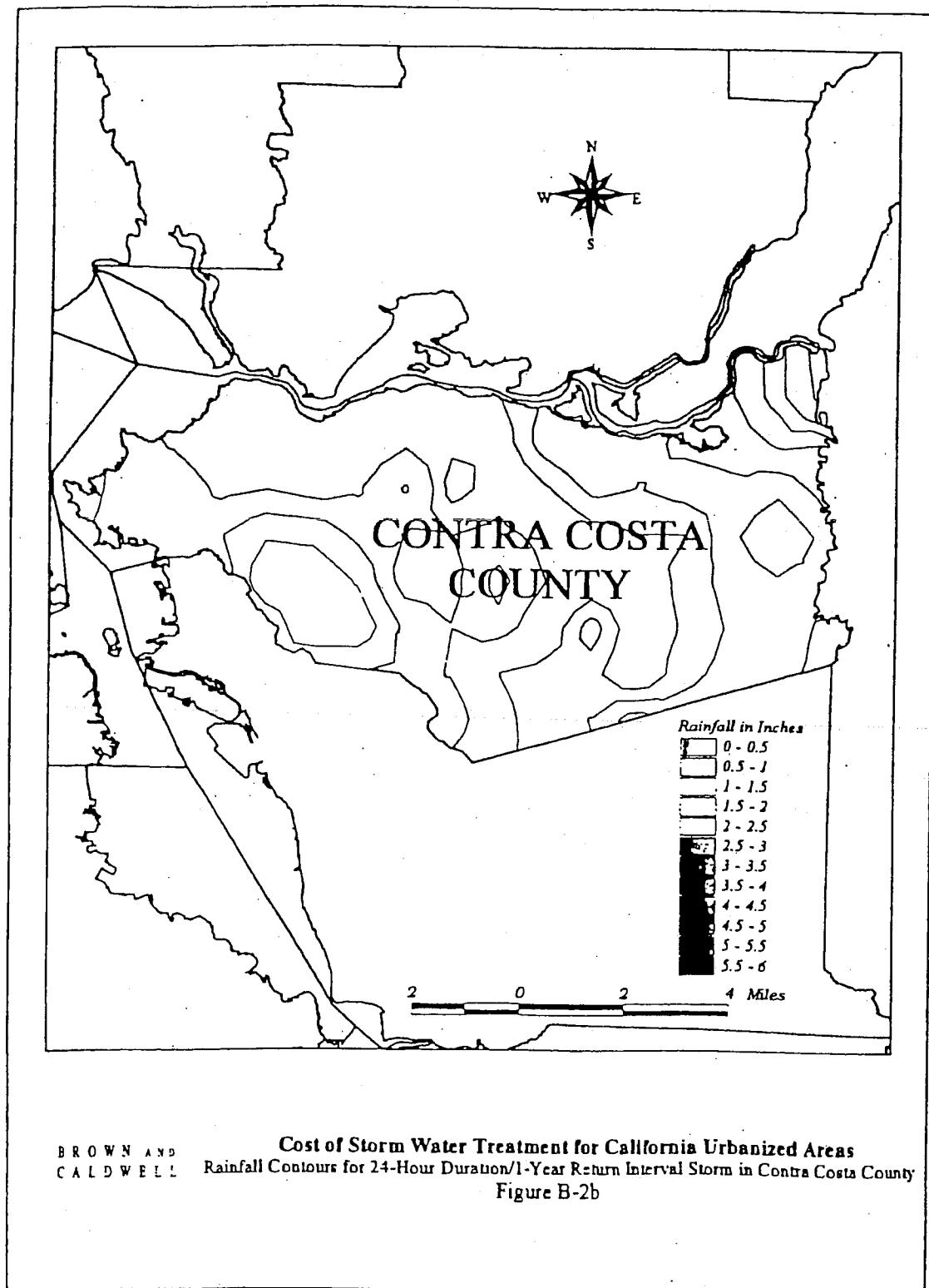
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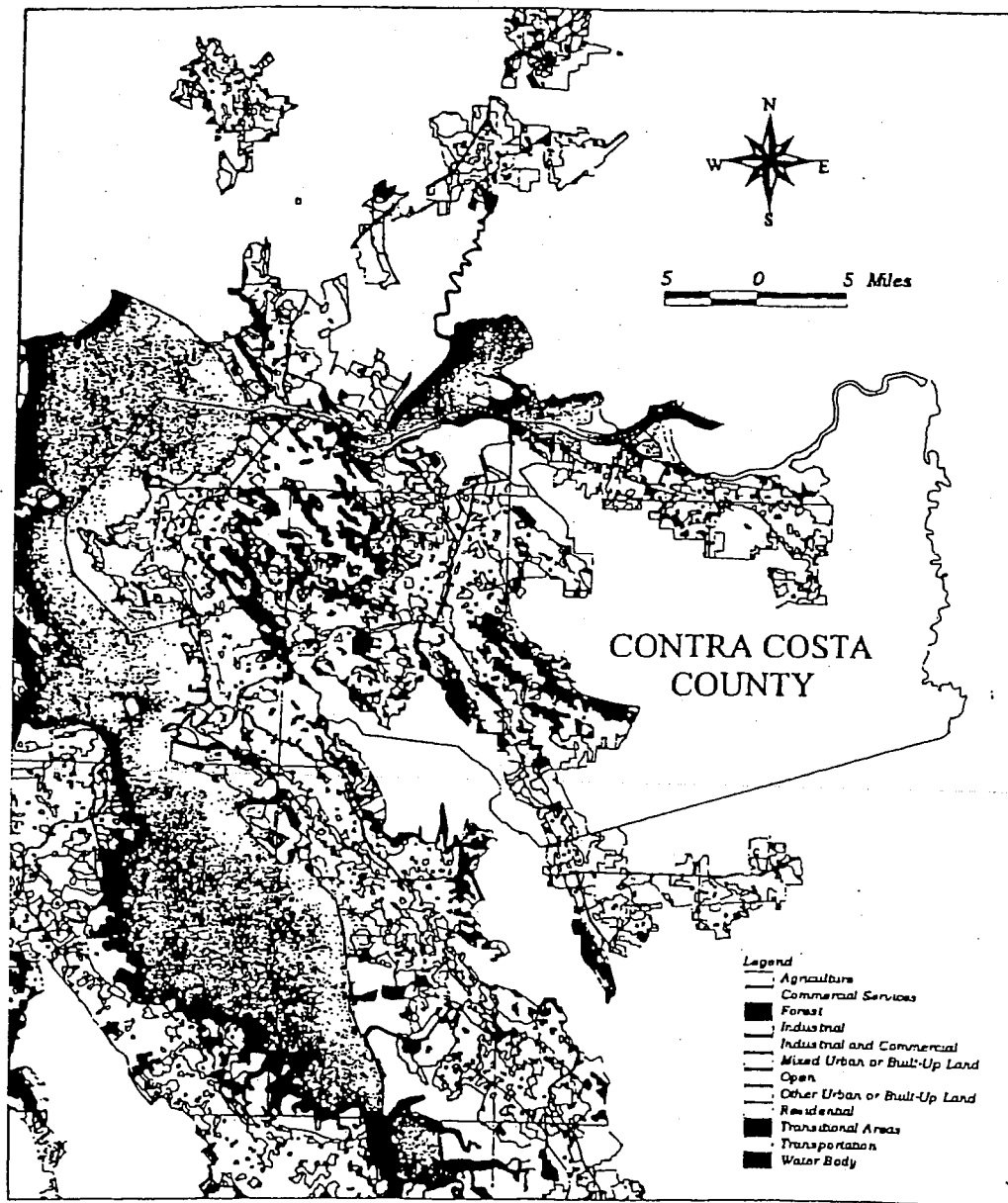
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Contra Costa County
Figure B-2a

R0006311



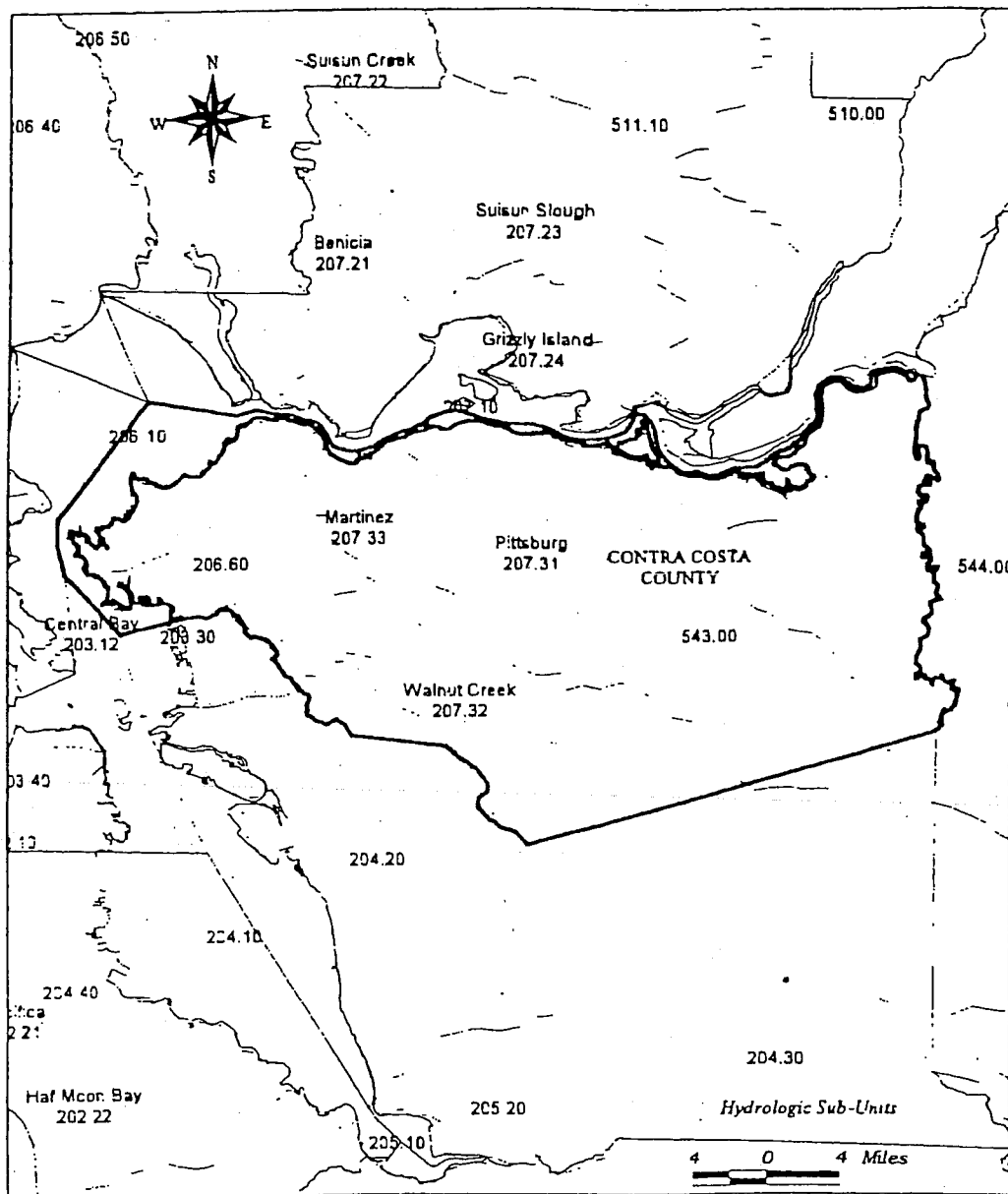
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Contra Costa County
Figure B-2c

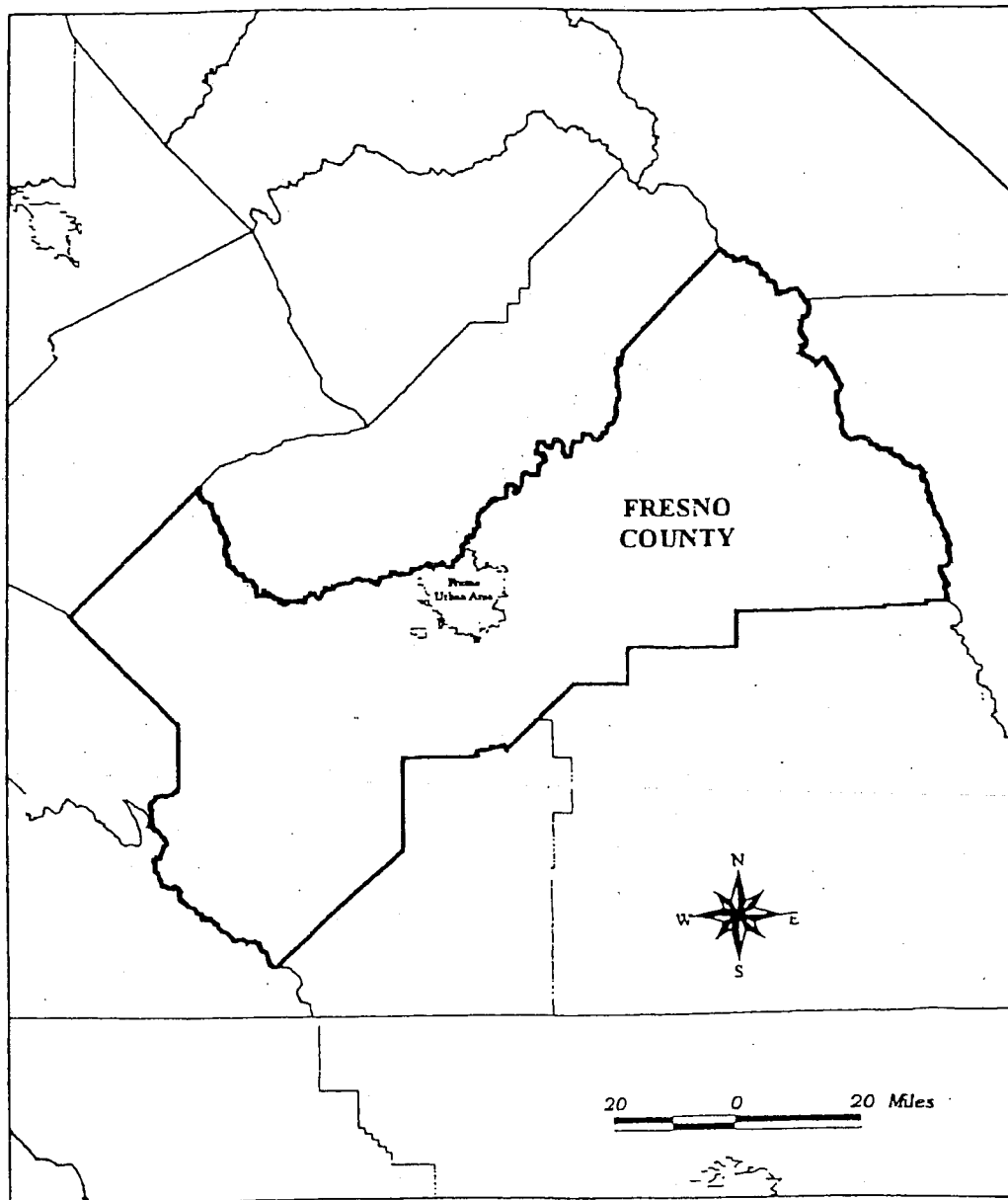
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Contra Costa County
Figure B-2d

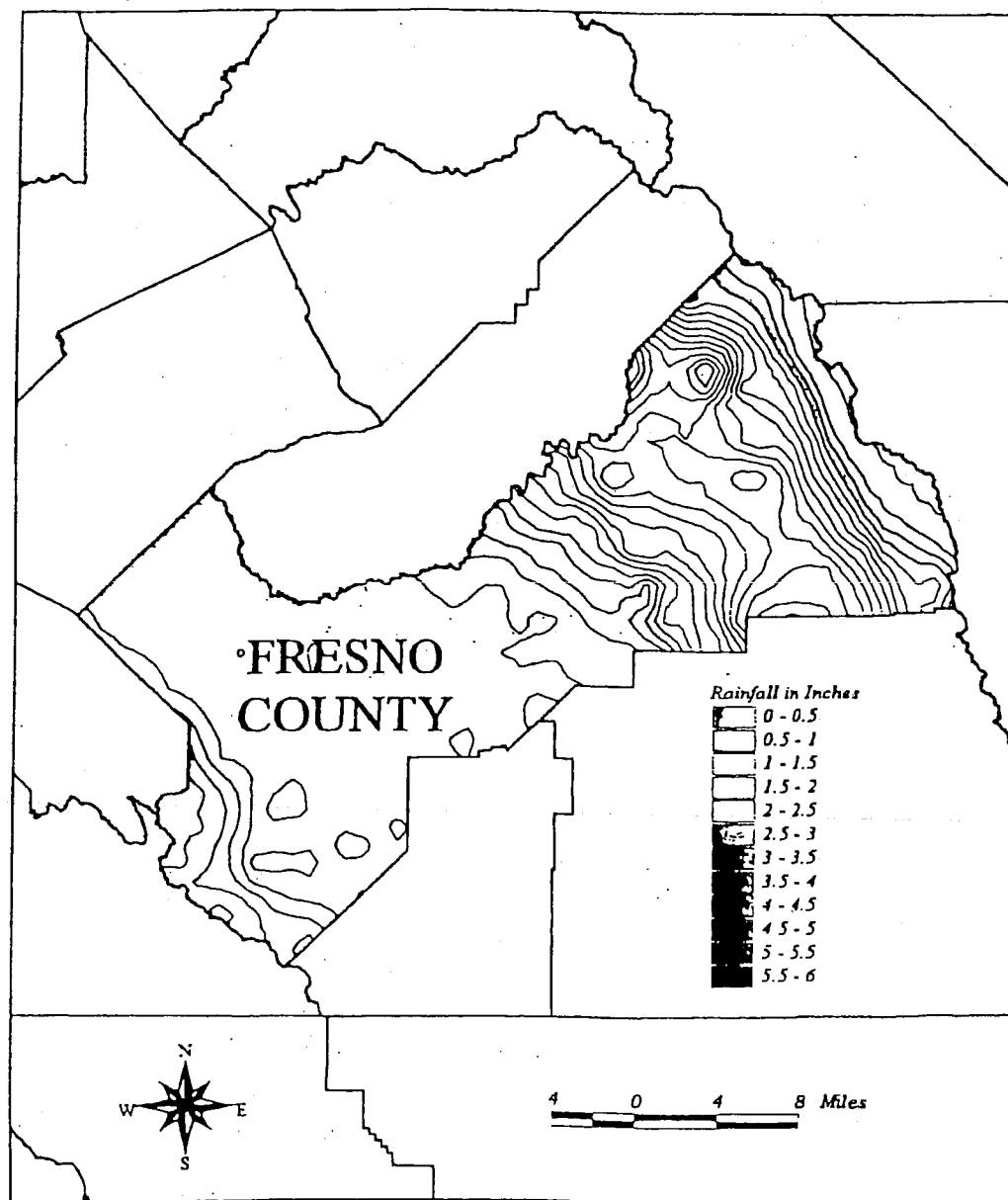
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Fresno County
Figure B-3a

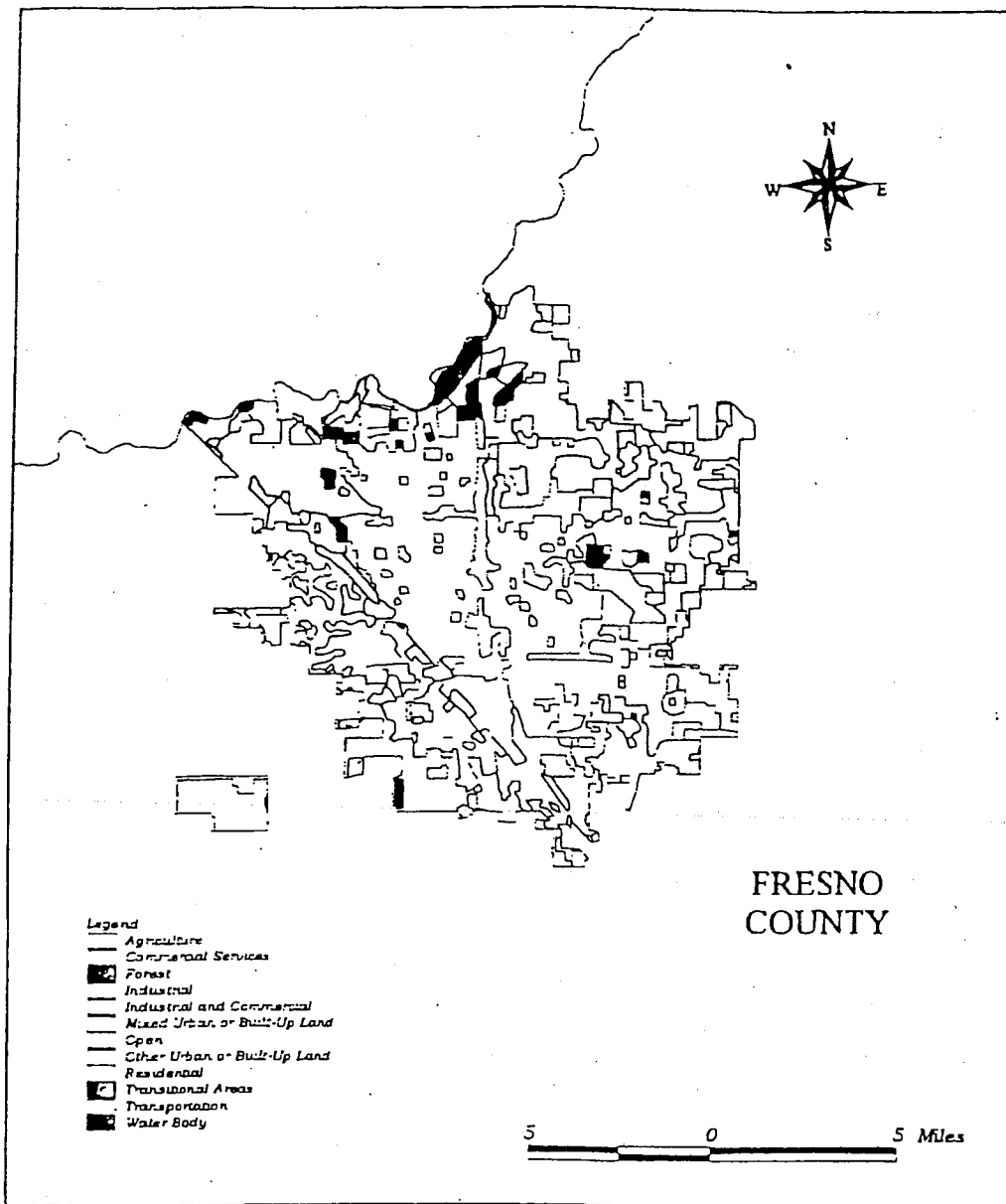
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Fresno County
 Figure B-3b

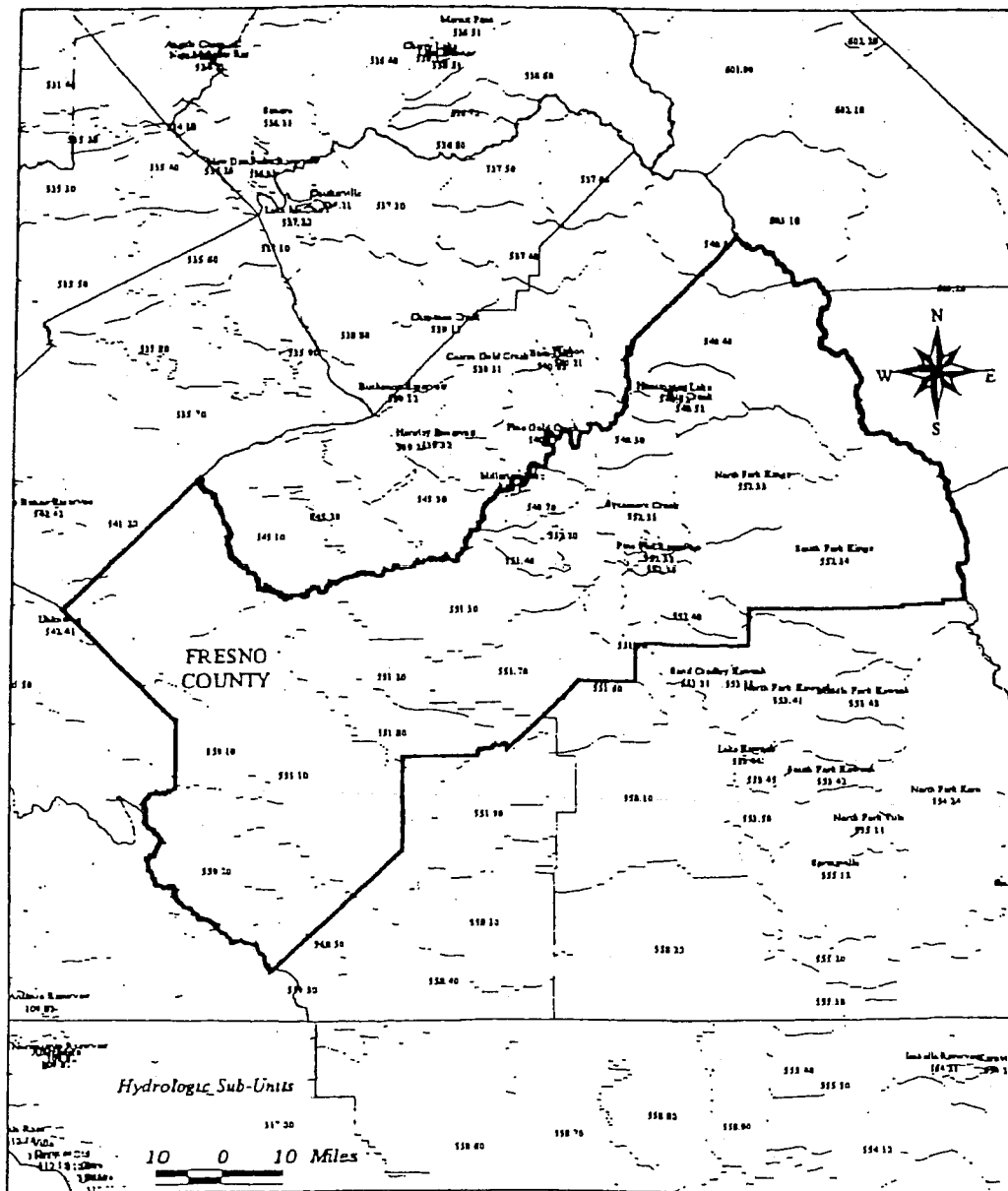
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Fresno County
Figure B-3c

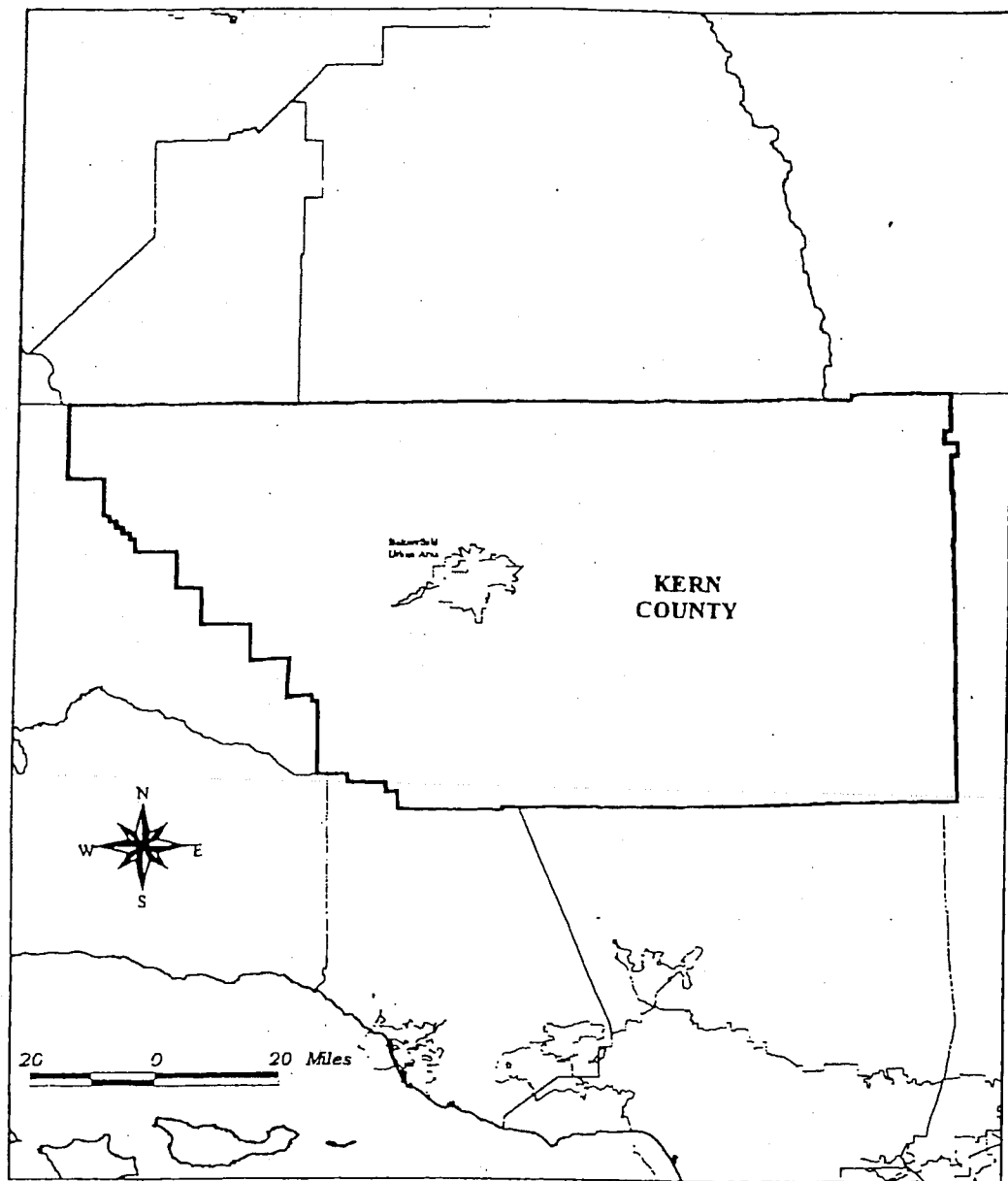
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Fresno County
Figure B-3d

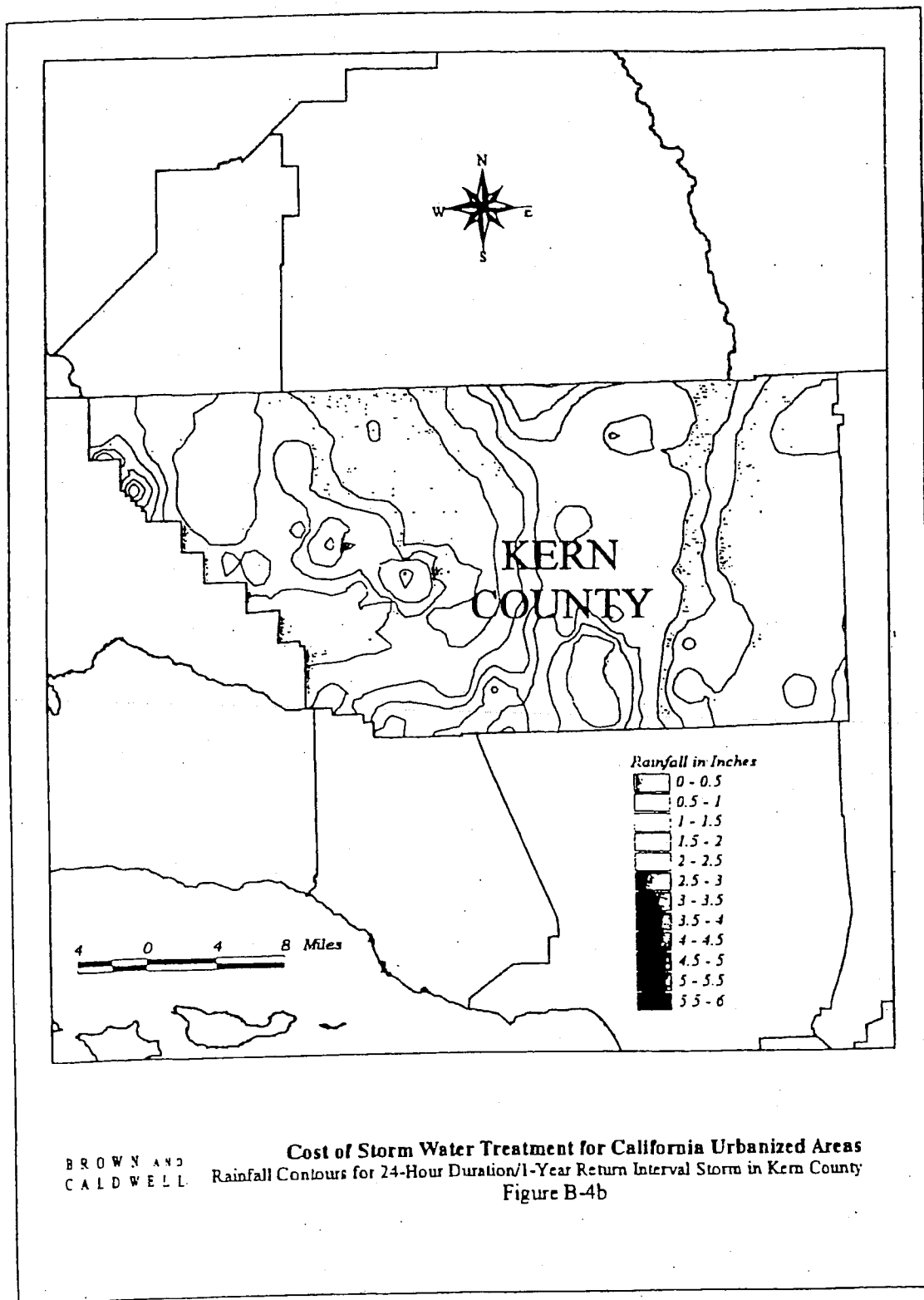
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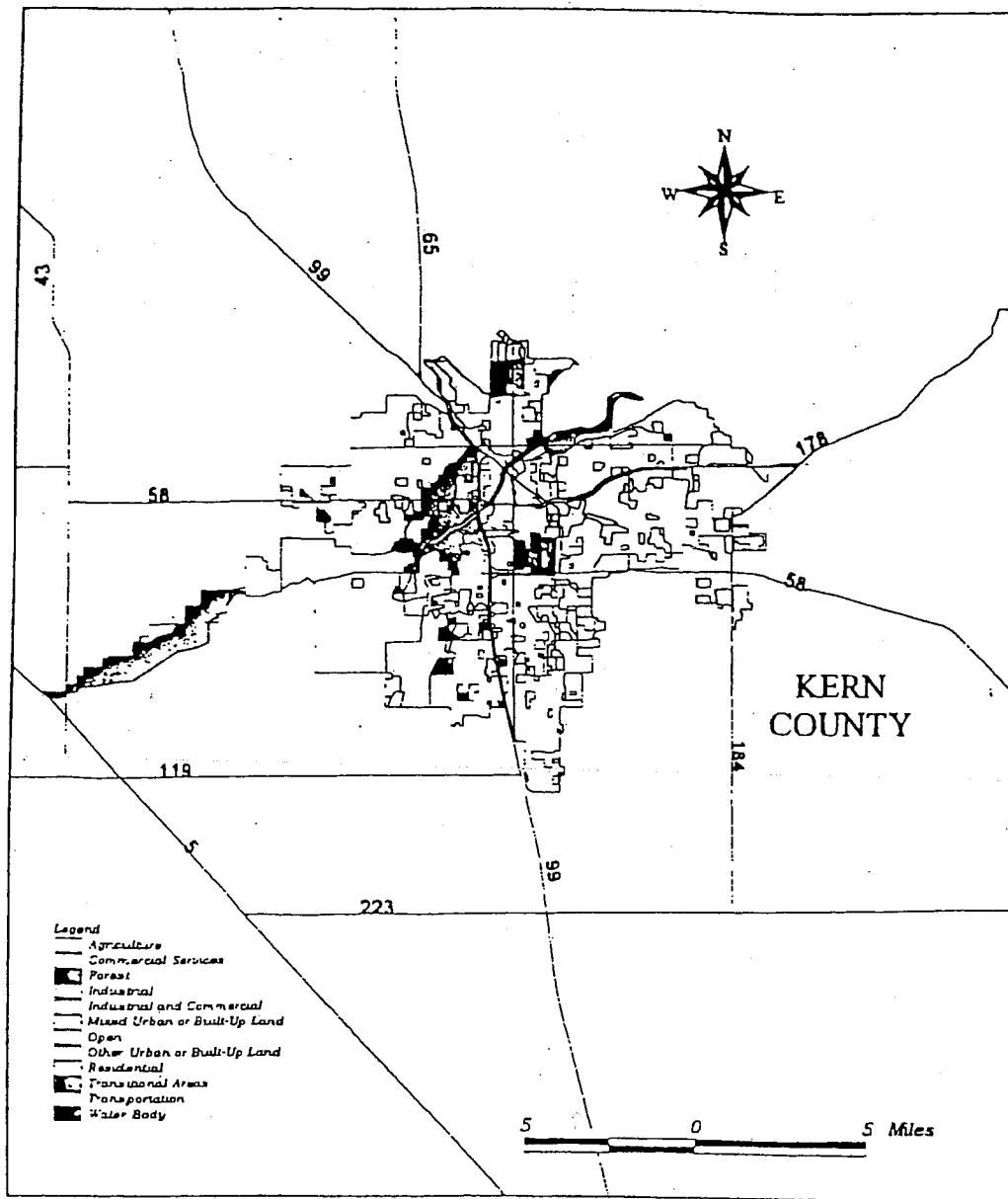
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Kern County
Figure B-4a

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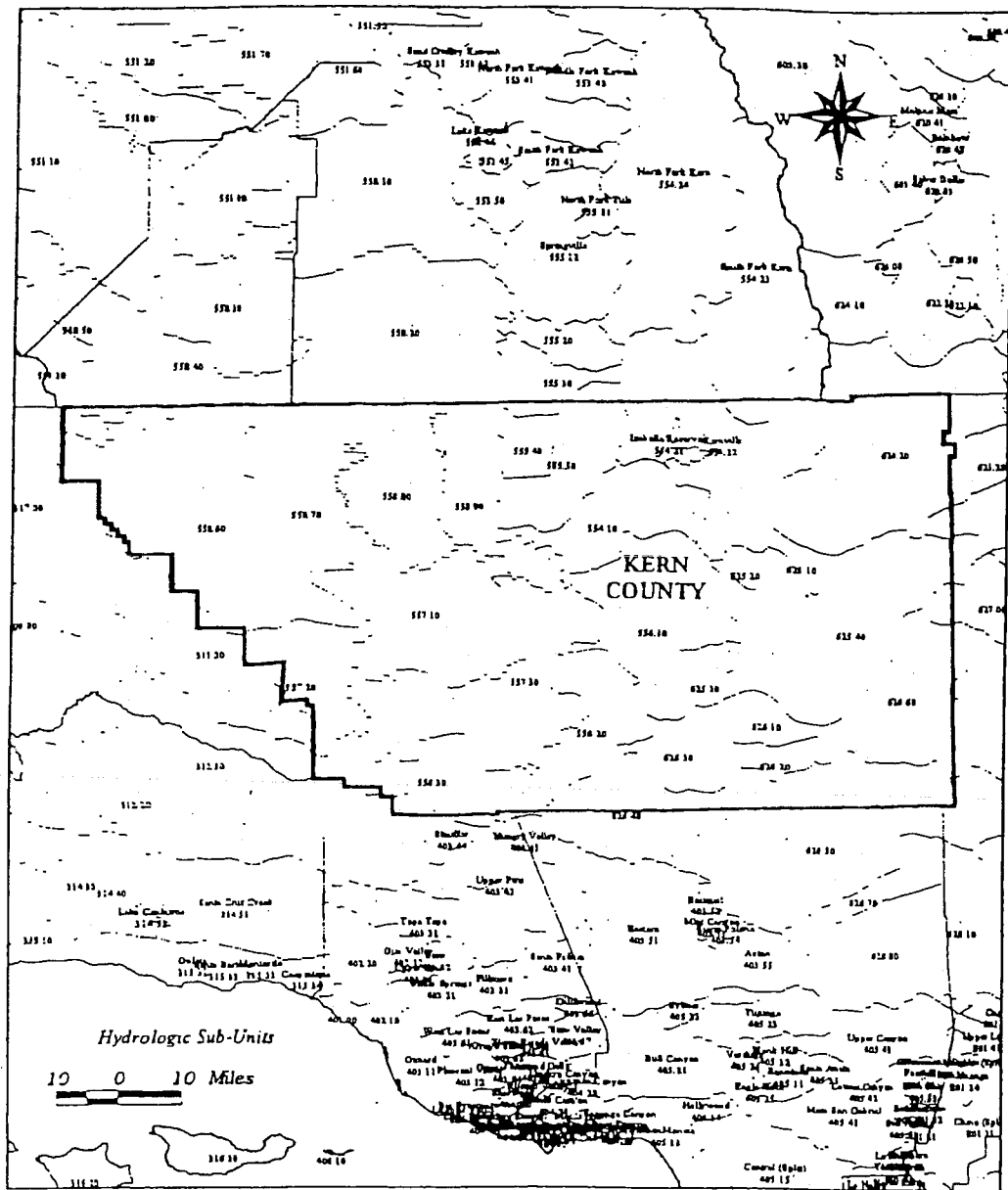
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Kern County
Figure B-4c

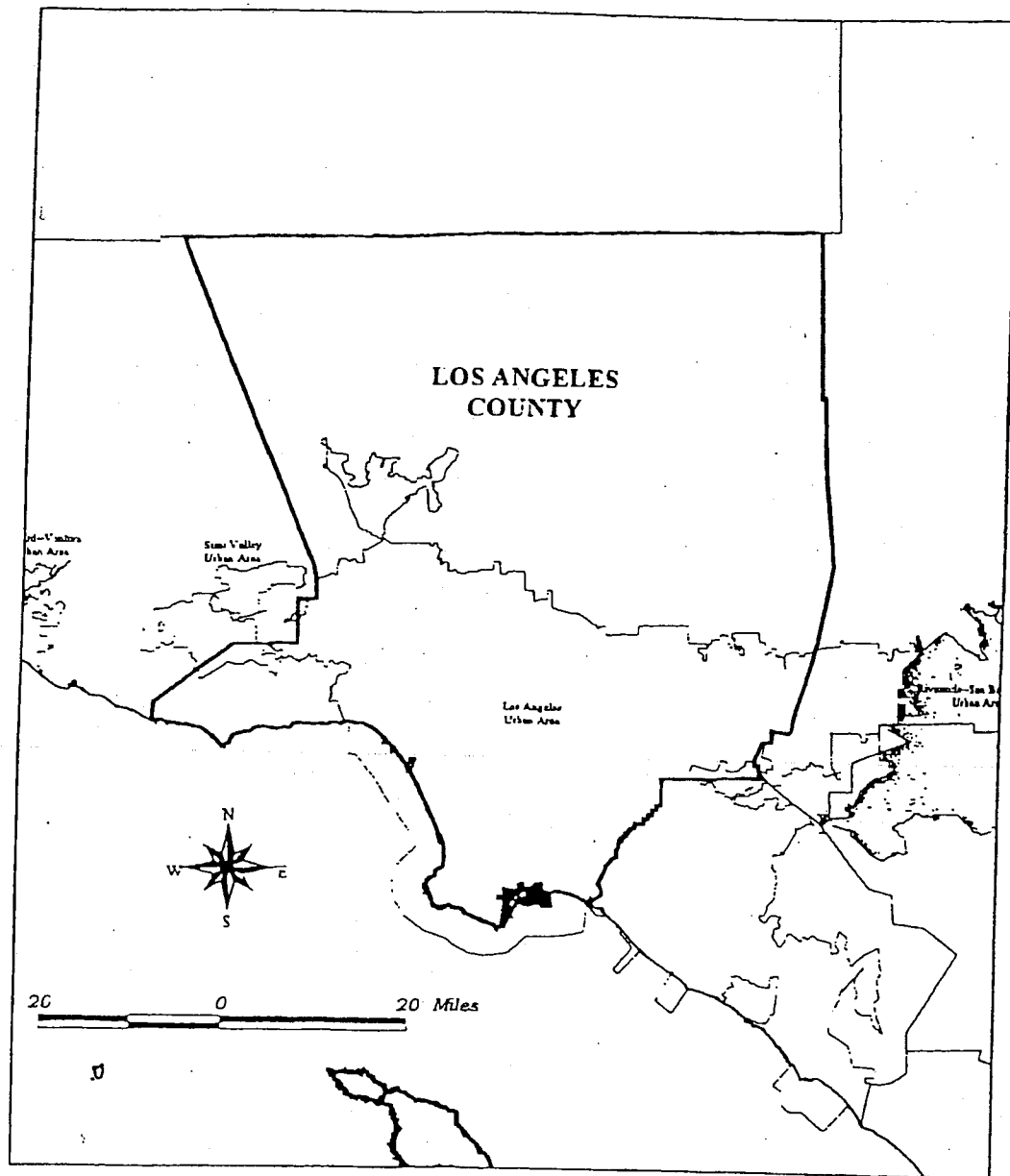
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Kern County
Figure B-4d

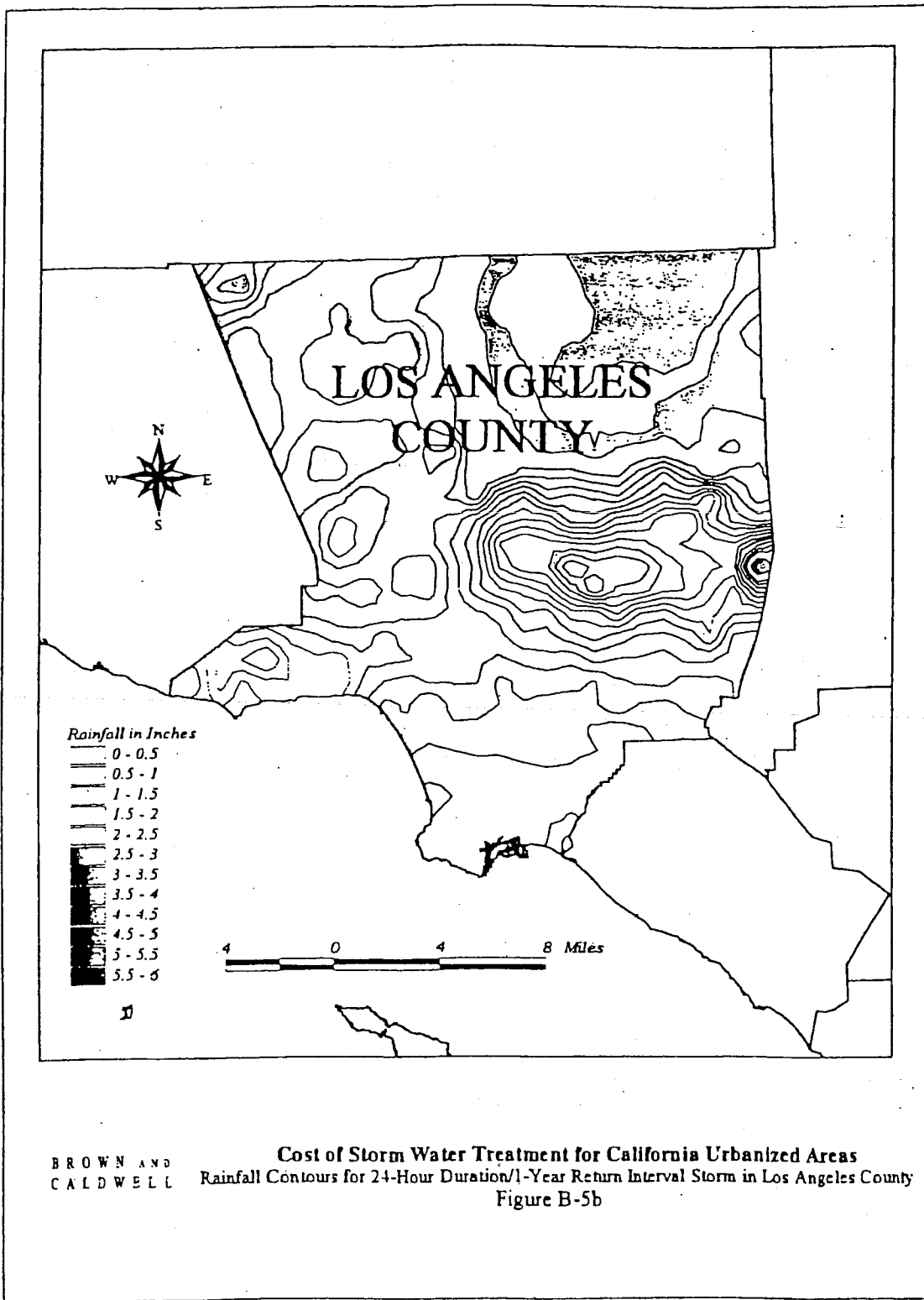
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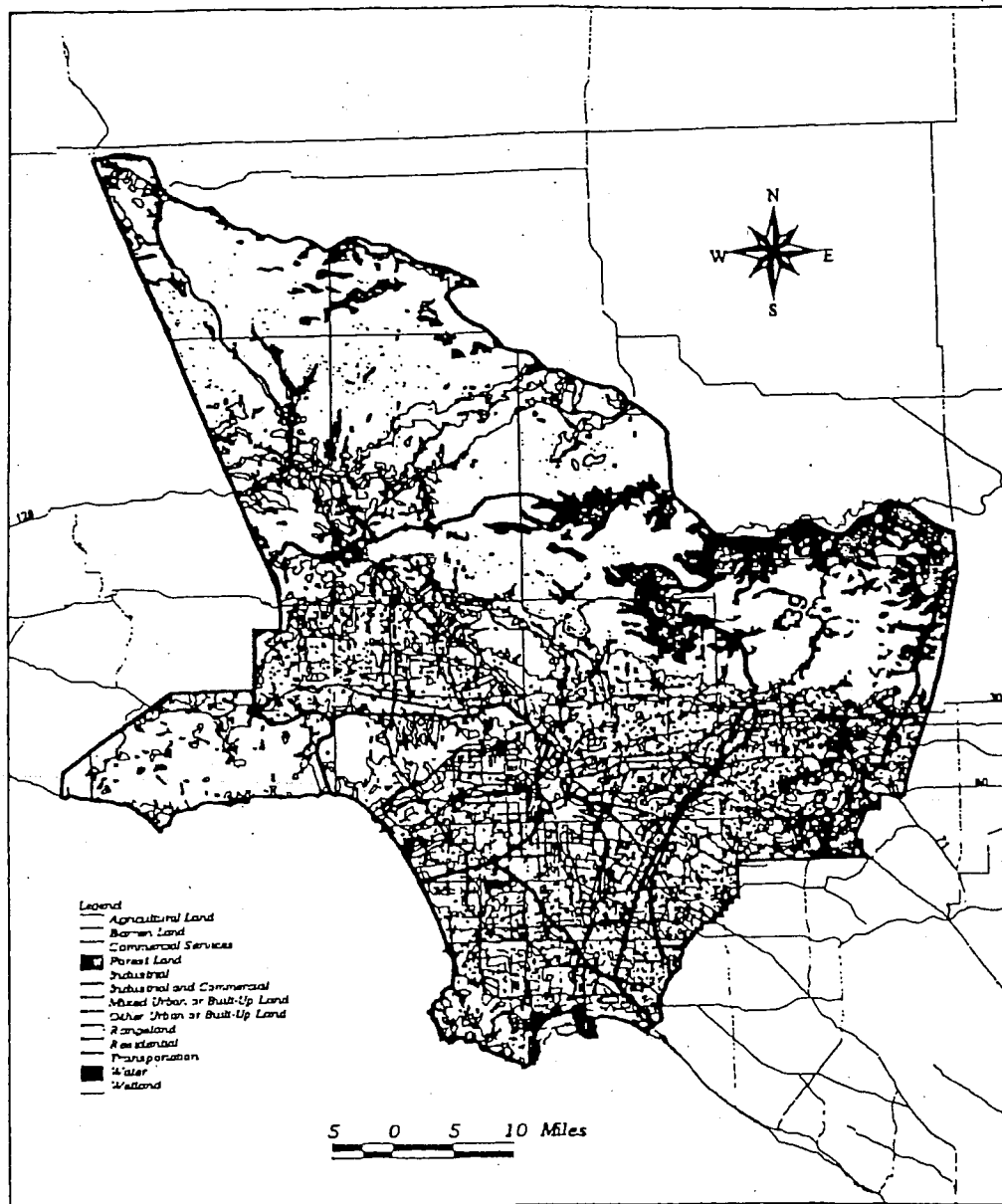
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Los Angeles County
Figure B-5a

R0006323



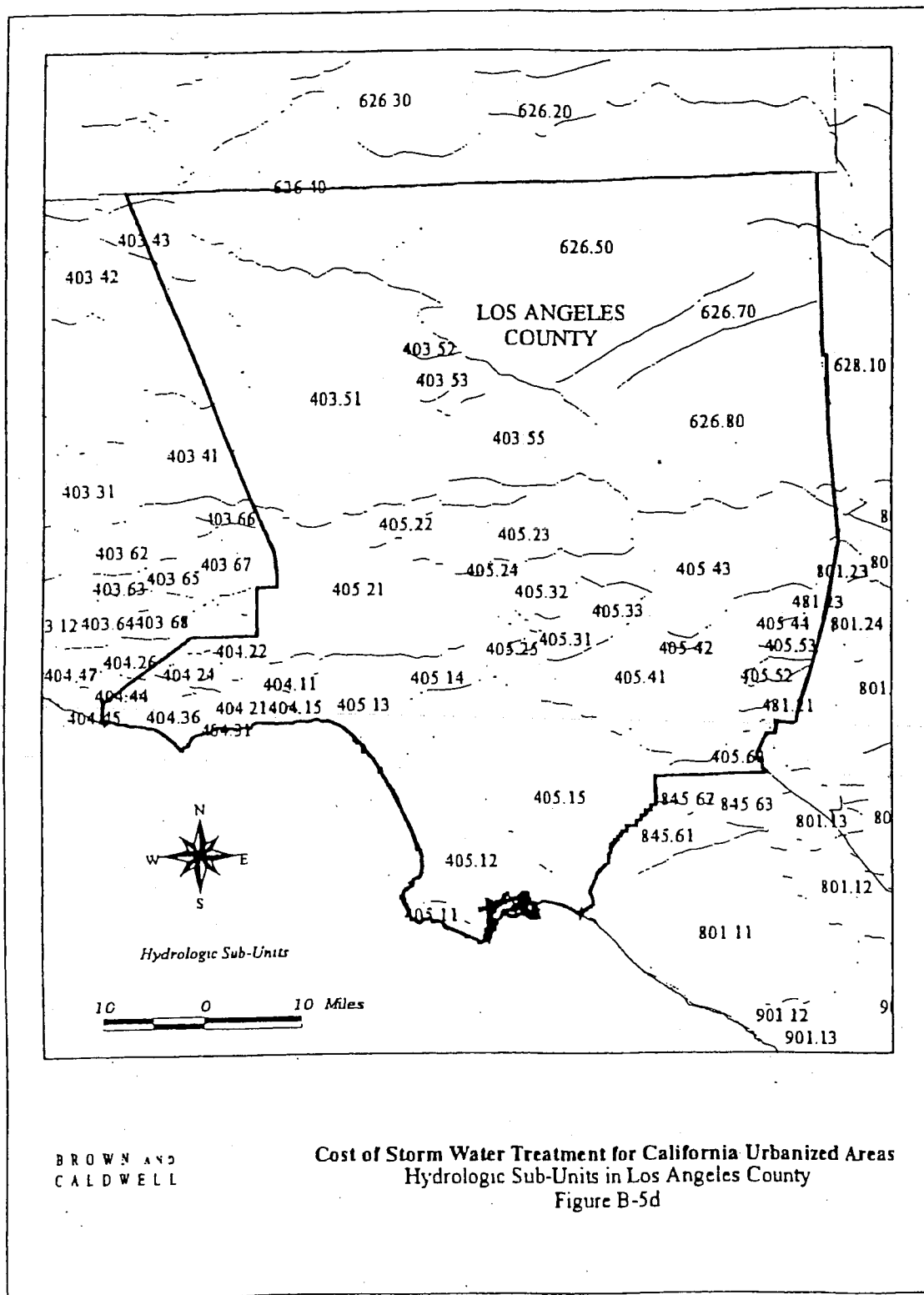
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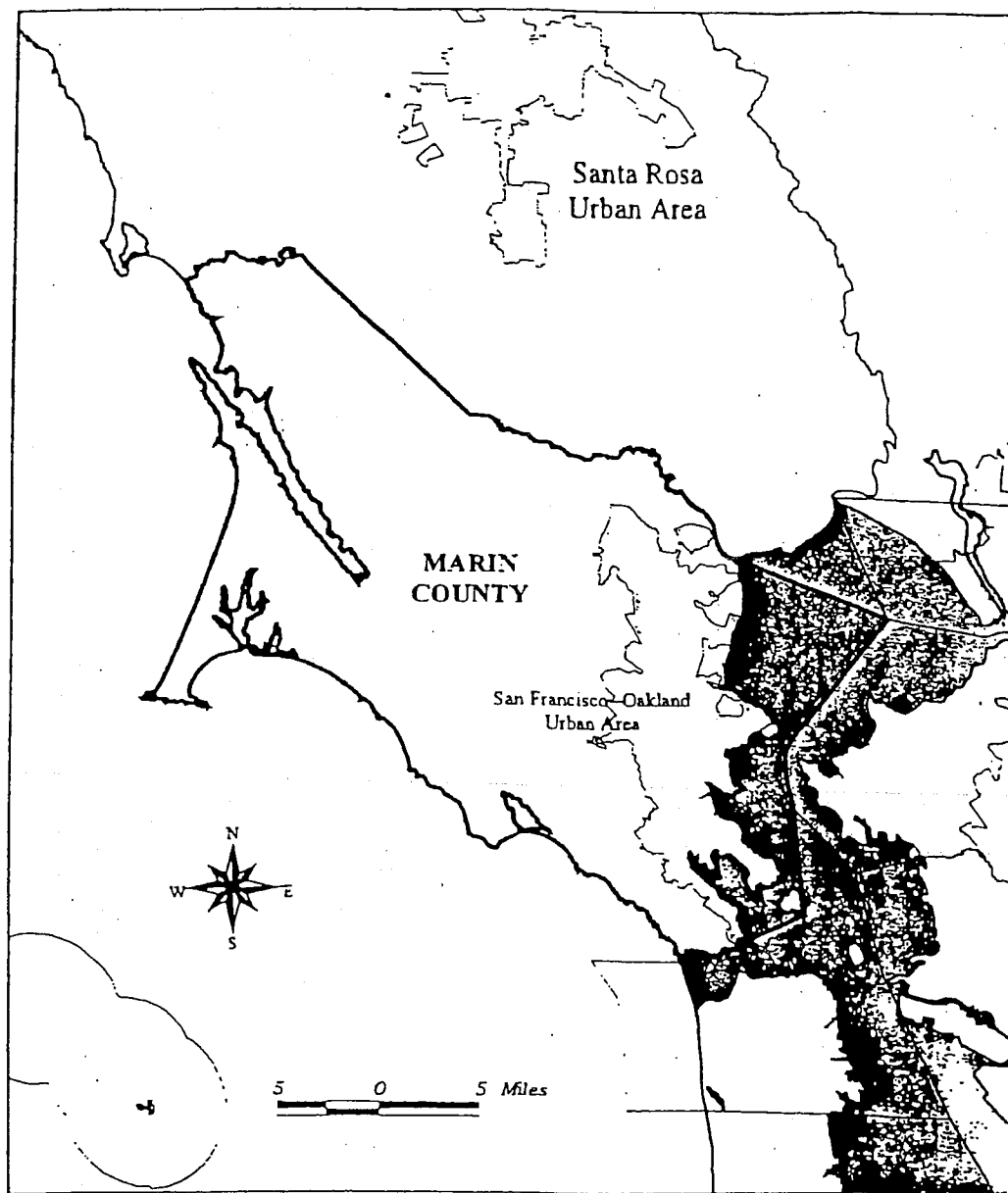
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Los Angeles Drainage Basins
Figure B-5c

R0006325



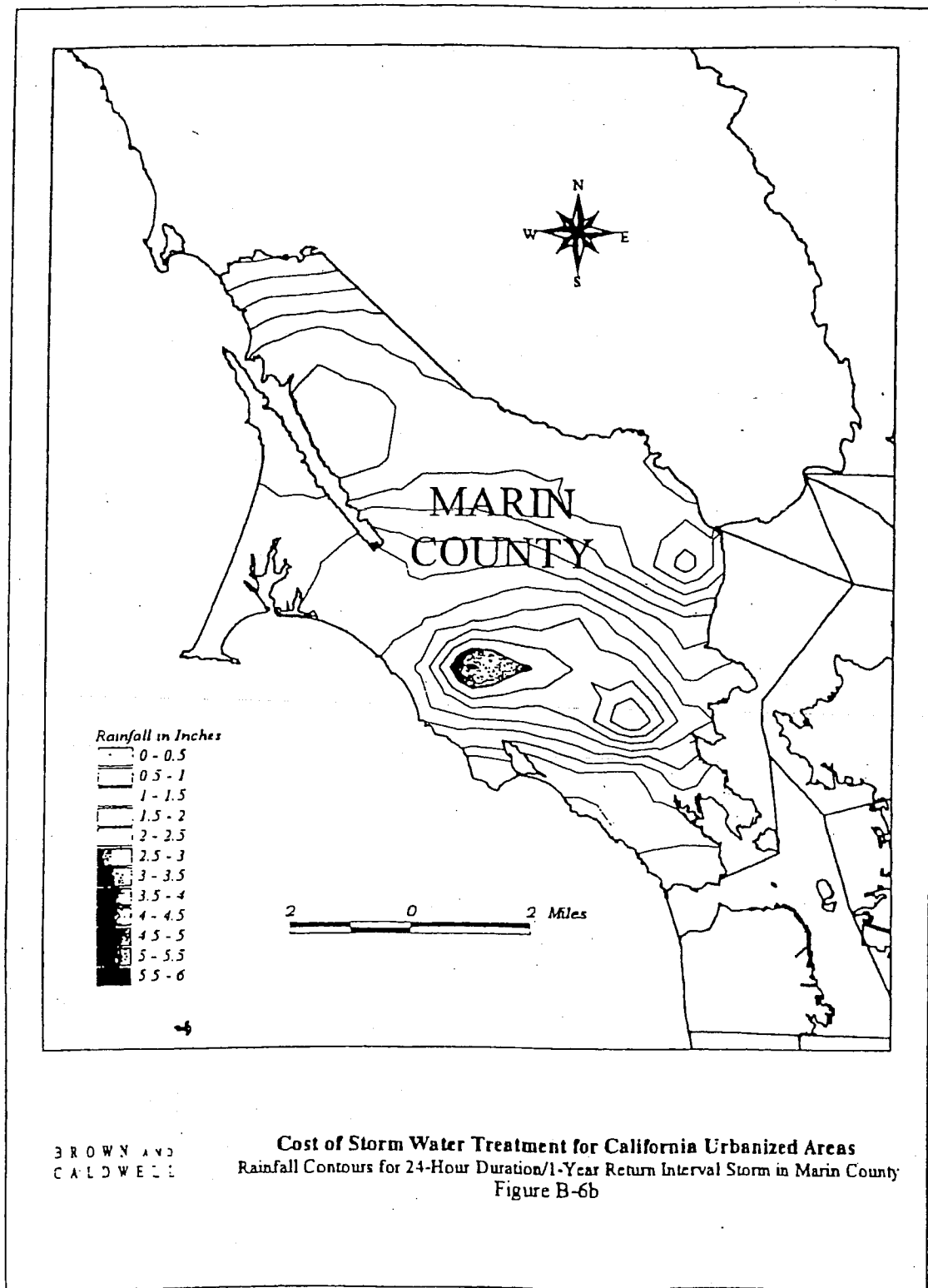
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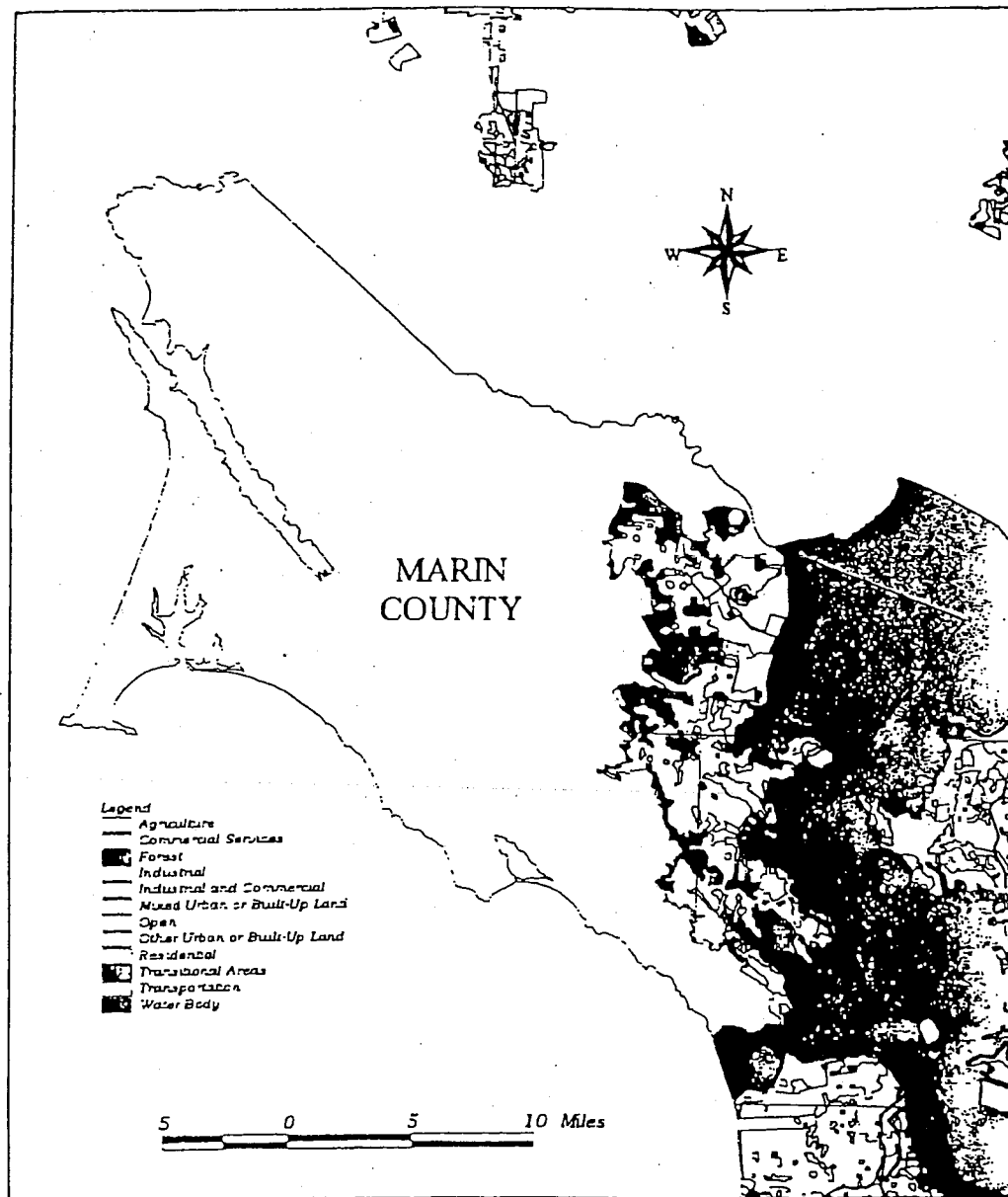
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Marin County
Figure B-6a

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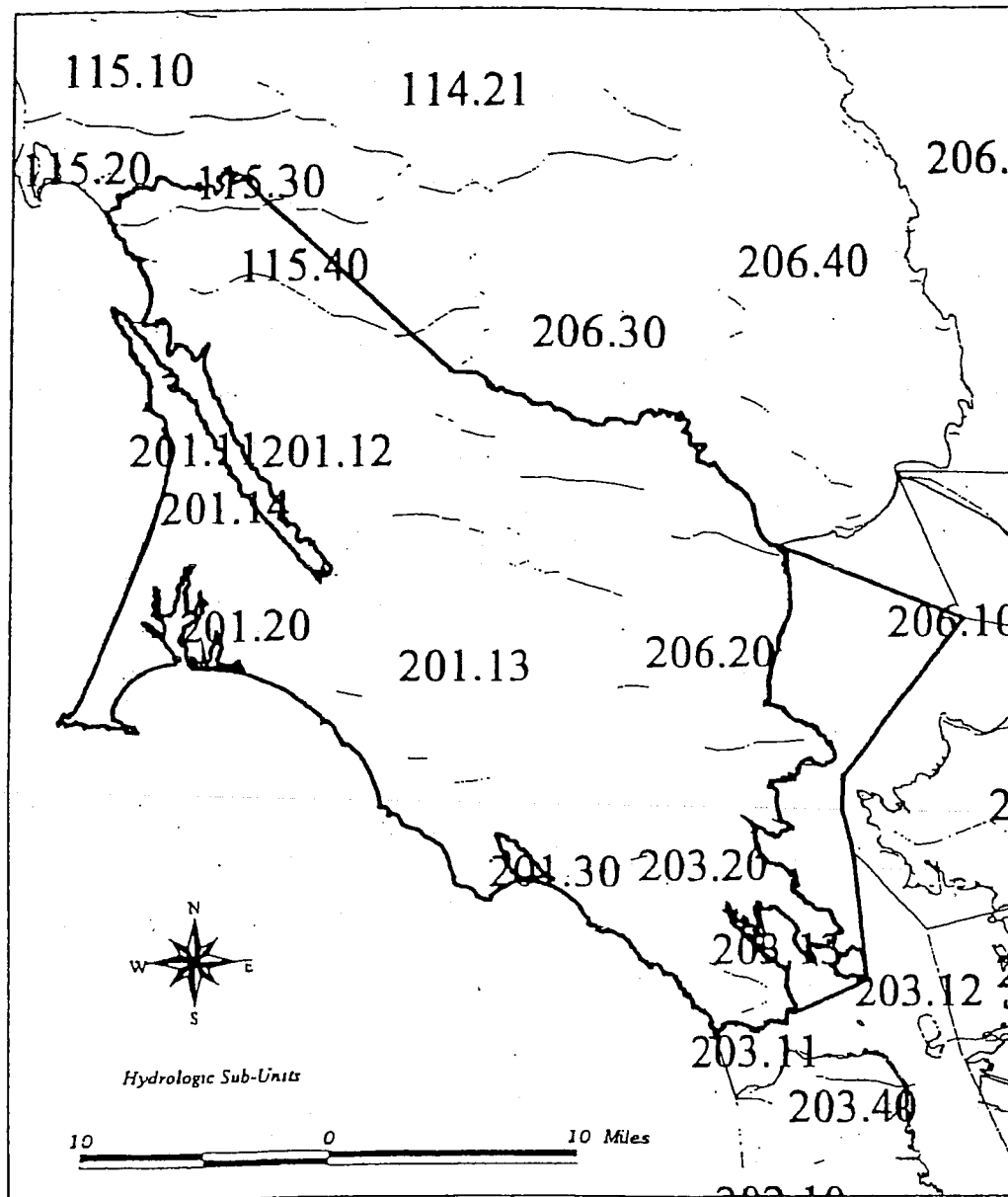
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Marin County
Figure B-6c

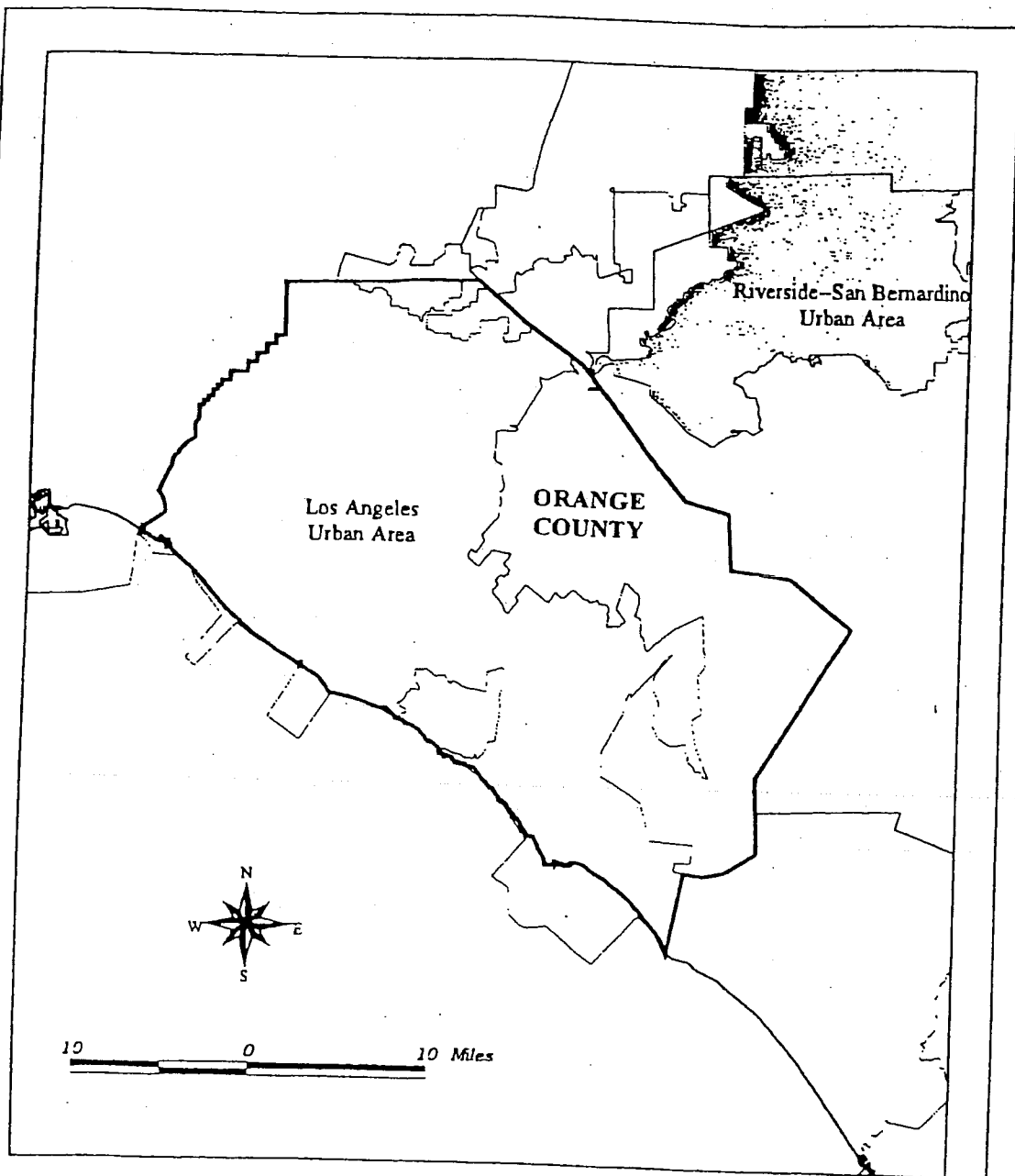
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Marin County
Figure B-6d

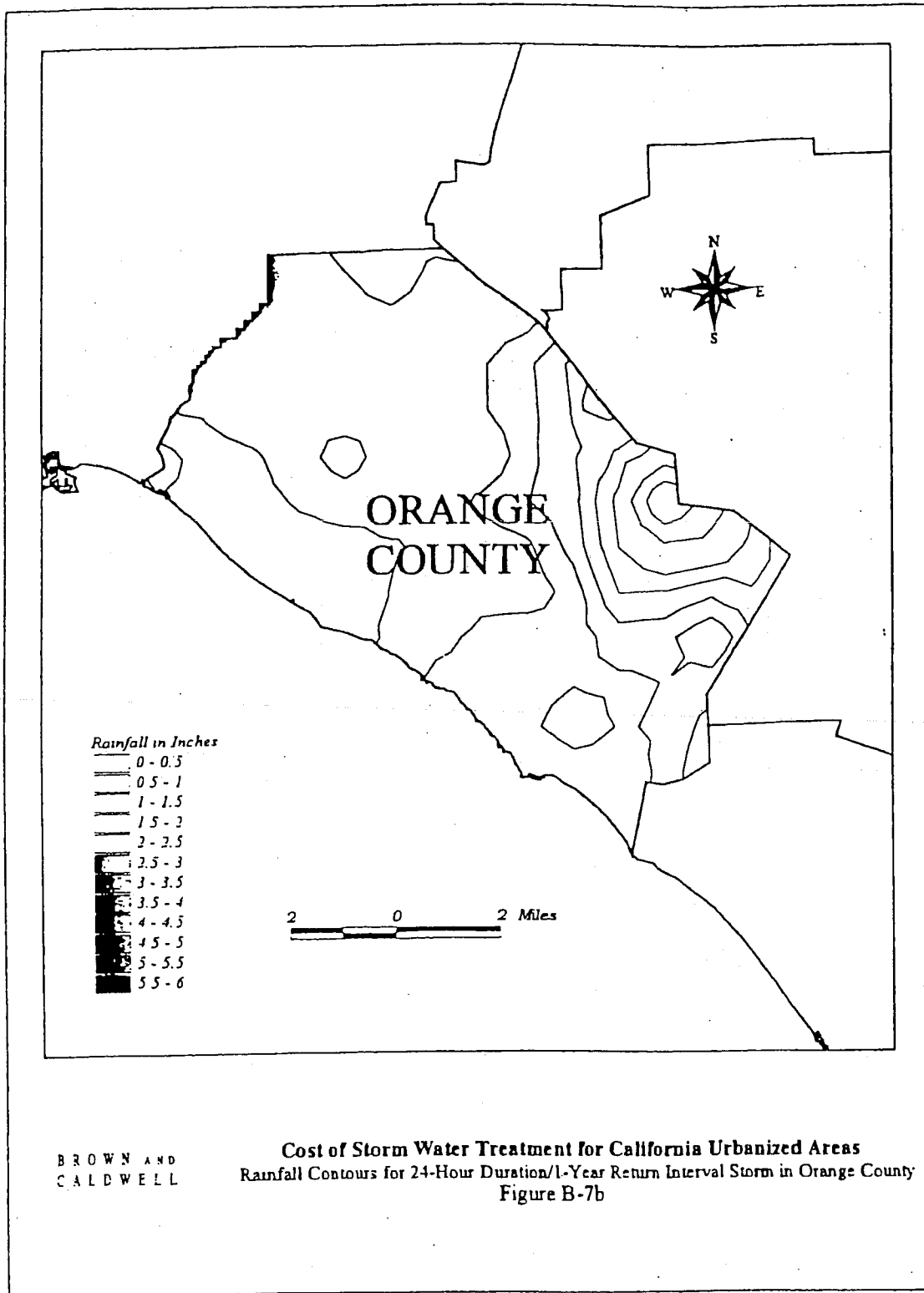
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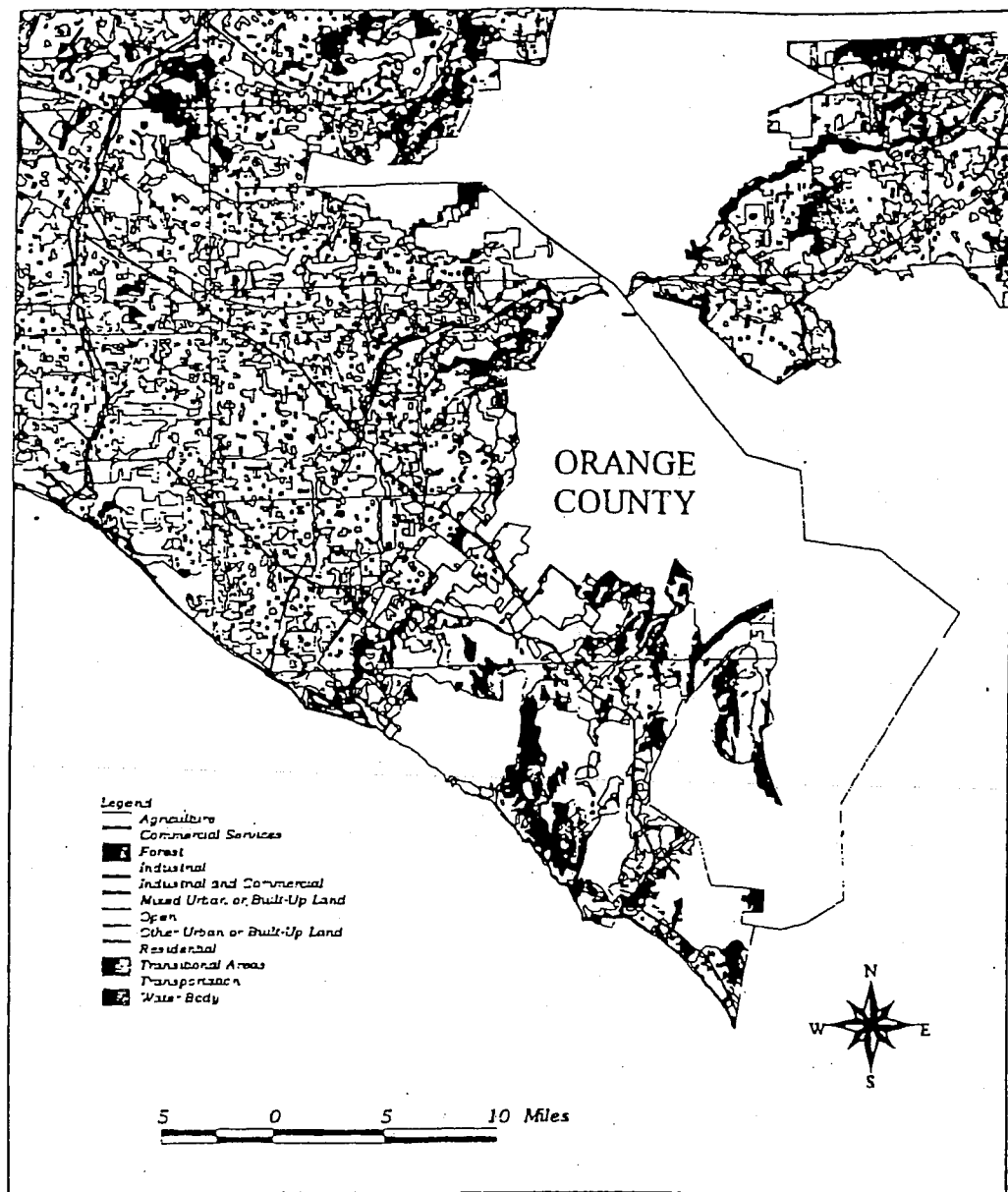
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Orange County
Figure B-7a

R0006331



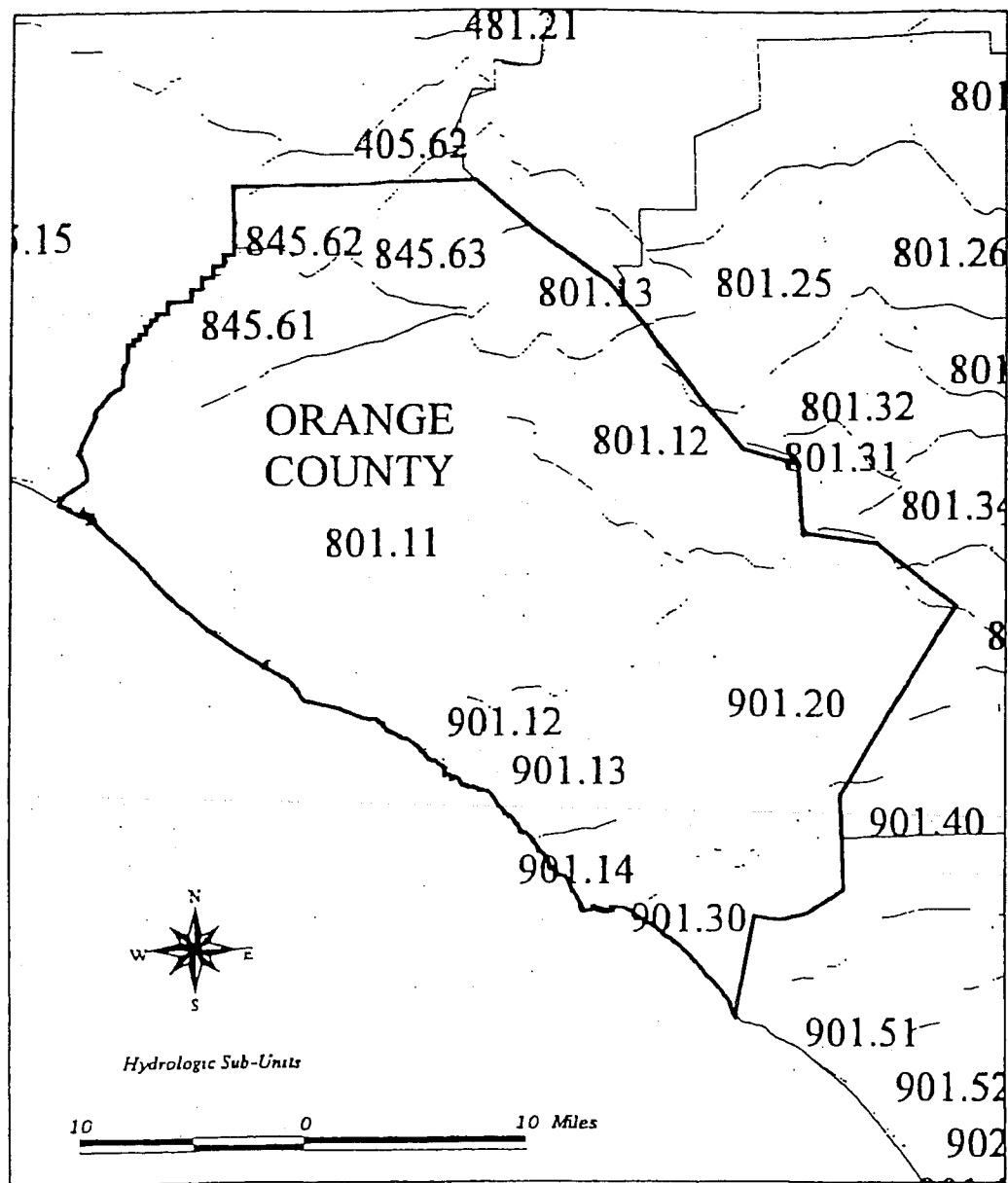
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Orange County
Figure B-7c

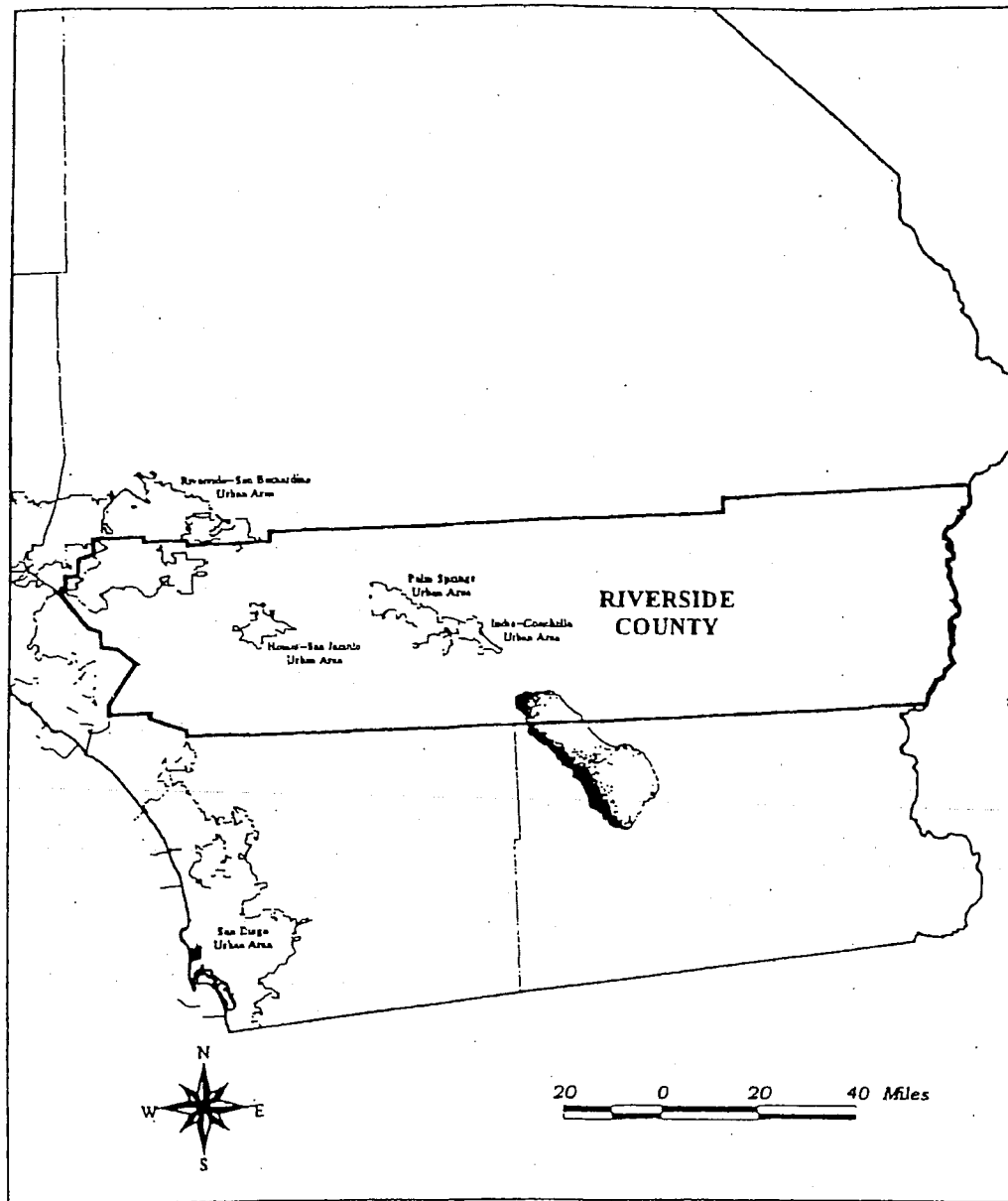
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Orange County
Figure B-7d

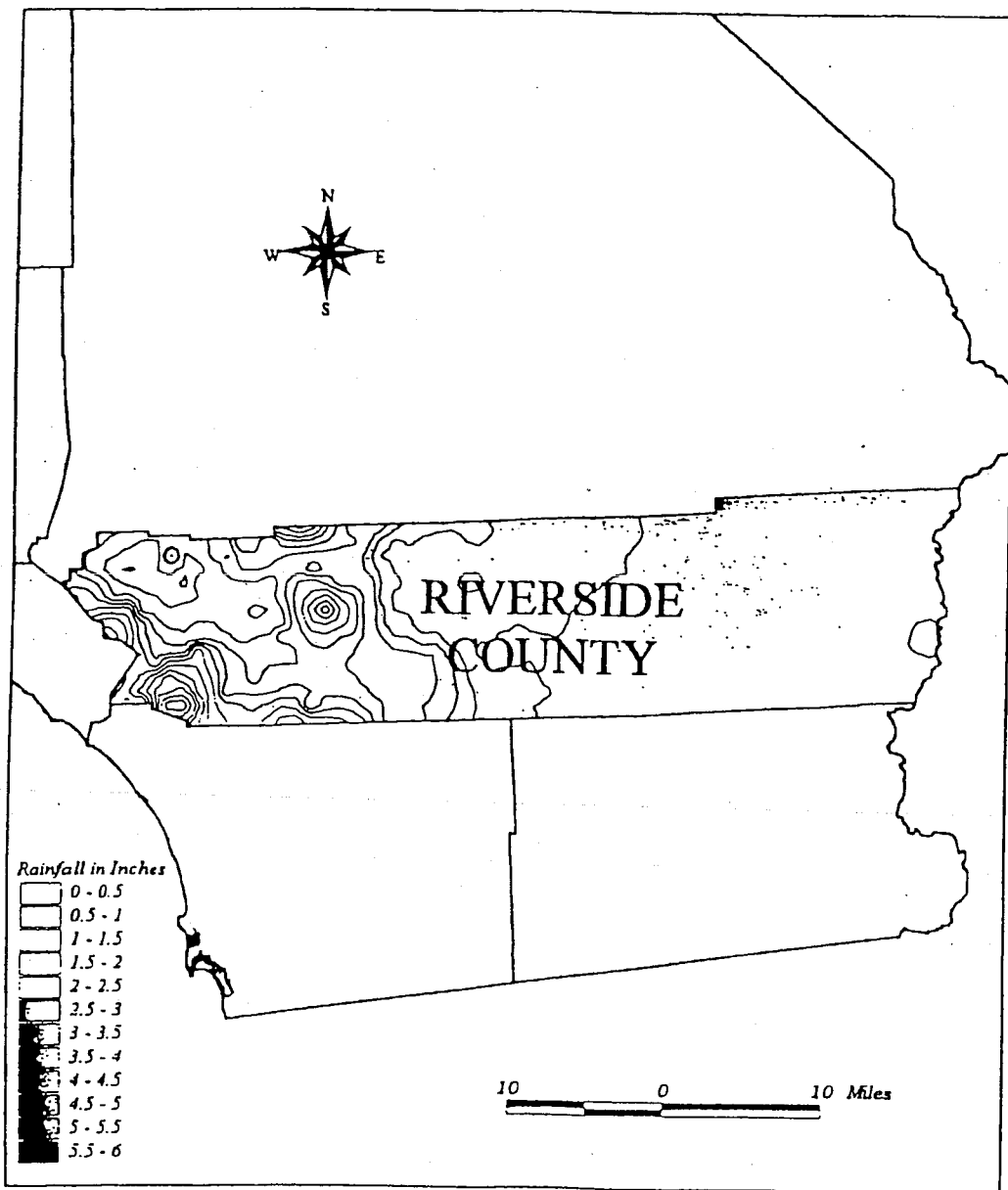
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Riverside County
Figure B-8a

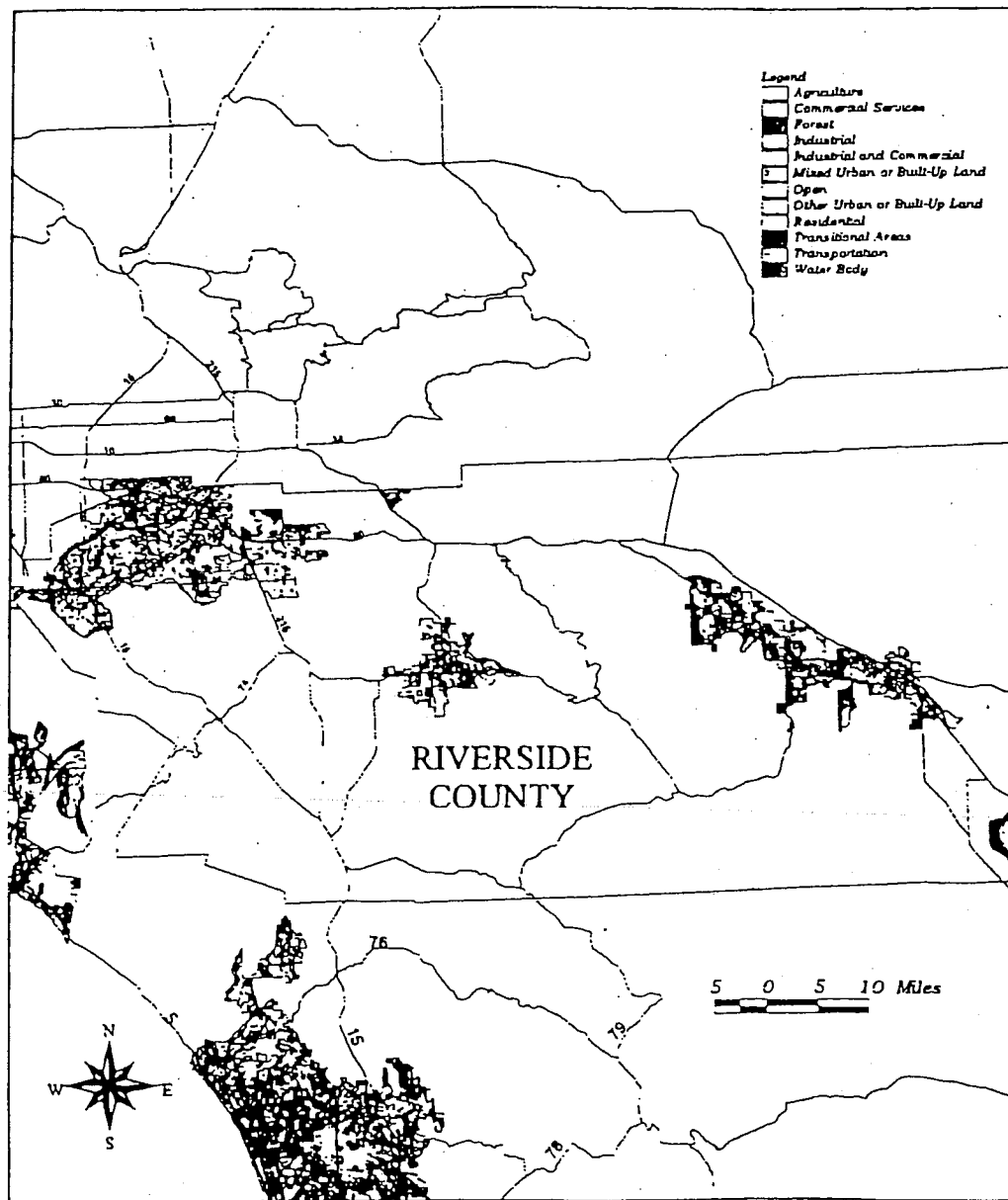
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Riverside County
Figure B-8b

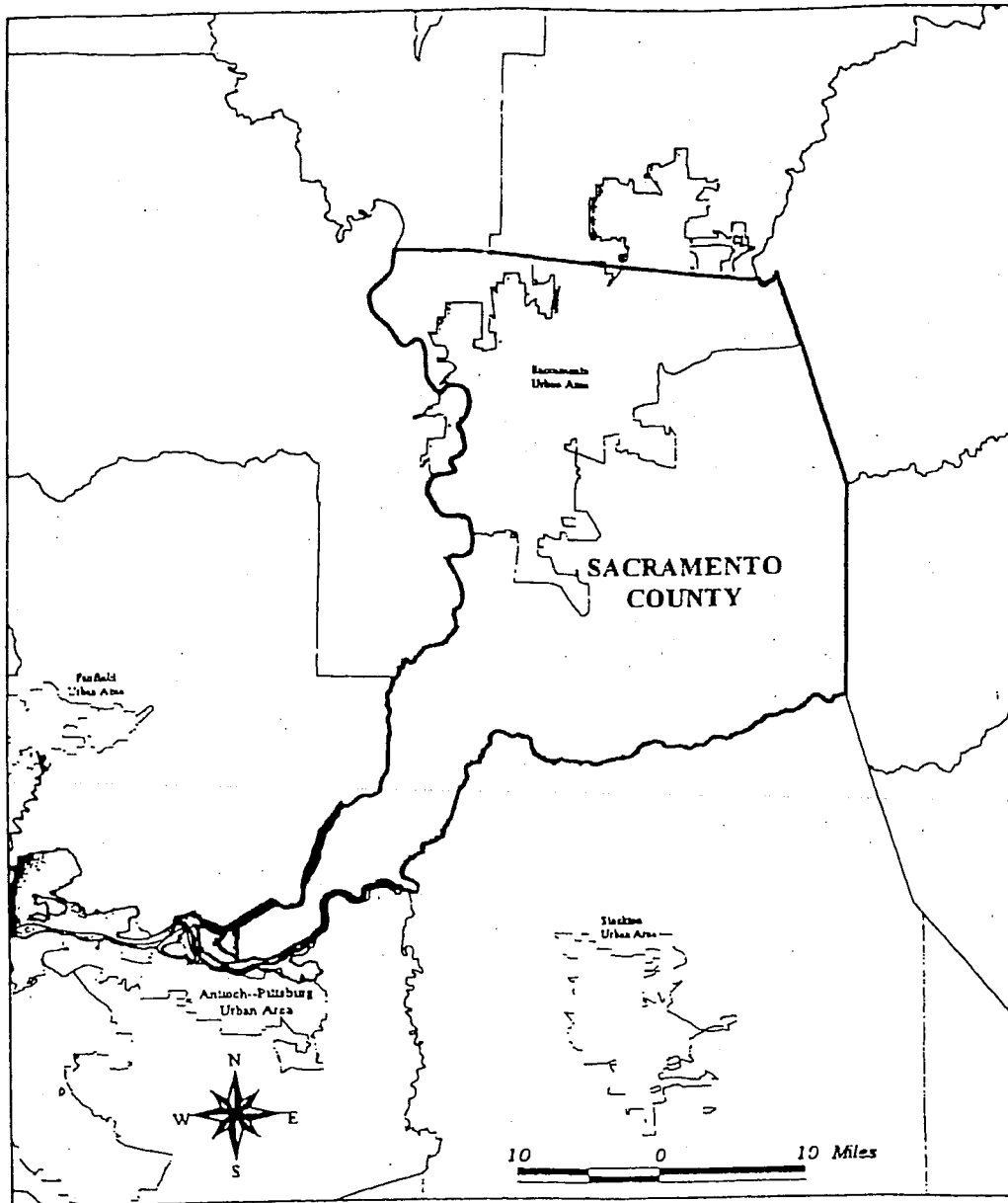
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Riverside County
Figure B-8c

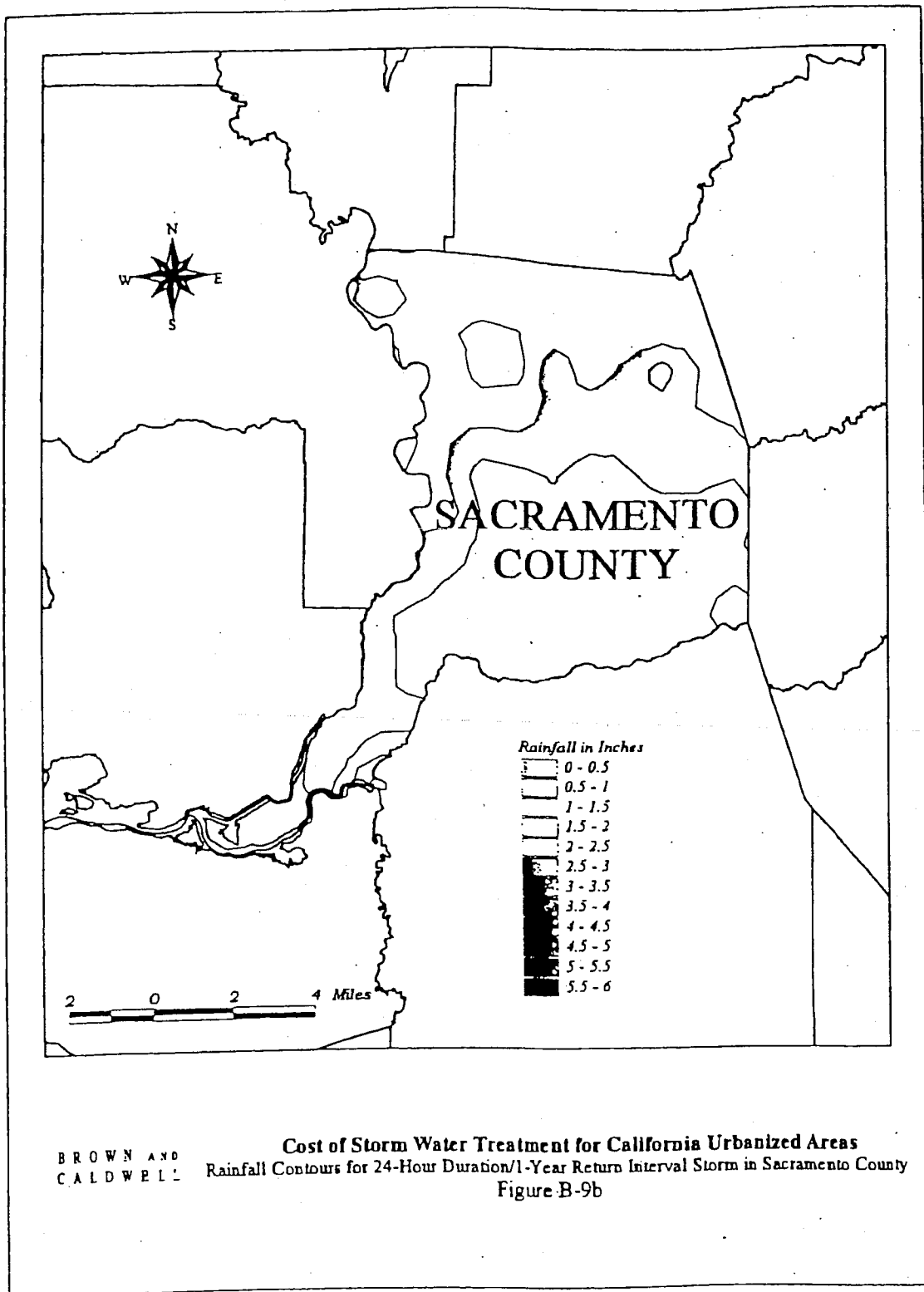
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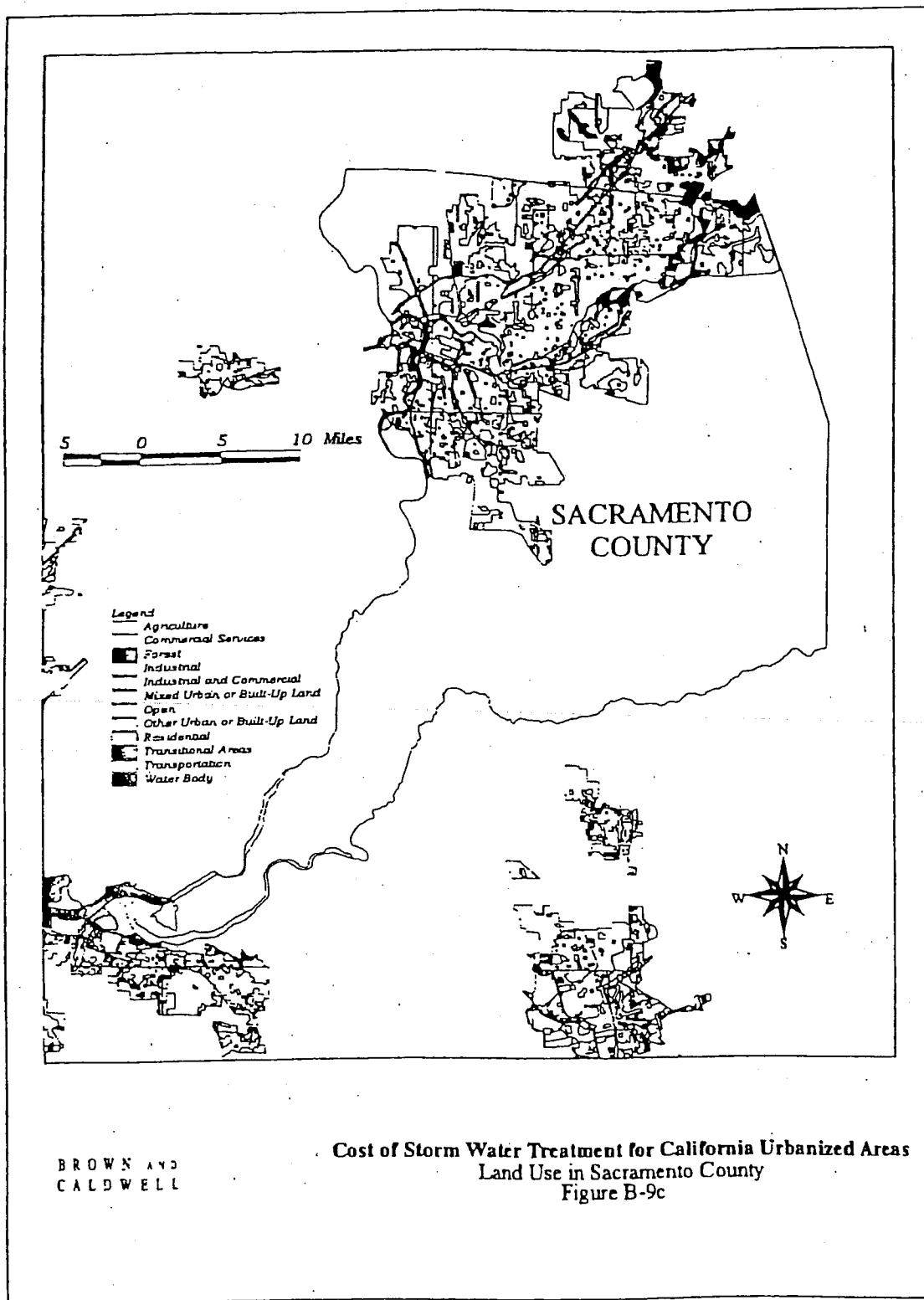
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Sacramento County
Figure B-9a

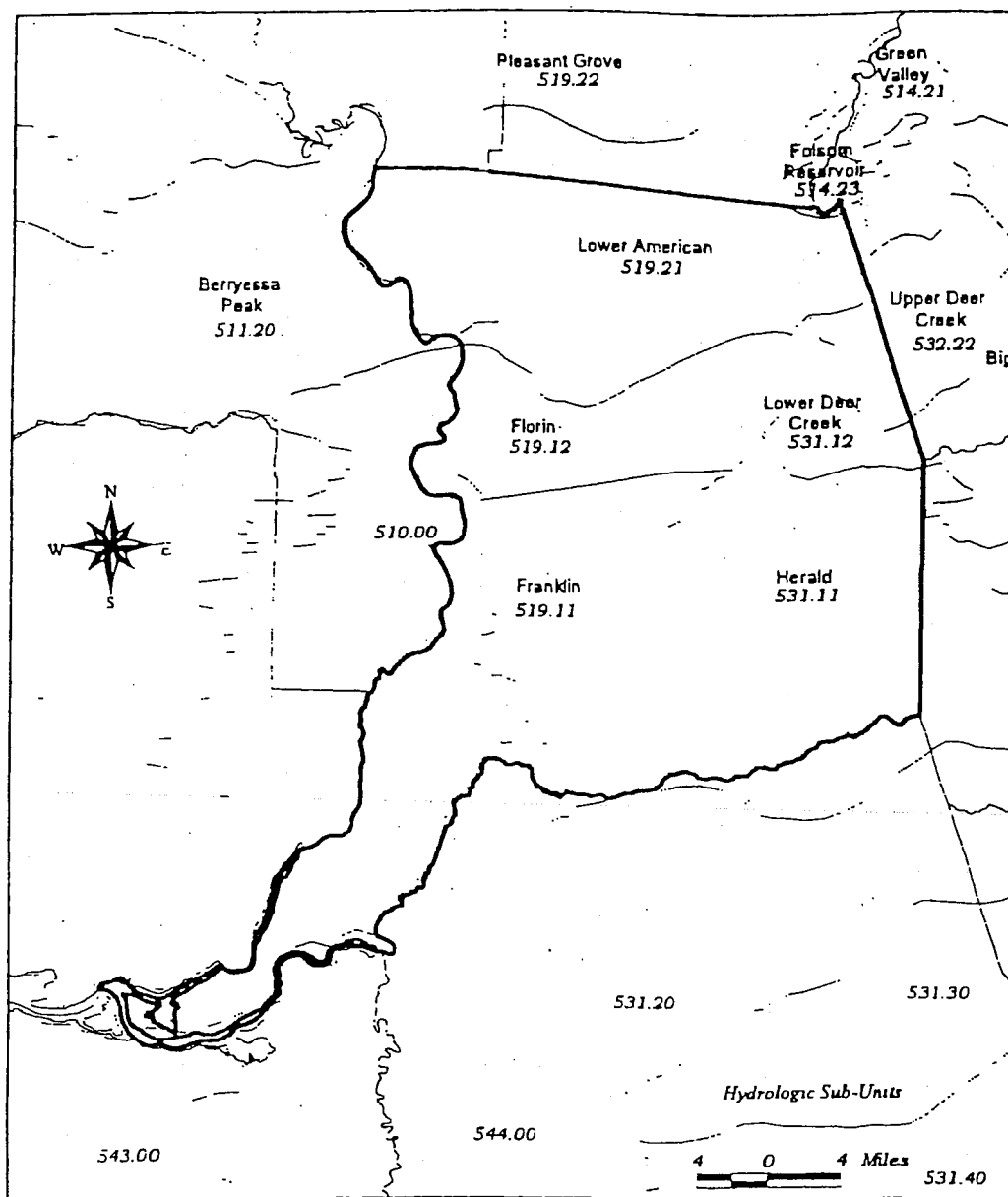
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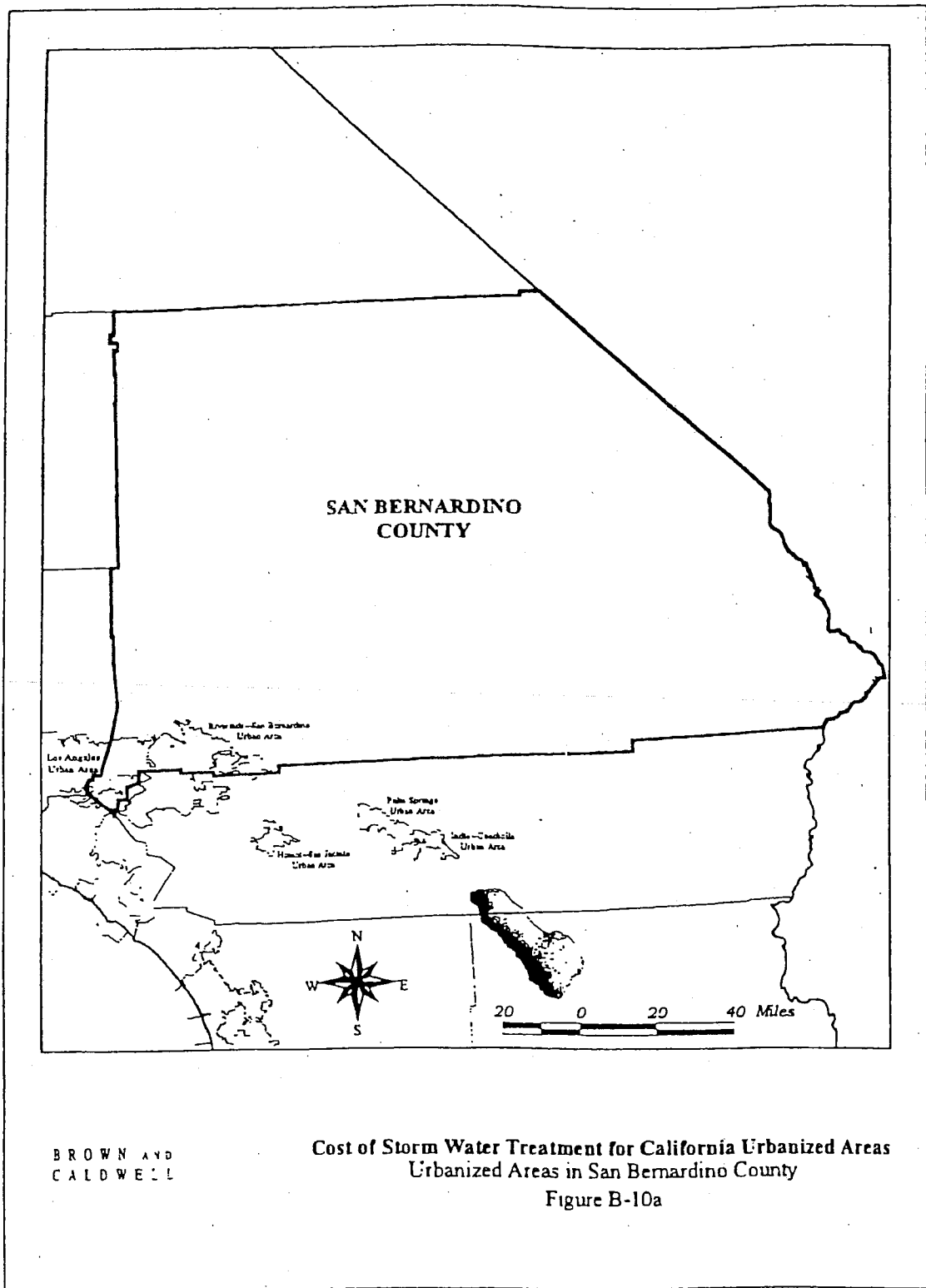
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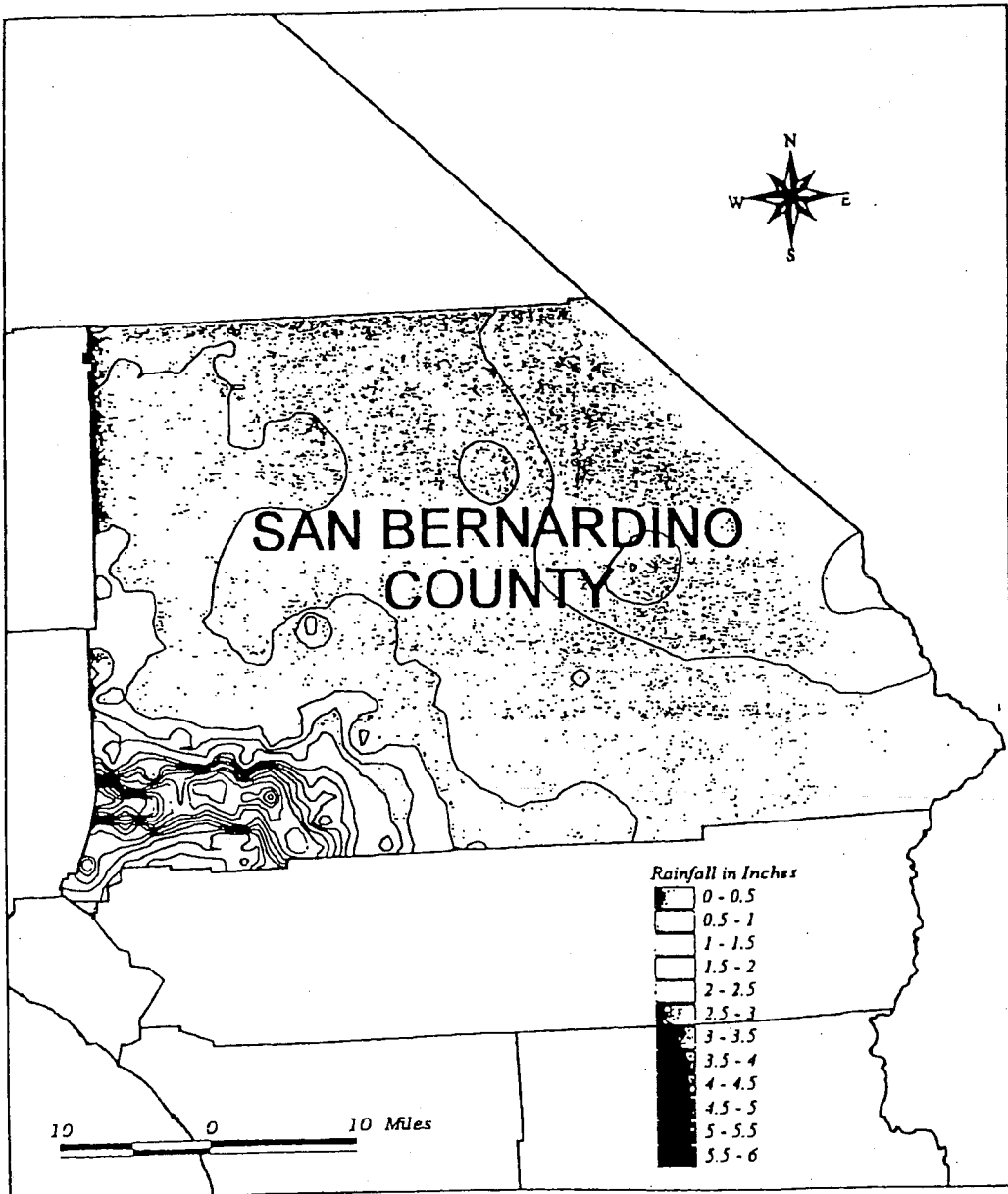
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Sacramento County
Figure B-9d

R0006342



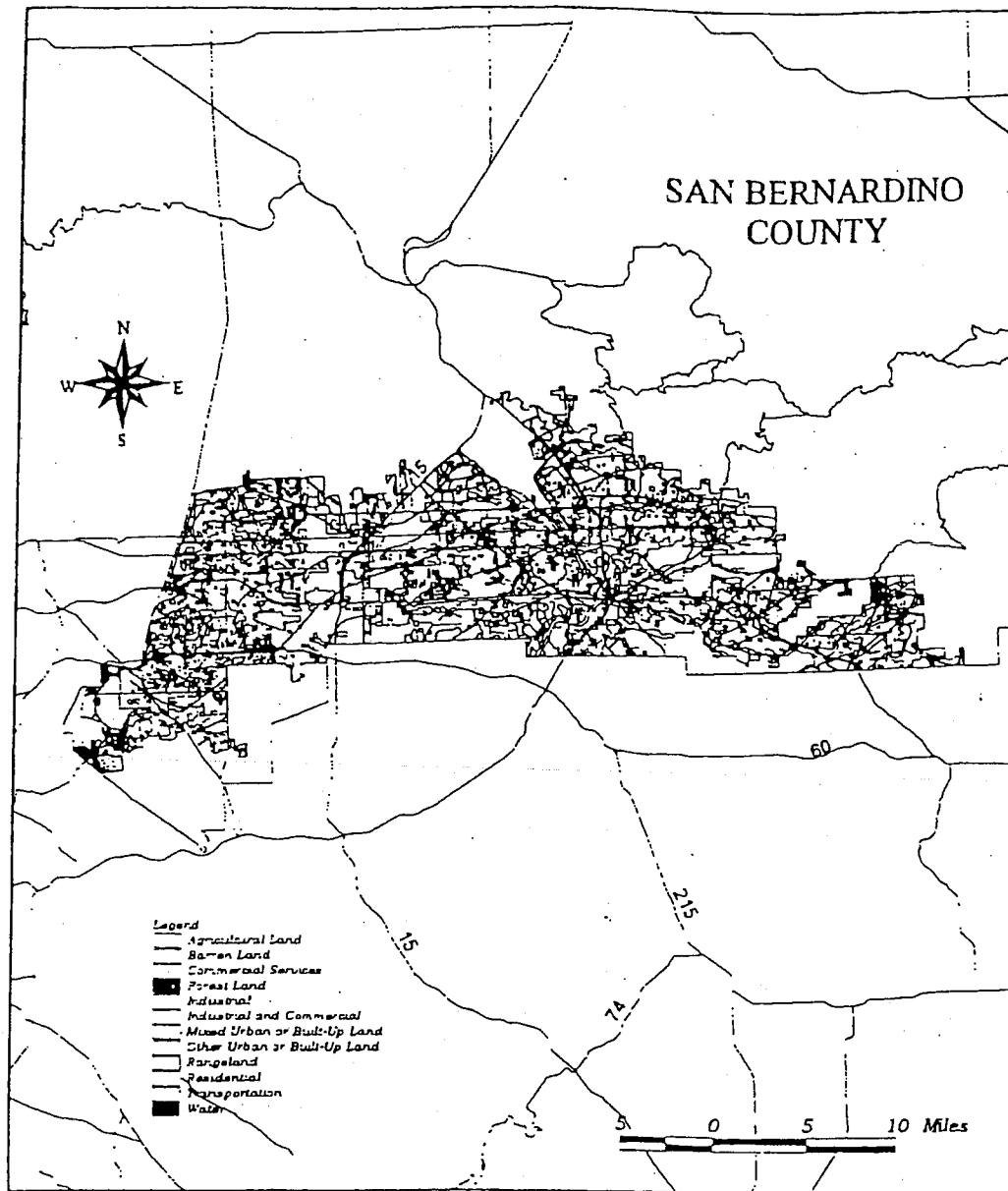
R0006343



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in San Bernardino County
 Figure B-10b

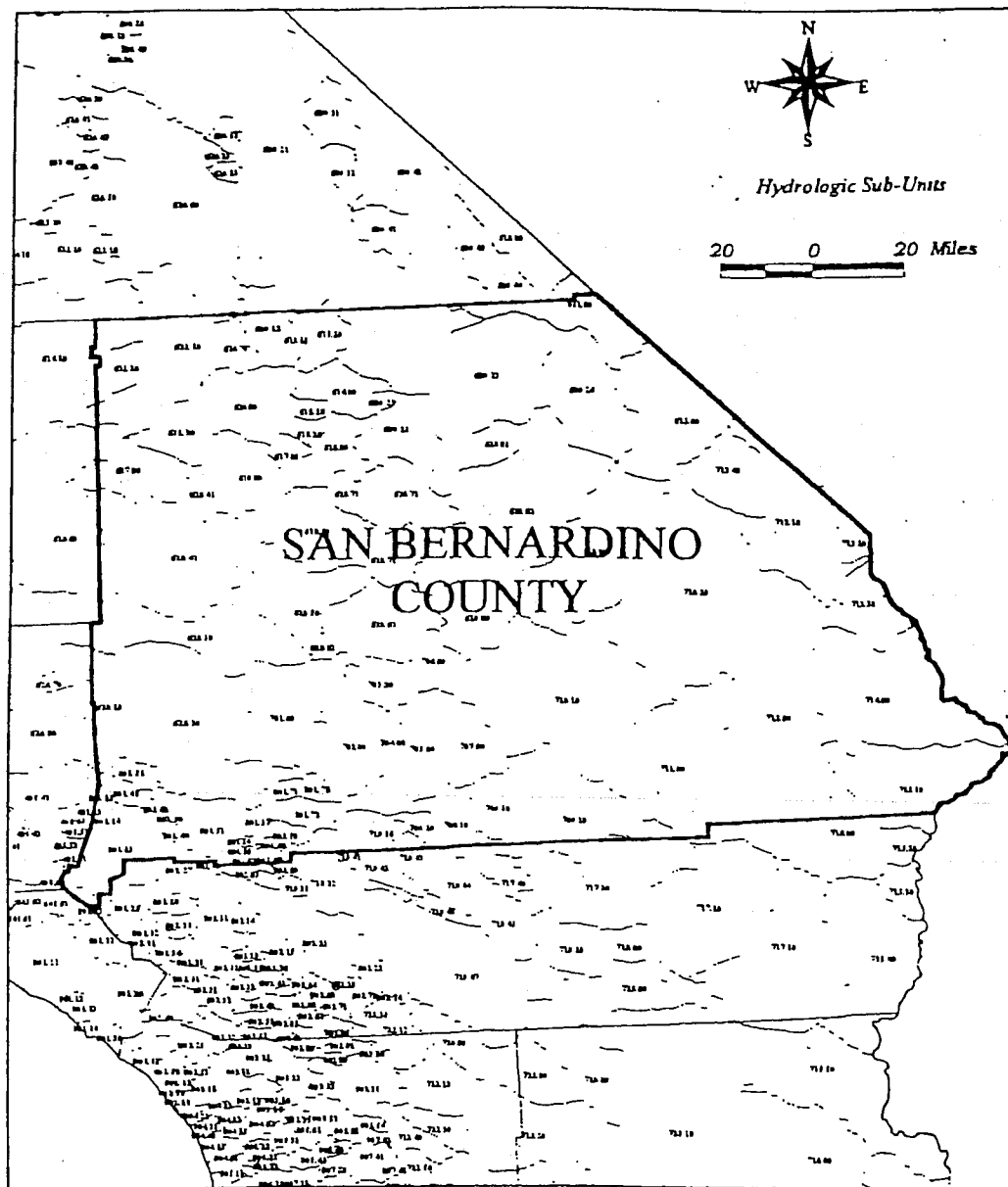
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in San Bernardino County
Figure B-10c

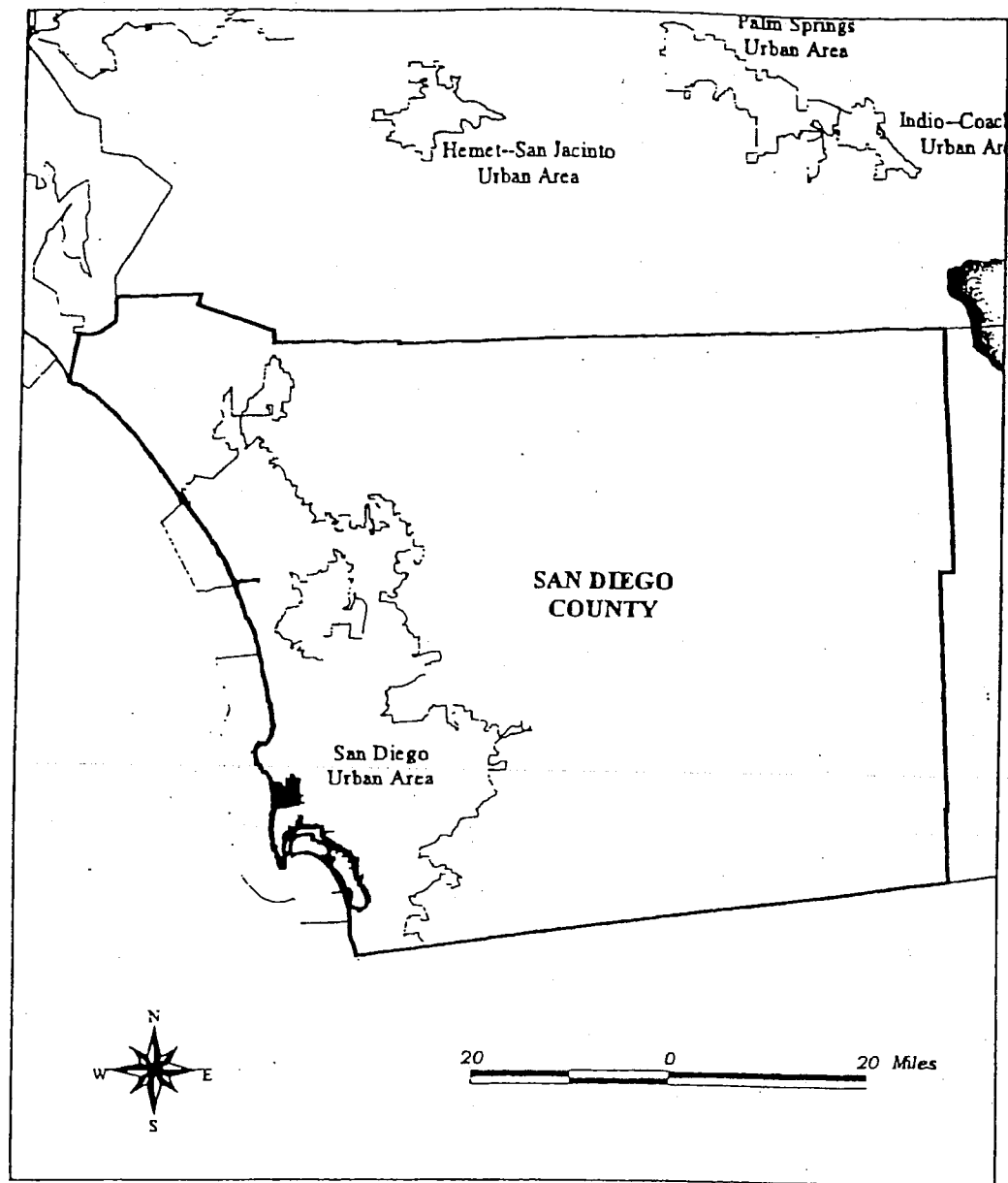
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BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in San Bernardino County
Figure B-10d

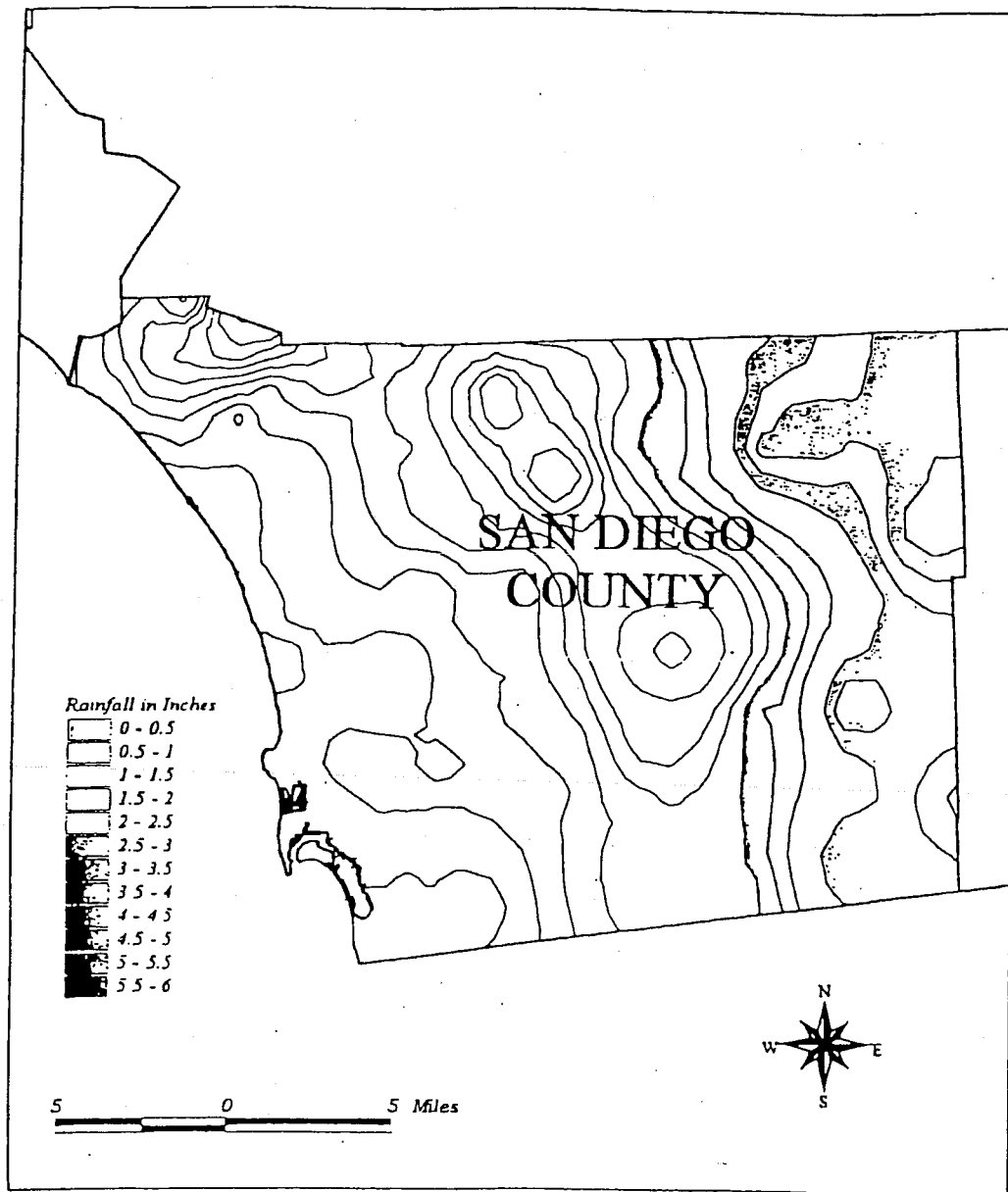
R0006346



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in San Diego County
Figure B-11a

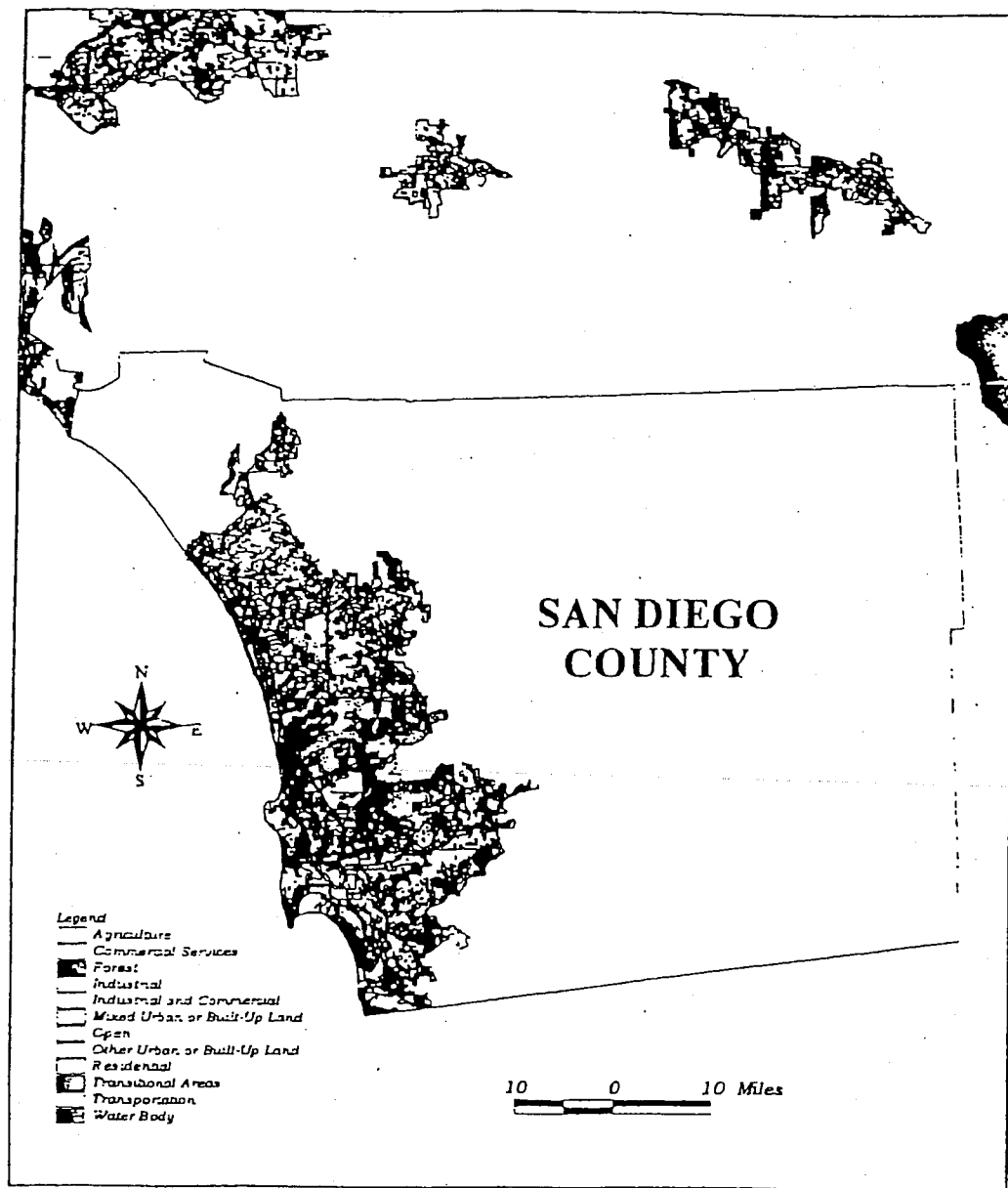
R0006347



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in San Diego County
 Figure B-11b

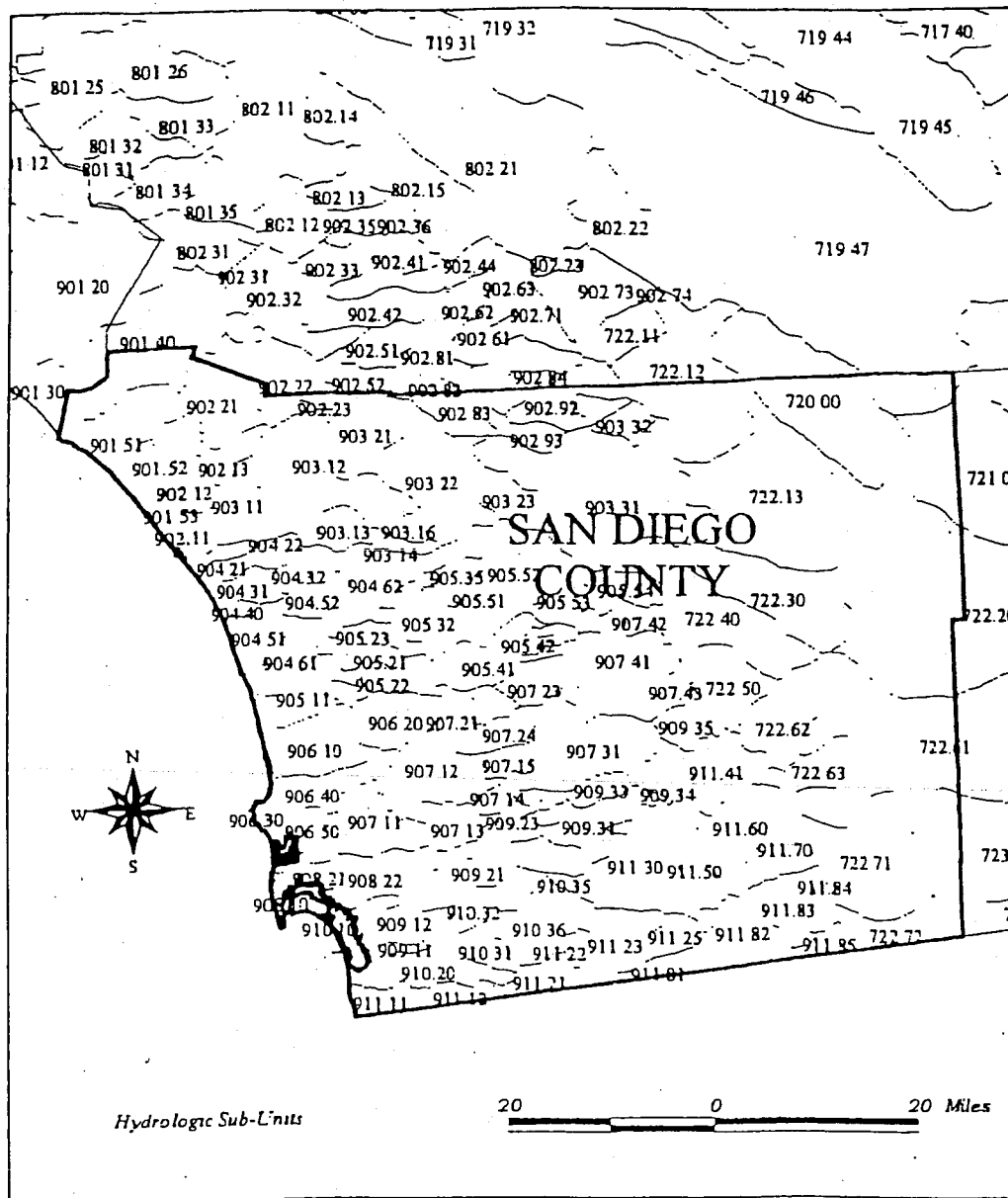
R0006348



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in San Diego County
Figure B-11c

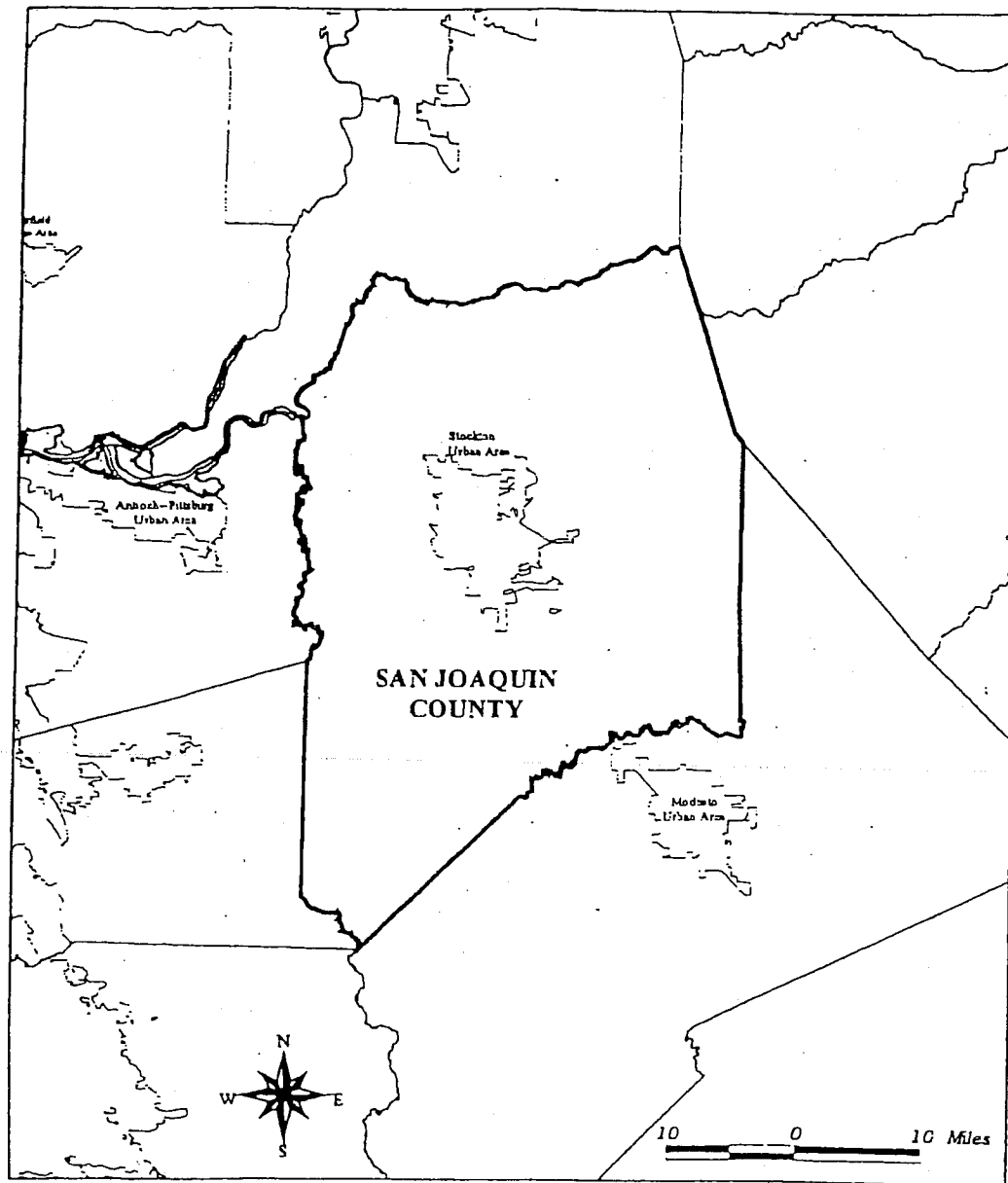
R0006349



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in San Diego County
Figure B-11d

R0006350

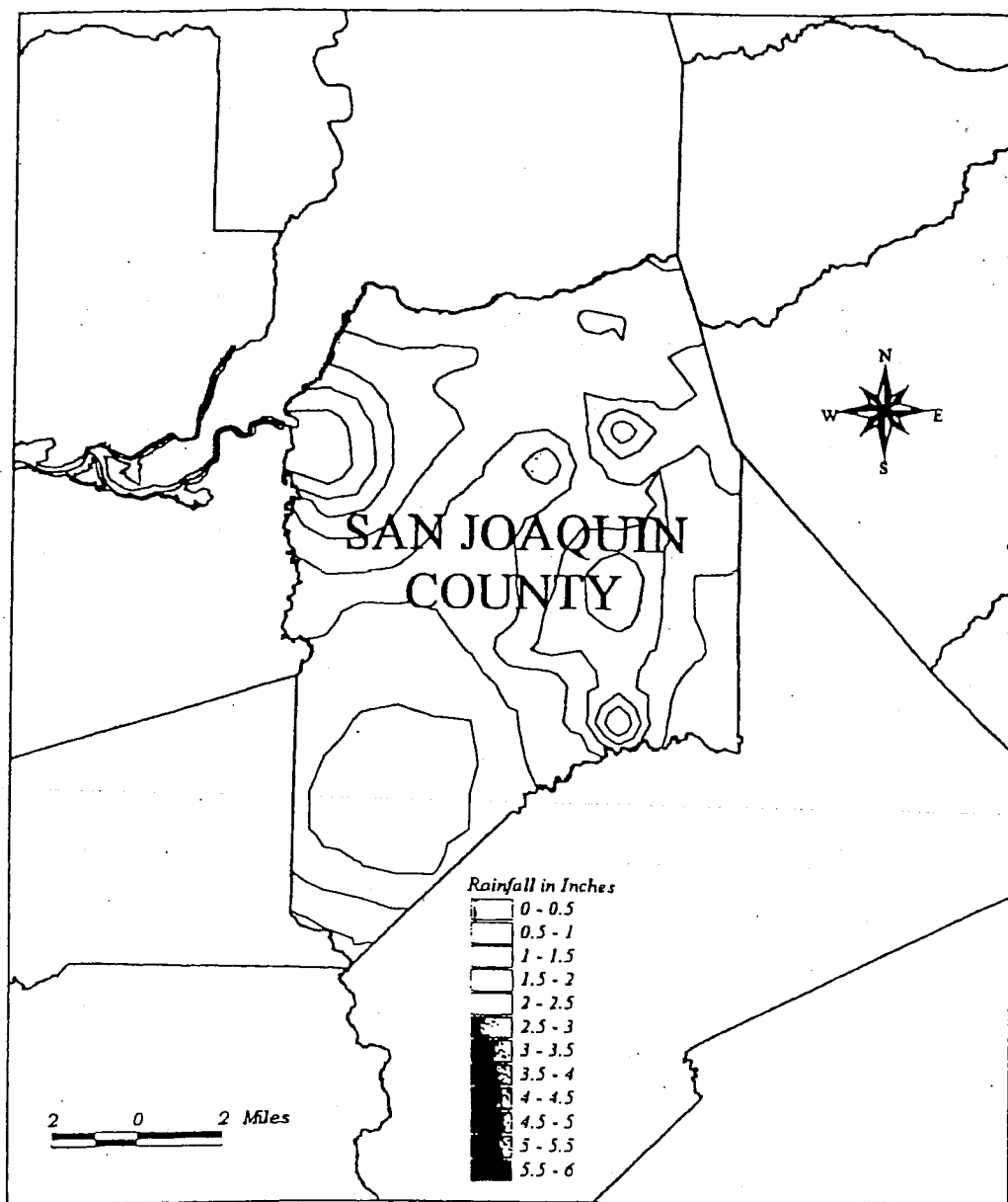


BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in San Joaquin County

Figure B-12a

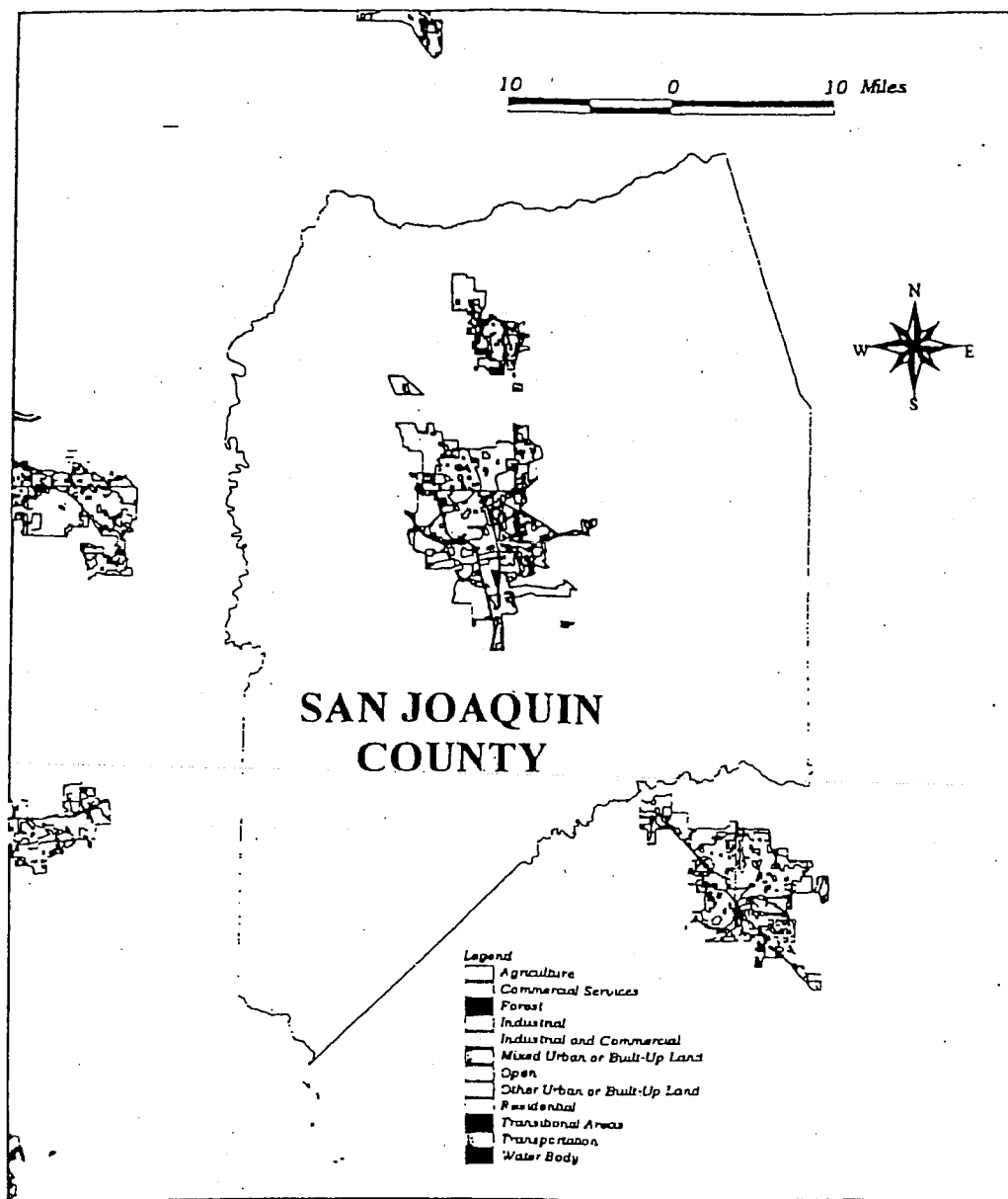
R0006351



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
 Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in San Joaquin County
 Figure B-12b

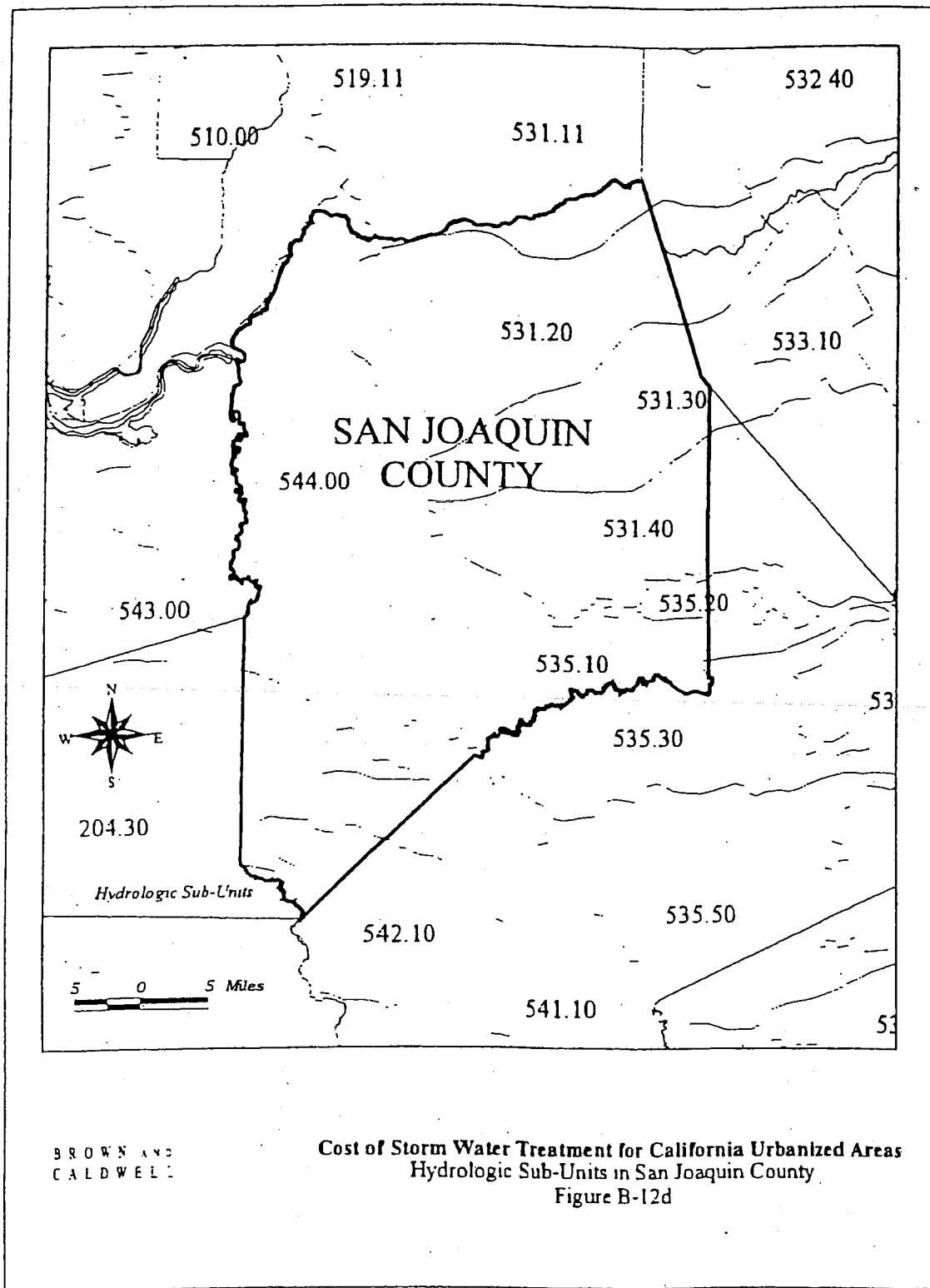
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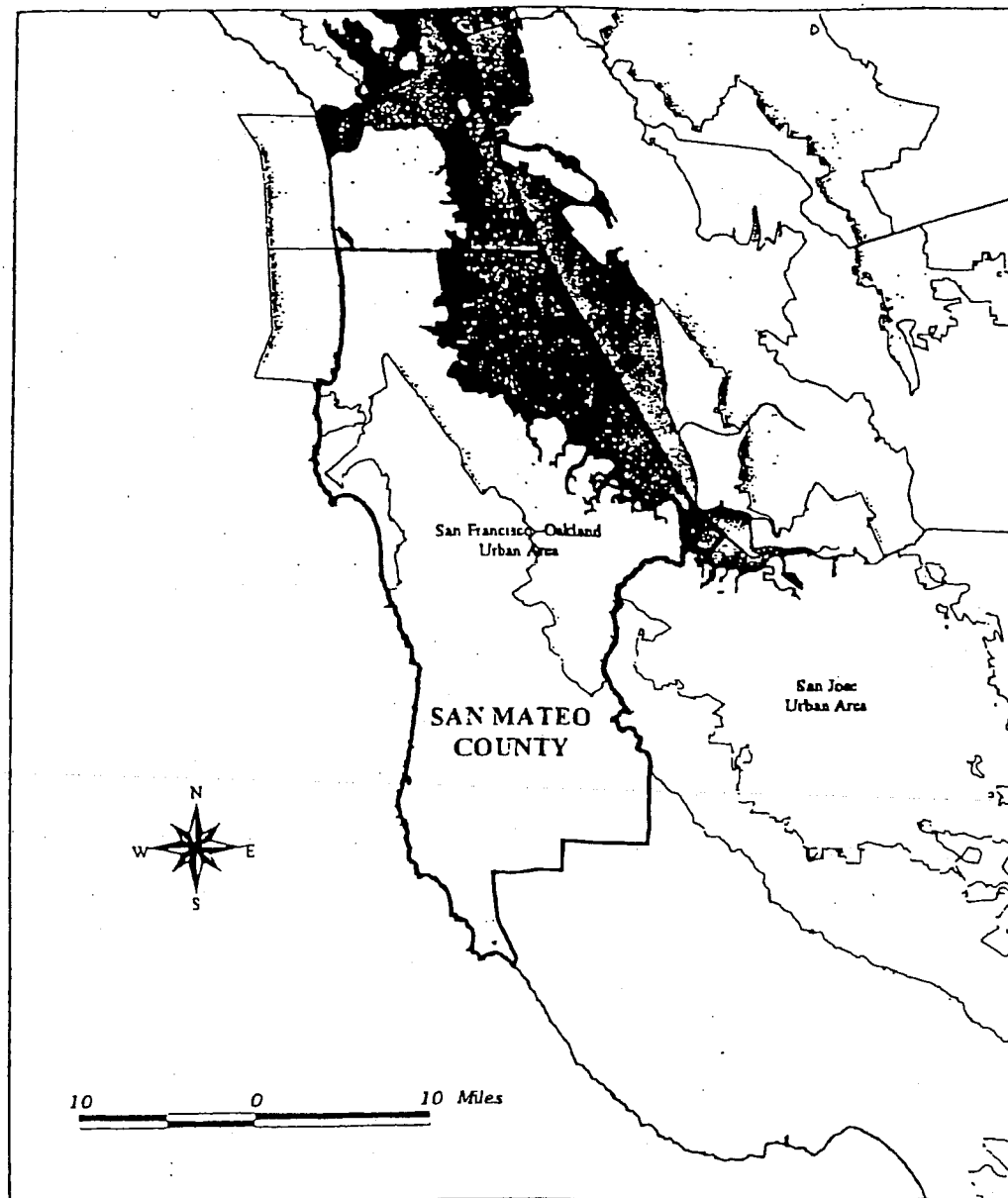
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in San Joaquin County
Figure B-12c

R0006353



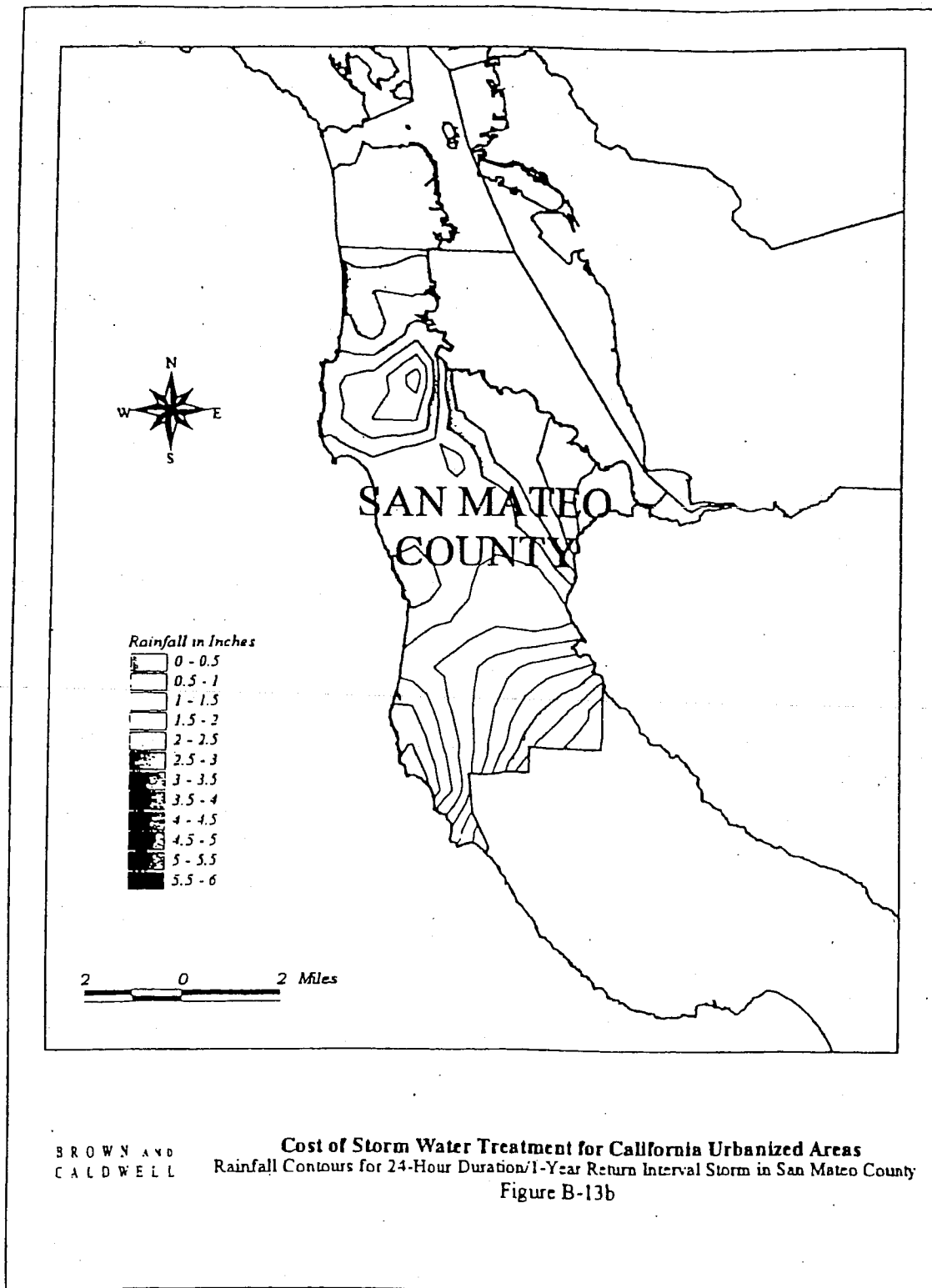
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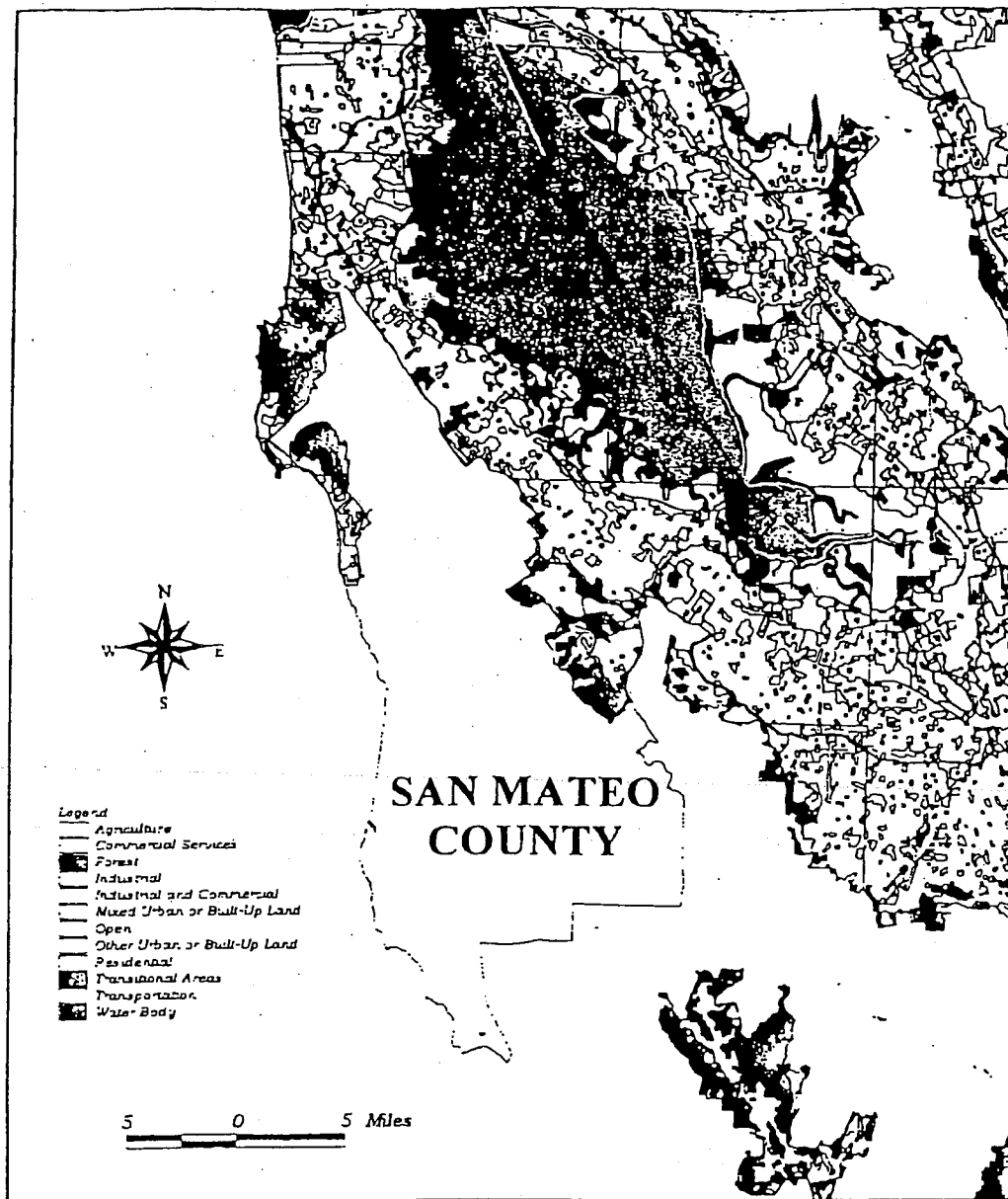
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in San Mateo County
Figure B-13a

R0006355



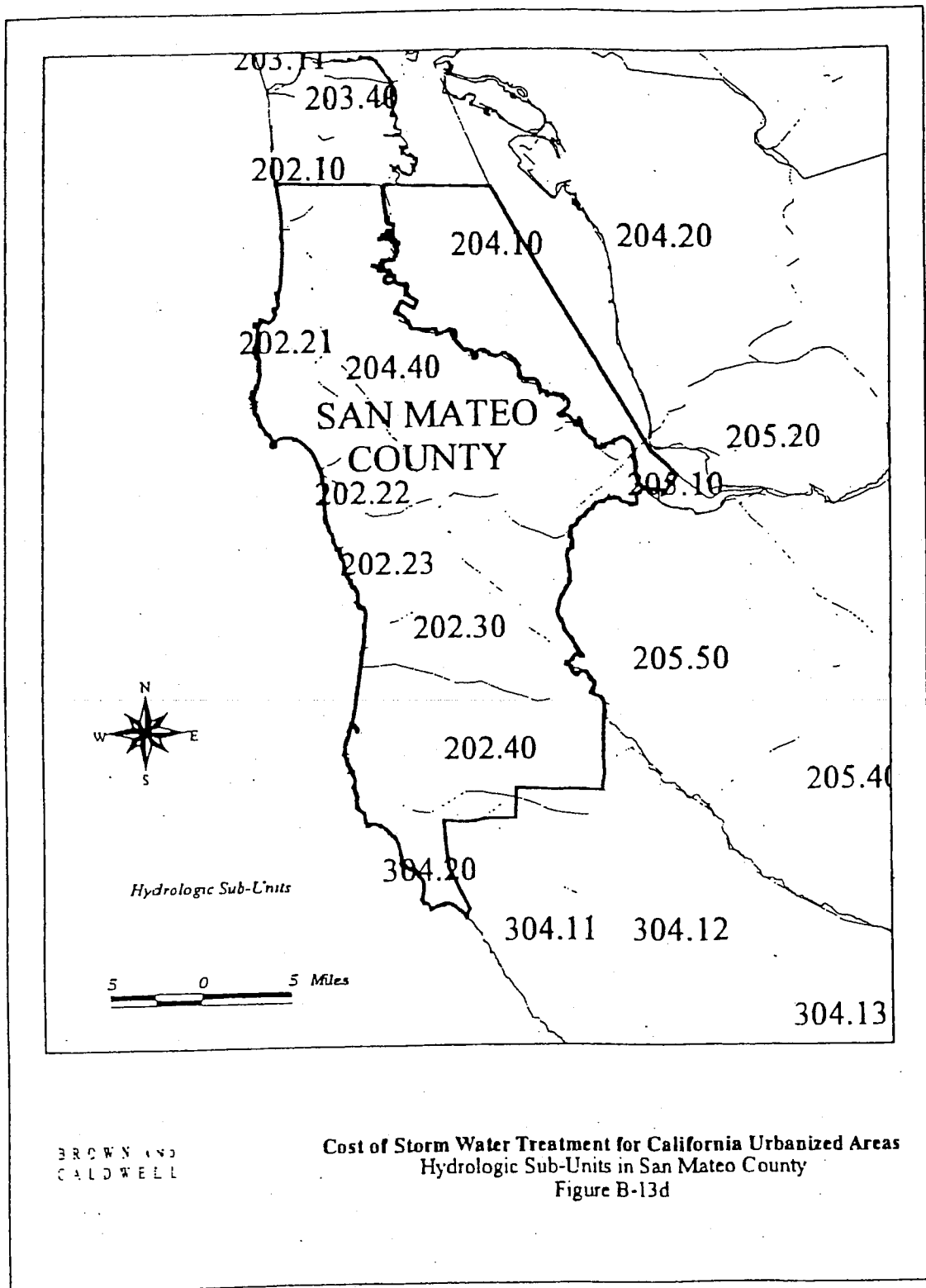
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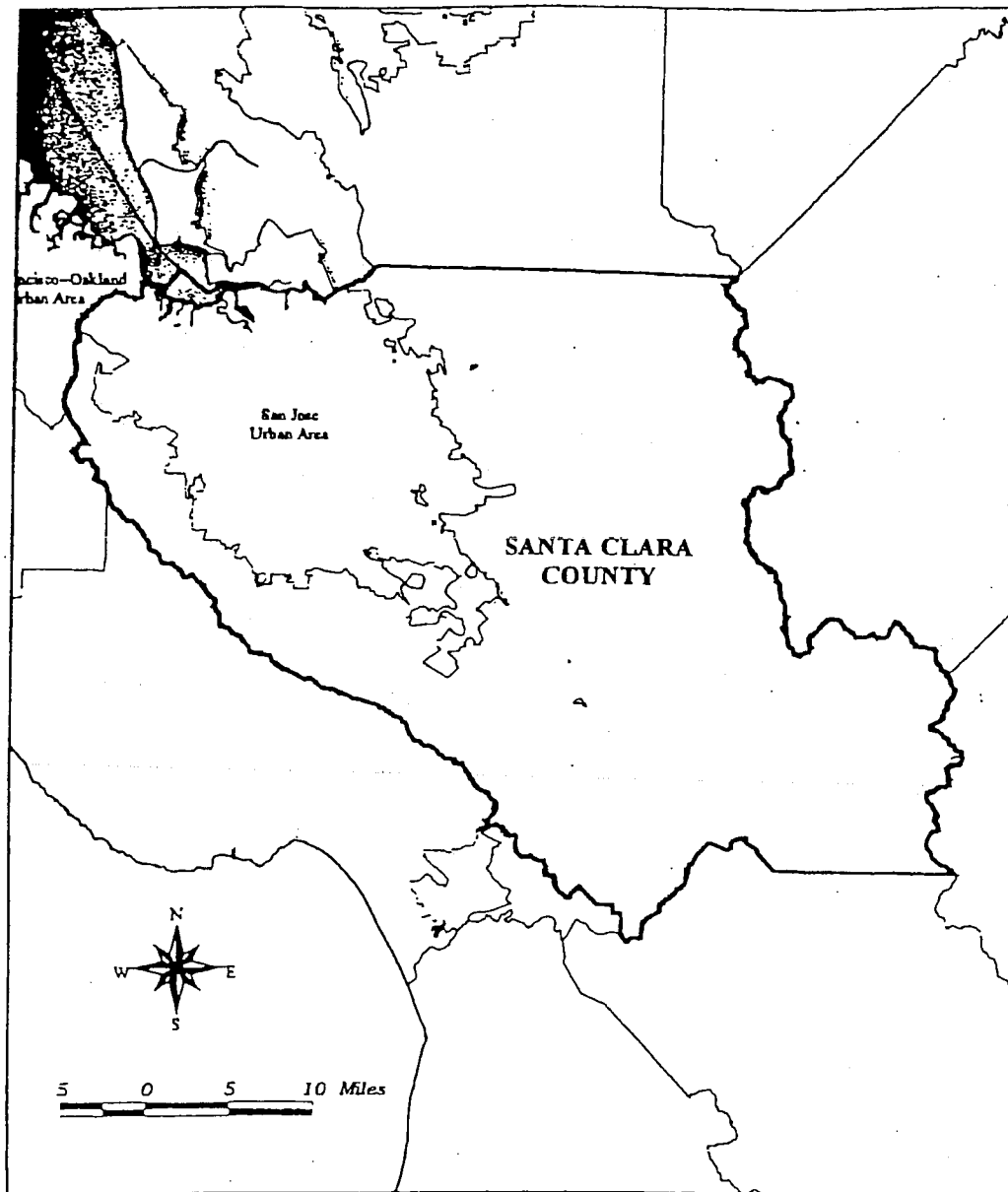
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in San Mateo County
Figure B-13c

R0006357



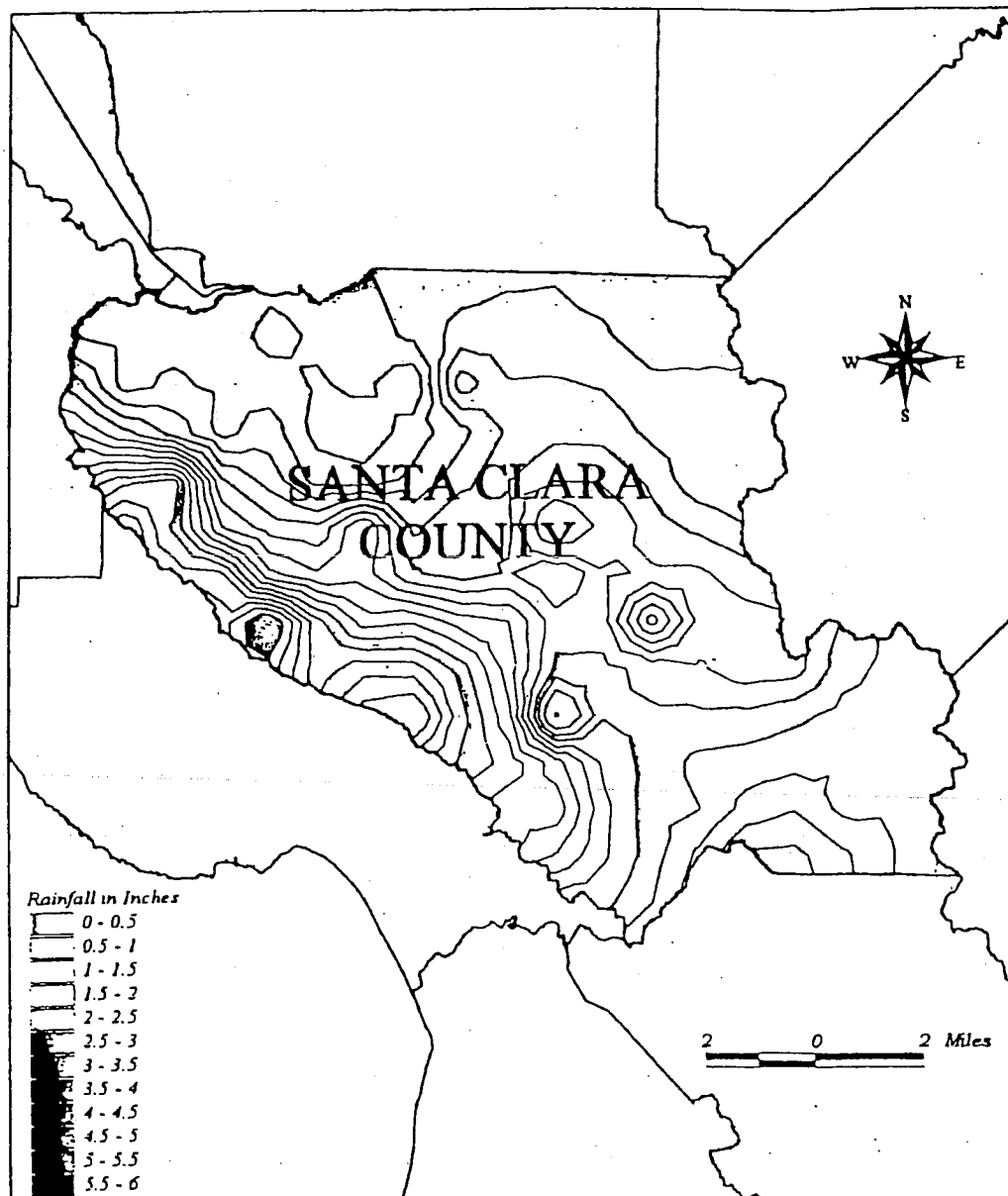
R0006358



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Santa Clara County
Figure B-14a

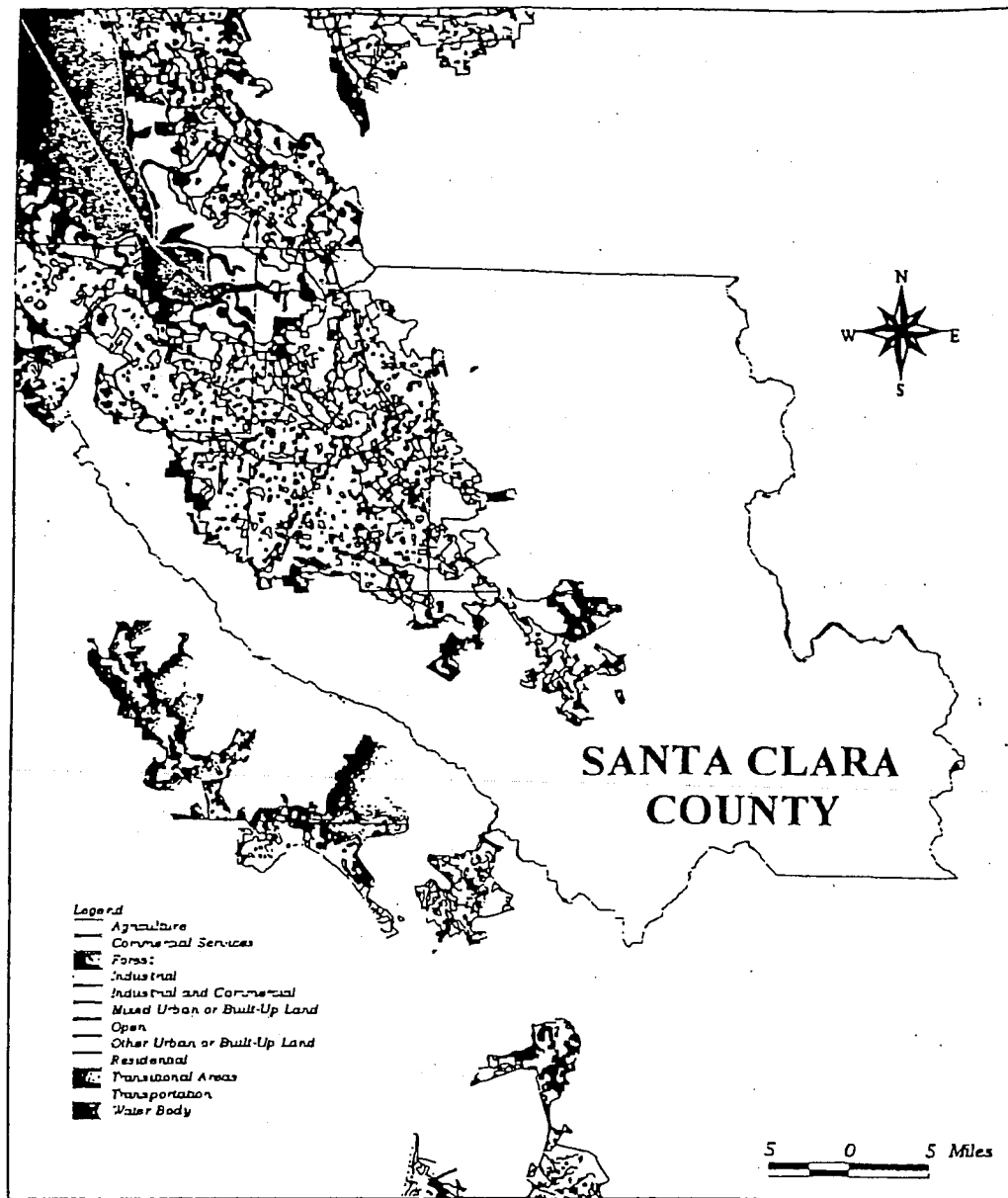
R0006359



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Santa Clara County
Figure B-14b

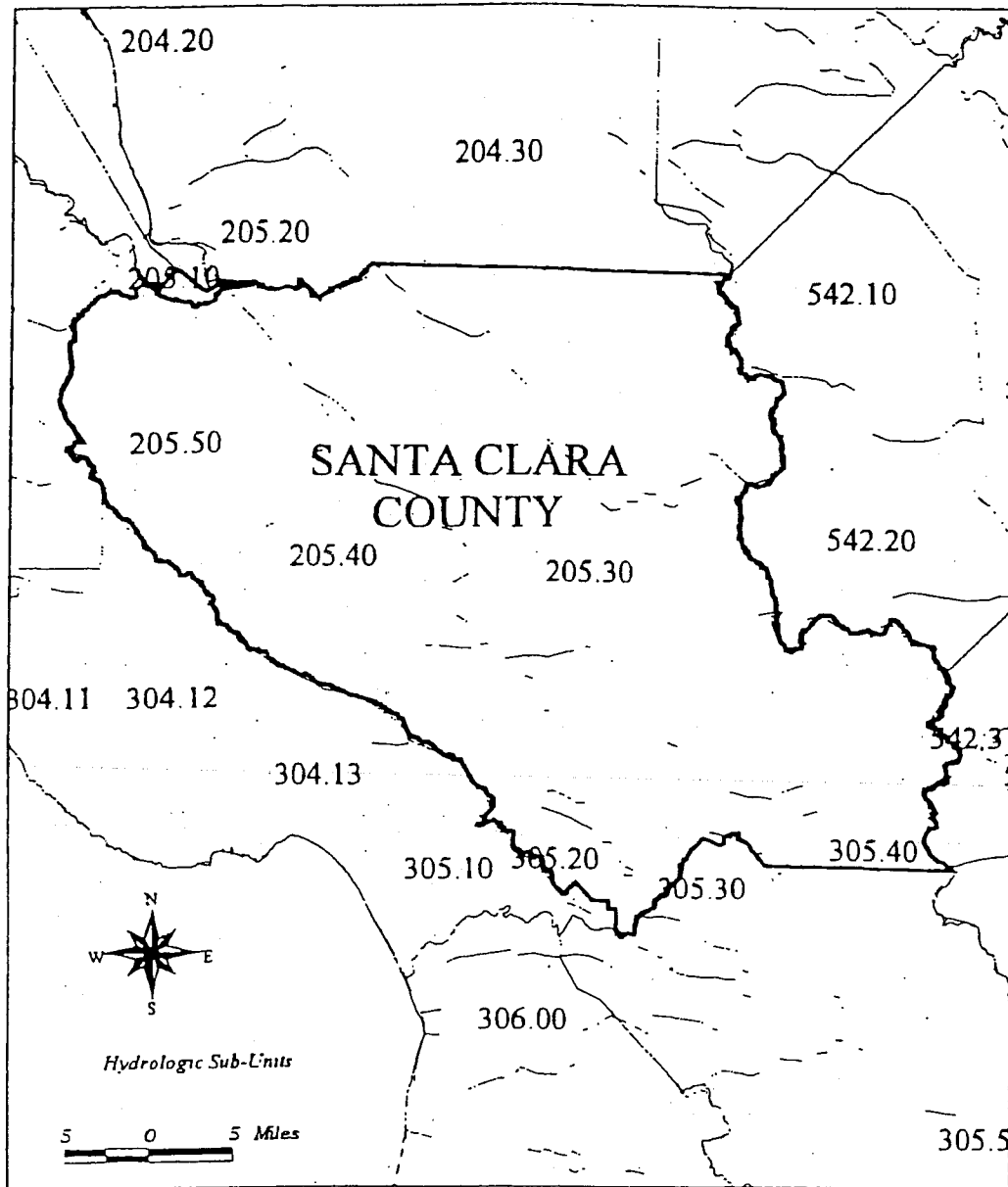
R0006360



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Santa Clara County
Figure B-14c

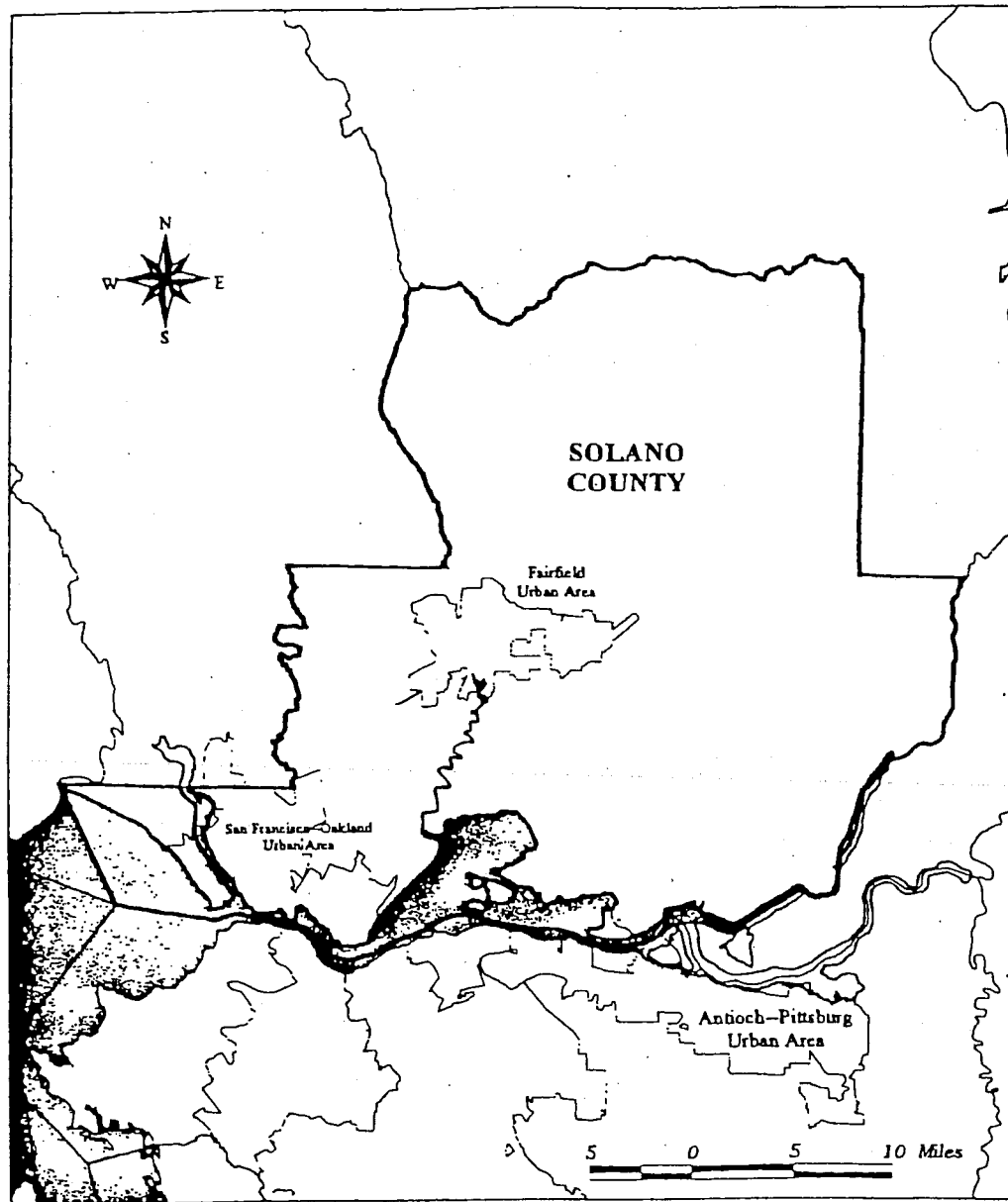
R0006361



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Santa Clara County
Figure B-14d

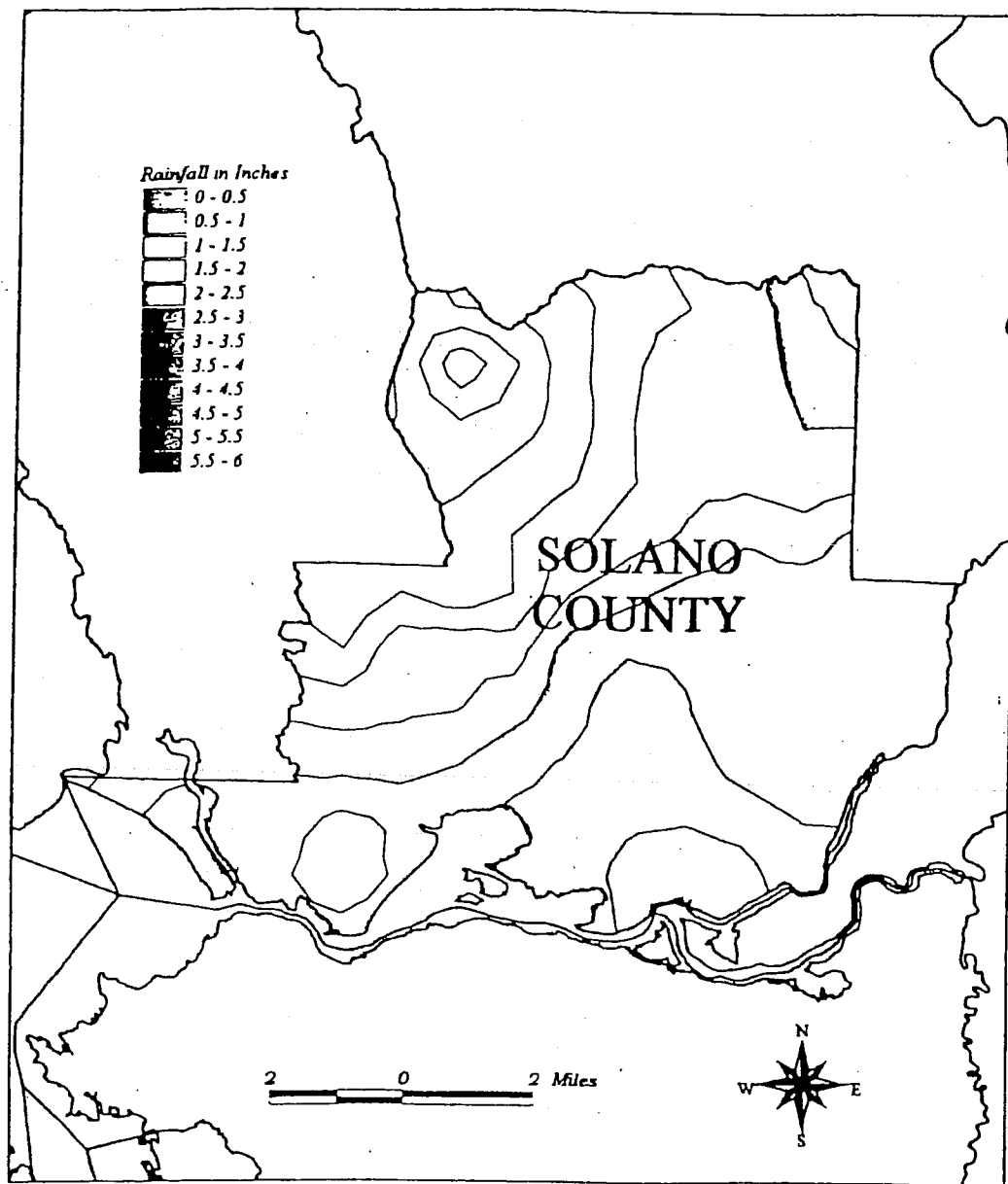
R0006362



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Solano County
Figure B-15a

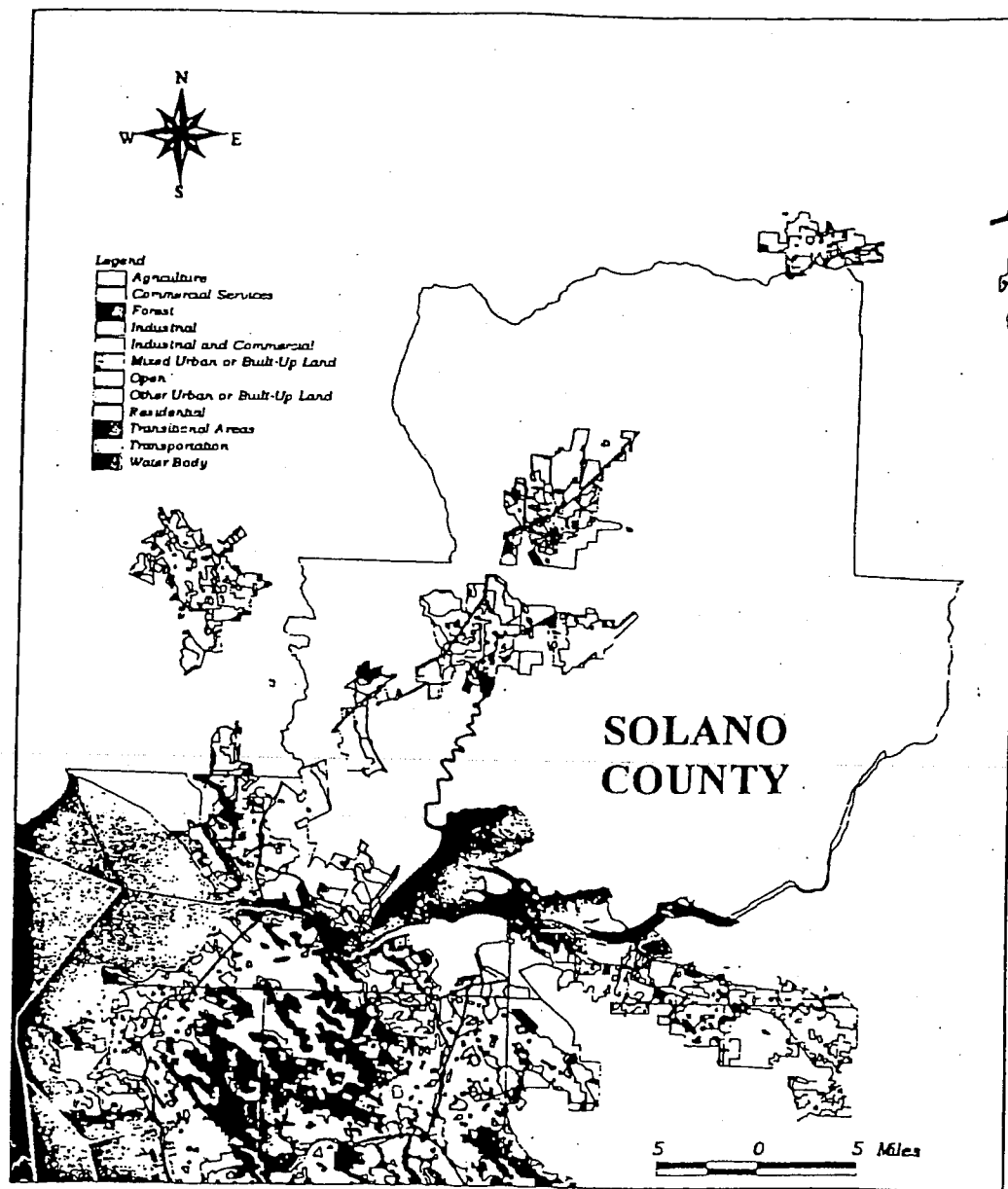
R0006363



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Solano County
Figure B-15b

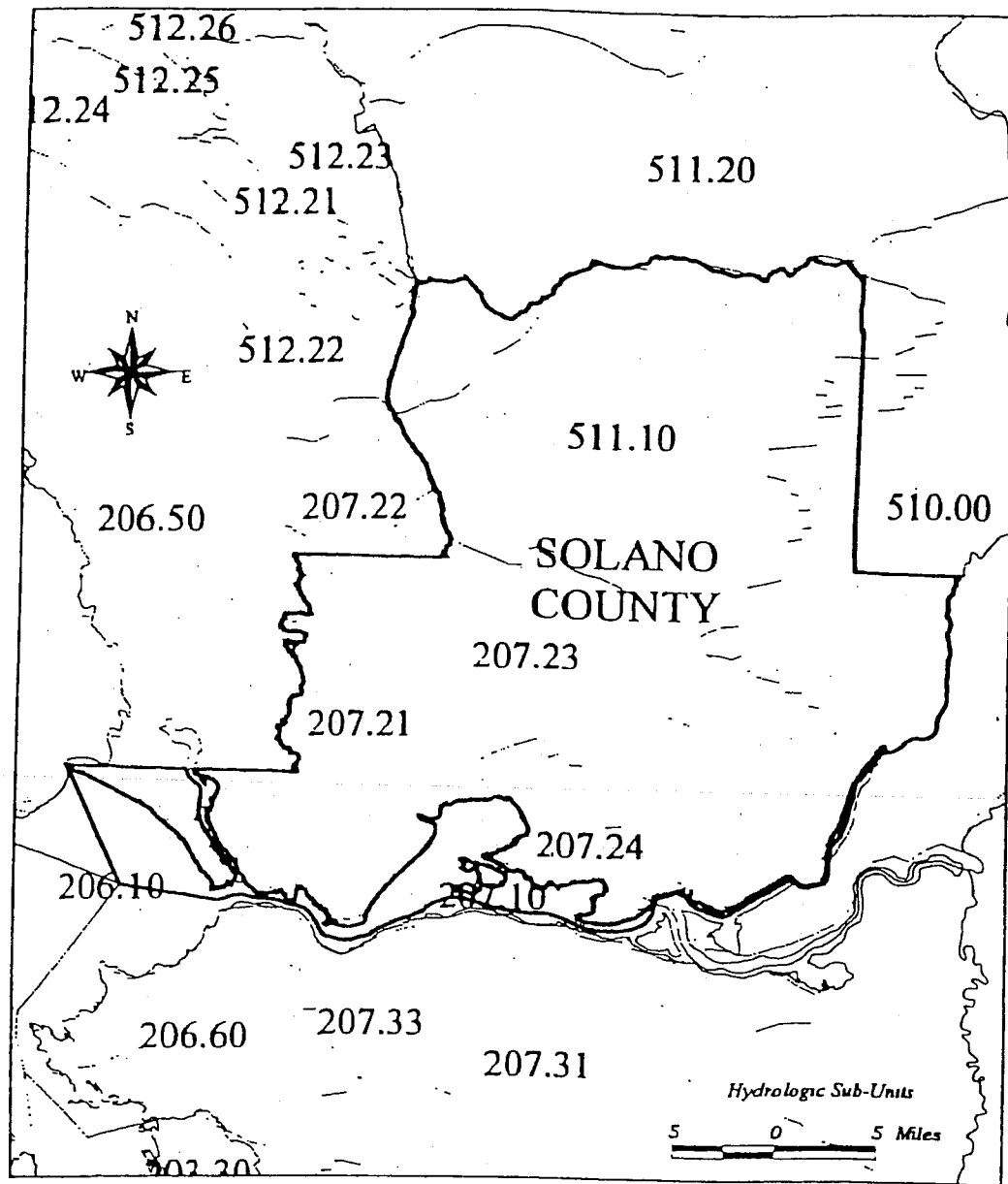
R0006364



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Solano County
Figure B-15c

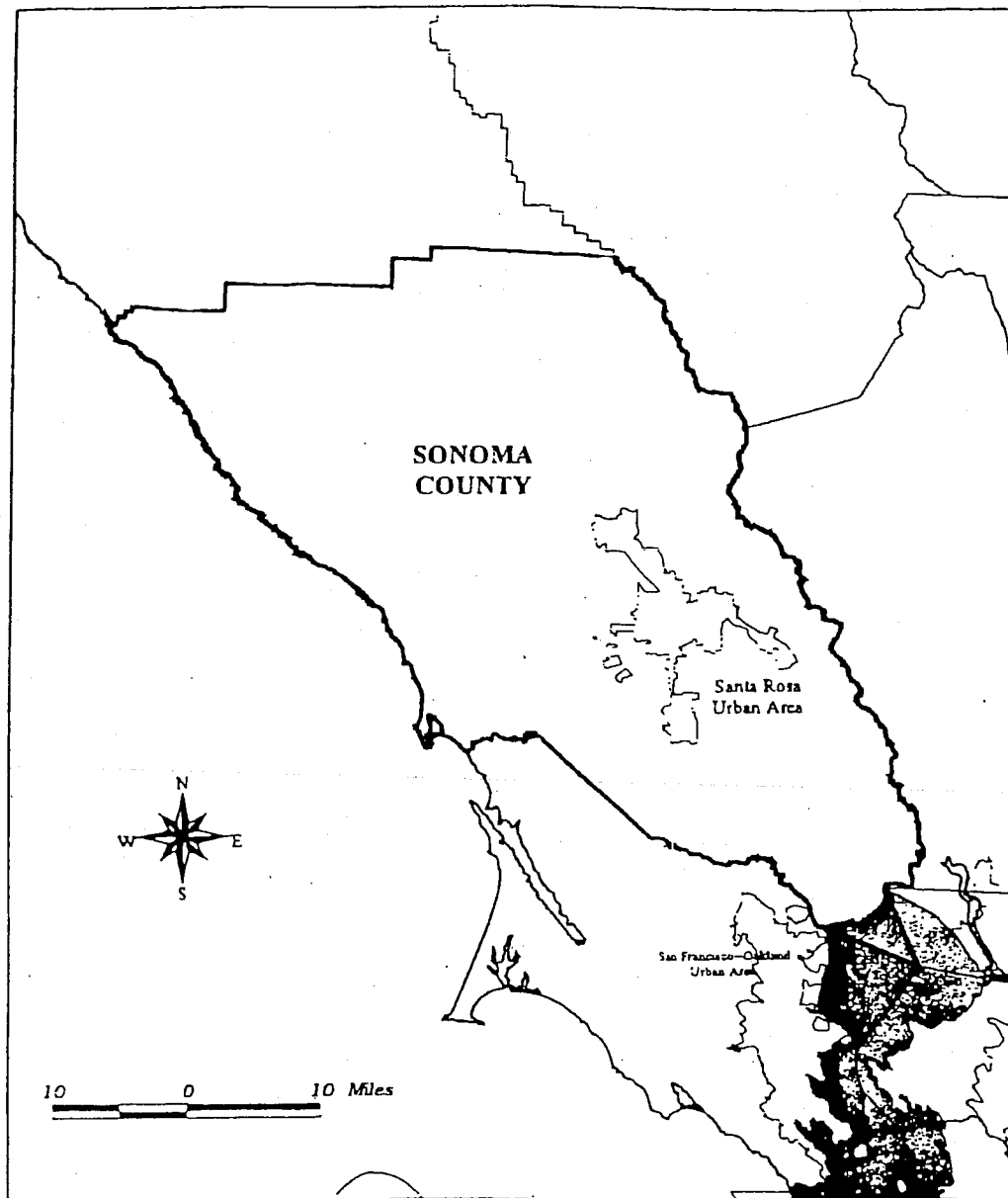
R0006365



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Solano County
Figure B-15d

R0006366

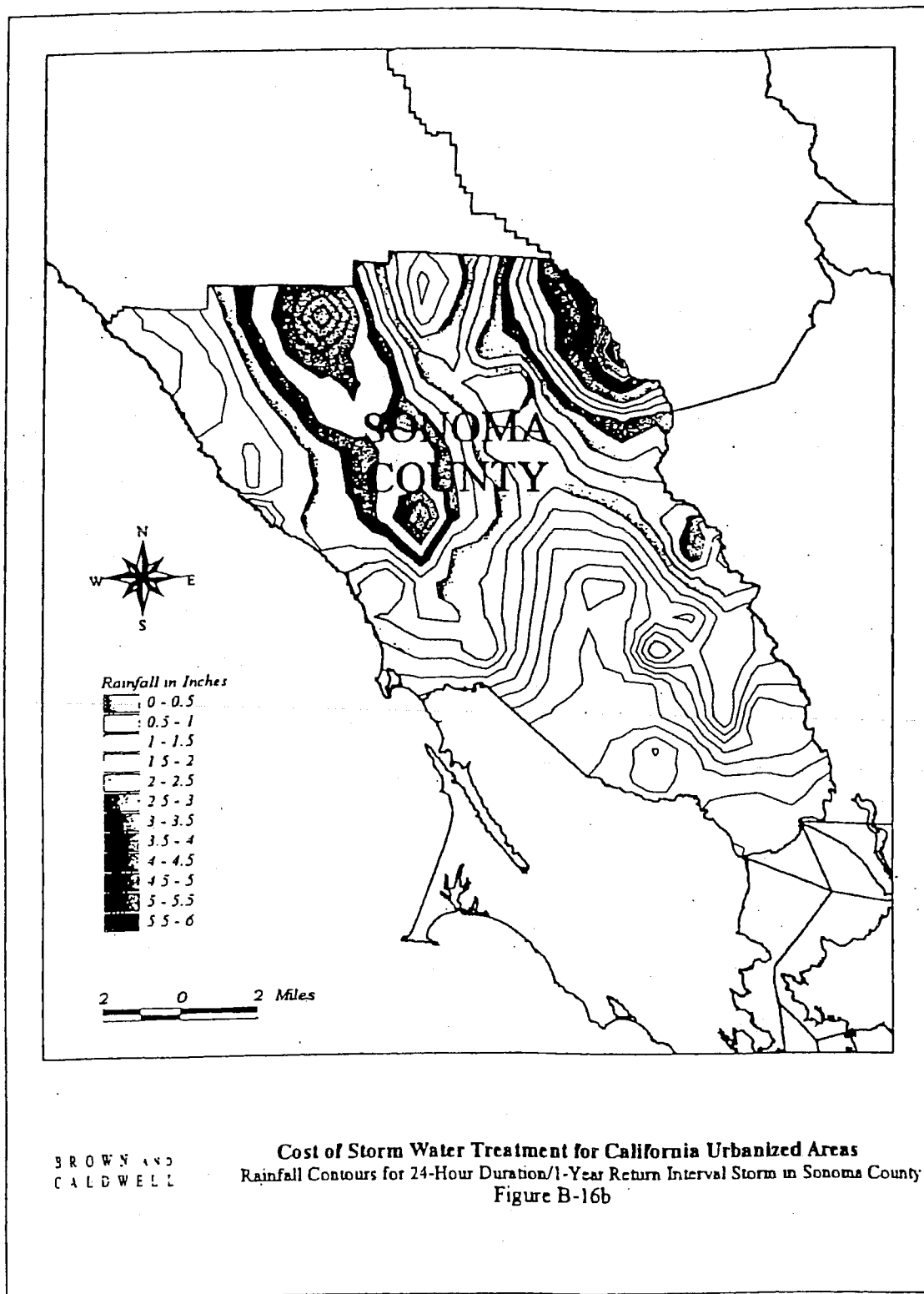


BROWN AND
CALDWELL

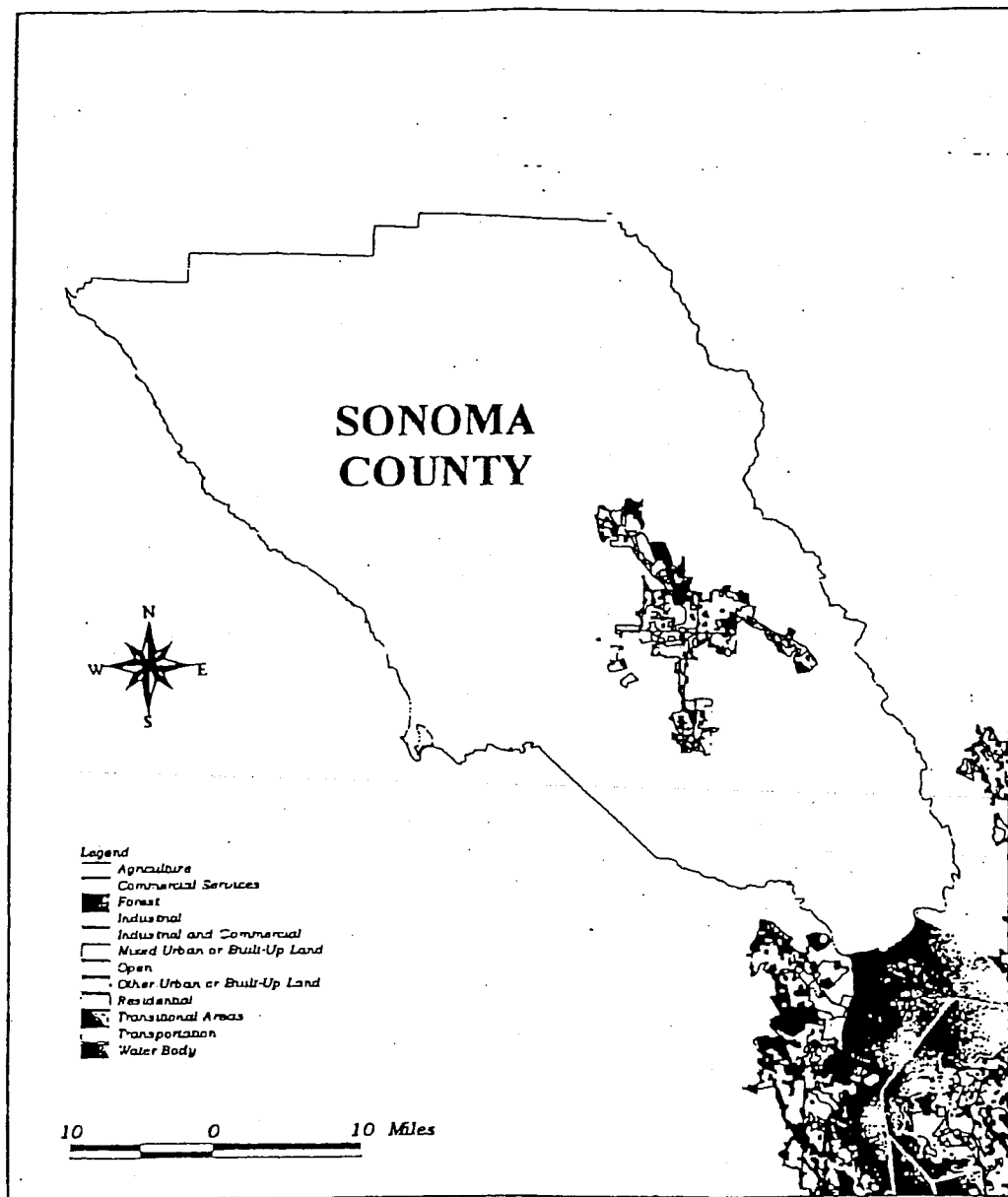
Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Sonoma County

Figure B-16a

R0006367



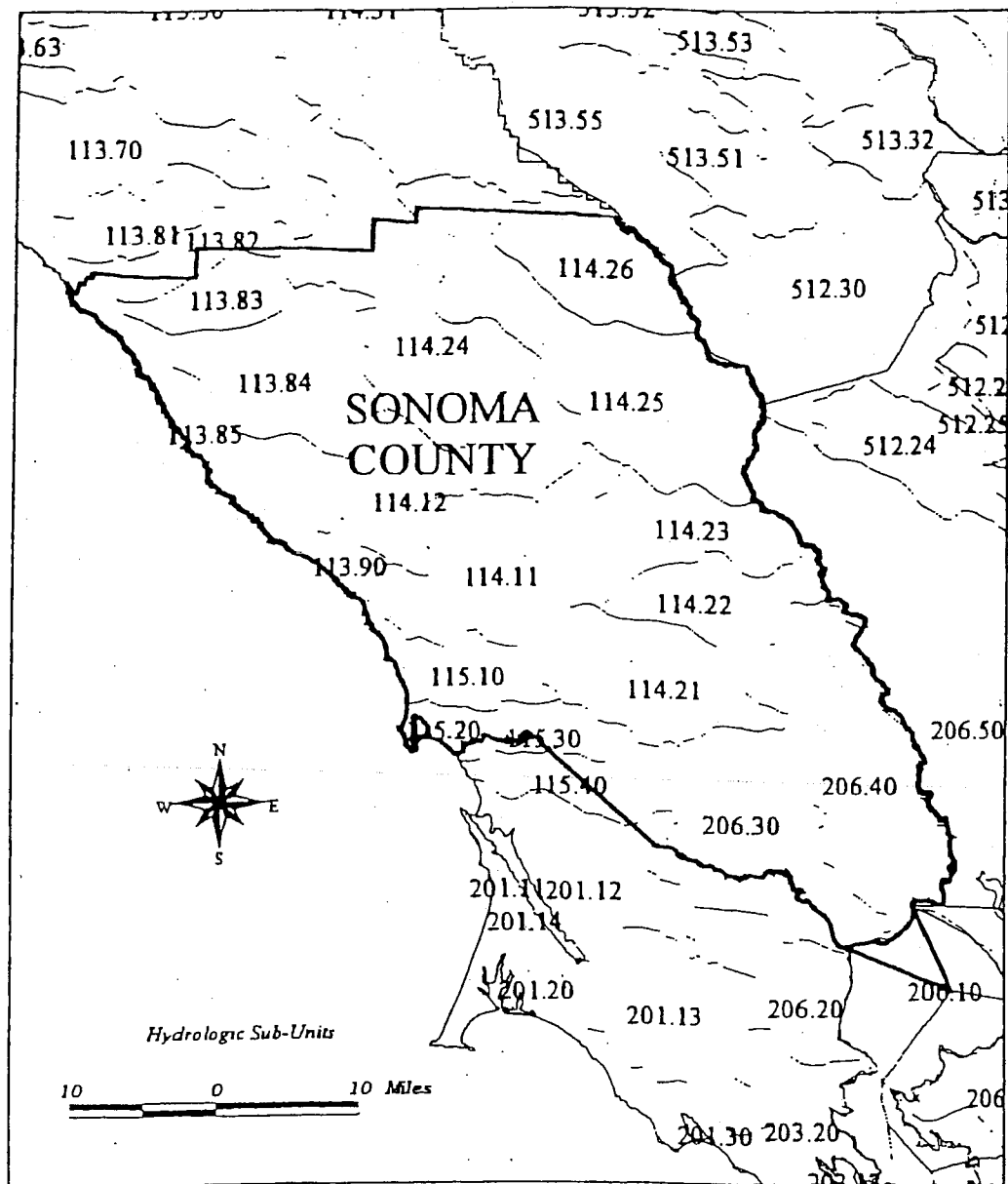
R0006368



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Sonoma County
Figure B-16c

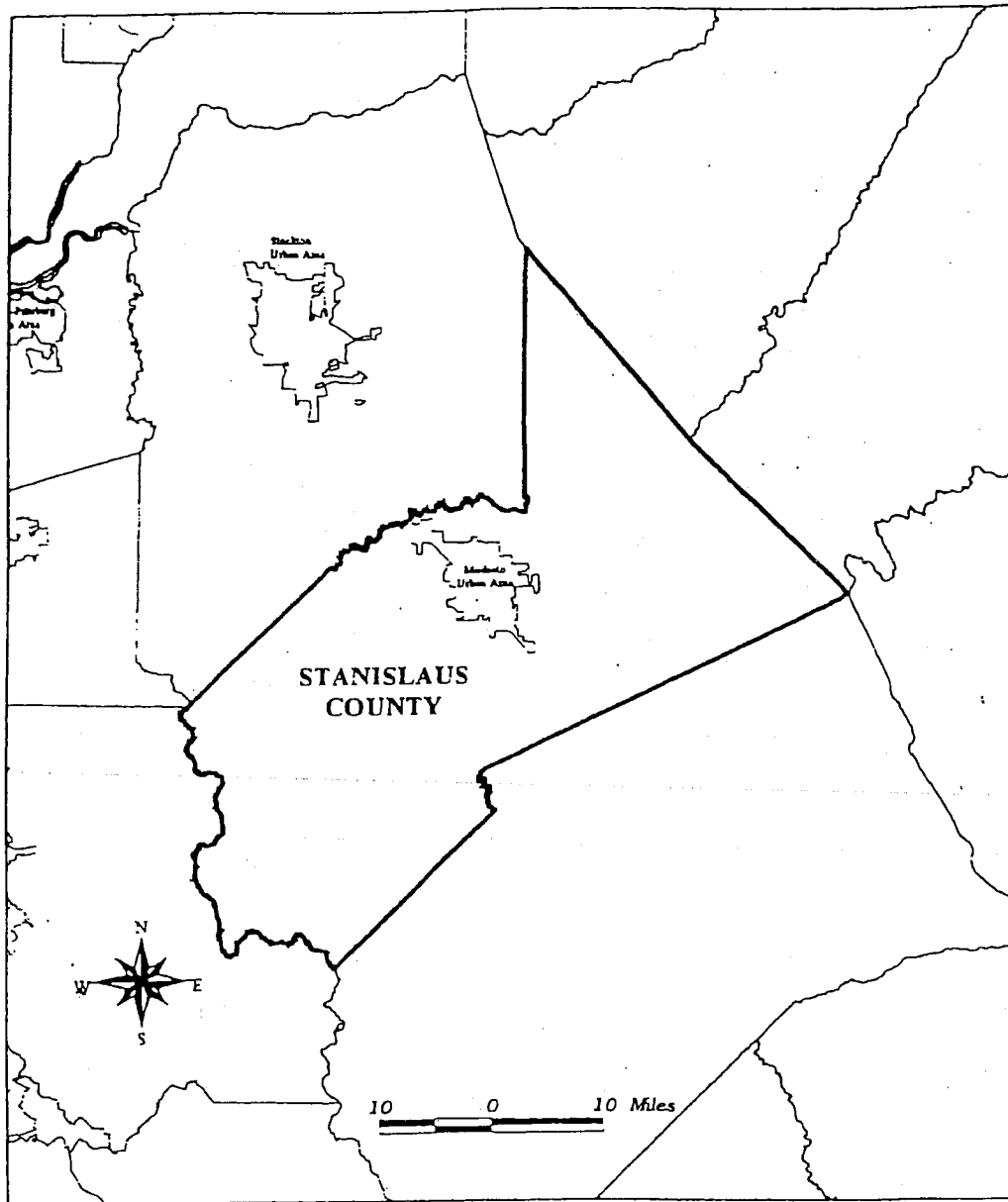
R0006369



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Sonoma County
Figure B-16d

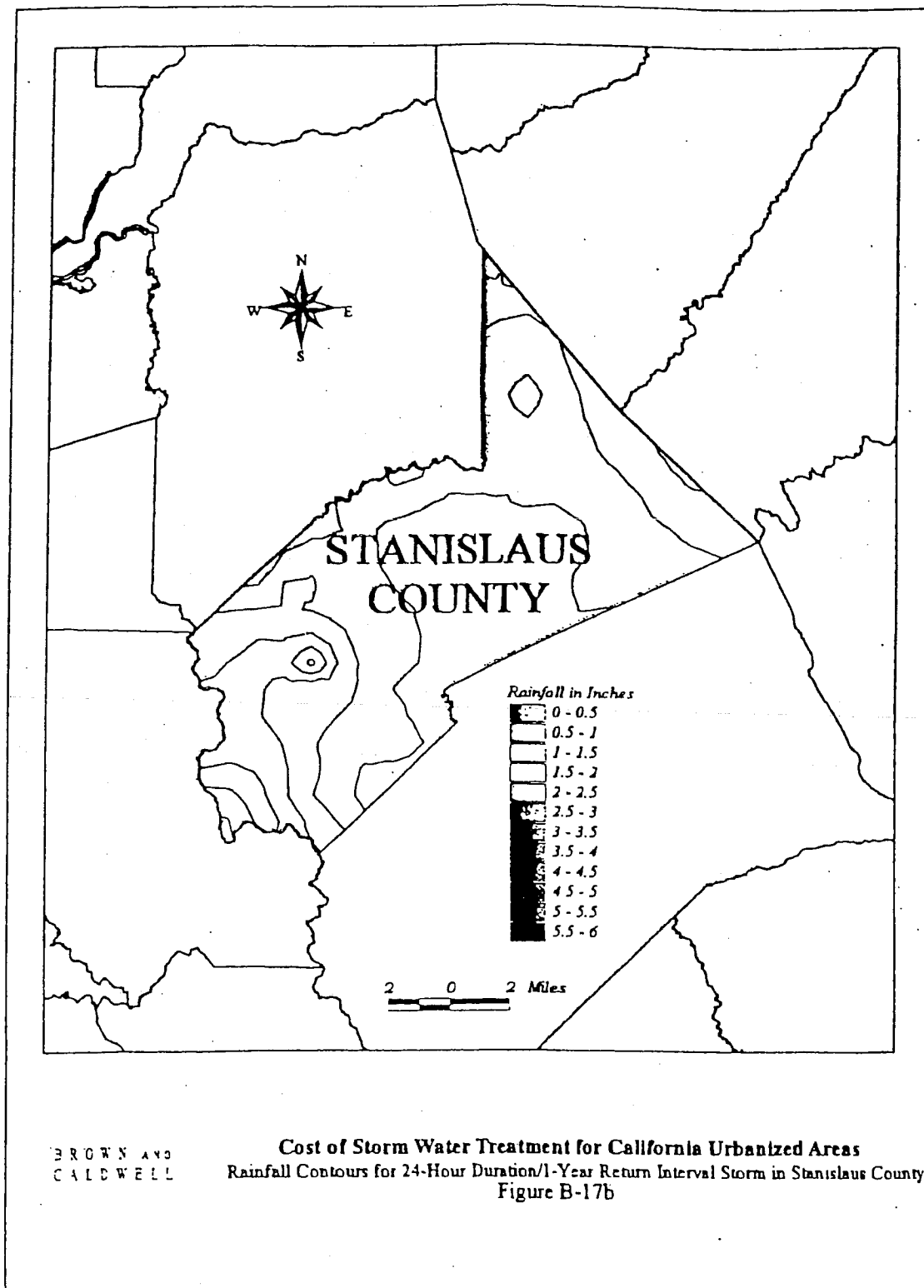
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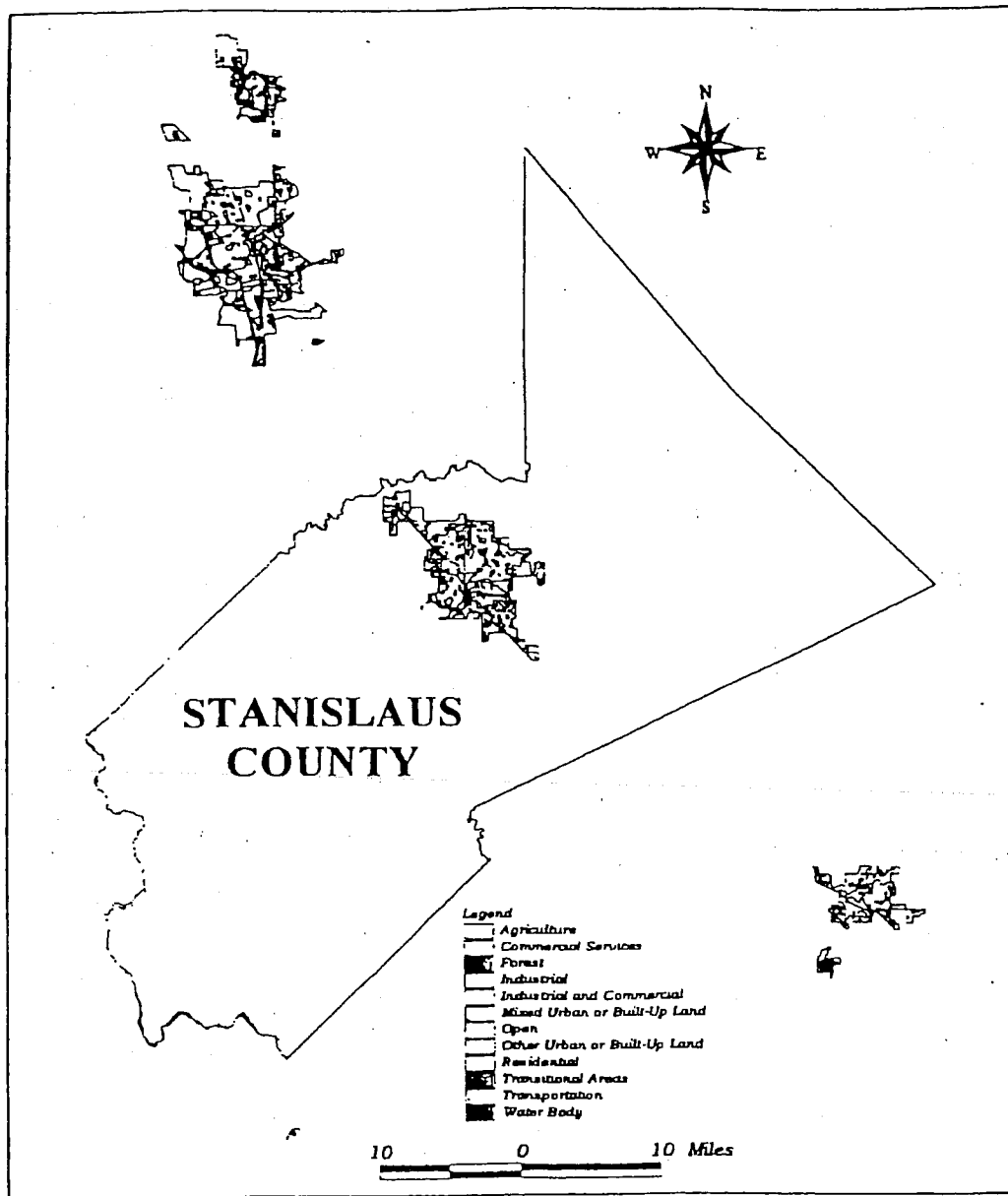
BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Stanislaus County
Figure B-17a

R0006371



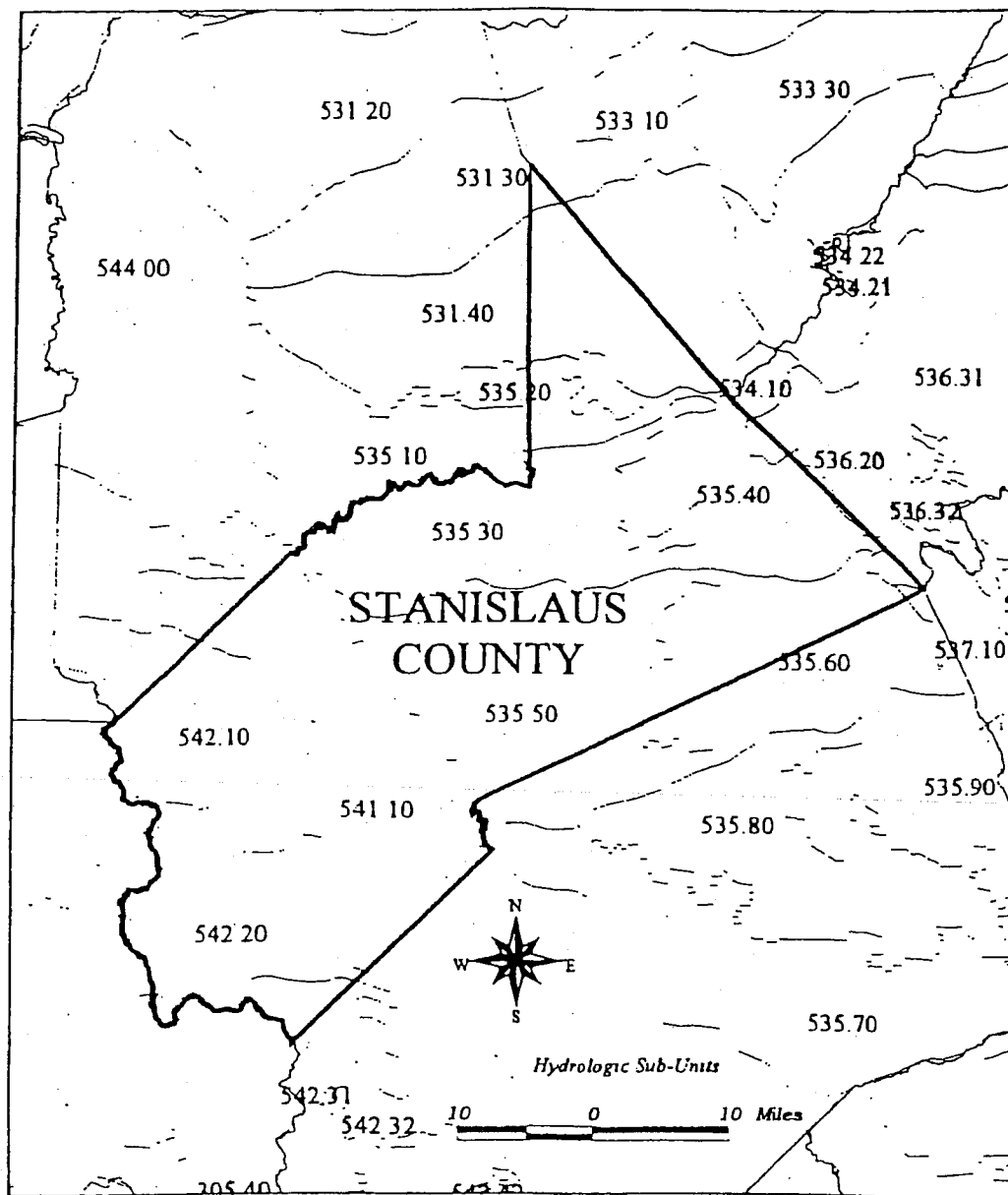
R0006372



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Stanislaus County
Figure B-17c

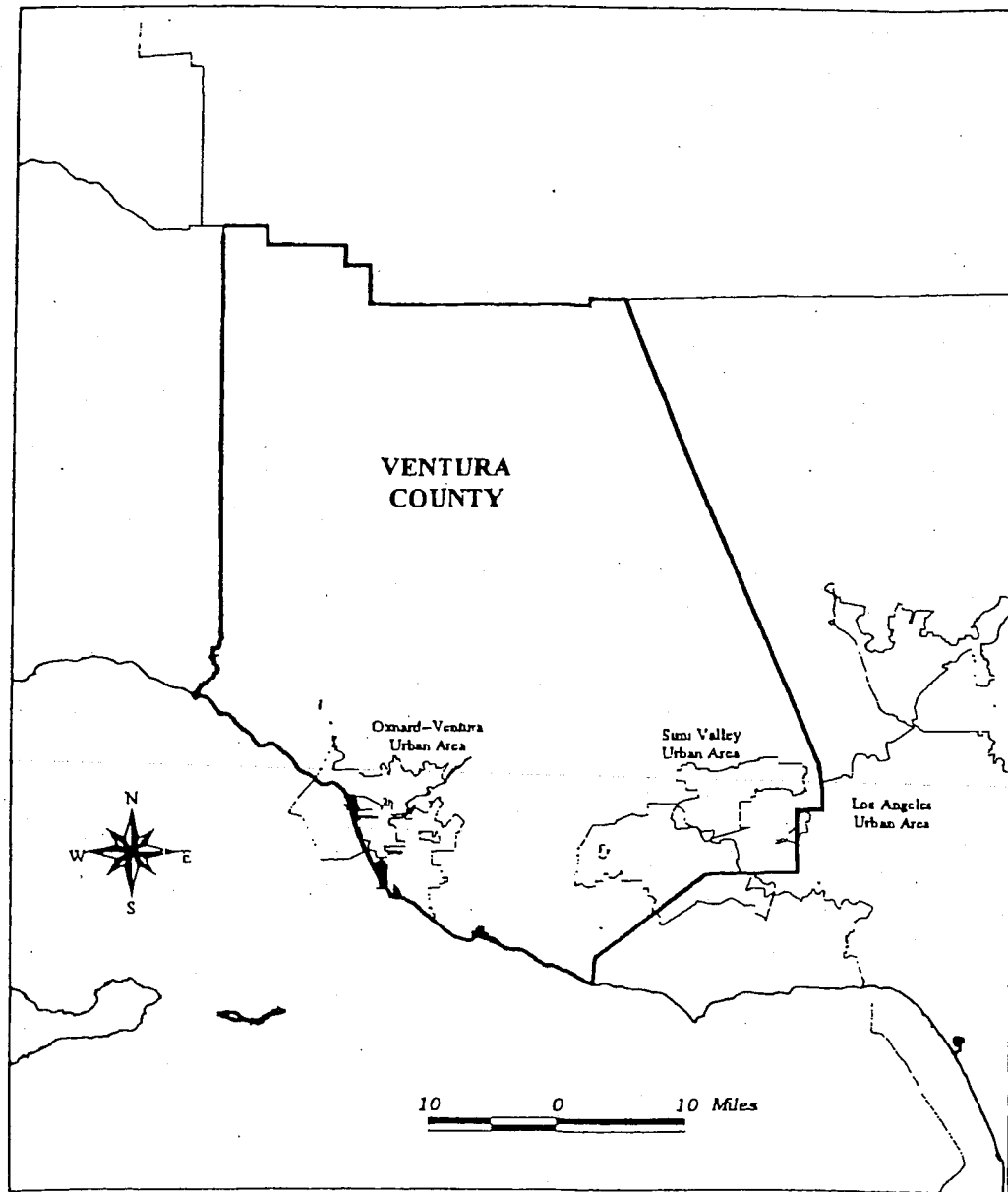
R0006373



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Hydrologic Sub-Units in Stanislaus County
Figure B-17d

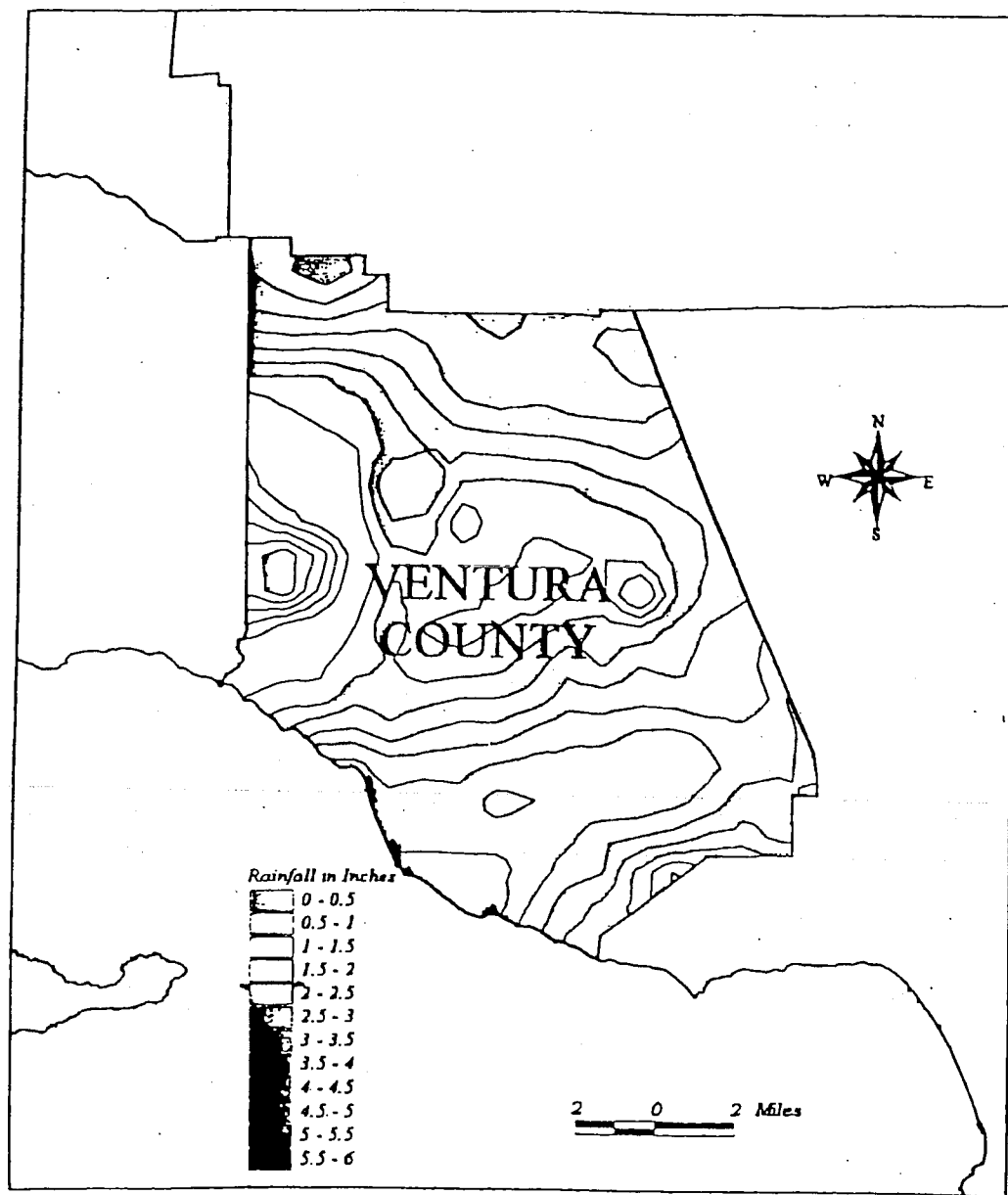
R0006374



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Urbanized Areas in Ventura County
Figure B-18a

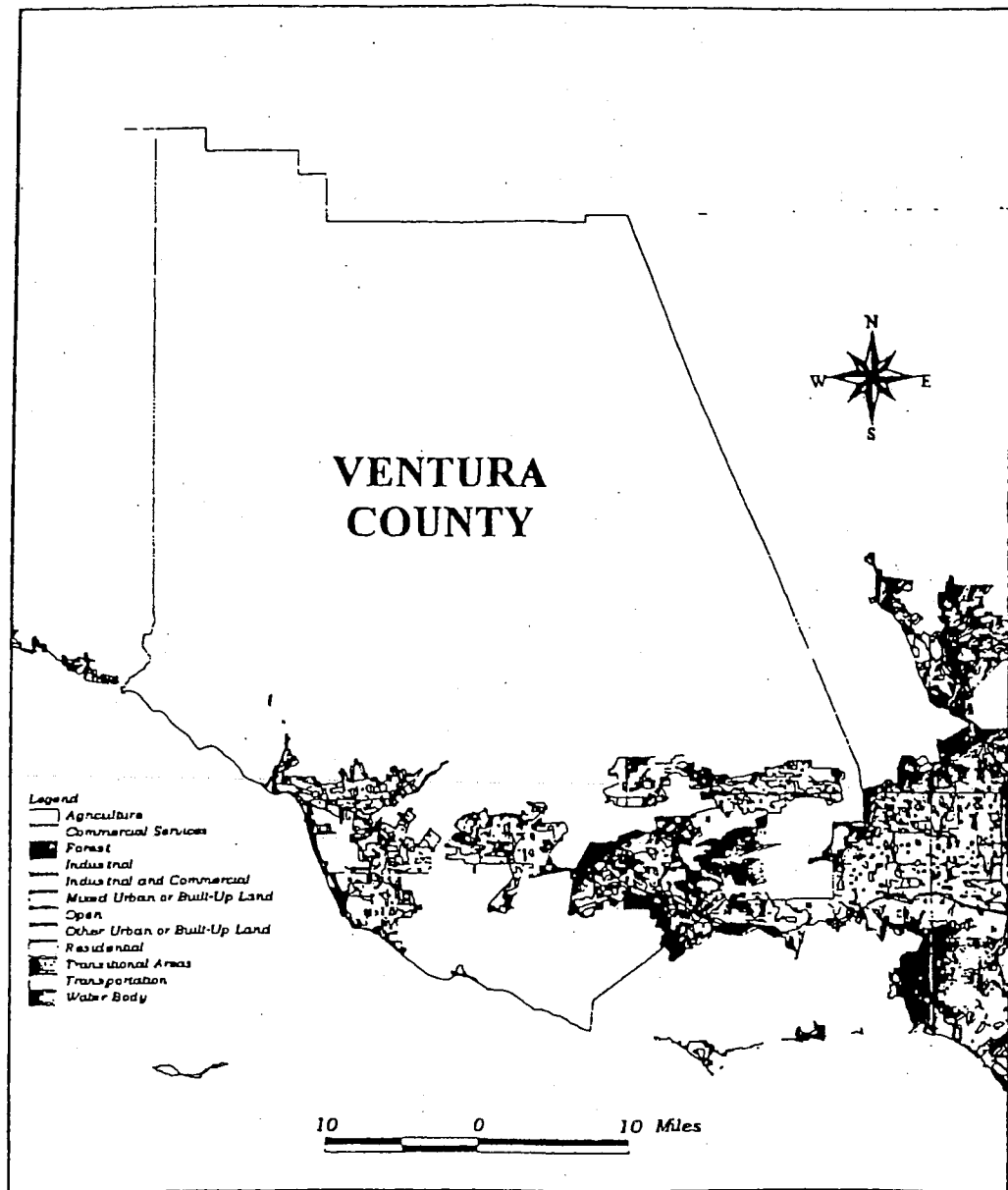
R0006375



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Rainfall Contours for 24-Hour Duration/1-Year Return Interval Storm in Ventura County
Figure B-18b

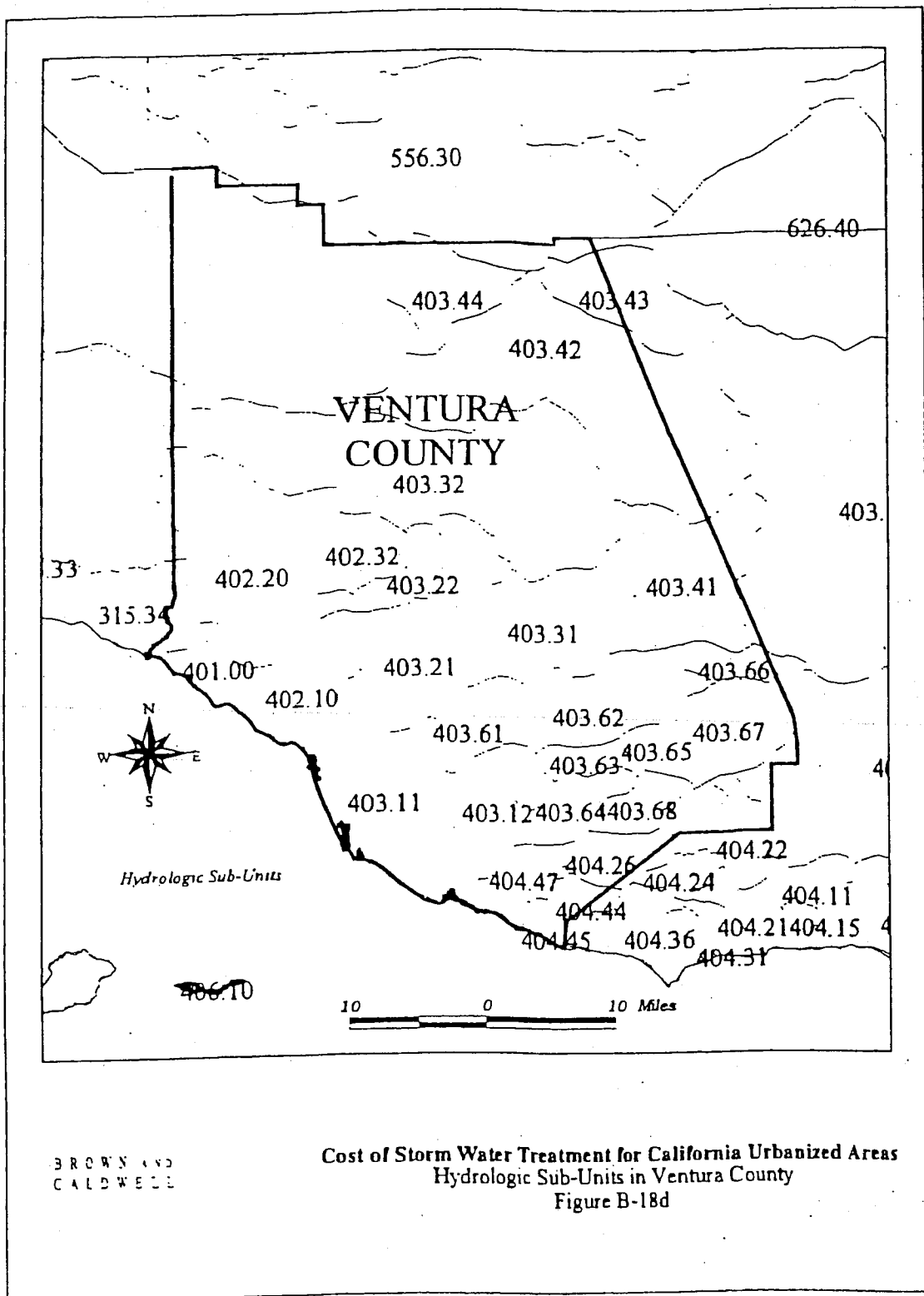
R0006376



BROWN AND
CALDWELL

Cost of Storm Water Treatment for California Urbanized Areas
Land Use in Ventura County
Figure B-18c

R0006377



R0006378

APPENDIX C
DATA TABLES

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R0006379



APPENDIX C

DATA TABLES

Table C-11
Unit-Retail Treatment Cost Calculations - Solid Gravity

Hydrologic Sub-Area	Unshaded Area (Acres)	Area (sq. ft.)	Runoff (MG per inches of rain)	Number of Treatment Units ^a	Storage Unit Size (MG)	Total Treatment Unit Area ^b (Acres)	Citywide Interceptors (sq. ft.)	Interceptor System Length ^c (feet)	Total Treatment Unit Length ^d (feet)	Project Cost (\$ million @ \$100,000)					Annual Operations and Maintenance Costs ^e (\$ million/year)				
										Level 1					Level 2				
										Total Cost ^f	Treatment Unit Cost ^g	Level Cost ^h	Total Cost ⁱ	Treatment Unit Cost ^j	Total Incremental Cost ^k	Incremental Unit Cost ^l	Total Incremental Cost ^m	Incremental Unit Cost ⁿ	Level 2 ^o
207.21	Farmland	7.13	24.33	1	24.33	17.27	7.85	8.81	17.27	17.27	17.27	17.27	17.27	17.27	17.27	17.27	17.27	17.27	17.27
207.23	Farmland	32.87	204.18	5	40.84	92.80	8.56	8.74	42.86	152.45	152.45	152.45	152.45	152.45	152.45	152.45	152.45	152.45	152.45
208.11	San Francisco-Oakland	19.11	4.81	1	4.81	6.23	6.00	6.18	6.23	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46	12.46
208.5	San Francisco-Oakland	23.34	164.94	4	41.14	74.41	8.43	8.89	34.79	103.23	103.23	103.23	103.23	103.23	103.23	103.23	103.23	103.23	103.23
207.1	San Francisco-Oakland	5.55	8.68	1	8.68	7.81	6.51	6.04	7.81	15.62	15.62	15.62	15.62	15.62	15.62	15.62	15.62	15.62	15.62
207.21	San Francisco-Oakland	17.87	102.19	2	24.08	46.82	5.89	6.29	24.08	50.96	50.96	50.96	50.96	50.96	50.96	50.96	50.96	50.96	50.96
TOTAL										347.17	347.17	347.17	347.17	347.17	347.17	347.17	347.17	347.17	347.17
Conversion Time										106.81	106.81	106.81	106.81	106.81	106.81	106.81	106.81	106.81	106.81

Costs based on savings of a 24-hour detention event with sub-instant treatment of 0.72-hour period.

a - Based on a maximum treatment unit size of 50 MG.

b - Based on a maximum treatment unit size of 50 MG.

c - Level 1 treatment unit size = (2.5 acres) * (Treatment unit size) = 0.6. Level 2 and Level 2 total treatment unit size = 1.52 Level 1 treatment unit size.

d - Project cost = (23.34 acres) * (Treatment unit size) = 0.6.

e - Project cost = (23.34 acres) * (Treatment unit size) = 0.6.

f - Level cost = (196,000/year) * (Treatment unit size) = 0.6.

g - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

h - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

i - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

j - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

k - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

l - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

m - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

n - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

o - Project cost = (196,000/year) * (Treatment unit size) = 0.6.

Table C-10

Total:

Source: U.S. Census Bureau, *Current Population Reports*, 1990.

Report available only with two weeks in advance of a 72-hour period
a copy is being sent to the Bureau on 10 April 1964, under 100-442887.

(7.0 acres) * (transmission unit size) = 0.6. Level 2 and Level 3 total

Instrument level size, MG) = 0.0

Prevalence and size, $MD \leq 0.8$
 (assumed) and size, $MD \leq 0.8$

percentage of intercept system construction cost

$\text{variance } \text{LQAL} = (32.970) \cdot (5.50 \text{ mps unit size, MG}) = 0.67$
 $\text{variance } \text{LQAL} = 0.67$

Table C-19
Urban Runoff Costs Summary

County	Runoff (MG per rainfall event)	Number of Treatment Units	Total Interceptor System Length (mi)	Project Cost (\$ million @ ENR CCI 6710)				Annual Operations and Maintenance Costs (\$ million/year)			
				Collection System	Level 1	Level 2	Level 3	Collection System	Level 1 (Including Collection)	Level 2 (Including Collection)	Level 3 (Including Collection)
				Total Cost	Total Cost (Including Collection)	Total Cost (Including Collection)	Total Cost (Including Collection)				
Alameda	1,816	43	371	\$1,180.36	\$2,775.39	\$3,229.11	\$4,445.58	\$0.9836	\$5,7882	\$9,8827	\$16,7628
Contra Costa	1,888	47	426	\$1,280.10	\$2,992.70	\$3,479.86	\$4,785.98	\$1.0686	\$6,1749	\$10,5677	\$17,9131
Fresno	480	13	133	\$416.48	\$808.27	\$910.05	\$1,240.53	\$0.3471	\$1,6391	\$2,7502	\$4,6082
Kern	279	8	92	\$274.26	\$517.59	\$592.24	\$782.77	\$0.2285	\$1,0061	\$1,6748	\$2,7928
Los Angeles	21,684	480	3,772	\$12,486.25	\$32,938.99	\$39,087.27	\$53,603.58	\$10.4052	\$67,5535	\$116,6996	\$198,8777
Marin	1,127	28	188	\$566.47	\$1,723.94	\$2,083.72	\$2,868.44	\$0.4721	\$3,5303	\$6,1603	\$10,5580
Orange	2,885	70	620	\$1,998.75	\$4,667.94	\$5,446.44	\$7,419.10	\$1.8656	\$9,3978	\$16,0473	\$27,1681
Riverside	1,110	35	357	\$1,061.90	\$2,038.68	\$2,299.72	\$3,109.37	\$0.8849	\$4,0185	\$6,7134	\$11,2195
Sacramento	1,914	41	352	\$1,146.88	\$2,627.12	\$3,024.65	\$4,230.63	\$0.9557	\$5,7060	\$9,7910	\$16,6218
San Bernardino	3,666	61	476	\$1,394.22	\$3,130.75	\$3,601.97	\$5,000.84	\$1.1618	\$12,5172	\$21,4145	\$36,2919
San Diego	314	106	882	\$2,806.48	\$6,920.53	\$6,820.16	\$9,490.65	\$2.1712	\$1,1023	\$1,8713	\$3,1570
San Joaquin	1,514	9	87	\$249.86	\$530.40	\$605.02	\$836.26	\$0.2082	\$4,7797	\$8,2286	\$13,9956
San Mateo	2,364	37	292	\$923.12	\$2,333.71	\$2,751.57	\$3,772.99	\$0.7693	\$7,3856	\$12,6918	\$21,5643
Santa Clara	522	55	441	\$1,458.59	\$3,729.80	\$4,426.76	\$5,992.20	\$1.2155	\$1,7980	\$3,0771	\$5,2193
Solano	602	16	136	\$367.54	\$851.49	\$984.14	\$1,369.65	\$0.3063	\$1,9145	\$3,3246	\$5,6824
Sonoma	214	107	107	\$329.75	\$874.72	\$1,028.38	\$1,448.48	\$0.2748	\$0.7618	\$1,2913	\$2,1767
Stanislaus	1,017	11	61	\$175.24	\$366.11	\$415.70	\$576.70	\$0.1460	\$3,5318	\$6,0631	\$10,2956
Ventura		39	257	\$705.97	\$1,701.41	\$1,982.11	\$2,749.49	\$0.5883			
Cumulative Total:	45,205	1115	9,055	\$28,621	\$70,530	\$82,759	\$113,721	\$23.85	\$145.15	\$249.46	\$423.88
Present Worth^a:					\$72,502	\$86,149	\$119,482				

a - Present worth costs calculated using an interest rate of 4 percent and a 20 year period. Includes project costs and operations and maintenance costs.

R0006385

(Rev2) UrbanRunoffCosts, its Summary

Table C.7
Urban Runoff Treatment Cost Calculations - Orange County

[illegible]

Costs of the program are covered by a 10% surcharge on the price of the product.

a = Operational and maintenance costs based on 10 rainfall events per year.
b = Based on a maximum treatment unit size of 10 haq
c = Level 1 treatment unit size = (2.0 acre) × 0.6 = 1.2 acre; Level 2 and Level 3 total treatment area = 1.92 acres; Level 1 treatment unit area = 1.92 acres / 2 = 0.96 acres
d = Meteorological unit length based on the sum of the lengths of two lots and the mid point of an assumed eastern boundary area
e = Project cost = (\$2,683,317) / (Length, mi) [Distance] = 1,037.56
f = The meteorological station used for the study was used in Carraro (1997)

$$\text{CONV}(\text{CONV}(\text{STCI}) = \text{max pur}) \cdot \text{e}$$

$$\text{IF } \text{CONV}(\text{CONV}(\text{STCI}) \cdot \text{max pur}) = \text{max pur}$$

$\alpha = 0.05$ (Two-tailed test) $\Rightarrow$ $\alpha/2 = 0.025$ $\Rightarrow$ $1 - \alpha/2 = 0.975$ $\Rightarrow$ $z_{1-\alpha/2} = 1.96$ $\Rightarrow$ $z_{\alpha/2} = -1.96$
 $\Rightarrow$ $z_{\alpha/2} = -1.96$ $\Rightarrow$ $z_{1-\alpha/2} = 1.96$ $\Rightarrow$ $z_{\alpha/2} = -1.96$ $\Rightarrow$ $z_{1-\alpha/2} = 1.96$ $\Rightarrow$ $z_{\alpha/2} = -1.96$ $\Rightarrow$ $z_{1-\alpha/2} = 1.96$

from long-term water's edge exposure as indicated by a low concentration of salt in the water and primary $\delta^{18}O = -12.7$ ‰ (see also Berner et al., 1994). In rock units $\delta^{18}O$ is more negative:

$\Delta H^{\circ}_{\text{f}}(\text{DM}) = 96.0 \text{ kJ/mol}$, $\Delta H^{\circ}_{\text{f}}(\text{DMSO}) = 74.8 \text{ kJ/mol}$, $\Delta H^{\circ}_{\text{f}}(\text{H}_2\text{O}) = -285.8 \text{ kJ/mol}$. The standard enthalpy of formation of DM is calculated as follows:

[illegible]

Revised 12/10/19

Table C-2
Unit Runoff Treatment Cost Calculations - Riverside County

Hydrologic Sub-Unit	Unaffiliated Area	Area (ac-ft)	Runoff (MG per rainfall event)	Number of Treatment Units ^a	Storage Unit Size (MG)	Total Level 1 Treated Unit Area ^b (ac-ft)	Volume Runoff Area ^c (MG)	Interceptor Fraction of System Length (in/ft)	Total Interceptor Length (ft)	Level 1				Level 2		Level 3		Annual Operations and Maintenance Costs ^d (\$ million/year)		
										Collection System	Treatment Unit Cost ^e	Land Cost ^f	Total Cost ^g	Treatment Unit Cost ^h	Land Cost ⁱ	Treatment Unit Cost ^j	Land Cost ^k	Collection System ^l	Level 1 ^m	Level 2 ⁿ
802.13	Harold-San Joaquin	0.07	0.18	1	0.18	0.07	0.07	0.08	0.08	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	
802.15	Harold-San Joaquin	22.74	51.74	2	33.87	28.17	11.37	11.50	23.20	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	
802.21	Harold-San Joaquin	21.22	47.04	1	47.04	20.16	71.27	12.81	12.81	12.81	14.13	12.81	14.13	12.81	14.13	12.81	14.13	12.81	14.13	
801.14	Harold-San Joaquin	0.04	0.25	1	0.25	0.25	0.04	0.04	0.04	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	
801.13	Harold-San Joaquin	2.25	50.86	1	50.86	11.30	3.25	8.14	8.14	11.41	11.41	11.41	11.41	11.41	11.41	11.41	11.41	11.41	11.41	
801.21	Riverside	23.86	150.79	3	54.83	50.88	10.86	11.28	33.43	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	
801.22	Riverside	40.48	164.46	4	41.11	74.38	10.17	42.50	168.65	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	
801.23	Riverside	99.08	233.79	5	47.18	100.86	11.81	58.90	235.67	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	
801.24	Riverside	1.88	10.73	1	10.73	8.31	1.88	4.65	4.65	11.07	11.07	11.07	11.07	11.07	11.07	11.07	11.07	11.07	11.07	
801.25	Riverside	0.09	0.39	1	0.39	1.17	0.09	1.02	1.02	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	
801.26	Riverside	0.07	0.28	1	0.28	0.84	0.07	0.71	0.71	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	
801.27	Riverside	0.07	0.28	1	0.28	0.84	0.07	0.71	0.71	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	10.09	
801.28	Riverside	1.78	14.17	1	14.17	9.34	1.78	4.35	4.35	11.07	11.07	11.07	11.07	11.07	11.07	11.07	11.07	11.07	11.07	
802.11	Riverside	26.71	123.15	2	31.42	27.71	12.22	12.22	24.44	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	
802.12	Riverside	27.48	116.47	1	33.83	17.56	17.56	18.01	18.01	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	11.48	
802.17	Harold-San Joaquin	20.42	204.47	6	42.46	115.18	79.21	13.26	339.42	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	12.68	14.13	
Total:										1,199.18	398.57	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	
Cumulative Total:										1,199.18	398.57	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	1,597.75	

FINAN RUND TREININGEN I CIVIL CALCULATIONS - \$ 800 US PER PERSON COURSE

Costs based on storage of a 24-hour duration were used in subsequent treatment of a 72-hour period.

[illegible]

Table C-11
Urban Rural Treatment Cost Calculations - San Diego County

[illegible]

Cells listed in range of 7 show duration event with subsequent treatment of a 17 day period.

a. Based on maximum sediment unit time of 50 Mg.

1. $\text{Lind cov} = 1174.260/\text{acre}$
 2. $\text{Propag cov} = [11,543 \text{ MJ}] \cdot (\text{Treatment und size, MJ/G}) \cdot 0.8$

$\delta^{18}\text{O}$ (‰) = [Dm¹⁸O / Dm¹⁶O] × 1000 ‰

$$A = \text{Annual electricity and maintenance cost} = (\$1,364) \cdot (5 \text{ years unit loss, } MCY) = 0.67$$
$$A^{\text{th}}(D) = \{ \text{LTP}^{\text{th}} \text{ "a type of an object"} \} = \{ \text{the } \text{LTP}^{\text{th}} \text{ "a type of an object"} \}$$

1

100

Table C-4
Urban Runoff Treatment Cost Calculations - Marin County

Watershed Sub-Unit	Unpaved Area	Area (sq. mi)	Runoff (mm per rainfall event)	Number of Units	Storage Unit Size (MG)	Level 1 Treatment Unit Area (sq. ft.)	Tributary Area (sq. ft.)	Interceptor Length (mi)	Total Interceptor Length (mi)	Project Cost (\$ millions @ 2018 Q1 2018)										Annual Operations and Maintenance Costs* (\$ thousands)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
										Level 1			Level 2			Level 3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
										Collection System		Total Cost ¹	Treatment Unit Area (sq. ft.)	Land Cost ²	Total Cost ¹	Treatment Unit Area (sq. ft.)	Land Cost ²	Total Treatment Unit Area (sq. ft.)	Treatment Unit Area (sq. ft.)	Land Cost ²	Total Treatment Unit Area (sq. ft.)	Treatment Unit Area (sq. ft.)	Land Cost ²	Total Treatment Unit Area (sq. ft.)	Collection System ³	Level 1 ⁴	Level 2 ⁴	Level 3 ⁴																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
										Treatment Unit Cost ¹	Land Cost ²																		Treatment Unit Cost ¹	Land Cost ²	Treatment Unit Cost ¹	Land Cost ²	Treatment Unit Cost ¹	Land Cost ²	Treatment Unit Cost ¹	Land Cost ²	Treatment Unit Cost ¹	Land Cost ²																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
201.3	San Francisco-Oakland	0.26	4.70	1	4.20	4.73	0.36	2.05	2.05	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37	11.37

Costs based on sample of 2-hour duration event with subsequent treatment of a 72-hour period.
 * Based on 100% runoff from paved areas.
 ** Based on 100% runoff from unpaved areas.
 *** Level 1 treatment unit area = (0.5 acre) * (Treatment unit size) * 0.8. Level 2 and Level 3 treatment unit area = 1.25 times Level 1 treatment unit area.
 **** Interceptor length based on the sum of the lengths of the sides and the diagonal of an assumed square shape.
 ***** Project cost = (0.35/3400) * (Treatment unit length, ft) * (Cost per ft) * (1.05), where the multiplier 1.05 is calculated relative to that used for the study area listed in Column (1977).
 * Level 1 cost = \$44,822/acre
 * Level 2 cost = \$14,000/acre
 * Level 3 cost = \$14,000/acre
 * Annual operations and maintenance cost = (0.15/3400) * (Treatment unit size, MG) * 0.8
 * Annual operations and maintenance cost = (0.15/3400) * (Treatment unit size, MG) * 0.8
 * Annual operations and maintenance cost = (0.15/3400) * (Treatment unit size, MG) * 0.8

Table C-1
Urban Runoff Treatment Cost Calculations - Alameda County

Hydrologic Sub-Unit	Project Cost (\$ million @ BMR CMC 97.16)										Annual Operations and Maintenance Costs* (\$ million/year)						
	Unutilized Area	Area (acres)	Roads (ft/acre related expense)	Number of Treatment Units ¹	Storage Unit Size (cu ft)	Total Treatment Unit Size ¹ (cu ft)	Temporary Storage (cu yd/acre)	Sedimentation System Length (mi)	Level 1		Level 2		Collection System	Level 1 ²	Level 2 ²	Level 3 ²	
									Treatment Unit Cost	Land Cost ³	Total Cost	Treatment Unit Incremental Cost					Land Cost ³
202.12	San Francisco-Oakland	14.72	2.97	1	3.87	119.26	16.82	61.82	17.20	11.26	10.42	15.12	15.47	40.086	10.100	10.188	10.073
202.2	San Francisco-Oakland	21.85	146.44	3	42.81	171.51	138.22	1159.47	44.97	11.26	10.42	15.12	15.47	40.086	10.100	10.188	10.073
204.1	San Francisco-Oakland	24.06	27.1	3	23.79	143.59	138.22	1159.47	44.97	11.26	10.42	15.12	15.47	40.086	10.100	10.188	10.073
204.2	San Francisco-Oakland	24.06	1,062.38	22	48.81	442.12	138.22	1159.47	44.97	11.26	10.42	15.12	15.47	40.086	10.100	10.188	10.073
204.3	San Francisco-Oakland	24.06	1,062.38	22	48.81	442.12	138.22	1159.47	44.97	11.26	10.42	15.12	15.47	40.086	10.100	10.188	10.073
205.1	San Francisco-Oakland	41.48	237.17	8	42.48	116.02	138.22	1159.47	44.97	11.26	10.42	15.12	15.47	40.086	10.100	10.188	10.073
205.2	San Francisco-Oakland	41.48	237.17	8	42.48	116.02	138.22	1159.47	44.97	11.26	10.42	15.12	15.47	40.086	10.100	10.188	10.073
208.1	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.2	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.3	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.4	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.5	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.6	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.7	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.8	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
208.9	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.1	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.2	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.3	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.4	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.5	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.6	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.7	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.8	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
209.9	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.1	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.2	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.3	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.4	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.5	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.6	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.7	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.8	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
210.9	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.1	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.2	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.3	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.4	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.5	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.6	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.7	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.8	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
211.9	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.1	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.2	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.3	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.4	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.5	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.6	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.7	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.8	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
212.9	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.1	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.2	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.3	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.4	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.5	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.6	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.7	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.8	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
213.9	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
214.1	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
214.2	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
214.3	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
214.4	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
214.5	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
214.6	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30.019	30.017	30.019
214.7	San Jose	5.53	0.28	1	1.74	2.78	1.16	11.16	15.70	11.71	10.13	11.62	14.34	30.019	30		

Costs based on storage of a 7-hour duration event with subsequent treatment of a 77-hour period.

a. Operations and maintenance costs based on 10 normal events per year.

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These findings suggest that it is not so much the amount of time spent on the job that is important, but the quality of the work environment. The study also found that the quality of the work environment is more important than the amount of time spent on the job. This is because a good work environment can lead to higher productivity and lower turnover, which can result in higher profits for the company. Therefore, companies should focus on improving the quality of their work environment rather than just increasing the amount of time their employees spend on the job.

* - Project cost = (2,067,310) * (Average ml) * (Duration) * 1.05

1 - Project cost = $(17.5230M) \cdot (7\text{ maintenance unit size, } 160) = 0.11$
 2 - Land cost = $1753.1404M$

$$h = \text{Project cost} = (\$1,500,000) \cdot (\text{Firearm's unit size, } WCI) \cdot 0.6$$

- Project cost = $(\$4,000/\text{hr}) \times (\text{Transverse units hrs}, \text{M}) \times 0.8$
- Annual operating and maintenance cost = $0.1 \times \text{sum of total cost} \times \text{return cost} / \text{hour cost}$

$$h = \text{Annual operations and maintenance cost} \times (10.344) \times (\text{Storage unit size, MCI}) = 0.67$$

1. Average and balance cost = $(12,070) \div (\text{Storage unit size, MO}) = 0.87$

[illegible]

Table C-3
Urban Runoff Treatment Cost Calculations - Central City County

Hydrologic Sub-Unit	Unsewered Area (sq. mi.)	Area (sq. mi.)	Runoff (MG per 100 acres year)	Number of Treatment Units ^a	Storage Unit Size (MG)	Level 1 Treatment Unit Area (Acres)	Total Treatment Unit Area (Acres)	Interceptor System Length (mi.)	Total Interceptor System Length (mi.)	PRMCS Cost (\$ mil/mi ² @ \$1M CCI/100)									
										Level 1		Level 2		Level 3		Annual Operations and Maintenance Costs ^b (\$ mil/year)			
										Treatment Unit Cost		Total Cost		Treatment Unit Incremental Cost		Collection System ^c	Treatment Unit ^d	Level 1 ^e	Level 2 ^f
										Year Cost	Level Cost	Total Cost	Level Cost	Incremental Cost	Incremental Cost				
207.1	Anderson-Parkway	4.84	3.86	1	1.86	4.50	4.50	7.25	7.25	16.37	17.54	16.37	17.54	17.54	17.54	10,000	10,000	10,000	10,000
207.2	Anderson-Parkway	21.34	16.57	2	46.41	40.00	40.00	22.34	22.34	175.84	182.94	175.84	182.94	182.94	182.94	10,000	10,000	10,000	10,000
207.3	Anderson-Parkway	15.78	12.35	1	22.44	17.78	17.78	11.18	11.18	112.97	119.97	112.97	119.97	119.97	119.97	10,000	10,000	10,000	10,000
207.4	San Francisco-Challenger	11.22	7.45	1	7.44	6.70	6.70	11.48	11.48	112.97	119.97	112.97	119.97	119.97	119.97	10,000	10,000	10,000	10,000
207.5	San Francisco-Challenger	13.22	8.40	2	17.07	15.31	15.31	11.48	11.48	225.94	237.94	225.94	237.94	237.94	237.94	10,000	10,000	10,000	10,000
207.6	San Francisco-Challenger	15.10	10.15	3	20.53	18.54	18.54	11.48	11.48	338.91	359.91	338.91	359.91	359.91	359.91	10,000	10,000	10,000	10,000
207.7	San Francisco-Challenger	26.81	16.81	4	4.86	5.25	5.25	20.43	20.43	451.87	467.87	451.87	467.87	467.87	467.87	10,000	10,000	10,000	10,000
207.8	San Francisco-Challenger	34.29	22.29	6	43.00	178.84	178.84	71.10	71.10	713.84	784.84	713.84	784.84	784.84	784.84	10,000	10,000	10,000	10,000
207.9	San Francisco-Challenger	46.12	29.12	8	41.71	113.15	113.15	11.12	11.12	826.81	837.81	826.81	837.81	837.81	837.81	10,000	10,000	10,000	10,000
207.10	San Francisco-Challenger	67.22	47.14	10	47.21	202.58	202.58	14.47	14.47	1,039.79	1,054.79	1,039.79	1,054.79	1,054.79	1,054.79	10,000	10,000	10,000	10,000
207.11	San Francisco-Challenger	31.02	21.02	5	42.29	6.17	6.17	42.47	42.47	509.01	515.01	509.01	515.01	515.01	515.01	10,000	10,000	10,000	10,000
207.12	San Francisco-Challenger	1.02	0.02	1	0.02	0.17	0.17	0.21	0.21	50.36	50.36	50.36	50.36	50.36	50.36	10,000	10,000	10,000	10,000
Total:										5,136.18	5,136.18	5,136.18	5,136.18	5,136.18	5,136.18	11,877	11,877	11,877	11,877
Cumulative Total:										5,136.18	5,136.18	5,136.18	5,136.18	5,136.18	5,136.18	11,877	11,877	11,877	11,877

Costs listed are averages of 24-hour duration events with subsequent treatment of 2.77-hour period.

a - Interceptor system length is based on a 100-foot treatment unit size of 50 MG.

b - Level 1 treatment unit area = (0.5 acres) * (Treatment unit size, MG) * 0.8.

c - Level 2 treatment unit area = (0.5 acres) * (Treatment unit size, MG) * 0.8.

d - Level 3 treatment unit area = (0.5 acres) * (Treatment unit size, MG) * 0.8.

e - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

f - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

g - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

h - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

i - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

j - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

k - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

l - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

m - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

n - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

o - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

p - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

q - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

r - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

s - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

t - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

u - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

v - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

w - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

x - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

y - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

z - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

aa - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ab - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ac - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ad - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ae - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

af - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ag - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ah - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ai - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

aj - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ak - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

al - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

am - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

an - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ao - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ap - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

aq - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ar - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

as - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

at - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

au - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

av - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

aw - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ax - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ay - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

az - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

ba - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

bb - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

bc - Project cost = (12.34 MG) * (Treatment unit size, MG) * 0.8.

Table C-3
Urban Runoff Treatment Cost Calculations - Fresno County

Hydrologic Sub-Job	Unpaved Area	Area (Acres)	Runoff (MG per 100 sq ft)	Number of Treatment Units ^a	Storage Unit Size (MG)	Total Level 1 Treatment Unit Area (sq ft)	Total Level 1 Treatment Unit Area (Acres)	Interceptor System Length (ft)	Interceptor System Capacity (MGD)	Total Incremental Cost	Project Cost (\$ million @ \$16.00 CWT)										Annual Operations and Maintenance Costs ^g (\$ million/year)																																																																																																																																																																																																																																																																																																													
											Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8		Level 9		Level 10		Level 11		Level 12		Level 13		Level 14		Level 15																																																																																																																																																																																																																																																																																											
											Total Cost ^h	Treatment Unit Cost ⁱ	Land Cost ^j	Total Cost ^k	Treatment Unit Cost ^l	Land Cost ^m	Total Cost ⁿ	Treatment Unit Cost ^o	Land Cost ^p	Total Cost ^q	Treatment Unit Cost ^r	Land Cost ^s	Total Cost ^t	Treatment Unit Cost ^u	Land Cost ^v	Total Cost ^w	Treatment Unit Cost ^x	Land Cost ^y	Total Cost ^z	Treatment Unit Cost ^{aa}	Land Cost ^{ab}	Total Cost ^{ac}	Treatment Unit Cost ^{ad}	Land Cost ^{ae}	Total Cost ^{af}	Treatment Unit Cost ^{ag}	Land Cost ^{ah}	Total Cost ^{ai}	Treatment Unit Cost ^{aj}	Land Cost ^{ak}	Total Cost ^{al}	Treatment Unit Cost ^{am}	Land Cost ^{an}	Total Cost ^{ao}	Treatment Unit Cost ^{ap}	Land Cost ^{aq}	Total Cost ^{ar}	Treatment Unit Cost ^{as}	Land Cost ^{at}	Total Cost ^{au}	Treatment Unit Cost ^{av}	Land Cost ^{aw}	Total Cost ^{ax}	Treatment Unit Cost ^{ay}	Land Cost ^{az}	Total Cost ^{ba}	Treatment Unit Cost ^{bb}	Land Cost ^{bc}	Total Cost ^{bd}	Treatment Unit Cost ^{be}	Land Cost ^{bf}	Total Cost ^{bg}	Treatment Unit Cost ^{bh}	Land Cost ^{bi}	Total Cost ^{bj}	Treatment Unit Cost ^{bk}	Land Cost ^{bl}	Total Cost ^{bm}	Treatment Unit Cost ^{bn}	Land Cost ^{bo}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}	Total Cost ^{bp}	Treatment Unit Cost ^{bp}	Land Cost ^{bp}

Costs based on average of 24-hour duration event with subsequent treatment of a 72-hour period.

- a. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- b. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- c. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- d. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- e. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- f. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- g. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- h. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- i. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- j. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- k. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- l. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- m. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- n. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- o. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- p. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- q. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- r. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- s. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- t. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- u. Based on 100-year return period rainfall intensity of 0.50 in/hr.
- v. Based on 100-year return period rainfall intensity of 0.50 in/hr.

Table C-1
Urban Runoff Treatment Costs Calculations - Los Angeles County

[illegible]

PHOTOGRAPHED BY GARY W. HARRIS

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,001-Year Return Period (in)
E40 0993 00	Berkeley	Alameda	-122.250	37.870	298	40	24.04	3.91	2.54	1.10
E40 0993 00	Berkeley	Alameda	-122.250	37.870	299	107	23.70	4.08	2.85	1.15
E40 1583 80	Castro Valley	Alameda	-122.081	37.698	255	13	19.19	2.89	1.88	0.81
E40 1848 00	Chabot Res.	Alameda	-122.120	37.730	245	115	22.04	3.17	2.06	0.86
E40 2213 00	Cull Canyon	Alameda	-122.062	37.770	620	6	16.60	3.25	2.11	0.91
E40 2213 77	Cull Canyon	Alameda	-122.062	37.776	620	19	27.80	5.19	3.37	1.46
E40 4357 00	Jenson Ranch	Alameda	-122.023	37.718	850	86	24.02	3.85	2.50	1.08
E40 5639 01	Mills College	Alameda	-122.183	37.763	200	11	25.75	3.65	2.37	1.03
E40 6332 01	Oakland 39th Ave	Alameda	-122.192	37.783	250	27	27.30	4.67	3.03	1.31
E40 6335 00	Oakland AP	Alameda	-122.200	37.733	3	83	20.39	3.30	2.14	0.93
E40 6335 00	Oakland AP	Alameda	-122.200	37.733	3	32	18.75	3.22	2.09	0.91
E40 6336 00	Oakland Museum	Alameda	-122.267	37.800	30	25	20.30	3.57	2.32	1.00
E40 6856 70	Piedmont FS	Alameda	-122.232	37.823	330	14	19.63	3.73	2.42	1.05
E40 6846 00	Temescal Reservoir	Alameda	-122.230	37.848	450	26	21.95	3.35	2.17	0.94
E40 9185 02	Upper San Leandro Dam	Alameda	-122.097	37.765	475	45	26.76	4.22	2.74	1.19
E50 0051 50	Alameda East Portal	Alameda	-121.867	37.550	775	8	19.90	2.74	1.78	0.77
E50 0146 00	Altamont	Alameda	-121.779	37.762	275	46	12.82	2.27	1.47	0.64
E50 0310 20	Arroyo Del Valle AC16	Alameda	-121.750	37.817	700	18	15.15	2.65	1.72	0.75
E50 0310 20	Arroyo Del Valle WTP	Alameda	-121.784	37.831	640	19	16.81	2.77	1.80	0.78
E50 1281 00	Cabreras Dam	Alameda	-121.820	37.490	805	83	21.94	3.18	2.06	0.89
E50 1583 80	Castro Valley	Alameda	-122.081	37.698	255	11	19.19	2.89	1.88	0.81
E50 1623 06	Castroville 54	Alameda	-122.335	37.557	52	68	18.17	2.61	1.69	0.73
E50 1958 00	Concannon Winery	Alameda	-121.748	37.699	580	10	15.39	2.64	1.71	0.74
E50 2326 00	Decoto	Alameda	-122.021	37.597	85	5	32.97	3.22	2.09	0.91
E50 2525 00	Dublin 1 W	Alameda	-121.938	37.698	450	18	23.10	3.88	2.52	1.09
E50 3863 00	Hayward Corp Yard	Alameda	-122.097	37.647	755	22	17.02	3.34	2.17	0.94
E50 3963 00	Hayward 6 ESE	Alameda	-121.986	37.652	715	45	25.87	4.75	3.08	1.34
E50 4997 00	Livermore	Alameda	-122.806	37.891	405	99	14.24	2.53	1.64	0.71
E50 4997 03	Livermore 2E	Alameda	-121.742	37.670	470	13	13.85	2.59	1.68	0.73
E50 4997 40	Livermore SNE	Alameda	-121.683	37.695	685	17	13.58	2.52	1.64	0.71
E50 5719 15	Mission San Jose	Alameda	-121.944	37.536	120	8	17.45	2.03	1.32	0.57
E50 5735 50	Mocho Well	Alameda	-121.872	37.687	345	8	12.96	2.33	1.51	0.66
E50 5735 50	Mocho Well 34	Alameda	-121.876	37.687	345	27	17.55	3.49	2.26	0.98
E50 5818 51	Mission Cr T K Rch	Alameda	-121.885	37.525	1,400	44	22.03	3.11	2.02	0.87
E50 6144 00	Newark	Alameda	-122.029	37.522	14	47	14.26	2.20	1.43	0.62
E50 6199 01	Niles	Alameda	-121.960	37.580	100	42	18.38	2.96	1.92	0.83
E50 6199 01	Niles	Alameda	-121.960	37.580	100	27	16.52	2.77	1.80	0.78
E50 6199 77	Niles 2 S	Alameda	-121.978	37.562	60	20	17.58	2.62	1.70	0.74
E50 6750 40	Patterson Pass WTP	Alameda	-121.683	37.746	685	28	13.36	2.48	1.61	0.70
E50 6991 09	Pleasanton 2 4 NE	Alameda	-121.848	37.680	370	18	16.78	3.25	2.11	0.91
E50 6991 09	Pleasanton Pumps	Alameda	-121.900	37.660	320	49	20.03	3.57	2.32	1.00
E50 7712 50	San Antonio	Alameda	-121.830	37.580	449	19	18.70	3.65	2.37	1.03
E50 7842 01	San Leandro	Alameda	-122.150	37.717	48	12	23.56	3.34	2.17	0.94
E50 7842 04	San Leandro 2 NE	Alameda	-122.150	37.717	48	9	21.51	3.32	2.15	0.93
E50 8670 01	Sunol	Alameda	-121.880	37.590	220	83	19.92	3.16	2.05	0.89
E50 9525 00	Wente Winery	Alameda	-121.774	37.663	775	18	13.46	2.44	1.58	0.69
E60 6144 00	Newark	Alameda	-122.029	37.522	14	46	14.21	2.21	1.43	0.62
B80 0232 00	Arboch PP	Contra Costa	-121.728	37.984	60	99	12.51	2.30	1.56	0.73
B80 1060 00	Brentwood 6 SW	Contra Costa	-121.774	37.883	325	35	16.19	3.20	2.17	1.01
B90 0227 00	Antioch Fiberboard	Contra Costa	-121.737	38.017	30	25	13.93	2.63	1.78	0.83
B90 0632 50	Baker Pump 14	Contra Costa	-121.625	37.940	14	16	10.21	1.77	1.20	0.56
B90 0632 50	Baker Pump 14	Contra Costa	-121.625	37.940	14	8	9.95	1.69	1.15	0.53
B90 1059 00	Brentwood	Contra Costa	-121.697	37.920	85	21	12.17	2.21	1.50	0.70
B90 1059 35	Brentwood CIMS 47	Contra Costa	-121.659	37.093	45	10	11.34	1.72	1.17	0.54
B90 5130 50	Los Medanos	Contra Costa	-121.855	37.998	130	17	9.78	1.83	1.24	0.58
B90 5130 50	Los Medanos 19	Contra Costa	-121.855	37.998	130	9	11.09	1.78	1.21	0.56
B90 6339 00	Oakley Stripup	Contra Costa	-121.735	37.935	65	5	14.91	2.96	2.02	0.94
E40 0064 00	Alamo 1N	Contra Costa	-122.033	37.867	410	17	22.33	4.51	2.93	1.27
E40 0451 70	Bald Peak	Contra Costa	-122.222	37.883	1,905	8	25.45	4.74	3.08	1.33
E40 0451 70	Bald Peak 32	Contra Costa	-122.222	37.883	1,905	8	27.31	4.25	2.76	1.20
E40 1216 00	Burton Ranch	Contra Costa	-122.083	37.867	530	18	24.29	4.66	3.02	1.31
E40 1962 00	Concord 3 E	Contra Costa	-121.983	37.967	200	18	16.28	3.13	2.03	0.88
E40 2177 80	Crockett C&H	Contra Costa	-122.217	38.051	9	34	18.59	3.35	2.17	0.94
E40 2177 80	Crockett C&H	Contra Costa	-122.217	38.051	9	15	18.20	3.34	2.17	0.94
E40 2279 50	Danville Wu	Contra Costa	-122.002	37.830	330	20	25.41	4.51	2.93	1.27
E40 2279 50	Danville Wu 17	Contra Costa	-122.002	37.830	330	20	25.41	4.52	2.93	1.27
E40 2533 20	Dublin FS	Contra Costa	-121.927	37.732	355	19	16.69	2.80	1.84	0.80
E40 2533 20	Dublin FS	Contra Costa	-121.927	37.732	355	20	16.69	2.84	1.91	0.83
E40 3652 00	Grozzley Peak	Contra Costa	-121.217	37.867	1,754	11	21.58	3.54	2.30	1.00
E40 4633 00	La Fayette	Contra Costa	-121.100	37.917	540	21	23.93	4.40	2.86	1.24
E40 4639 00	La Fayette Reservoir	Contra Costa	-121.100	37.767	460	59	26.94	4.50	2.92	1.27
E40 5366 50	Marsh Creek Fire Sta	Contra Costa	-121.865	37.897	680	18	19.71	3.63	2.36	1.02
E40 5366 50	Marsh Creek Fire Sta 17	Contra Costa	-121.865	37.897	680	17	20.29	3.86	2.50	1.08

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year) Return Period (in)	1,0181-Year Return Period (in)
E40 5371 00	Martinez 3S	Contra Costa	-122.133	37.967	225	45	21.70	3.71	2.41	1.04
E40 5371 50	Martinez FCD	Contra Costa	-122.087	37.968	49	23	16.03	2.90	1.88	0.82
E40 5371 50	Martinez FCD	Contra Costa	-122.087	37.968	49	23	15.42	3.08	1.99	0.86
E40 5371 77	Martinez 37	Contra Costa	-122.179	37.977	800	9	20.23	3.70	2.40	1.04
E40 5371 77	Martinez 37	Contra Costa	-122.179	37.977	800	11	19.38	3.67	2.38	1.03
E40 5372 00	Martinez 3 SSE	Contra Costa	-122.100	37.957	260	20	20.31	3.75	2.43	1.05
E40 5378 00	Martinez Wb Ph	Contra Costa	-122.117	38.017	40	86	18.40	3.27	2.12	0.92
E40 5456 50	Morgan Territory	Contra Costa	-121.795	37.818	2,030	13	23.93	4.43	2.87	1.25
E40 5456 50	Morgan Territory	Contra Costa	-121.795	37.818	2,030	13	23.79	4.48	2.91	1.26
E40 5915 00	Mt Diablo Junction	Contra Costa	-121.933	37.867	2,170	44	23.23	4.09	2.65	1.13
E40 5916 00	Mt Diablo St Ph	Contra Costa	-121.933	37.850	1,600	27	22.75	4.41	2.86	1.24
E40 5916 00	Mt Diablo St Ph 13	Contra Costa	-121.933	37.850	1,600	30	22.75	4.20	2.73	1.18
E40 5916 20	Mt Diablo	Contra Costa	-121.918	37.880	3,690	15	28.21	5.05	3.28	1.42
E40 5916 20	Mt Diablo 22	Contra Costa	-121.918	37.880	3,690	15	27.54	4.93	3.20	1.39
E40 5925 00	Mt Eden	Contra Costa	-122.108	37.830	35	21	17.58	5.15	3.34	1.45
E40 5925 00	Mt Eden	Contra Costa	-122.108	37.830	35	21	17.58	3.30	2.14	0.93
E40 6501 01	Orinda Filters	Contra Costa	-122.200	37.893	370	32	32.55	6.05	3.93	1.70
E40 6501 01	Orinda Filters	Contra Costa	-122.200	37.893	370	51	31.83	5.25	3.41	1.48
E40 6501 01	Orinda FS 18	Contra Costa	-122.170	37.895	700	22	28.22	4.72	3.06	1.33
E40 6502 00	Orinda Bowman	Contra Costa	-122.167	37.867	700	12	30.52	4.93	3.20	1.39
E40 6502 22	Orinda FS 18	Contra Costa	-122.170	37.894	700	41	28.93	4.79	3.11	1.35
E40 6503 07	Orinda 11 Ivy Dr	Contra Costa	-122.151	37.855	695	28	33.91	5.81	3.77	1.63
E40 6931 00	Phelan Cr GS	Contra Costa	-122.241	37.972	385	25	20.14	3.07	1.99	0.86
E40 7031 50	Point Richmond	Contra Costa	-122.561	37.908	10	43	21.27	3.19	2.07	0.90
E40 7414 50	Port Chicago	Contra Costa	-122.017	38.017	50	27	15.65	2.69	1.75	0.78
E40 7414 50	Richmond City Hall	Contra Costa	-122.350	37.933	55	19	19.21	3.81	2.47	1.07
E40 7414 50	Richmond City Hall 21	Contra Costa	-122.350	37.933	55	45	21.77	3.93	2.55	1.11
E40 7528 77	Rockley Ridge	Contra Costa	-122.061	37.817	2,020	9	23.43	3.80	2.47	1.07
E40 7528 77	Rockley Ridge	Contra Costa	-122.061	37.817	2,020	7	22.14	3.19	2.07	0.90
E40 7528 10	Rodero Fire Station	Contra Costa	-122.770	38.035	30	22	18.22	3.30	2.14	0.93
E40 7528 10	Rodero Fire Station 15	Contra Costa	-122.770	38.035	30	22	18.22	3.35	2.17	0.94
E40 7661 00	St Marys College	Contra Costa	-122.107	37.841	640	40	27.53	5.26	3.41	1.48
E40 7661 00	St Marys College 13	Contra Costa	-122.107	37.841	640	52	27.32	5.01	3.25	1.41
E40 7872 06	San Pablo Creek	Contra Costa	-122.203	37.897	345	17	23.84	3.91	2.54	1.10
E40 7872 07	San Pablo Filters	Contra Costa	-122.286	37.912	250	18	25.08	4.13	2.58	1.16
E40 7874 14	San Pablo Reservoir	Contra Costa	-122.262	37.941	330	67	26.12	4.07	2.64	1.14
E40 8324 50	Sabranite Filters	Contra Costa	-122.279	37.964	250	21	26.86	4.63	3.00	1.30
E40 8324 50	Sabranite Filters	Contra Costa	-122.279	37.964	250	28	24.53	3.61	2.34	1.02
E40 9185 00	Upper San Leandro Filters	Contra Costa	-122.164	37.774	413	50	23.12	3.82	2.48	1.07
E40 9185 00	Upper San Leandro Filters	Contra Costa	-122.164	37.774	413	44	23.08	3.93	2.55	1.11
E40 9223 11	Valley Vista	Contra Costa	-122.130	37.821	550	15	27.49	3.99	2.59	1.12
E40 9420 00	Walnut School	Contra Costa	-122.083	37.950	120	12	21.00	4.80	3.11	1.35
E40 9421 01	Walnut Creek Filters	Contra Costa	-122.085	37.913	384	16	22.74	4.18	2.71	1.18
E40 9421 01	Walnut Creek Filters	Contra Costa	-122.085	37.913	384	28	22.16	3.82	2.48	1.07
E40 9423 00	Walnut Creek 2 ESE	Contra Costa	-122.033	37.883	250	26	20.79	3.52	2.28	0.99
E40 9423 07	Walnut Creek Johnson	Contra Costa	-122.058	37.924	95	10	22.37	3.91	2.54	1.10
E40 9423 77	Walnut Creek Treat	Contra Costa	-122.029	37.938	83	9	18.29	3.56	2.31	1.00
E40 9425 80	Walnut Cr Glenhaven	Contra Costa	-121.058	37.880	180	7	16.29	3.23	2.10	0.91
E40 9426 80	Walnut Cr FTC 33	Contra Costa	-122.029	37.938	25	9	15.44	2.35	1.52	0.64
E40 9426 80	Walnut Cr FTC 33	Contra Costa	-122.029	37.938	25	9	12.28	2.64	1.71	0.74
E40 9427 00	Walnut Creek 4 E	Contra Costa	-121.983	37.900	400	21	16.52	3.44	2.23	0.97
E40 9429 50	Walnut Creek 2 ENE	Contra Costa	-122.044	37.935	80	44	17.89	3.77	2.45	1.06
E40 9429 50	Walnut Creek 2 NE	Contra Costa	-122.044	37.935	80	15	15.72	3.78	2.45	1.06
E50 0058 00	Alamo Creek	Contra Costa	-121.891	37.802	800	46	17.63	2.97	1.93	0.84
E50 2428 00	Diablo PO	Contra Costa	-121.963	37.837	500	20	18.49	2.79	1.81	0.78
E50 2533 20	Dublin Fire Sta	Contra Costa	-121.927	37.732	355	19	18.89	2.83	1.84	0.80
E50 8785 00	Tassajara Creek	Contra Costa	-121.848	37.788	750	43	15.95	2.65	1.72	0.73
E50 8785 50	Tassajara Creek Wood	Contra Costa	-121.941	37.803	520	39	19.50	3.18	2.05	0.88
E50 9502 00	Wedemans Ranch	Contra Costa	-121.983	37.765	750	19	20.87	4.41	2.86	1.24
800 3083 00	Firebaugh SW	Fresno	-120.617	36.851	187	6	8.21	1.57	1.06	0.50
800 4979 00	Little Panoche Del Dam	Fresno	-120.800	36.783	2,650	7	6.54	1.82	1.23	0.58
800 5520 00	Mendota VDL Farms	Fresno	-120.800	36.749	230	14	7.19	1.43	0.97	0.45
800 5528 00	Mendota 1 NNW	Fresno	-120.388	36.773	172	17	6.30	1.26	0.85	0.40
800 5528 00	Mendota Dam	Fresno	-120.372	36.786	168	90	7.38	1.59	1.08	0.50
800 5529 00	Mendota Halfway Pump	Fresno	-120.392	36.468	450	12	8.99	1.43	0.97	0.45
800 6877 00	Panoche Creek	Fresno	-120.583	36.683	370	6	5.99	1.89	1.28	0.60
800 7088 11	Paso Canal Co HQ	Fresno	-120.501	36.982	125	34	7.87	1.48	0.99	0.46
860 0049 00	Ahwasnee 2 NNW	Fresno	-119.735	37.388	2,680	25	23.15	4.08	2.75	1.28
860 0544 50	Baccharion RS	Fresno	-119.626	37.432	2,100	19	31.00	4.55	3.09	1.44
870 0379 00	Auberry 1 NW	Fresno	-119.508	37.090	2,140	81	24.88	4.02	2.73	1.27
870 0756 00	Big Creek PH 1	Fresno	-119.242	37.204	4,930	54	31.33	4.92	3.34	1.58
870 3093 00	Florence Lake	Fresno	-118.974	37.273	7,345	56	25.87	3.67	2.49	1.18
870 3093 00	Florence Lake	Fresno	-118.974	37.273	7,345	66	23.02	3.86	2.62	1.22

R0006402

Table C-26
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,0101-Year Return Period (in)
870 3261 00	Friant GC	Fresno	-119.717	36.983	410	79	13.70	2.49	1.89	0.79
870 3261 00	Friant GC	Fresno	-119.717	36.983	410	11	13.65	2.04	1.38	0.85
870 4176 00	Huntington Lake	Fresno	-119.229	37.229	7,020	54	40.47	5.86	3.84	1.79
870 4176 00	Huntington Lake	Fresno	-119.229	37.229	7,020	69	34.76	5.07	3.44	1.80
870 4442 00	Kaiser Meadows	Fresno	-119.100	37.300	9,300	5	48.51	6.95	4.71	2.20
870 5496 00	Meadow Lake	Fresno	-119.023	37.229	4,480	27	28.54	4.61	3.13	1.46
870 5893 00	Mountain Rest	Fresno	-119.370	37.055	4,100	5	30.47	6.15	4.17	1.95
870 8140 01	Shaver Lake	Fresno	-119.302	37.147	5,393	23	37.43	5.33	3.61	1.69
870 8651 00	Tolhouse	Fresno	-119.400	37.017	1,790	29	27.07	4.80	3.12	1.45
880 4979 00	Little Panache Del Dam	Fresno	-120.800	36.783	2,850	7	6.58	1.82	1.23	0.58
880 5550 00	Mercury Hot Springs	Fresno	-120.867	36.700	1,170	24	8.15	2.04	1.38	0.65
C00 1490 00	Caninus Ranch	Fresno	-120.389	36.476	290	20	7.53	1.97	1.25	0.53
C00 1851 00	Clover 7SE	Fresno	-119.700	36.833	375	30	12.29	2.21	1.41	0.59
C00 1864 00	Coalinga	Fresno	-120.350	36.150	671	86	7.44	1.72	1.10	0.46
C00 1867 00	Coalinga 1 SE	Fresno	-120.344	36.128	863	54	7.37	1.99	1.27	0.53
C00 3064 00	Five Points Damar	Fresno	-120.103	36.372	263	48	6.86	1.70	1.08	0.45
C00 3085 00	Five Points CIMIS 2	Fresno	-120.113	36.336	285	13	9.42	2.51	1.80	0.67
C00 3257 00	Fresno	Fresno	-119.717	36.770	331	94	10.21	2.06	1.31	0.55
C00 3257 00	Fresno	Fresno	-119.717	36.770	331	109	10.07	2.11	1.34	0.56
C00 3258 00	Fresno Westside FS	Fresno	-120.273	36.141	600	27	6.47	1.72	1.10	0.46
C00 4186 00	Huron Ranch	Fresno	-120.100	36.267	335	53	6.92	1.78	1.13	0.47
C00 4453 00	Kearney FS	Fresno	-119.500	36.543	337	7	11.02	2.14	1.36	0.57
C00 4510 00	Kerman	Fresno	-120.050	36.717	218	18	8.01	1.75	1.11	0.47
C00 4564 20	Kingsburg 2 S	Fresno	-119.550	36.500	286	24	10.52	2.36	1.50	0.63
C00 4929 07	Luton	Fresno	-119.696	36.433	250	27	8.67	2.08	1.32	0.55
C00 5526 00	Mendota Murreta	Fresno	-120.455	36.650	261	17	6.86	1.48	0.94	0.39
C00 5526 16	Mendota	Fresno	-120.315	36.630	260	40	7.10	1.57	1.00	0.42
C00 6393 00	Offhills	Fresno	-120.314	36.247	950	25	8.18	2.09	1.33	0.56
C00 6476 00	Orange Cove	Fresno	-119.311	36.622	431	53	12.79	2.48	1.58	0.66
C00 6678 00	Panache Junction	Fresno	-120.450	36.533	420	24	5.63	1.55	0.99	0.41
C00 6712 00	Parlier CIMIS 39	Fresno	-119.503	35.598	337	11	14.30	2.77	1.76	0.74
C00 7354 80	Raeclay MVFD	Fresno	-119.450	36.617	347	38	11.94	2.37	1.51	0.63
C00 7460 00	Riverdale	Fresno	-119.311	36.622	413	63	8.00	1.83	1.17	0.49
C00 7460 70	Riverdale 3 E	Fresno	-119.796	36.431	230	3	12.24	2.34	1.49	0.62
C00 7800 02	Sanger 1 NE	Fresno	-119.543	36.725	375	42	11.59	2.25	1.43	0.60
C00 7800 03	Sanger RS	Fresno	-119.555	36.730	375	31	11.30	2.14	1.36	0.57
C00 7816 00	San Joaquin	Fresno	-120.188	36.607	174	75	7.11	1.61	1.03	0.43
C00 9006 00	Tranquility Glot	Fresno	-120.237	36.633	165	27	7.47	2.05	1.31	0.55
C00 9391 50	Westside FS	Fresno	-120.100	36.333	275	9	8.09	2.03	1.29	0.54
C00 9560 00	Westhaven	Fresno	-119.994	36.227	285	55	7.01	1.79	1.14	0.48
C10 0009 00	Academy	Fresno	-119.540	36.863	545	11	13.36	3.06	1.95	0.82
C10 0451 50	Bald Mtn	Fresno	-119.400	37.070	4,720	5	34.94	5.95	3.79	1.59
C10 0680 00	Blastinggame	Fresno	-119.446	36.960	1,050	31	19.76	3.58	2.26	0.95
C10 1664 00	Charlton Lake	Fresno	-118.422	36.797	10,400	11	30.55	4.37	2.78	1.17
C10 1720 00	Batch PH	Fresno	-119.087	36.909	1,720	58	29.20	5.40	3.44	1.44
C10 1720 00	Batch PH	Fresno	-119.087	36.909	1,720	42	27.56	4.62	2.94	1.23
C10 1821 00	CMI Camp	Fresno	-118.967	36.963	6,174	18	36.09	6.50	4.14	1.73
C10 2439 01	Dinkley Meadow	Fresno	-119.150	37.100	5,550	14	34.71	6.44	4.10	1.72
C10 3894 00	Helm Creek	Fresno	-118.967	37.133	8,200	8	35.36	5.17	3.29	1.38
C10 6857 00	Pedra	Fresno	-119.383	36.817	580	35	16.63	3.20	2.04	0.85
C10 6896 00	Pine Flat Dam	Fresno	-119.330	36.830	615	47	19.28	3.99	2.54	1.06
C10 6896 00	Pine Flat Dam	Fresno	-119.330	36.830	615	32	19.07	4.01	2.55	1.07
C10 6902 00	Pinehurst	Fresno	-119.015	36.598	2,050	32	30.36	5.81	3.70	1.55
C10 8474 80	Square Valley	Fresno	-119.206	36.749	1,750	33	21.90	4.34	2.78	1.16
C10 9025 00	Trimmar RS	Fresno	-119.268	36.902	1,540	44	25.05	5.53	3.52	1.48
C10 9749 00	Wichon Dam	Fresno	-118.975	37.067	6,560	39	44.42	6.08	5.15	2.16
C20 5708 00	Miramonte HC	Fresno	-119.063	36.667	3,005	39	25.84	4.54	2.89	1.21
C70 0353 05	Associated Oil 83	Fresno	-120.630	36.152	1,850	14	16.69	3.60	2.29	0.96
C70 0827 00	Bitterwater Pump Sta	Fresno	-120.113	35.558	1,544	21	7.87	2.04	1.30	0.54
C70 1864 02	Coalinga Roberts	Fresno	-120.444	36.038	1,350	27	14.09	3.24	2.06	0.86
C70 1869 00	Coalinga 14 WNW	Fresno	-120.567	36.223	1,640	23	15.43	3.43	2.18	0.91
C70 2785 00	El Rancho Caninus	Fresno	-120.479	36.413	1,021	24	7.04	2.14	1.36	0.57
C70 3258 01	Fresno Co Road Camp	Fresno	-120.600	36.308	1,800	7	15.37	3.73	2.38	0.99
C70 5320 00	Maple Ranch	Fresno	-120.483	36.039	2,640	9	19.60	4.77	3.04	1.27
C70 6708 00	Partfield 8 NWW	Fresno	-120.483	36.017	2,640	28	12.74	2.86	1.82	0.76
C70 8438 35	Spanish Lake	Fresno	-120.526	36.262	4,840	9	15.82	3.24	2.06	0.86
G10 7128 00	Prather Talmán Ranch	Fresno	-119.660	37.040	1,300	8	26.16	4.34	2.71	1.03
C00 0332 00	Arvin	Kern	-118.817	35.200	445	34	8.34	1.67	1.06	0.45
C00 0332 30	Arvin FS	Kern	-118.833	35.210	440	20	6.12	1.69	1.08	0.45
C00 0332 50	Arvin Edison	Kern	-118.776	35.209	510	15	8.27	2.18	1.39	0.58
C00 0440 00	Bakersfield 1W	Kern	-119.038	35.378	400	56	6.48	1.60	1.02	0.43
C00 0440 40	Bakersfield Greenlee	Kern	-119.081	35.077	383	20	7.72	2.13	1.36	0.57
C00 0442 00	Bakersfield AP	Kern	-119.043	35.427	494	96	6.03	1.51	0.96	0.40

R0006403

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,0101-Year Return Period (in)
C00 0442 00	Bakersfield AP	Kern	-119.043	35.427	494	58	6.05	1.43	0.91	0.38
C00 0631 00	Bellview	Kern	-119.116	35.336	369	8	6.41	1.44	0.92	0.38
C00 0875 00	Blackwells Corner	Kern	-119.894	35.621	271	28	5.86	1.77	1.13	0.47
C00 0875 50	Blackwells Corner CIMS 54	Kern	-119.958	35.650	705	9	8.49	2.08	1.32	0.55
C00 1171 50	Buena Vista	Kern	-119.287	35.235	340	19	4.41	1.50	0.96	0.40
C00 1174 00	Buena Vista Ranch	Kern	-119.317	35.350	310	78	5.78	1.67	1.06	0.45
C00 1244 50	Buttontwallow	Kern	-119.469	35.401	275	60	5.43	1.46	0.93	0.39
C00 1244 50	Buttontwallow FS	Kern	-119.469	35.401	275	20	4.76	1.32	0.84	0.35
C00 2012 00	Delano	Kern	-119.248	35.773	323	52	6.99	1.66	1.06	0.44
C00 2012 01	Delano Govt Camp	Kern	-119.183	35.810	394	24	7.78	1.93	1.23	0.51
C00 2355 50	Del Kern Station	Kern	-119.012	35.268	345	13	8.15	1.83	1.17	0.49
C00 2408 00	Devil's Den	Kern	-119.973	35.785	500	27	6.78	1.96	1.18	0.50
C00 2436 00	Di Giorgio	Kern	-118.850	35.252	483	13	6.34	1.83	1.17	0.49
C00 3428 01	Gin Yard	Kern	-119.738	35.153	295	32	5.13	1.73	1.10	0.46
C00 3747 00	Hamford	Kern	-119.665	36.329	242	86	8.21	1.82	1.16	0.49
C00 4513 50	Kern Co Comm Center	Kern	-118.964	35.411	450	19	5.48	1.52	0.97	0.41
C00 4534 00	Kettleman City	Kern	-119.965	35.993	310	55	7.05	1.72	1.10	0.46
C00 5151 00	Lost Hills	Kern	-119.785	35.617	285	56	8.01	1.53	0.97	0.41
C00 5151 30	Lost Hills DWR	Kern	-119.694	35.614	312	38	6.31	1.65	1.05	0.44
C00 5460 50	Mc Farland	Kern	-119.228	35.674	450	19	5.69	1.39	0.89	0.37
C00 5757 00	Magunden	Kern	-118.922	36.362	440	62	6.47	1.54	0.96	0.41
C00 6230 50	North Belridge	Kern	-119.791	35.551	630	29	5.66	1.79	1.14	0.48
C00 6651 00	Paloma ranch	Kern	-119.192	35.181	300	8	5.41	1.56	0.99	0.42
C00 7098 11	Paso Ranch	Kern	-119.236	36.608	370	56	5.94	1.55	0.99	0.41
C00 7436 11	Rio Bravo FS	Kern	-118.869	35.431	450	16	6.48	1.59	1.01	0.42
C00 7555 00	Rosedale Ranch	Kern	-119.129	36.428	380	55	5.82	1.53	0.97	0.41
C00 7753 00	San Emigdio Ranch	Kern	-119.188	35.008	280	56	8.38	2.13	1.36	0.57
C00 7753 00	San Emigdio Ranch	Kern	-119.188	35.008	280	5	6.72	1.97	1.25	0.53
C00 7967 80	Santiago Ranch	Kern	-119.204	35.076	500	6	5.88	1.72	1.10	0.48
C00 8123 11	Shafter CIMS 5	Kern	-119.281	35.533	360	13	7.78	1.90	1.21	0.51
C00 8375 00	South Belridge	Kern	-119.709	35.455	575	53	5.99	1.68	1.07	0.45
C00 8596 00	Stratford CIMS 15	Kern	-119.850	36.158	193	13	7.67	2.07	1.32	0.55
C00 8707 00	South Lake FS	Kern	-118.390	35.647	190	5	5.51	1.60	1.02	0.43
C00 8839 00	Taylor Rancho	Kern	-118.744	35.027	1,425	98	11.22	2.27	1.45	0.61
C00 9052 00	Tulefield	Kern	-119.017	35.150	300	11	5.01	1.41	0.90	0.38
C00 9145 00	US Cotton Field Sta	Kern	-119.278	35.533	367	46	5.99	1.59	1.01	0.42
C00 9411 01	Walt	Kern	-119.043	35.420	300	19	5.90	1.47	0.94	0.39
C00 9452 00	Wasco	Kern	-119.333	35.593	333	69	6.47	1.72	1.10	0.46
C00 9499 50	Weed Patch 8 SW	Kern	-118.922	35.139	390	8	6.80	1.53	0.97	0.41
C00 9614 00	Wheeler Ridge	Kern	-118.950	34.967	1,675	5	6.79	1.57	1.00	0.42
C00 9614 10	Wheeler Ridge WSD	Kern	-119.086	35.058	484	23	7.84	2.17	1.38	0.58
C00 9724 60	Wind Gap	Kern	-119.753	35.936	210	17	8.66	2.12	1.35	0.57
C40 3463 00	Glenville	Kern	-118.702	35.724	3,140	67	19.37	3.57	2.27	0.95
C40 3465 00	Glenville Fulton	Kern	-118.667	35.733	3,500	45	21.55	3.46	2.20	0.92
C40 3465 00	Glenville Fulton	Kern	-118.667	35.733	3,500	32	17.48	4.19	2.67	1.12
C40 6391 00	Smoot Ranch	Kern	-118.898	35.520	805	13	8.01	1.83	1.17	0.49
C40 9805 00	Woody	Kern	-118.843	35.701	1,630	33	12.23	2.21	1.41	0.59
C50 0961 00	Bonel PH	Kern	-118.517	35.583	2,280	8	12.12	3.07	1.96	0.82
C50 4303 00	Isabella Dam	Kern	-118.480	35.650	2,660	48	10.40	2.80	1.78	0.75
C50 4303 00	Isabella Dam	Kern	-118.480	35.650	2,660	29	10.18	2.78	1.77	0.74
C50 4513 00	Kern Canyon PH PG&E	Kern	-118.795	35.441	700	45	8.73	1.87	1.19	0.50
C50 4519 00	Kern Riv Intake SCE	Kern	-118.478	35.945	3,642	59	12.02	4.15	2.64	1.11
C50 4520 00	Kern River PH 1	Kern	-118.783	35.487	970	77	10.62	2.18	1.39	0.58
C50 4523 00	Kern River PH 3	Kern	-118.435	35.776	2,703	47	12.79	2.95	1.86	0.79
C50 6462 80	Onyx 2	Kern	-118.233	35.683	2,700	37	8.65	2.38	1.52	0.63
C50 9612 00	Weldon 1 WSW	Kern	-118.300	35.687	2,680	47	8.13	2.05	1.31	0.55
C50 9754 00	Worford Heights	Kern	-118.450	35.717	2,700	78	10.46	2.74	1.75	0.73
C60 0571 01	Bear Valley	Kern	-118.640	35.117	4,100	33	19.97	3.44	2.19	0.92
C60 1296 01	Callente	Kern	-118.633	35.300	1,290	26	12.02	2.75	1.75	0.73
C60 1296 02	Callente 11 E	Kern	-118.483	35.300	2,450	6	19.68	3.39	2.16	0.90
C60 2222 00	Cummings Valley	Kern	-118.583	35.117	3,825	9	10.53	2.08	1.32	0.55
C60 2643 20	Edmonson Pump	Kern	-118.825	34.944	450	5	11.15	3.48	2.22	0.93
C60 2643 20	Edmonson Pump	Kern	-118.825	34.944	450	21	8.28	2.39	1.52	0.64
C60 4443 00	Keene	Kern	-118.565	35.224	2,575	9	14.83	2.88	1.83	0.77
C60 4443 00	Keene FS	Kern	-118.565	35.224	2,575	42	14.95	2.77	1.78	0.74
C60 4863 00	Labac	Kern	-118.864	34.833	3,500	50	12.79	3.56	2.27	0.95
C60 5098 00	Loraine	Kern	-118.480	35.335	2,720	52	8.31	2.07	1.32	0.55
C60 6754 00	Pattaway	Kern	-119.381	34.941	3,868	71	9.87	2.44	1.55	0.65
C60 8826 00	Tehachapi	Kern	-118.442	35.134	3,975	75	11.01	2.55	1.62	0.68
C60 8826 01	Tehachapi #1	Kern	-118.448	35.112	4,150	15	11.35	2.91	1.85	0.78
C60 8826 02	Tehachapi #2	Kern	-118.448	35.092	4,700	10	15.16	3.48	2.20	0.92
C60 8826 04	Tehachapi #4	Kern	-118.424	35.075	5,100	17	15.37	2.96	1.89	0.79
C60 8826 06	Tehachapi #6	Kern	-118.417	35.064	5,000	18	17.11	3.95	2.52	1.05

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								10-Year Return Period (in)	Mean 2-Year Return Period (in)	1,001-Year Return Period (in)
C60 8826 09	Tehachapi #9	Kern	-118.490	35.060	5,500	17	18.61	4.56	2.90	1.22
C60 8826 12	Tehachapi #12	Kern	-118.447	35.071	5,500	15	18.61	4.56	2.90	1.22
C60 8826 13	Tehachapi #13	Kern	-118.447	35.079	5,200	15	16.82	4.27	2.72	1.14
C60 8826 18	Tehachapi #16	Kern	-118.483	35.071	6,300	17	18.42	4.25	2.71	1.13
C60 8826 18	Tehachapi #18	Kern	-118.461	35.057	6,100	12	21.55	4.00	2.55	1.07
C60 8826 26	Tehachapi #26	Kern	-118.411	35.093	4,400	16	11.35	2.92	1.86	0.78
C60 8826 28	Tehachapi #28	Kern	-118.414	35.130	4,100	16	8.72	1.82	1.16	0.49
C60 8826 30	Tehachapi #30	Kern	-118.404	35.111	4,150	16	10.83	2.32	1.48	0.62
C60 8832 00	Tehachapi AP	Kern	-118.442	35.134	3,973	54	11.01	2.32	1.48	0.62
C60 9417 10	Waukar Bash	Kern	-118.543	35.388	3,450	9	16.05	4.51	2.87	1.20
C70 0215 00	Annette	Kern	-120.178	35.851	2,140	22	10.74	2.54	1.62	0.68
C70 0220 00	Antelope Valley	Kern	-120.167	35.713	1,205	26	8.95	2.14	1.36	0.57
C70 0353 01	Associated Oil A	Kern	-120.325	36.280	1,200	7	5.58	1.52	0.97	0.41
C70 0353 02	Associated Oil #1	Kern	-120.392	36.145	825	13	8.36	1.64	1.04	0.44
C70 0353 03	Associated Oil #2	Kern	-120.477	36.080	1,343	15	9.88	2.51	1.60	0.67
C70 0353 04	Associated Oil #2H	Kern	-120.575	36.110	1,153	7	9.26	2.84	1.81	0.76
C70 1545 00	Carnegie	Kern	-119.800	35.533	720	9	5.71	1.52	0.97	0.41
C70 3005 00	Fellows	Kern	-119.544	35.179	1,340	30	6.80	1.87	1.19	0.50
C70 4424 00	Junction	Kern	-119.960	35.645	703	32	6.01	2.01	1.28	0.54
C70 5338 00	Mancoopa	Kern	-119.383	35.080	680	79	5.99	1.84	1.17	0.49
C70 5338 01	Mancoopa FS	Kern	-118.400	35.067	885	33	6.00	1.99	1.27	0.53
C70 5480 01	McKibick FS	Kern	-119.822	35.306	1,051	45	5.88	1.77	1.13	0.47
C70 5480 01	McKibick FS	Kern	-119.822	35.306	1,051	12	4.83	1.27	0.81	0.34
C70 5602 00	Middlewater	Kern	-119.817	35.500	800	51	5.15	1.48	0.94	0.39
C70 5607 01	Midway	Kern	-119.462	35.172	1,070	27	5.19	1.43	0.91	0.38
C70 6909 00	Pine Mtn FS	Kern	-119.168	34.851	5,400	6	13.57	3.19	2.03	0.85
C70 8679 01	Sunset	Kern	-119.388	35.097	639	8	8.76	1.77	1.13	0.47
C70 8752 00	Taft	Kern	-119.465	35.142	1,025	49	5.61	1.58	1.01	0.42
C70 8755 00	Taft KTKR	Kern	-119.472	35.147	1,030	36	5.78	1.71	1.09	0.46
W24 1773 00	China Lake Amridge	Kern	-117.683	35.683	2,220	42	3.77	1.89	1.06	0.28
W24 4278 00	Inyochem FS	Kern	-117.683	35.649	2,430	23	4.04	1.91	1.07	0.28
W25 1488 00	Canal	Kern	-117.967	35.300	2,010	19	4.02	2.03	1.14	0.30
W25 7253 00	Randsburg	Kern	-117.650	35.367	3,522	21	6.07	2.52	1.42	0.38
W25 7253 00	Randsburg	Kern	-117.650	35.367	3,522	57	6.07	2.57	1.45	0.38
W26 0418 00	Baculus Ranch	Kern	-118.183	34.950	2,645	15	4.50	1.73	0.97	0.26
W26 0979 00	Boron	Kern	-117.651	35.000	2,460	29	5.32	2.04	1.15	0.30
W26 0979 00	Boron	Kern	-117.651	35.000	2,460	37	5.08	1.47	0.83	0.22
W26 5756 00	Mojave	Kern	-118.167	35.050	2,735	16	6.05	2.14	1.20	0.32
W26 5756 00	Mojave	Kern	-118.167	35.050	2,735	44	5.53	2.26	1.27	0.34
W26 5758 00	Mojave 2 ENE	Kern	-118.150	35.033	2,680	6	5.76	3.68	2.07	0.55
W26 7253 50	Randsburg FS	Kern	-117.651	35.368	3,520	21	6.07	2.52	1.42	0.38
W26 7560 75	Rosamond	Kern	-118.164	35.864	2,350	13	5.12	1.89	1.06	0.28
U03 0014 00	Action Escondido	Los Angeles	-118.257	34.429	3,100	34	10.01	2.78	1.68	0.52
U03 0014 00	Action Escondido Cyn	Los Angeles	-118.275	34.492	2,940	48	10.41	3.20	1.93	0.60
U03 0014 00	Action Escondido NWS	Los Angeles	-118.257	34.429	3,100	11	12.58	3.42	2.07	0.64
U03 1013 00	Boquet Canyon	Los Angeles	-118.363	34.587	3,055	69	17.86	4.56	2.76	0.86
U03 1013 00	Boquet Canyon	Los Angeles	-118.363	34.587	3,055	38	16.24	4.45	2.69	0.84
U03 1561 21	Casitas Junction	Los Angeles	-118.606	34.440	1,001	28	11.82	3.63	2.19	0.68
U03 1562 11	Casitas Pal Sta	Los Angeles	-118.616	34.464	1,066	13	12.98	3.97	2.40	0.75
U03 2516 00	Dry Canyon Res 127	Los Angeles	-118.523	34.482	1,511	75	13.76	4.19	2.53	0.79
U03 2734 00	Elizabeth Lake 123	Los Angeles	-118.433	34.667	3,280	14	20.56	6.97	4.21	1.31
U03 2735 00	Elizabeth Lake 128	Los Angeles	-118.561	34.608	2,075	64	22.34	6.09	3.68	1.14
U03 2735 00	Elizabeth Lake 128	Los Angeles	-118.561	34.608	2,075	16	21.79	6.48	3.92	1.22
U03 3511 11	Gorman Sherff 298	Los Angeles	-118.822	34.787	2,680	31	12.32	2.83	1.71	0.53
U03 5256 00	Magick Mtn	Los Angeles	-118.287	34.396	4,450	12	15.89	3.90	2.36	0.73
U03 5637 00	Mt Creek Summit RS	Los Angeles	-118.081	34.390	4,990	21	22.44	6.04	3.65	1.13
U03 6164 00	Neenah Soledad 32	Los Angeles	-118.533	34.363	1,240	100	17.64	5.94	3.59	1.12
U03 6164 00	Neenah Soledad 32	Los Angeles	-118.533	34.363	1,240	56	18.87	5.42	3.27	1.02
U03 6891 00	Pru Cyn PS 321	Los Angeles	-118.431	34.675	3,290	60	18.81	5.59	3.36	1.05
U03 7734 00	Sandberg PS	Los Angeles	-118.712	34.743	4,025	38	15.26	5.17	3.12	0.97
U03 7735 00	Sandberg WB	Los Angeles	-118.733	34.750	4,517	58	13.63	5.07	3.06	0.95
U03 7735 00	Sandberg WB	Los Angeles	-118.733	34.750	4,517	41	12.89	4.16	2.51	0.78
U03 8014 00	Saugus Pkrt 125	Los Angeles	-118.454	34.580	2,105	75	18.16	4.69	2.83	0.88
U03 9049 00	Tupunga Mtr Cr 470	Los Angeles	-118.090	34.368	4,650	28	16.19	4.37	2.64	0.82
U03 9345 00	Vincent Pal Sta	Los Angeles	-118.141	34.488	3,136	68	8.80	2.81	1.70	0.53
U04 2867 01	Escondido Cyn 2	Los Angeles	-118.774	34.048	1,050	47	19.06	5.30	3.20	1.00
U04 4867 00	Larchuz PS	Los Angeles	-118.880	34.077	1,820	22	23.95	5.36	3.24	1.01
U04 4867 00	Larchuz PS 352	Los Angeles	-118.880	34.077	1,820	35	23.08	6.84	4.13	1.29
U04 4867 00	Larchuz PS 352	Los Angeles	-118.880	34.077	1,820	63	22.11	6.93	4.19	1.30
U04 5268 45	Matibou Lakeside 4	Los Angeles	-118.754	34.103	800	48	22.56	8.66	5.23	1.63
U04 5790 11	Monte Nido 435	Los Angeles	-118.603	34.078	800	49	21.54	6.88	4.16	1.29
U04 8088 01	Seminole Hot Sp 3	Los Angeles	-118.792	34.107	875	50	20.78	7.48	4.52	1.41
U04 8967 00	Toppanga Cyn 6	Los Angeles	-118.599	34.084	745	50	24.04	7.61	4.60	1.43

R0006405

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,010-Year Return Period (in)
U04 8967 00	Topanga SP 8	Los Angeles	-118.599	34.084	745	67	24.18	8.09	4.89	1.52
U04 8967 50	Topanga Summit 19	Los Angeles	-118.844	34.140	1,520	17	22.16	7.41	4.48	1.39
U04 9990 11	Zuma Cyn 386	Los Angeles	-118.827	34.083	1,500	51	26.35	9.01	5.44	1.69
U05	Franklin Canyon 12	Los Angeles	-118.000	34.000		32	18.70	6.39	3.86	1.20
U05 0115 00	Aliso Canyon Oat Mtn	Los Angeles	-118.557	34.315	2,367	43	22.88	5.73	3.46	1.08
U05 0115 00	Aliso Canyon Oat Mtn	Los Angeles	-118.557	34.315	2,367	35	21.25	5.97	3.61	1.12
U05 0144 00	Altadena 178	Los Angeles	-118.138	34.182	1,125	67	21.95	6.65	4.02	1.25
U05 0208 20	Angeles Crest Hery	Los Angeles	-117.978	34.344	5,920	17	21.82	7.75	4.68	1.48
U05 0327 00	Arroyo Seco RS	Los Angeles	-118.170	34.208	1,220	58	22.25	7.89	4.77	1.48
U05 0355 00	Associated Oil Anaheim 1	Los Angeles	-117.883	33.900	340	18	11.31	3.85	2.33	0.72
U05 0410 00	Azusa	Los Angeles	-117.905	34.134	612	23	17.08	6.00	3.63	1.13
U05 0410 01	Azusa Foothill Rich 99	Los Angeles	-117.892	34.078	615	61	19.48	6.04	3.65	1.13
U05 0410 30	Azusa	Los Angeles	-117.898	34.107	545	20	24.70	5.53	3.34	1.04
U05 0431 01	Baldwin Park 347	Los Angeles	-118.081	34.124	1,179	44	23.42	6.86	4.15	1.29
U05 0431 01	Baldwin Park 347	Los Angeles	-118.081	34.124	1,179	80	23.51	7.47	4.51	1.40
U05 0455 00	Baldwin Park 347	Los Angeles	-117.961	34.093	1,386	48	17.33	5.95	3.60	1.12
U05 0509 00	Barneson Park	Los Angeles	-117.850	33.933	575	17	12.60	5.32	3.21	1.00
U05 0619 00	Bel Air Hotel	Los Angeles	-118.448	34.860	540	53	18.79	5.85	3.53	1.10
U05 0619 00	Bel Air Hotel	Los Angeles	-118.446	34.860	540	59	18.79	5.80	3.50	1.09
U05 0722 11	Beverly Hills City Hall	Los Angeles	-118.399	34.074	290	15	18.07	5.17	3.12	0.97
U05 0722 11	Beverly Hills City Hall	Los Angeles	-118.399	34.074	3	60	17.01	5.13	3.10	0.96
U05 0758 00	Big Dalton Dam	Los Angeles	-117.810	34.168	1,575	31	24.00	8.06	4.87	1.51
U05 0785 01	Big Santa Anita Dam 63	Los Angeles	-118.019	34.185	1,400	60	25.40	8.09	4.89	1.52
U05 0798 00	Big Tujunga Dam	Los Angeles	-118.188	34.292	2,315	69	26.50	9.31	5.63	1.75
U05 0818 00	Birmingham Gen Hosp	Los Angeles	-118.507	34.189	724	31	13.50	4.41	2.66	0.83
U05 1043 51	Braz Park 210	Los Angeles	-118.273	34.188	1,250	42	18.18	5.93	3.58	1.11
U05 1090 11	Briggs Terrace 373	Los Angeles	-118.225	34.238	2,225	35	26.06	7.73	4.67	1.45
U05 1192 00	Burbank FD	Los Angeles	-118.307	34.182	680	23	14.80	5.26	3.18	0.99
U05 1194 00	Burbank Valley PP	Los Angeles	-118.428	34.186	655	57	15.99	5.17	3.12	0.97
U05 1194 00	Burbank Valley PP	Los Angeles	-118.428	34.186	655	53	15.21	4.58	2.77	0.86
U05 1274 00	Calabasas 5	Los Angeles	-118.637	34.157	924	60	17.62	5.97	3.61	1.12
U05 1370 10	Camp Balty 354	Los Angeles	-117.670	34.260	4,527	12	32.65	14.43	8.72	2.71
U05 1440 00	Camp Rincón 349	Los Angeles	-117.863	34.241	1,510	42	27.91	10.40	6.28	1.96
U05 1484 00	Canoga Park PC	Los Angeles	-118.573	34.181	794	47	16.46	5.24	3.17	0.98
U05 1613 01	Cedar Springs	Los Angeles	-117.876	34.358	6,780	42	32.58	9.19	5.55	1.73
U05 1665 01	Charter Oaks	Los Angeles	-117.834	34.100	850	32	19.42	6.09	3.68	1.14
U05 1680 00	Chatsworth 24	Los Angeles	-118.655	34.256	957	18	17.94	4.92	2.92	0.92
U05 1682 00	Chatsworth Res 23	Los Angeles	-118.622	34.229	900	62	15.64	4.51	2.73	0.85
U05 1682 00	Chatsworth Res 23	Los Angeles	-118.622	34.233	906	47	14.06	4.19	2.53	0.79
U05 1682 11	Chatsworth PS 259	Los Angeles	-118.604	34.278	1,254	33	18.68	5.57	3.37	1.05
U05 1777 02	Claremont Indian Hill 91	Los Angeles	-117.720	34.123	1,403	56	18.09	5.54	3.35	1.04
U05 1798 11	Clear Creek School 47	Los Angeles	-118.171	34.278	3,200	41	30.77	9.72	5.87	1.83
U05 1798 11	Clear Creek School 47	Los Angeles	-118.171	34.278	3,200	62	30.22	9.93	6.00	1.87
U05 1883 00	Cogswell Dam 334	Los Angeles	-117.960	34.243	2,330	52	33.79	12.17	7.35	2.29
U05 1883 00	Cogswell Dam 334	Los Angeles	-117.960	34.243	2,330	36	31.74	11.34	6.85	2.13
U05 1895 50	Coltonbrook RS 78	Los Angeles	-117.841	34.291	3,260	18	29.58	7.66	4.63	1.44
U05 1896 00	Colby 53	Los Angeles	-118.111	34.200	1,675	94	28.41	9.64	5.82	1.81
U05 1896 00	Colby 53	Los Angeles	-118.111	34.200	1,675	45	26.23	9.10	5.50	1.71
U05 2089 02	Covina Griffin 107	Los Angeles	-117.818	34.070	975	14	15.60	4.83	2.92	0.91
U05 2090 00	Covina Temple 193	Los Angeles	-117.875	34.082	580	67	17.98	4.95	2.99	0.93
U05 2199 00	Crystal Lake 283	Los Angeles	-117.837	34.327	5,770	64	26.28	10.65	6.44	2.00
U05 2199 00	Crystal Lake 283	Los Angeles	-117.837	34.327	5,770	31	35.26	10.83	6.60	2.05
U05 2214 00	Culver City 248	Los Angeles	-118.400	34.017	60	64	13.71	3.97	2.40	0.75
U05 2438 01	Dillon Ranch 34	Los Angeles	-118.350	34.487	2,200	8	23.19	6.23	3.76	1.17
U05 2494 00	Downey City Hall	Los Angeles	-118.134	33.938	116	70	14.49	4.43	2.68	0.83
U05 2681 30	Edison Intake 75	Los Angeles	-117.858	34.211	1,275	33	27.45	9.08	5.49	1.71
U05 2779 01	El Monte 108	Los Angeles	-118.041	34.059	775	33	16.02	4.73	2.86	0.89
U05 2801 00	El Serrano 380	Los Angeles	-118.811	34.081	525	27	16.51	5.15	3.11	0.97
U05 2961 11	Falling Springs 51	Los Angeles	-117.872	34.302	4,010	44	31.18	8.66	5.23	1.63
U05 3018 00	Fenner Canyon	Los Angeles	-117.774	34.390	5,380	11	24.33	8.45	5.11	1.59
U05 3091 00	Flint Ridge	Los Angeles	-118.198	34.183	1,345	41	21.03	6.84	4.13	1.29
U05 3218 40	Franklin Cyn 12	Los Angeles	-118.378	34.078	800	33	18.70	6.10	3.69	1.15
U05 3430 11	Gard Res 20	Los Angeles	-118.610	34.152	988	56	17.82	8.17	3.73	1.18
U05 3450 00	Glendale Stapanhorst	Los Angeles	-118.267	34.150	530	22	15.98	5.40	3.28	1.01
U05 3450 70	Glendale Gregg	Los Angeles	-118.242	34.198	1,350	20	24.24	5.51	3.33	1.04
U05 3452 00	Glendale West	Los Angeles	-117.850	34.140	822	113	22.24	6.15	3.72	1.18
U05 3452 60	Glendale 315	Los Angeles	-117.793	34.123	1,064	12	25.77	8.22	4.97	1.54
U05 3452 80	Glendale 314	Los Angeles	-117.881	34.148	865	9	20.68	6.79	4.10	1.28
U05 3535 00	Granada Hills 29	Los Angeles	-118.532	34.251	1,035	51	17.70	5.05	3.05	0.95
U05 3535 00	Griffith Park Zoo 375	Los Angeles	-118.532	34.251	1,038	30	18.49	7.33	4.43	1.38
U05 3643 00	Griffith Park	Los Angeles	-118.284	34.122	850	24	17.55	5.37	3.24	1.01
U05 3703 00	Haines Cyn Lower 364	Los Angeles	-118.264	34.264	2,450	60	23.35	7.85	4.74	1.47
U05 3704 00	Haines Cyn Upper 367	Los Angeles	-118.252	34.272	3,440	37	28.57	8.72	5.27	1.64

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,919-Year Return Period (in)
U05 3704 00	Hansen Cyn Upper 367	Los Angeles	-118.252	34.272	3,440	63	28.41	9.16	5.53	1.72
U05 3751 00	Hansen Dam	Los Angeles	-118.400	34.269	1,110	45	15.13	4.58	2.77	0.86
U05 3751 00	Hansen Dam	Los Angeles	-118.399	34.269	1,110	47	15.04	4.15	2.51	0.78
U05 3910 00	Henninger Flats	Los Angeles	-118.088	34.194	850	42	26.22	7.55	4.56	1.42
U05 4017 00	Hoegers	Los Angeles	-118.034	34.209	2,850	55	37.91	12.80	7.73	2.40
U05 4017 00	Hoegers 57	Los Angeles	-118.034	34.209	2,850	42	37.55	10.98	6.83	2.06
U05 4021 15	Holiday Hill	Los Angeles	-117.681	34.357	8,150	16	19.55	4.93	2.98	0.93
U05 4031 11	Hollywood 136	Los Angeles	-118.325	34.091	305	34	15.51	7.19	4.34	1.35
U05 4032 11	Hollywood Dam 238	Los Angeles	-118.332	34.118	750	63	16.92	4.94	2.98	0.93
U05 4621 11	La Canada Arroyo Seco 50	Los Angeles	-118.185	34.198	1,155	55	21.38	6.86	4.15	1.29
U05 4628 00	La Cienega 251	Los Angeles	-118.244	34.222	1,440	64	24.03	7.46	4.51	1.40
U05 4659 31	La Habra Heights	Los Angeles	-117.096	33.948	445	11	14.61	3.69	2.23	0.69
U05 4920 50	Lewis Ranch 517	Los Angeles	-117.886	34.420	4,815	51	15.74	6.38	3.85	1.20
U05 4920 50	Lewis Ranch 517	Los Angeles	-117.886	34.420	4,815	50	15.44	6.28	3.79	1.18
U05 4986 00	Lima Tujunga 471	Los Angeles	-118.301	34.316	2,750	25	18.16	6.27	3.79	1.03
U05 4993 00	Live Oak Canyon	Los Angeles	-117.733	34.117	1,250	34	18.50	5.46	3.30	0.71
U05 5080 00	Long Beach 36	Los Angeles	-118.150	33.817	30	60	12.79	3.76	2.27	0.75
U05 5080 05	Long Beach 224	Los Angeles	-118.191	33.768	180	93	12.15	3.99	2.41	0.71
U05 5085 00	Long Beach NWS R	Los Angeles	-118.150	33.817	25	20	13.62	4.08	2.47	0.77
U05 5098 11	Looma Ranch 54	Los Angeles	-118.048	34.349	4,325	42	18.38	6.37	3.85	1.20
U05 5098 11	Looma Ranch 54	Los Angeles	-118.048	34.349	4,325	39	18.01	5.53	3.34	1.04
U05 5111 01	Los Angeles City College	Los Angeles	-118.291	34.087	310	49	11.61	5.30	3.20	1.00
U05 5111 03	Los Angeles Co Sur 291	Los Angeles	-118.255	33.949	121	41	13.29	4.33	2.62	0.81
U05 5111 17	Los Angeles Hancock Ph	Los Angeles	-118.360	34.064	1,975	42	15.23	4.82	2.91	0.91
U05 5112 00	Los Angeles Terminal Area	Los Angeles	-118.235	34.069	175	23	15.81	4.69	2.83	0.88
U05 5114 00	Los Angeles AP	Los Angeles	-118.387	33.942	105	60	13.64	4.16	2.51	0.78
U05 5114 00	Los Angeles AP	Los Angeles	-118.387	33.942	105	48	12.06	3.86	2.33	0.73
U05 5114 00	Los Angeles AP	Los Angeles	-118.233	34.050	270	124	15.29	4.55	2.75	0.85
U05 5115 00	Los Angeles CC	Los Angeles	-118.233	34.050	270	97	14.56	4.30	2.60	0.81
U05 5115 00	Los Angeles CC	Los Angeles	-118.482	34.288	1,150	68	17.84	4.78	2.89	0.90
U05 5115 40	Los Angeles Res 293	Los Angeles	-118.001	34.149	560	53	20.46	6.26	3.78	1.18
U05 5781 00	Monrovia 67	Los Angeles	-117.987	34.185	1,800	22	29.88	9.29	5.61	1.75
U05 5781 05	Monrovia Falls 150	Los Angeles	-118.104	34.019	250	62	15.15	4.49	2.71	0.84
U05 5790 00	Montebello 391	Los Angeles	-118.066	34.227	5,709	87	34.89	9.53	5.76	1.79
U05 6006 00	At Wilson	Los Angeles	-118.066	34.227	5,709	34	32.92	10.30	6.22	1.94
U05 6006 00	At Wilson 338	Los Angeles	-118.366	34.156	619	77	17.58	5.86	3.54	1.10
U05 6256 00	North Hollywood 13	Los Angeles	-118.541	34.231	810	53	15.01	4.21	2.54	0.79
U05 6270 00	Northridge 25	Los Angeles	-118.541	34.231	810	18	14.64	4.95	2.99	0.93
U05 6270 00	Northridge 25	Los Angeles	-118.526	34.239	835	12	16.30	5.47	3.31	1.03
U05 6270 25	Northridge CSU FAB	Los Angeles	-118.546	34.239	835	18	14.64	4.95	2.99	0.93
U05 6270 25	Northridge FAB	Los Angeles	-118.095	34.255	4,250	66	39.85	12.39	7.49	2.33
U05 6270 25	Opids Camp 57	Los Angeles	-118.095	34.255	4,250	46	38.57	11.88	7.18	2.23
U05 6270 25	Opids Camp 57	Los Angeles	-118.444	34.149	902	48	15.12	4.44	2.68	0.83
U05 6601 61	Pacoma Raddatz 27	Los Angeles	-118.399	34.330	1,500	40	19.98	5.44	3.29	1.02
U05 6602 00	Pacoma Dam 33	Los Angeles	-118.400	34.330	1,500	80	19.87	5.27	3.18	0.99
U05 6602 00	Pacoma Dam 33	Los Angeles	-118.351	33.799	215	67	12.43	3.72	2.25	0.70
U05 6663 00	Palo Verde Estates 43	Los Angeles	-118.123	34.148	864	96	20.50	5.85	3.53	1.10
U05 6719 00	Pasadena	Los Angeles	-118.123	34.137	795	39	19.95	6.20	3.75	1.16
U05 6719 02	Pasadena Cal Tac 303	Los Angeles	-118.124	34.181	1,375	34	23.29	7.72	4.66	1.45
U05 6719 91	Pasadena Glenn 279	Los Angeles	-118.083	33.742	125	60	10.44	3.58	2.16	0.67
U05 7036 11	Point Vincent LH 44	Los Angeles	-118.411	33.742	1,630	60	17.32	5.09	3.08	0.96
U05 7160 01	Puddingstone Dam 96	Los Angeles	-117.806	34.092	1,630	18	15.28	4.62	2.79	0.87
U05 7160 01	Puddingstone Dam 96	Los Angeles	-117.806	34.092	1,630	31	16.35	4.69	2.83	0.88
U05 7161 06	Puente Hills 201	Los Angeles	-117.990	33.994	860	11	16.35	4.69	2.83	0.88
U05 7324 00	Red Box 429	Los Angeles	-119.112	35.262	4,460	8	36.95	12.67	7.66	2.38
U05 7324 00	Redondo Beach	Los Angeles	-118.389	33.845	70	69	11.43	3.32	2.01	0.62
U05 7491 15	Roberts Ranch 61	Los Angeles	-118.019	34.199	1,850	5	29.65	8.14	4.92	1.53
U05 7530 00	Rogers Canyon 70	Los Angeles	-117.902	34.163	790	42	21.73	6.49	3.92	1.22
U05 7553 11	Rozco Merrill 14	Los Angeles	-118.389	34.239	1,050	60	15.58	4.39	2.65	0.82
U05 7748 01	San Dennis Dam	Los Angeles	-117.771	34.153	1,350	80	22.58	7.16	4.33	1.35
U05 7748 01	San Dennis Gd Sta 87	Los Angeles	-117.767	34.368	1,350	42	22.70	7.04	4.25	1.32
U05 7749 00	San Dimas Fire Warden 95	Los Angeles	-117.805	34.107	955	43	25.48	7.45	4.50	1.40
U05 7749 00	San Dimas Fire Warden 95	Los Angeles	-117.805	34.107	955	68	18.60	5.01	3.03	0.94
U05 7759 00	San Fernando	Los Angeles	-118.464	34.273	965	55	16.17	5.00	3.02	0.94
U05 7762 00	San Fernando PH	Los Angeles	-118.492	34.314	1,248	49	18.29	4.94	2.98	0.93
U05 7762 00	San Fernando PH	Los Angeles	-118.492	34.314	1,248	23	17.10	4.65	2.81	0.87
U05 7776 00	San Gabriel Cyn PH 627	Los Angeles	-117.908	34.156	744	91	22.77	6.51	3.93	1.22
U05 7776 00	San Gabriel FD 742	Los Angeles	-118.099	34.103	450	58	18.07	5.18	3.13	0.97
U05 7779 00	San Gabriel Dam 425	Los Angeles	-117.861	34.205	1,481	58	28.91	9.02	5.45	1.89
U05 7779 00	San Gabriel Dam 425	Los Angeles	-117.861	34.205	1,481	44	27.99	8.86	5.35	1.86
U05 7779 01	San Gabriel Dam NWS 425	Los Angeles	-117.861	34.205	1,481	20	29.63	8.29	5.01	1.56
U05 7779 01	San Gabriel Dam Camp 76	Los Angeles	-117.857	34.226	1,500	42	27.17	9.58	5.78	1.80
U05 7783 30	San Gabriel Cyn 348	Los Angeles	-117.769	34.239	2,075	22	30.06	9.92	5.99	1.86
U05 7876 00	San Pedro 629	Los Angeles	-118.267	33.717	10	37	20.84	3.37	2.04	0.63

R0006407

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,5101-Year Return Period (in)
U05 7897 00	Santa Anita FL 432	Los Angeles	-118.018	34.209	2,035	40	30.85	10.35	6.25	1.94
U05 7912 11	Santa Clara Ridge 419	Los Angeles	-118.206	34.374	5,450	13	25.49	7.69	4.65	1.44
U05 7926 00	Santa Fe Dam	Los Angeles	-117.973	34.118	427	44	17.71	4.66	2.82	0.88
U05 7926 00	Santa Fe Dam	Los Angeles	-117.973	34.118	427	21	15.56	4.76	2.88	0.89
U05 7950 00	Santa Monica 534	Los Angeles	-118.491	34.012	64	91	14.12	4.58	2.76	0.86
U05 8022 14	Sawpit Dam 68	Los Angeles	-117.987	34.176	1,378	61	25.22	7.85	4.74	1.47
U05 8022 03	Sawpit 140	Los Angeles	-118.456	34.058	345	93	15.32	4.92	2.97	0.92
U05 8032 11	Sawpit Upper 69	Los Angeles	-117.978	34.178	1,775	36	29.44	9.74	5.89	1.83
U05 8092 00	Sepulveda Dam	Los Angeles	-118.470	34.168	883	48	15.20	5.07	3.06	0.95
U05 8092 01	Sepulveda Rayen 9	Los Angeles	-118.468	34.231	828	58	15.19	4.84	2.92	0.91
U05 8092 11	Sepulveda Cyn 17	Los Angeles	-118.491	34.131	1,425	50	15.99	4.78	2.89	0.90
U05 8158 00	Shell Absorber Plant	Los Angeles	-117.900	33.950	680	15	13.68	4.23	2.56	0.79
U05 8201 01	Sierra Madre Dam 144	Los Angeles	-118.042	34.178	1,100	59	24.07	7.22	4.36	1.36
U05 8210 07	Sierra Madre 86	Los Angeles	-118.043	34.158	658	58	21.29	7.26	4.39	1.36
U05 8211 11	Sierra Madre 681	Los Angeles	-117.669	34.200	3,000	30	23.08	8.42	5.09	1.58
U05 8211 20	Sierra Madre MAUP 294	Los Angeles	-118.048	34.170	895	57	23.91	7.04	4.25	1.32
U05 8230 00	Signal Hill	Los Angeles	-118.168	33.797	140	50	12.24	4.11	2.48	0.77
U05 8230 00	Signal Hill	Los Angeles	-118.168	33.797	140	31	11.93	3.97	2.40	0.75
U05 8230 00	Signal Hill NWS	Los Angeles	-118.168	33.797	140	22	14.29	4.05	2.45	0.78
U05 8436 00	Spadra Pac Col 356	Los Angeles	-117.817	34.050	713	30	15.06	4.61	2.79	0.87
U05 8436 00	Spadra Pac Col 356	Los Angeles	-117.817	34.050	713	67	16.28	4.73	2.86	0.89
U05 8436 00	Spadra Pac Col 356 HPO	Los Angeles	-117.817	34.050	713	20	17.48	4.86	2.94	0.91
U05 8574 02	Stone Canyon Dam 237	Los Angeles	-118.454	34.108	725	62	20.38	6.18	3.72	1.16
U05 8614 01	Sturtevant Camp 58	Los Angeles	-118.031	34.223	3,275	43	35.20	11.08	6.69	2.08
U05 8660 00	Sunland	Los Angeles	-118.300	34.267	1,480	17	15.58	4.60	2.78	0.88
U05 8680 04	Sunset Ridge RS 683	Los Angeles	-118.147	34.215	2,110	44	22.20	7.56	4.57	1.42
U05 8728 11	Sylmar 30	Los Angeles	-118.470	34.310	1,250	61	17.59	4.89	2.95	0.92
U05 8783 31	Tanbark Flats 158	Los Angeles	-117.781	34.208	2,750	50	28.17	8.64	5.22	1.62
U05 8783 31	Tanbark Flats 158	Los Angeles	-117.781	34.208	2,750	33	26.37	7.72	4.66	1.45
U05 8973 00	Torrance	Los Angeles	-118.333	33.800	100	47	13.49	4.31	2.60	0.81
U05 9047 00	Tujunga 647	Los Angeles	-118.293	34.273	1,690	65	21.40	6.71	4.05	1.26
U05 9047 01	Tujunga Cyn 464	Los Angeles	-118.198	34.300	3,300	16	23.87	10.38	6.27	1.95
U05 9048 10	Tujunga Vogle 695	Los Angeles	-118.226	34.287	1,850	52	28.06	10.10	6.10	1.90
U05 9138 00	Union Of Streams	Los Angeles	-117.867	33.933	710	21	13.91	3.96	2.39	0.74
U05 9152 00	UCLA	Los Angeles	-118.442	34.069	430	48	15.92	5.09	3.06	0.96
U05 9152 00	Van Nuys 15	Los Angeles	-118.451	34.180	695	68	16.05	5.37	3.24	1.01
U05 9152 00	Van Nuys 15	Los Angeles	-118.451	34.180	695	35	16.03	5.02	3.03	0.94
U05 9163 05	Upper Franklin Res 11	Los Angeles	-118.411	34.121	867	43	19.30	5.95	3.60	1.12
U05 9163 05	Upper Franklin Res 11	Los Angeles	-118.411	34.121	867	60	18.88	5.75	3.47	1.08
U05 9231 00	Valley Forge 56	Los Angeles	-118.072	34.253	3,450	22	38.66	10.82	6.54	2.03
U05 9431 00	Walnut Pal Sta 102	Los Angeles	-117.871	34.003	488	68	16.52	4.52	2.73	0.85
U05 9464 01	Waterman GS 52	Los Angeles	-118.144	34.266	3,290	29	28.34	9.36	5.68	1.78
U05 9464 01	Waterman GS 52	Los Angeles	-118.144	34.266	3,290	51	28.00	9.76	5.90	1.83
U05 9547 01	West Covina 101	Los Angeles	-118.962	34.079	350	52	17.14	5.23	3.16	0.98
U05 9660 00	Whittier 106	Los Angeles	-118.035	33.975	320	68	14.58	4.13	2.50	0.78
U05 9666 00	Whittier Narrows Dam	Los Angeles	-118.087	34.021	250	14	15.58	4.26	2.57	0.80
U05 9784 00	Woodland Hills 21	Los Angeles	-118.592	34.171	875	79	15.19	4.57	2.76	0.86
U06 0395 00	Avaton	Los Angeles	-118.333	33.483	25	39	12.06	4.34	2.62	0.82
U06 7910 00	Santa Catalina Is AP	Los Angeles	-118.417	33.400	1,570	11	11.75	3.06	1.85	0.57
W26 0195 07	Ans Verdi Plat Ranch	Los Angeles	-118.181	34.574	2,945	24	11.54	4.12	2.32	0.81
W26 0630 60	Bellview 722	Los Angeles	-118.231	34.630	3,274	45	10.87	3.59	2.02	0.53
W26 2941 00	Fairmont 542	Los Angeles	-118.454	34.740	2,855	28	11.83	4.55	2.56	0.68
W26 2941 00	Fairmont Res	Los Angeles	-118.428	34.704	3,090	85	15.36	5.28	2.97	0.79
W26 4005 11	H Vista	Los Angeles	-117.779	34.742	3,087	35	5.34	1.95	1.10	0.29
W26 4181 11	Hunt Canyon Bones Ranch	Los Angeles	-118.060	34.513	3,263	33	7.81	3.06	1.72	0.48
W26 4747 02	Lancaster HWS 455	Los Angeles	-118.134	34.683	2,356	52	7.22	2.74	1.54	0.41
W26 4749 00	Lancaster AP 1212	Los Angeles	-118.217	34.733	2,340	44	6.53	2.54	1.43	0.38
W26 4904 20	Leon Valley Rich 122	Los Angeles	-118.323	34.631	3,300	65	14.82	4.71	2.65	0.70
W26 4983 00	Little Rock Schwab 299	Los Angeles	-117.979	34.537	2,800	62	6.96	2.66	1.50	0.40
W26 4983 77	Little Rock Sycamore 1060	Los Angeles	-117.970	34.417	4,000	35	12.98	4.91	2.76	0.73
W26 4985 25	Little Rock Abv Dam 1017	Los Angeles	-118.023	34.478	3,280	44	9.10	3.27	1.84	0.48
W26 5001 50	Llano 564	Los Angeles	-117.834	34.487	3,390	65	7.78	2.82	1.59	0.42
W26 5569 20	Mescal Creek 442	Los Angeles	-117.748	34.468	3,810	54	7.78	3.02	1.70	0.45
W26 5618 20	Mile High Ranch 1168	Los Angeles	-117.771	34.411	5,280	11	10.73	3.28	1.83	0.48
W26 6034 11	Muritz Valley Ranch 322	Los Angeles	-118.354	34.714	2,600	63	10.51	4.82	2.80	0.86
W26 6122 00	Neenach 508	Los Angeles	-118.783	34.783	3,000	36	8.89	3.31	1.86	0.48
W26 6624 00	Palm Springs	Los Angeles	-118.092	34.588	2,595	53	6.14	2.11	1.19	0.31
W26 6624 00	Palmdale 1058	Los Angeles	-118.092	34.588	2,595	57	6.44	2.12	1.19	0.32
W26 6624 00	Palmdale 2 NE 1058	Los Angeles	-118.092	34.588	2,595	13	8.05	2.97	1.67	0.44
W26 6625 00	Palmdale 2 NE 1058	Los Angeles	-118.092	34.588	2,595	40	7.02	2.41	1.38	0.36
W26 6627 00	Palmdale AP 750	Los Angeles	-118.083	34.622	2,517	54	7.45	2.50	1.41	0.37
W26 6767 00	Pearlblossom DWR 1240	Los Angeles	-117.921	34.509	3,050	14	7.61	2.87	1.61	0.43

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,0101-Year Return Period (in)
W26 6891 01	Pine Cyn GS 1117	Los Angeles	-118.510	34.699	3,825	19	19.76	6.68	3.78	1.00
W26 6958 03	Pulte Butte	Los Angeles	-117.849	34.651	2,680	42	5.58	2.12	1.19	0.32
W26 6963 41	Pleasant View Mesa 460	Los Angeles	-117.334	34.461	3,960	11	11.09	4.42	2.49	0.66
W26 8020 01	Sawmill Mtn 277	Los Angeles	-118.583	34.721	3,700	62	22.06	6.87	3.86	1.02
W26 8748 00	Table Mtn 82	Los Angeles	-117.685	34.382	7,500	63	17.10	4.98	2.80	0.74
W26 9250 00	Vaynemo	Los Angeles	-117.850	34.450	3,700	66	9.85	3.92	2.20	0.58
W28 0779 00	Big Pines Park 83	Los Angeles	-117.691	34.379	6,860	69	25.52	7.30	4.10	1.09
W28 0779 00	Big Pines Park 83	Los Angeles	-117.691	34.379	6,860	59	25.18	6.66	3.74	0.99
W28 0779 00	Big Pines Rac Cr 83 HPO	Los Angeles	-117.691	34.380	6,860	19	27.60	6.14	3.45	0.91
Y01 1256 51	Capitol 1 CDF	Los Angeles	-116.965	33.930	2,609	39	10.42	2.86	1.76	0.59
Y01 1777 01	Clermont Police Sta 93	Los Angeles	-117.722	34.096	1,170	58	17.74	4.85	2.99	1.00
Y01 1779 00	Clermont PC	Los Angeles	-117.710	34.100	1,185	98	17.70	4.97	3.08	1.02
Y01 1779 00	Clermont PC 92	Los Angeles	-117.710	34.100	1,185	40	17.36	4.98	3.07	1.02
Y01 1779 00	Clermont Pomona Col 92	Los Angeles	-117.708	34.067	1,201	40	17.36	4.98	3.07	1.02
Y01 2432 00	Diamond Bar HC 18	Los Angeles	-117.815	33.994	748	39	15.55	4.74	2.82	0.98
Y01 5900 00	Mt Baldy 85	Los Angeles	-117.659	34.237	4,275	57	32.58	10.79	6.64	2.22
Y01 5900 00	Mt Baldy 85	Los Angeles	-117.659	34.237	4,275	34	29.57	9.09	5.60	1.87
Y01 7050 00	Pomona Cal Poly	Los Angeles	-117.817	34.067	740	68	17.41	4.94	3.04	1.02
Y01 7050 01	Pomona 256	Los Angeles	-117.753	34.054	844	62	16.86	4.71	2.90	0.97
Y01 8213 00	Santa PH	Los Angeles	-117.669	34.200	2,300	87	31.69	9.39	5.78	1.93
Y01 8213 00	Santa PH	Los Angeles	-117.746	34.200	3,000	9	25.17	6.20	3.82	1.28
Y01 8315 20	Snow Crest Canto 307	Los Angeles	-117.626	34.266	6,500	9	36.56	10.50	6.46	2.16
E10 0572 00	Bear Valley	Marin	-122.797	38.044	50	19	37.95	6.47	4.20	1.82
E10 0876 00	Blakes Landing	Marin	-122.917	38.096	40	17	36.15	4.62	3.00	1.30
E10 0934 00	Bodega Bay Marine Lab	Marin	-123.070	38.320	40	24	35.29	6.24	4.05	1.75
E10 0954 06	Bolinas Siedman	Marin	-122.705	37.902	200	12	29.02	3.82	2.48	1.07
E10 0954 30	Bolinas Silva	Marin	-122.553	37.907	40	5	53.73	7.23	4.69	2.03
E10 0969 00	Bon Tempe Dam	Marin	-122.620	37.960	723	47	44.19	6.62	4.30	1.86
E10 3941 20	Hicks Valley	Marin	-122.720	38.130	400	19	30.80	4.40	2.86	1.24
E10 4277 00	Inverness	Marin	-122.850	38.080	150	43	34.65	6.19	4.02	1.74
E10 4502 00	Kent Lake	Marin	-122.708	37.998	360	43	57.37	9.48	6.15	2.67
E10 4652 00	Lagunitas Lake	Marin	-122.595	37.947	785	115	52.36	8.22	5.33	2.31
E10 4652 00	Lagunitas Lake	Marin	-122.595	37.947	785	52	49.47	8.07	5.24	2.27
E10 6187 01	Nicasio Town	Marin	-122.700	38.040	265	30	36.39	6.18	4.01	1.74
E10 6187 02	Nicasio Dam JNNW	Marin	-122.720	38.110	315	26	35.99	5.55	3.60	1.56
E10 6853 00	Phoenix Lake	Marin	-122.570	37.950	175	69	48.77	8.17	5.30	2.30
E10 7027 00	Point Reyes Light House	Marin	-122.850	38.180	490	38	18.24	3.10	2.01	0.87
E10 7027 00	Point Reyes Light House	Marin	-122.850	38.180	490	25	17.37	2.64	1.71	0.74
E10 7088 20	Point Reyes Station	Marin	-122.800	38.050	31	19	29.73	5.12	3.32	1.44
E10 7787 21	San Geronimo Tr PI	Marin	-122.624	38.011	350	23	41.20	6.85	4.44	1.93
E10 8374 50	Soudaule Rest	Marin	-122.780	39.150	400	19	35.05	5.36	3.48	1.51
E10 8500 00	Starford Lake	Marin	-122.637	38.116	180	36	28.07	4.54	2.95	1.28
E10 8518 50	Sinson Beach	Marin	-122.645	37.914	10	15	26.05	3.95	2.56	1.11
E10 8943 20	Tocaloma Pump	Marin	-122.758	38.050	100	6	41.29	5.28	3.43	1.48
E10 8943 20	Tocaloma Pump	Marin	-122.758	38.050	100	20	36.99	5.77	3.74	1.62
E10 8954 00	Tomolles FD	Marin	-122.903	38.247	80	23	26.45	3.95	2.56	1.11
E10 9117 02	Two Rock JW	Marin	-122.770	38.250	200	22	31.11	5.40	3.50	1.52
E10 9770 00	Woodsons FD	Marin	-122.642	38.007	430	38	43.51	7.07	4.59	1.99
E20 2057 00	Corte Madera	Marin	-122.530	37.920	55	34	36.86	6.54	4.24	1.84
E20 3434 00	Hamilton AFB	Marin	-122.517	38.067	0	15	25.60	4.89	3.17	1.37
E20 4500 00	Kentfield	Marin	-122.550	37.950	80	95	45.96	8.02	5.20	2.26
E20 4500 00	Kentfield	Marin	-122.551	37.946	80	10	38.21	7.42	4.81	2.09
E20 5342 00	Marin Meadows	Marin	-122.528	38.080	47	13	22.90	3.48	2.26	0.98
E20 5342 77	Marin City	Marin	-122.632	37.874	15	5	21.80	3.22	2.09	0.91
E20 5647 00	Mill Valley	Marin	-122.518	37.925	10	16	39.18	6.81	4.42	1.91
E20 5995 00	Mt Tarnaples 1 S	Marin	-122.526	37.904	950	35	29.70	4.68	3.04	1.32
E20 5996 00	Mt Tarnaples 2SW	Marin	-122.567	37.917	950	20	40.13	5.76	3.74	1.62
E20 5998 00	Mt Tarnaples	Marin	-122.600	37.900	1,480	55	41.22	6.21	4.03	1.75
E20 6027 00	Mal Woods	Marin	-122.583	37.917	2,600	19	28.05	3.68	2.39	1.03
E20 6290 00	Novato 8 WNW	Marin	-122.567	37.900	220	46	36.54	5.14	3.34	1.45
E20 6290 01	Novato FS	Marin	-122.717	38.133	350	53	30.02	4.32	2.80	1.21
E20 7707 00	San Anselmo Road VFD	Marin	-122.537	38.105	35	36	26.79	4.46	2.89	1.25
E20 7707 00	San Anselmo Road VFD	Marin	-122.021	37.975	25	36	40.67	7.34	4.76	2.06
E20 7880 08	San Rafael	Marin	-122.021	37.975	25	14	39.51	7.06	4.58	1.99
E20 7880 10	San Rafael FS4	Marin	-122.525	37.970	25	76	37.25	6.55	4.25	1.84
E20 7880 20	San Rafael Civic Center	Marin	-122.503	37.967	5	17	33.87	6.37	4.13	1.79
E20 8779 00	Tarnaples Valley	Marin	-122.530	37.990	120	22	29.80	5.46	3.54	1.54
E20 8920 02	Tiburon Cohen	Marin	-122.543	37.879	250	18	35.84	4.87	3.16	1.37
E20 8920 11	Tiburon Flint	Marin	-122.483	37.902	20	38	29.22	4.68	3.02	1.31
E20 8920 21	Tiburon Topham	Marin	-122.443	37.883	125	5	24.36	3.49	2.26	0.98
E20 9770 21	Woodsons	Marin	-122.453	37.874	400	22	31.42	5.57	3.61	1.57
E10 0135 00	Alpine Dam	Marin	-122.642	38.007	430	26	36.82	6.58	4.27	1.85
			-122.640	37.940	680	77	50.11	7.44	4.83	2.09

R0006409

Table C-26
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,5181-Year Return Period (in)
U05 1056 00	Brea City	Orange	-117.900	33.917	350	22	12.63	3.99	2.41	0.75
U05 1057 00	Brea Dam	Orange	-117.925	33.894	275	41	12.79	3.44	2.08	0.65
U05 1057 00	Brea Dam	Orange	-117.927	33.891	275	50	12.89	3.84	2.32	0.72
U05 1057 00	Brea Dam	Orange	-117.915	33.930	375	42	13.64	4.45	2.69	0.84
U05 1057 00	Brea Union Oil	Orange	-117.991	33.858	79	66	13.56	3.78	2.27	0.71
U05 1168 10	Buena Park 5	Orange	-117.783	33.917	1,824	33	14.45	3.94	2.38	0.74
U05 1518 00	Carbon Cyn Gaman	Orange	-117.783	33.917	1,824	8	13.57	3.98	2.40	0.75
U05 1518 00	Carbon Cyn Gaman	Orange	-117.883	33.900	340	45	14.70	4.31	2.80	0.81
U05 1518 00	Carbon Cyn Workman	Orange	-117.919	33.900	320	17	12.28	4.12	2.49	0.77
U05 3279 00	Fullerton Arques	Orange	-117.867	33.917	400	10	13.91	5.42	3.27	1.02
U05 3282 00	Fullerton Creek 5	Orange	-117.883	33.900	340	48	13.28	4.04	2.44	0.78
U05 3285 00	Fullerton Dam	Orange	-117.883	33.900	94	29	12.51	4.19	2.53	0.79
U05 3288 00	Fullerton Hillcrest 96	Orange	-117.920	33.883	320	56	14.28	4.01	2.42	0.75
U05 3289 03	Fullerton AP	Orange	-117.974	33.873	100	50	13.07	4.05	2.45	0.78
U05 3289 03	Fullerton AP	Orange	-117.871	33.871	94	28	12.29	3.91	2.36	0.75
U05 5106 01	Los Alamitos 170	Orange	-118.095	33.757	7	35	10.07	2.81	1.70	0.53
U05 5106 20	Los Alamitos RB Aut	Orange	-118.095	33.757	7	27	10.03	2.85	1.72	0.54
U05 6432 00	Olinda	Orange	-117.850	33.917	490	18	11.67	4.15	2.51	0.78
U05 9847 00	Yorba Linda	Orange	-117.817	33.900	420	32	13.97	3.71	2.24	0.70
U05 9847 21	Yorba Res 163	Orange	-117.810	33.872	320	39	14.03	3.94	2.38	0.74
U05 9847 21	Yorba Reservoir 163	Orange	-117.810	33.873	394	39	14.03	3.70	2.24	0.70
Y01 0192 10	Anaheim 1267	Orange	-117.913	33.820	147	20	11.73	3.43	2.11	0.71
Y01 0193 50	Anaheim Ag Dept 167	Orange	-117.913	33.820	147	31	12.78	3.87	2.38	0.80
Y01 0193 50	Anaheim Kulela 209	Orange	-117.876	33.803	160	21	12.42	3.37	2.07	0.68
Y01 0193 50	Anaheim OCF	Orange	-117.876	33.803	150	24	13.23	3.74	2.30	0.77
Y01 0194 00	Anaheim	Orange	-117.911	33.830	155	57	13.34	4.21	2.59	0.87
Y01 0375 77	Athwood 174	Orange	-117.818	33.859	260	11	14.45	3.58	2.20	0.74
Y01 2026 01	Costa Mesa 165	Orange	-117.893	33.669	55	38	11.78	3.20	1.97	0.68
Y01 2026 01	Costa Mesa 165	Orange	-117.858	33.610	300	29	11.87	3.51	2.18	0.72
Y01 2031 20	Corona Del Mar	Orange	-117.858	33.610	300	35	12.52	3.20	1.97	0.68
Y01 2031 20	Corona Del Mar 189	Orange	-117.893	33.669	53	39	11.57	3.02	1.86	0.62
Y01 2060 01	Costa Mesa 165	Orange	-117.782	33.800	464	38	13.28	3.96	2.44	0.82
Y01 2775 00	El Modena	Orange	-117.782	33.800	464	35	13.17	3.92	2.41	0.81
Y01 2775 00	El Modena	Orange	-117.691	33.828	455	37	14.45	3.73	2.30	0.77
Y01 2821 15	El Toro 176 CDF	Orange	-117.691	33.828	455	24	14.05	3.78	2.33	0.78
Y01 2821 15	El Toro 176 CDF	Orange	-117.695	33.828	520	26	15.14	3.24	1.99	0.67
Y01 2821 20	El Toro 178	Orange	-117.968	33.791	80	16	14.85	3.96	2.44	0.82
Y01 3336 30	Garden Grove 225	Orange	-117.997	33.664	32	67	11.60	2.97	1.83	0.61
Y01 4173 11	Huntington Beach 41	Orange	-118.000	33.680	75	19	9.83	3.02	1.86	0.62
Y01 4173 21	Huntington Beach	Orange	-117.769	33.883	200	50	12.74	3.41	2.10	0.70
Y01 4300 15	Inverne 125	Orange	-117.711	33.694	470	40	12.33	3.30	2.03	0.68
Y01 4729 00	Lambert Res 146	Orange	-117.899	33.603	8	73	11.59	3.10	1.91	0.64
Y01 5175 00	Newport Beach Harbor	Orange	-117.638	33.821	2,700	15	23.52	5.15	3.18	1.08
Y01 6308 05	Oak Flat 198	Orange	-117.841	33.788	215	95	13.60	3.77	2.32	0.78
Y01 6472 01	Orange 222	Orange	-117.833	33.933	660	50	13.69	4.12	2.54	0.85
Y01 6473 00	Orange Co Res	Orange	-117.833	33.933	660	40	13.60	3.63	2.23	0.75
Y01 6473 00	Orange Co Res 144	Orange	-117.867	33.744	115	78	13.45	3.58	2.20	0.74
Y01 7888 01	Santa Ana FS	Orange	-117.870	33.750	125	56	12.97	3.51	2.16	0.72
Y01 7888 30	San Juan Gd Sta 134	Orange	-117.512	33.591	730	38	13.94	3.60	2.22	0.74
Y01 7987 00	Santiago Dam	Orange	-117.717	33.783	860	55	14.82	3.99	2.46	0.82
Y01 7987 00	Santiago Dam	Orange	-117.717	33.783	860	50	14.37	3.98	2.45	0.82
Y01 8243 00	Silverado	Orange	-117.667	33.753	1,100	49	17.01	4.63	2.85	0.95
Y01 8243 00	Silverado	Orange	-117.667	33.753	1,100	48	16.33	4.44	2.73	0.91
Y01 8243 25	Silverado 210	Orange	-117.615	33.747	1,400	19	21.69	5.23	3.22	1.08
Y01 8375 75	South Coast FS	Orange	-117.833	33.683	4	9	15.21	3.35	2.06	0.69
Y01 9075 00	Tustin Inverne	Orange	-117.782	33.731	118	100	12.57	3.34	2.06	0.68
Y01 9086 10	Tustin Inverne	Orange	-117.811	33.748	130	18	10.70	3.21	1.98	0.68
Y01 9338 03	Vila Park Dam 173	Orange	-117.767	33.812	566	27	15.29	3.68	2.27	0.78
Y01 9338 03	Vila Park Dam 173	Orange	-117.767	33.815	572	25	14.50	3.93	2.42	0.81
Y01 9569 11	Westminster	Orange	-117.988	33.752	38	30	11.94	3.23	1.98	0.68
Y01 9587 01	Westminster	Orange	-117.447	34.012	908	22	10.68	3.22	1.98	0.68
Z01 1507 00	Capistrano Beach	Orange	-117.684	33.468	20	32	11.75	2.87	1.78	0.73
Z01 2821 11	El Toro Mutton Ranch	Orange	-117.702	33.607	160	94	14.06	3.68	2.26	0.84
Z01 4647 00	Laguna Beach 100	Orange	-117.781	33.547	50	66	12.41	3.44	2.11	0.88
Z01 4650 00	Laguna Beach	Orange	-117.783	33.550	210	38	12.30	3.10	1.90	0.79
Z01 6622 51	Palaudres Res 186	Orange	-117.650	33.463	360	27	13.37	3.29	2.02	0.84
Z01 7836 52	San Juan Capistrano	Orange	-117.666	33.512	160	70	13.93	3.88	2.38	0.99
Z01 7837 00	San Juan Guard Sta	Orange	-117.517	33.600	730	27	18.43	3.93	2.41	1.00
Z01 8638 30	Sulphur Cr Dam 218	Orange	-117.784	33.328	190	12	17.69	3.46	2.12	0.88
Z01 8992 00	Trabuco Canyon	Orange	-117.592	33.657	970	51	18.18	4.83	2.98	1.23
Z01 8992 00	Trabuco Canyon	Orange	-117.592	33.657	970	56	18.35	5.05	3.10	1.29
X15 0924 00	Blythe	Riverside	-114.596	33.614	267	87	3.81	2.26	1.23	0.32

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,010-Year Return Period (in)
X15 0925 00	Byrne TW	Riverside	-114.717	33.817	360	53	3.10	1.86	1.03	0.27
X15 0927 00	Byrne AP	Riverside	-114.717	33.817	360	54	3.53	2.11	1.15	0.30
X15 0928 00	Byrne CDF	Riverside	-114.596	33.814	267	33	3.81	2.12	1.16	0.30
X15 0928 00	Byrne CDF	Riverside	-114.714	33.814	360	53	3.81	2.00	1.09	0.29
X17 2404 08	Desert Center	Riverside	-115.383	33.736	700	27	3.83	2.06	1.12	0.29
X18 3855 00	Hayfield Pump	Riverside	-115.833	33.700	1,370	58	4.04	1.99	1.09	0.28
X18 3855 00	Hayfield Pump	Riverside	-115.833	33.700	1,370	58	3.98	2.15	1.17	0.31
X19 0487 20	Banning Bench	Riverside	-118.912	33.973	3,600	21	25.80	6.16	3.36	0.88
X19 0487 20	Banning Bench 2	Riverside	-118.909	33.989	4,000	19	25.50	6.30	3.44	0.90
X19 0487 20	Bumuda Duns	Riverside	-118.288	33.744	100	30	4.15	2.10	1.15	0.30
X19 0489 00	Banning	Riverside	-118.874	33.922	2,296	73	16.52	4.45	2.43	0.64
X19 1250 00	Cabazon	Riverside	-118.783	33.917	1,815	56	13.09	4.40	2.40	0.63
X19 1250 00	Camp Sherman	Riverside	-118.594	33.847	5,350	16	23.07	4.72	2.57	0.68
X19 1255 00	Cabazon South	Riverside	-118.781	33.909	1,700	9	12.18	3.81	2.08	0.55
X19 1445 20	Camp Sherman	Riverside	-118.594	33.847	5,350	9	19.86	4.32	2.36	0.62
X19 1587 50	Cathedral City RD	Riverside	-118.468	33.783	295	22	5.02	2.83	1.43	0.38
X19 1587 50	Cathedral City RD	Riverside	-118.468	33.783	295	24	4.96	1.51	0.82	0.22
X19 1594 00	Cathedral City	Riverside	-118.467	33.782	295	15	6.03	3.29	1.79	0.47
X19 1594 00	Cathedral City	Riverside	-118.464	33.781	295	45	4.51	2.33	1.27	0.33
X19 1880 00	Coachella	Riverside	-116.177	33.678	-70	13	4.02	2.25	1.23	0.32
X19 2071 80	Cottonwood Sp RS	Riverside	-115.823	33.749	3,000	6	4.32	2.07	1.13	0.30
X19 2327 00	Deep Cyn Lab	Riverside	-118.376	33.648	1,000	13	8.18	4.02	2.19	0.58
X19 2327 00	Deep Cyn Lab	Riverside	-116.383	33.650	1,200	33	6.08	3.03	1.65	0.43
X19 2327 07	Deep Cyn Agave	Riverside	-116.387	33.640	2,750	20	9.01	3.83	2.09	0.55
X19 2327 13	Deep Cyn Buckel	Riverside	-116.392	33.642	1,045	7	8.52	4.32	2.36	0.62
X19 2327 20	Deep Cyn Coyote	Riverside	-116.358	33.643	1,100	7	7.62	4.10	2.24	0.59
X19 2327 80	Deep Cyn Taylor	Riverside	-116.419	33.599	3,600	6	14.31	5.69	3.10	0.81
X19 2328 11	Indio SDF	Riverside	-116.223	33.713	8	30	3.07	1.72	0.94	0.25
X19 2405 00	Desert Hot Sp East	Riverside	-116.510	33.962	1,080	36	5.32	2.45	1.34	0.35
X19 2405 00	Desert Hot Sp West	Riverside	-116.510	33.962	1,080	44	5.74	2.51	1.37	0.36
X19 2405 08	Desert Hot Sp East	Riverside	-116.494	33.967	1,220	28	6.20	2.60	1.42	0.37
X19 3342 00	Garnet Valley	Riverside	-116.627	33.615	4,520	6	18.37	4.92	2.68	0.70
X19 3859 50	Haystack Mtn	Riverside	-116.479	33.702	2,800	14	8.98	3.83	2.09	0.55
X19 3859 50	Haystack Mtn	Riverside	-116.479	33.702	2,800	14	8.98	4.12	2.25	0.59
X19 4255 20	Indian Wells	Riverside	-116.337	33.722	144	9	4.63	2.24	1.22	0.32
X19 4259 00	Indio	Riverside	-116.224	33.713	8	94	3.29	2.12	1.16	0.30
X19 4259 05	Indio Money	Riverside	-116.229	33.835	1,160	8	6.06	3.24	1.77	0.46
X19 4782 11	La Quinta SDF	Riverside	-116.291	33.674	85	41	3.90	2.09	1.14	0.30
X19 5502 00	Mecca	Riverside	-116.078	33.571	190	81	3.20	2.09	1.14	0.30
X19 5626 00	Meadow Cyn Balcha	Riverside	-116.788	33.983	3,740	9	26.39	6.65	3.63	0.95
X19 5718 61	Mission Creek	Riverside	-116.627	34.011	2,400	18	11.68	4.84	2.64	0.69
X19 5718 61	Mission Creek	Riverside	-116.627	34.011	2,400	27	11.06	4.21	2.30	0.60
X19 5978 00	Mc San Jacinto St Pt	Riverside	-116.640	33.811	8,417	17	28.39	6.36	3.47	0.91
X19 5978 00	Mc San Jacinto WS	Riverside	-116.633	33.800	8,417	28	27.49	7.38	4.03	1.06
X19 6262 62	No Palm Sp SDF	Riverside	-116.546	33.924	875	35	6.25	2.57	1.40	0.37
X19 6275 20	No Shore	Riverside	-115.937	33.521	180	28	4.03	2.11	1.15	0.30
X19 6356 01	Oasis SDF	Riverside	-116.112	33.494	171	37	3.69	2.24	1.22	0.32
X19 6633 01	Palm Desert SDF	Riverside	-116.393	33.719	275	43	4.31	2.16	1.18	0.31
X19 6633 30	Palm Desert North	Riverside	-116.374	33.758	265	7	5.84	2.53	1.38	0.36
X19 6633 40	Palm Desert South	Riverside	-116.387	33.694	560	4	5.28	2.41	1.31	0.35
X19 6635 00	Palm Springs FD	Riverside	-116.545	33.826	465	59	6.13	2.76	1.51	0.40
X19 6635 20	Palm Springs DWA	Riverside	-116.495	33.805	453	15	8.25	2.63	1.43	0.38
X19 6635 50	Palm Springs East	Riverside	-116.510	33.827	425	77	5.63	2.80	1.53	0.40
X19 7102 50	Potom Canyon	Riverside	-116.935	33.870	1,220	12	15.09	4.17	2.27	0.60
X19 7247 78	Rancho Mirage North	Riverside	-116.433	33.771	250	17	4.99	2.40	1.31	0.34
X19 7247 78	Rancho Mirage RC	Riverside	-116.433	33.771	250	13	5.21	2.38	1.30	0.34
X19 7247 80	Rancho Mirage	Riverside	-116.431	33.755	249	15	6.23	3.34	1.82	0.48
X19 7279 00	Raywood Flats	Riverside	-116.823	34.047	7,070	60	33.63	10.04	5.48	1.44
X19 7279 00	Raywood Flats	Riverside	-116.817	34.046	6,620	19	33.28	9.31	5.08	1.33
X19 8274 40	Sky Valley SDF	Riverside	-116.389	33.917	1,330	6	5.61	2.69	1.47	0.39
X19 8315 00	Snow Creek	Riverside	-116.683	33.883	1,280	26	12.25	4.13	2.25	0.59
X19 8315 50	Snow Creek	Riverside	-116.693	33.892	1,600	5	14.15	5.58	3.04	0.80
X19 8317 00	Snow Creek Upper	Riverside	-116.683	33.867	1,940	53	13.30	5.12	2.79	0.73
X19 8750 33	Tachevah Dam	Riverside	-116.558	33.841	580	24	7.58	3.54	1.93	0.51
X19 8750 33	Tachevah Dam	Riverside	-116.560	33.867	584	25	7.42	3.35	1.83	0.48
X19 8892 00	Thermal AP	Riverside	-116.164	33.635	-118	54	3.21	1.83	1.00	0.26
X19 8892 00	Thermal AP	Riverside	-116.162	33.634	-118	56	3.14	1.95	1.06	0.28
X19 8892 01	Thermal AP CDF	Riverside	-116.164	33.635	-118	39	3.02	1.78	0.97	0.25
X19 8892 01	Thousand Palms CDF	Riverside	-116.383	33.820	240	35	4.10	2.00	1.11	0.29
X19 8908 20	Thousand Palms CDF	Riverside	-116.393	33.820	240	35	4.11	2.11	1.15	0.30
X19 9002 25	Tranway Valley Sta	Riverside	-116.613	33.837	2,700	16	17.28	5.73	3.13	0.82
X19 9002 25	Tranway Valley Sta	Riverside	-116.612	33.837	2,700	16	17.06	5.68	3.10	0.81
X19 9105 20	Twin Pines Ranch	Riverside	-116.791	33.868	3,440	22	23.34	6.83	3.73	0.98

R0006411

Table C-20
 Riverside Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean 2-Year Return Period (in)	1,919-Year Return Period (in)
X19 9105 20	Twin Pines Ranch	Riverside	-116.783	33.867	2,400	42	20.96	6.35	3.48	0.91
X19 9655 30	Whitewater North	Riverside	-116.656	33.990	2,200	16	19.56	6.38	3.48	0.91
X19 9655 30	Whitewater North	Riverside	-116.656	33.990	2,200	16	19.56	6.02	3.28	0.86
X19 9669 20	Wide Canyon Dam	Riverside	-116.391	33.934	1,530	18	5.56	2.59	1.41	0.37
X19 9669 20	Wide Canyon Dam	Riverside	-116.383	33.933	1,600	29	4.85	2.29	1.25	0.33
Y01 0264 00	Arlington	Riverside	-117.434	33.919	830	30	10.41	2.35	1.45	0.48
Y01 0609 00	Beaumont 1 E	Riverside	-116.965	33.930	2,809	63	18.26	3.87	2.38	0.80
Y01 0809 07	Beaumont East	Riverside	-116.950	33.930	2,600	33	17.60	3.87	2.38	0.80
Y01 0809 12	Beaumont CDF	Riverside	-116.973	33.930	2,610	29	16.82	4.32	2.66	0.86
Y01 1021 11	Box Spring Mtn	Riverside	-117.280	33.962	3,080	16	10.30	9.24	5.69	1.90
Y01 1306 05	Calimesa CDF	Riverside	-117.058	34.004	2,400	36	17.02	4.09	2.52	0.84
Y01 1306 25	Calimesa East	Riverside	-117.018	34.003	2,813	31	19.79	4.32	2.68	0.86
Y01 1670 25	Chase & Taylor	Riverside	-117.578	33.844	1,005	26	16.25	4.42	2.72	0.91
Y01 1670 25	Chase & Taylor	Riverside	-117.578	33.844	1,005	64	15.15	4.49	2.76	0.92
Y01 1696 01	Cherry Valley CDF	Riverside	-116.972	33.978	2,860	82	20.57	4.80	2.95	0.99
Y01 1696 01	Cherry Valley East	Riverside	-116.948	33.978	2,080	9	15.27	3.08	1.90	0.63
Y01 1696 01	Cherry Valley East	Riverside	-116.948	33.978	2,080	8	15.03	3.43	2.11	0.71
Y01 2031 00	Corona	Riverside	-117.578	33.968	760	84	12.90	3.76	2.31	0.77
Y01 2033 00	Corona South	Riverside	-117.545	33.837	1,070	76	13.61	4.11	2.53	0.83
Y01 2033 03	Corona No CDF	Riverside	-117.561	33.902	638	43	11.44	3.01	1.85	0.62
Y01 2033 03	Corona No CDF	Riverside	-117.577	33.844	1,050	13	16.43	4.48	2.76	0.92
Y01 2034 21	Corona Lamon Co	Riverside	-117.474	33.858	1,365	20	11.65	3.40	2.09	0.70
Y01 2598 50	Eagle Valley	Riverside	-117.276	33.924	1,535	28	11.92	3.03	1.87	0.62
Y01 2679 00	Edgemont	Riverside	-117.509	33.825	800	30	12.14	3.04	1.87	0.63
Y01 2717 00	El Camilo CDF	Riverside	-117.358	33.491	2,050	9	14.06	3.63	2.23	0.75
Y01 3365 33	Gavilan Springs	Riverside	-117.454	34.012	745	30	12.95	3.01	1.85	0.62
Y01 3438 20	Glen Avon FD	Riverside	-117.311	34.233	5,080	6	39.97	8.12	5.00	1.67
Y01 3453 50	Glen Crest	Riverside	-117.487	33.766	1,100	84	16.35	5.96	3.67	1.23
Y01 3458 11	Glen Ivy	Riverside	-117.434	33.871	1,275	25	9.33	2.72	1.67	0.56
Y01 3792 50	Harrison Dam	Riverside	-117.434	33.871	1,275	19	9.21	2.66	1.64	0.55
Y01 3792 50	Harrison Dam	Riverside	-117.333	34.015	945	38	11.72	2.65	1.63	0.55
Y01 3951 11	Highgrove	Riverside	-117.331	34.025	945	27	11.31	2.92	1.80	0.60
Y01 3951 11	Highgrove North	Riverside	-117.331	34.025	945	27	11.30	2.55	1.57	0.52
Y01 3951 11	Highgrove North	Riverside	-117.331	34.025	945	36	12.13	4.44	2.73	0.91
Y01 3951 11	Highgrove Steam Plant	Riverside	-117.331	34.025	945	36	12.13	4.44	2.73	0.91
Y01 4059 20	Home Gardens	Riverside	-117.549	33.875	640	68	12.50	3.70	2.28	0.76
Y01 4246 00	Indian Hills	Riverside	-117.453	33.980	840	7	10.85	2.88	1.77	0.59
Y01 4689 40	Lake Mathews North	Riverside	-117.434	33.871	1,275	32	9.39	2.65	1.63	0.55
Y01 4689 40	Lake Mathews North	Riverside	-117.434	33.871	1,275	32	9.39	2.35	1.45	0.48
Y01 4689 51	Lake Mathews 1	Riverside	-117.446	33.842	1,375	16	7.19	3.90	2.40	0.80
Y01 4689 52	Lake Mathews 2	Riverside	-117.038	33.840	1,400	15	7.97	3.40	2.09	0.70
Y01 4689 53	Lake Mathews 3	Riverside	-117.454	33.847	1,160	22	9.18	2.47	1.52	0.51
Y01 4689 57	Lake Mathews	Riverside	-117.430	33.852	1,447	37	9.67	2.67	1.64	0.55
Y01 4689 57	Lake Mathews East	Riverside	-117.369	33.839	1,480	22	11.19	2.94	1.81	0.61
Y01 4814 11	La Sierra FS	Riverside	-117.486	33.919	720	38	10.12	2.50	1.54	0.51
Y01 5163 60	Lower Ranch	Riverside	-117.592	33.864	1,850	42	14.47	4.62	2.84	0.95
Y01 5326 00	March Field	Riverside	-117.250	33.867	1,490	16	8.11	2.23	1.37	0.46
Y01 5706 02	Mira Loma	Riverside	-117.530	34.028	827	56	13.14	3.72	2.29	0.77
Y01 6215 11	Norco	Riverside	-117.578	33.900	620	11	11.52	3.17	1.95	0.65
Y01 6215 11	Norco FD	Riverside	-117.548	33.931	630	37	11.09	2.86	1.77	0.59
Y01 6299 20	Nuyvee	Riverside	-117.132	33.818	1,467	17	10.21	2.96	1.83	0.61
Y01 6308 05	Oak Flat	Riverside	-117.638	33.829	2,700	17	23.47	5.25	3.23	1.08
Y01 6310 20	Oak Glen	Riverside	-116.905	34.033	5,520	8	21.77	5.14	3.16	1.06
Y01 6310 20	Oak Glen	Riverside	-116.957	34.054	47	54	27.63	6.79	4.18	1.40
Y01 6778 21	Pedley	Riverside	-117.485	33.975	710	39	11.58	2.97	1.83	0.61
Y01 6818 11	Pima CDF	Riverside	-117.227	33.788	710	46	11.24	3.14	1.93	0.65
Y01 6858 01	Pigeon Pass	Riverside	-117.269	33.988	1,910	37	12.27	3.11	1.91	0.64
Y01 6858 01	Pigeon Pass	Riverside	-117.485	33.975	710	33	11.87	2.88	1.77	0.59
Y01 6858 10	Pigeon Pass Dam	Riverside	-117.246	33.953	1,700	8	11.83	2.74	1.69	0.56
Y01 7123 00	Prado Dam	Riverside	-117.638	33.890	560	54	14.01	4.23	2.60	0.87
Y01 7123 00	Prado Dam	Riverside	-117.633	33.890	560	56	13.63	3.93	2.42	0.81
Y01 7284	San Bernardino CSU 2348	Riverside	-117.282	34.043	1,120	27	12.88	3.18	1.95	0.65
Y01 7284 00	Rancho Canyon North	Riverside	-117.231	33.996	1,750	76	13.74	3.32	2.04	0.68
Y01 7315 20	Roadside CC 3238	Riverside	-116.840	33.833	4,400	8	19.36	3.94	2.43	0.81
Y01 7469 01	Rod Man	Riverside	-117.378	34.003	800	31	12.10	3.08	1.90	0.63
Y01 7470 00	Riverside FS #3	Riverside	-117.388	33.951	990	18	10.98	2.73	1.68	0.56
Y01 7470 00	Riverside FS #3	Riverside	-117.388	33.980	838	32	10.88	2.52	1.55	0.52
Y01 7470 00	Riverside N FCD	Riverside	-117.388	33.951	990	100	10.07	2.69	1.66	0.55
Y01 7473 00	Riverside Citrus	Riverside	-117.335	33.967	990	72	10.83	2.81	1.73	0.58
Y01 7473 00	Riverside Citrus	Riverside	-117.335	33.967	990	57	10.40	2.45	1.51	0.50
Y01 7473 44	Riverside Citrus?	Riverside	-117.336	33.965	1,020	10	10.30	2.38	1.47	0.49
Y01 7473 77	Riverside CIMS 44	Riverside	-117.388	33.961	840	45	9.90	2.39	1.47	0.49
Y01 7586 01	Rubidoux Fire Dept	Riverside	-117.404	33.999	776	27	12.49	2.80	1.72	0.58
Y01 7586 01	Rubidoux Lab	Riverside	-117.397	33.980	838	25	10.68	2.48	1.53	0.51

R0006412

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean 2-Year Return Period (in)	1,0191-Year Return Period (in)
Y01 7887 13	San Timoteo Canyon	Riverside	-117.100	33.973	1,970	53	14.54	3.42	2.11	0.70
Y01 8668 85	Sunny Slope	Riverside	-117.447	34.012	906	45	11.97	3.10	1.81	0.64
Y01 8845 15	Temescal Cyn SAR	Riverside	-117.507	33.757	1,580	5	24.97	7.64	4.70	1.57
Y01 8845 20	Temescal Cyn Shop	Riverside	-117.507	33.772	1,300	30	16.22	4.97	3.06	1.02
Y01 8845 60	Temescal Cyn WRO	Riverside	-117.499	33.786	928	43	14.14	5.04	3.10	1.04
Y01 8845 70	Temescal Cyn WS	Riverside	-117.496	33.758	1,220	88	17.06	6.05	3.72	1.25
Y01 8848 50	Temescal Water Co	Riverside	-117.578	33.868	680	61	12.41	3.75	2.31	0.77
Y01 9163 25	Upper Drive	Riverside	-117.579	33.834	1,250	62	17.36	5.31	3.27	1.08
Y01 9587 01	West Riverside CDF	Riverside	-117.447	34.012	906	32	11.74	3.14	1.83	0.65
Y01 9675 51	Wildrose Ranch	Riverside	-117.450	33.783	875	20	11.98	5.50	3.39	1.13
Y01 9774 40	Woodcrest CDF	Riverside	-117.350	33.865	1,557	34	9.47	2.53	1.56	0.52
Y01 9774 40	Woodcrest CDF	Riverside	-117.350	33.865	1,557	34	9.46	2.39	1.47	0.49
Y02 0072 50	Alondale	Riverside	-116.754	33.782	5,800	36	34.94	7.63	4.70	1.57
Y02 0072 50	Alondale	Riverside	-116.754	33.781	5,800	8	28.36	6.11	3.78	1.28
Y02 0208 70	Angeles Hill	Riverside	-116.852	33.807	3,920	5	23.38	4.70	2.80	0.97
Y02 0208 70	Angeles Hill	Riverside	-116.852	33.807	3,920	5	15.53	4.97	3.06	1.02
Y02 0507 00	Beaumont PP	Riverside	-116.968	33.868	2,305	63	20.63	5.02	3.09	1.03
Y02 0608 00	Beaumont	Riverside	-116.974	33.929	2,313	86	18.08	4.11	2.53	0.85
Y02 0608 00	Beaumont	Riverside	-116.974	33.929	2,313	57	16.93	3.85	2.37	0.79
Y02 0609 00	Beaumont 1 E	Riverside	-116.965	33.930	2,609	72	18.55	3.96	2.44	0.82
Y02 1510	El Canelo Station	Riverside	-117.412	33.650	2,660	25	24.18	5.63	3.47	1.16
Y02 2805 00	Elsinore	Riverside	-117.331	33.669	1,265	99	12.48	3.77	2.32	0.78
Y02 2805 00	Elsinore	Riverside	-116.912	33.669	1,285	57	11.74	3.37	2.07	0.69
Y02 2805 50	Elsinore St Park	Riverside	-117.372	33.678	1,265	27	16.30	3.78	2.33	0.78
Y02 3363 33	Gavilan Sonings	Riverside	-117.396	33.792	2,050	13	13.08	3.24	1.99	0.67
Y02 3363 33	Gavilan Sonings	Riverside	-117.396	33.792	2,050	13	13.08	3.53	2.17	0.73
Y02 3415 50	Galman Hot Springs	Riverside	-116.968	33.833	1,470	32	12.05	3.23	1.99	0.66
Y02 3507	Good Hope	Riverside	-117.281	33.762	1,630	14	12.70	3.21	1.98	0.66
Y02 3896 00	Hemet	Riverside	-116.950	33.750	1,635	63	12.58	3.13	1.93	0.64
Y02 3899 00	Hemet Reservoir	Riverside	-116.876	33.869	4,355	97	19.29	4.27	2.63	0.88
Y02 3899 00	Hemet Reservoir	Riverside	-116.876	33.867	4,355	47	11.94	3.41	2.10	0.70
Y02 4062 05	Homeland	Riverside	-117.743	33.743	1,600	31	12.03	2.73	1.68	0.56
Y02 4181 00	Hunkey Park	Riverside	-116.676	33.677	4,390	32	19.95	4.75	2.92	0.98
Y02 4181 00	Hunkey Park	Riverside	-116.676	33.677	4,390	57	19.14	4.19	2.58	0.86
Y02 4211 00	Idyllwild	Riverside	-117.723	33.713	5,397	68	28.19	5.66	3.48	1.16
Y02 4211 00	Idyllwild	Riverside	-117.723	33.713	5,397	58	27.10	5.18	3.19	1.07
Y02 4431 00	Juniper Flats	Riverside	-117.083	33.764	2,110	12	14.08	3.08	1.90	0.63
Y02 4431 00	Juniper Flats	Riverside	-117.083	33.764	2,110	29	13.67	4.16	2.56	0.86
Y02 4686 51	Lakeview Village	Riverside	-117.346	33.637	1,319	38	16.13	4.28	2.63	0.88
Y02 4717 30	Lakeview	Riverside	-117.132	33.818	1,487	36	11.72	3.15	1.94	0.65
Y02 4979 40	Little Lake SDF	Riverside	-116.931	33.745	1,897	33	12.64	2.80	1.72	0.58
Y02 5326 00	March AFB	Riverside	-117.243	33.917	1,567	30	8.72	2.47	1.52	0.51
Y02 5492 20	Mead Valley	Riverside	-117.285	33.838	1,660	8	10.36	2.50	1.54	0.51
Y02 5736 30	Mockingbird Res	Riverside	-117.415	33.897	1,007	53	9.80	2.35	1.45	0.48
Y02 5840 40	Moreno South #1	Riverside	-117.235	33.902	1,535	34	9.44	2.50	1.54	0.51
Y02 5840 45	Moreno South #2	Riverside	-117.235	33.901	1,535	7	11.14	2.86	1.76	0.59
Y02 5840 60	Moreno East	Riverside	-117.137	33.941	1,840	21	14.38	3.58	2.20	0.74
Y02 5840 60	Moreno Valley	Riverside	-117.137	33.941	1,840	21	14.35	3.78	2.33	0.78
Y02 6299 20	Navajo SDF	Riverside	-117.132	33.818	1,467	23	11.70	3.63	2.23	0.75
Y02 6815 16	Perris Res	Riverside	-117.196	33.864	1,625	29	11.07	3.27	2.01	0.67
Y02 6815 16	Perris Res	Riverside	-117.196	33.864	1,625	29	11.06	3.18	1.96	0.65
Y02 6816 00	Perris	Riverside	-117.201	33.861	1,520	12	9.87	3.51	2.16	0.72
Y02 6816 00	Perris	Riverside	-117.201	33.861	1,520	18	12.08	3.18	1.96	0.65
Y02 6816 77	Perris State Park	Riverside	-117.229	33.788	1,452	22	11.50	3.30	2.03	0.68
Y02 6818 11	Perris CDF	Riverside	-117.225	33.859	1,461	10	7.94	1.86	1.15	0.38
Y02 6818 25	Perris Valley	Riverside	-117.225	33.859	1,461	11	7.94	1.86	1.15	0.38
Y02 6818 25	Perris Valley CH	Riverside	-117.253	33.978	1,850	9	11.83	3.18	1.96	0.65
Y02 6858 10	Pigeon Pass	Riverside	-117.246	33.953	1,700	14	10.37	2.42	1.49	0.50
Y02 6858 10	Pigeon Pass Dam	Riverside	-116.737	33.750	6,220	25	31.77	5.24	3.23	1.08
Y02 6891 12	Pine Cove	Riverside	-116.447	33.586	4,000	16	17.30	4.15	2.56	0.85
Y02 6933 50	Prinyon Flat	Riverside	-116.447	33.586	4,000	25	14.96	4.27	2.63	0.88
Y02 6933 50	Prinyon Flat	Riverside	-116.859	33.848	3,520	16	25.86	4.61	2.84	0.96
Y02 7058 80	Poppal Flats	Riverside	-117.239	33.702	1,590	34	12.02	3.35	2.06	0.69
Y02 7178 70	Quail Valley SDF	Riverside	-117.275	33.677	1,380	59	11.02	3.27	2.01	0.67
Y02 7221 01	Rail Road Canyon	Riverside	-117.021	33.730	1,509	6	12.15	2.63	1.62	0.54
Y02 7613 11	Ryan Field	Riverside	-117.021	33.730	1,509	38	11.56	2.82	1.74	0.58
Y02 7613 11	Ryan Field	Riverside	-116.966	33.821	1,510	46	13.23	3.26	2.01	0.67
Y02 7810 40	San Jacinto North	Riverside	-116.997	33.792	1,500	26	10.91	2.74	1.69	0.56
Y02 7811 00	San Jacinto Res	Riverside	-116.958	33.787	1,560	100	12.91	2.85	1.75	0.59
Y02 7813 00	San Jacinto	Riverside	-116.958	33.787	1,560	55	12.19	2.89	1.78	0.59
Y02 7813 00	San Jacinto RS	Riverside	-116.958	33.787	1,560	55	12.19	2.89	1.78	0.59
Y02 7813 20	San Jacinto Valley	Riverside	-117.119	33.874	1,450	4	14.81	3.30	2.03	0.68
Y02 7813 50	San Jacinto Valley	Riverside	-117.119	33.874	1,450	9	11.90	2.73	1.68	0.56
Y02 8272 01	Skinner Lake Park	Riverside	-117.023	33.587	1,700	14	13.34	3.30	2.03	0.68

Table C-26
Sutroville Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean 2-Year Return Period (in)	1,001-Year Return Period (in)
Y02 8650 00	Sun City	Riverside	-117.190	33.715	1,426	21	12.61	3.56	2.19	0.73
Y02 8650 50	Sun City South	Riverside	-117.209	33.696	1,412	23	11.98	3.58	2.27	0.78
Y02 8650 75	Sun City CDF	Riverside	-117.190	33.715	1,426	23	12.14	3.17	1.95	0.65
Y02 8664 01	Sunnyvale	Riverside	-117.247	33.938	1,641	38	11.55	2.70	1.66	0.56
Y02 8664 20	Sunnyvale #2	Riverside	-117.226	33.944	1,688	11	11.59	2.39	1.47	0.49
Y02 8338 20	Valley Vista	Riverside	-117.892	33.758	1,740	5	16.54	4.25	2.62	0.87
Y02 9722 00	Winchester	Riverside	-117.008	33.710	1,475	48	11.86	3.50	2.15	0.72
Y02 9722 00	Winchester	Riverside	-117.008	33.710	1,475	49	11.61	3.40	2.09	0.70
Z01 2711 70	El Cerrito 192	Riverside	-117.412	33.650	2,660	22	22.63	5.87	3.48	1.45
Z01 2711 70	El Cerrito GS	Riverside	-117.412	33.650	2,660	15	24.42	5.89	3.81	1.50
Z01 7987 12	Santiago	Riverside	-117.533	33.711	5,638	45	33.31	8.05	4.94	2.06
Z01 7987 12	Santiago Peak 156	Riverside	-117.533	33.711	5,638	41	33.10	7.58	4.65	1.94
Z01 9675 85	Widomar La Cresta	Riverside	-117.308	33.592	2,360	4	22.53	5.93	3.64	1.51
Z02 0035 00	Aguanga Valley	Riverside	-118.880	33.444	1,920	13	12.91	4.92	3.02	1.26
Z02 0035 00	Aguanga Valley	Riverside	-118.880	33.444	1,920	21	12.24	4.92	3.02	1.26
Z02 0035 00	Aguanga Valley	Riverside	-118.803	33.486	34	36	14.14	3.08	1.89	0.79
Z02 0235 00	Anza	Riverside	-116.875	33.556	3,920	31	14.59	3.27	2.01	0.84
Z02 0235 00	Anza	Riverside	-116.875	33.556	3,915	44	12.79	3.42	2.10	0.87
Z02 4629 50	La Cresta	Riverside	-117.311	33.556	2,200	14	17.65	5.05	3.10	1.29
Z02 5530 50	Mentee	Riverside	-117.204	33.649	1,570	13	17.51	5.16	3.17	1.32
Z02 6042 00	Mumeta Creek	Riverside	-117.223	33.563	1,131	7	18.00	4.52	2.77	1.15
Z02 6042 00	Mumeta Creek	Riverside	-117.223	33.563	1,131	50	15.38	4.95	3.04	1.26
Z02 6043 20	Mumeta Creek	Riverside	-117.232	33.555	1,100	7	18.00	4.52	2.77	1.15
Z02 7220 00	Red Mountain	Riverside	-116.840	33.633	4,400	8	16.69	3.35	2.06	0.86
Z02 7222 05	Rainbow Cottage	Riverside	-117.167	33.447	1,330	23	17.68	4.58	2.80	1.16
Z02 7640 50	Sage	Riverside	-116.931	33.581	2,290	32	14.79	3.49	2.14	0.89
Z02 7736 30	Skinner Lake	Riverside	-117.075	33.586	1,490	15	13.93	3.49	2.14	0.89
Z02 7736 50	Skinner Lake	Riverside	-117.083	33.583	1,400	32	12.88	3.48	2.14	0.89
Z02 7965 80	Santa Rosa Plateau	Riverside	-117.288	33.505	2,040	4	30.26	8.91	5.47	2.28
Z02 7965 80	Santa Rosa Plateau	Riverside	-117.288	33.505	2,040	4	24.54	9.13	5.60	2.33
Z02 7969 41	Santa Rosa Ranch	Riverside	-117.268	33.512	1,820	12	25.54	9.26	5.68	2.36
Z02 8272 13	Skinner Lake Park	Riverside	-117.023	33.597	1,700	14	15.02	3.41	2.09	0.87
Z02 8840 01	Tamucula	Riverside	-117.149	33.497	1,020	41	16.81	4.52	2.77	1.15
Z02 8840 01	Tamucula East	Riverside	-117.096	33.525	1,300	5	13.25	3.03	1.86	0.77
Z02 8840 01	Tamucula SDF	Riverside	-117.149	33.497	1,020	38	16.84	4.63	2.84	1.18
Z02 8840 20	Tamucula NW	Riverside	-117.149	33.497	1,020	38	16.64	5.76	3.53	1.47
Z02 9675 47	Widomar La Cresta	Riverside	-117.308	33.592	2,360	4	22.53	6.00	3.68	1.53
Z02 9675 75	Widomar	Riverside	-117.275	33.603	1,268	84	14.06	4.67	2.87	1.19
A00 0179 77	American River College	Sacramento	-121.345	38.654	95	10	19.27	2.95	2.00	0.93
A00 0249 34	Arcoide Gravier	Sacramento	-121.384	38.628	70	22	21.62	3.38	2.30	1.06
A00 0255 77	Arden Way SC 281	Sacramento	-121.389	38.596	35	11	18.56	3.01	2.04	0.95
A00 0257 34	Ardenway 1E Ford	Sacramento	-121.380	38.582	65	20	22.03	3.49	2.37	1.10
A00 0559 77	Beach Lake	Sacramento	-121.499	38.439	0	5	21.27	3.59	2.44	1.13
A00 1041 34	Branch Center	Sacramento	-121.339	38.537	75	25	16.59	3.24	2.20	1.02
A00 1540 90	Carmichael Winston	Sacramento	-121.311	38.621	100	3	21.02	3.34	0.91	0.42
A00 1540 77	Carmichael 1 ESE	Sacramento	-121.311	38.621	100	15	26.18	3.95	2.68	1.24
A00 1540 77	Carmichael 2 4W	Sacramento	-121.371	38.628	78	18	24.69	3.83	2.60	1.20
A00 1540 77	Carmichael 2 7 N	Sacramento	-121.322	38.656	119	13	18.64	2.87	1.95	0.90
A00 1714 77	Chicago SC 779	Sacramento	-121.258	38.662	220	11	22.30	3.75	2.55	1.18
A00 1773 32	Citus Heights	Sacramento	-121.300	38.700	138	34	23.16	3.45	2.34	1.08
A00 2006 77	Corabel	Sacramento	-121.397	38.614	13	6	24.57	4.03	2.74	1.27
A00 2160 00	Crestia Park SC 267	Sacramento	-121.368	38.593	70	37	19.27	3.26	2.21	1.02
A00 2253 77	DOS SC	Sacramento	-121.422	38.584	25	6	20.06	3.34	2.27	1.05
A00 2608 34	Eagles Nest	Sacramento	-121.260	38.485	100	21	16.82	2.50	1.70	0.79
A00 2742 00	Elk Grove SC 270	Sacramento	-121.377	38.423	45	31	17.20	2.80	1.90	0.88
A00 2744 77	Elkhor Blvd SC	Sacramento	-121.448	38.664	45	6	20.86	3.50	2.38	1.10
A00 2948 65	Fair Oaks Johnson	Sacramento	-121.257	38.677	185	10	21.74	4.14	2.81	1.30
A00 3387 34	Garber Road	Sacramento	-121.402	38.481	30	5	13.68	2.52	1.71	0.79
A00 4283 77	Jones Road SC	Sacramento	-121.068	38.448	310	6	17.91	2.45	1.66	0.77
A00 4339 00	Jani Drive	Sacramento	-121.318	38.647	135	17	20.27	3.65	2.48	1.15
A00 5403 00	Meather AFB	Sacramento	-121.300	38.670	90	51	18.54	2.94	2.00	0.92
A00 5447 00	McCallan AFB	Sacramento	-121.390	38.670	70	42	21.68	3.46	2.35	1.08
A00 5569 90	Sac Metropolitan AP	Sacramento	-121.588	38.686	17	34	15.39	2.60	1.77	0.82
A00 6160 50	Navon SC 773	Sacramento	-121.309	38.705	140	27	22.15	3.38	2.30	1.06
A00 6481 03	Orangevale Wade	Sacramento	-121.242	39.694	230	7	22.48	4.33	2.94	1.38
A00 6482 02	Orangevale SC 278	Sacramento	-121.219	38.686	233	36	20.59	3.22	2.19	1.01
A00 6482 77	Orangevale 1 NW	Sacramento	-121.239	38.686	250	12	22.71	3.80	2.58	1.19
A00 6890 34	Prairie City SC 287	Sacramento	-121.161	38.592	280	10	19.05	2.68	1.82	0.84
A00 7247 00	Rancho Cordova JF	Sacramento	-121.333	38.592	85	28	20.22	3.13	2.13	0.98
A00 7247 01	Rancho Cordova SC 277	Sacramento	-121.312	38.603	72	32	18.04	2.94	2.00	0.92
A00 7247 03	Rancho Cordova Denley	Sacramento	-121.282	38.604	98	13	23.55	3.75	2.55	1.18
A00 7439 34	Corneil Center	Sacramento	-121.424	38.306	18	11	16.28	2.80	1.90	0.88
A00 7443 34	Rio Linda	Sacramento	-121.450	38.670	42	8	18.52	3.45	2.34	1.08

R0006414

Table C-20
Stepwise Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean 2-Year Return Period (in)	1,001-Year Return Period (in)
A00 7443.34	Rio Linda SC 278	Sacramento	-121.448	38.700	42	26	18.88	2.98	2.02	0.94
A00 7630.00	Sacramento Es AP	Sacramento	-121.220	38.520	17	54	17.21	2.92	1.98	0.92
A00 7630.00	Sacramento Es AP	Sacramento	-121.220	38.520	17	47	17.02	2.83	1.92	0.89
A00 7633.00	Sacramento City	Sacramento	-121.480	38.580	25	127	18.24	3.10	2.11	0.97
A00 7633.00	Sacramento City	Sacramento	-121.480	38.580	25	95	17.44	3.10	2.11	0.97
A00 7633.34	Sacramento Coldwater	Sacramento	-121.478	38.619	16	13	20.40	3.51	2.38	1.10
A00 7636.34	Sacramento Water	Sacramento	-121.370	38.600	85	15	22.10	3.68	2.50	1.16
A00 7639.34	Sacramento Metro AP	Sacramento	-121.594	38.698	20	33	14.97	3.89	2.64	1.22
A00 8573.34	Stonemead	Sacramento	-121.290	38.510	120	15	20.27	3.18	2.16	1.00
A00 8573.34	Stonemead	Sacramento	-121.290	38.510	120	13	20.10	3.12	2.12	0.98
A00 8607.77	Strong Ranch	Sacramento	-121.412	38.595	35	6	22.27	3.81	2.59	1.20
A00 8677.34	Sunrise Boulevard 291	Sacramento	-121.271	38.689	162	10	16.96	2.85	1.94	0.90
A00 9258.34	Van Mann 286	Sacramento	-121.308	38.698	120	11	20.92	3.37	2.29	1.06
A70 3113.00	Folsom	Sacramento	-121.131	38.707	350	104	23.98	3.47	2.36	1.09
A70 7370.00	Repreca	Sacramento	-121.161	38.693	295	94	22.46	3.33	2.26	1.05
B00 1835.01	Central Valley Hatchery	Sacramento	-121.367	37.417	38	28	18.72	3.04	2.06	0.96
B00 1785.50	Clay 1 NW	Sacramento	-121.173	38.356	96	41	16.67	2.50	1.70	0.79
B00 2742.00	Elk Grove Hatchery	Sacramento	-121.374	38.421	45	26	16.31	2.73	1.85	0.86
B00 2742.02	Elk Grove Lorenzan	Sacramento	-121.379	38.403	41	10	21.13	2.58	1.75	0.82
B00 3301.00	Galt	Sacramento	-121.300	38.250	47	91	16.85	2.70	1.83	0.85
B00 3919.00	Herald	Sacramento	-121.242	38.296	70	16	13.68	2.67	1.81	0.84
B00 7248.00	Rancho Murietta	Sacramento	-121.101	38.511	215	14	17.56	2.91	1.97	0.92
B00 7248.92	Rancho Murietta	Sacramento	-121.100	38.508	220	5	22.68	3.21	2.18	1.02
B00 8293.00	Sloughhouse 6 SE	Sacramento	-121.083	38.467	150	13	18.63	2.96	2.01	0.94
B00 9639.00	White Rock	Sacramento	-121.080	38.564	353	42	22.90	3.29	2.23	1.04
B90 1043.00	Brannon Island	Sacramento	-121.697	38.109	35	20	18.17	2.82	1.91	0.86
B90 1541.00	Grand Island	Sacramento	-121.619	38.196	0	39	17.60	2.82	1.91	0.86
B90 9429.00	Georgiana Slough SC 271	Sacramento	-121.517	38.237	20	33	15.56	2.75	1.86	0.87
B90 9429.00	Walnut Grove Leary	Sacramento	-121.437	38.268	2	29	16.65	3.01	2.04	0.95
W08 6848.01	Pinos Hills	San Bernardino	-117.610	34.416	1,250	8	11.84	1.62	2.04	0.54
W08 6843.00	Summit	San Bernardino	-117.423	34.329	3,860	17	11.70	4.53	2.55	0.68
W12 4312.50	Ivanpah Co Yd	San Bernardino	-115.257	34.388	2,927	20	4.46	2.00	1.12	0.30
W12 5890.00	Mountain Pass	San Bernardino	-115.533	35.467	4,670	38	8.06	2.69	1.51	0.40
W12 5890.00	Mountain Pass 6362	San Bernardino	-115.544	35.472	4,670	10	9.40	2.46	1.38	0.37
W16 3498.00	Coldstone Echo	San Bernardino	-116.783	35.283	2,950	32	5.61	2.19	1.23	0.33
W21 9035.00	Trona	San Bernardino	-117.383	35.783	1,695	67	4.13	1.88	1.06	0.28
W28 0024.00	Adelanto	San Bernardino	-117.415	34.576	2,845	44	4.85	2.17	1.22	0.32
W28 0024.20	Adelanto WD	San Bernardino	-117.405	34.572	2,880	9	5.75	2.16	1.21	0.32
W28 0244.00	Apple Valley	San Bernardino	-117.214	34.524	2,935	32	4.98	2.05	1.15	0.31
W28 0244.00	Apple Valley Co Yd	San Bernardino	-117.077	34.359	3,030	24	6.22	2.52	1.42	0.38
W28 0310.00	Arrowhead RS	San Bernardino	-117.191	34.239	5,593	27	40.42	12.77	7.18	1.90
W28 0310.77	Arrowhead FS1 5140	San Bernardino	-117.186	34.249	5,205	19	35.12	9.31	5.23	1.39
W28 0436.00	Baker	San Bernardino	-117.020	36.267	944	43	3.12	1.59	0.89	0.24
W28 0436.00	Baker	San Bernardino	-116.067	35.267	940	36	2.65	0.93	0.52	0.14
W28 0437.00	Baker 9 NNW	San Bernardino	-116.117	35.383	1,045	18	2.64	1.36	0.76	0.20
W28 0455.20	Baldy Mesa	San Bernardino	-117.387	34.462	3,320	6	8.10	2.94	1.65	0.44
W28 0455.47	Baldy Mesa	San Bernardino	-117.387	34.462	3,320	3	8.95	4.02	2.26	0.60
W28 0519.00	Barstow	San Bernardino	-117.017	34.900	2,320	73	4.32	1.71	0.96	0.25
W28 0519.00	Barstow	San Bernardino	-117.017	34.900	2,142	10	3.65	0.63	0.35	0.09
W28 0900.30	Blue Jay Village	San Bernardino	-117.298	34.219	5,140	7	35.15	9.63	5.41	1.44
W28 1267.01	Cajon Junction 2016	San Bernardino	-117.475	34.312	3,118	48	17.74	7.00	3.94	1.04
W28 1272.00	Cajon West Summit	San Bernardino	-117.574	34.390	4,780	32	11.68	3.49	1.96	0.52
W28 1272.00	Cajon West Summit 2052	San Bernardino	-117.576	34.392	4,838	34	9.93	3.82	2.15	0.57
W28 1272.00	Cajon West Summit 52	San Bernardino	-117.574	34.390	4,780	22	8.33	3.29	1.85	0.49
W28 1302.50	Calico Co Park	San Bernardino	-116.865	34.950	2,340	23	3.48	1.60	0.90	0.24
W28 1302.50	Calico Park 6304	San Bernardino	-116.864	34.950	2,340	9	3.57	1.49	0.84	0.22
W28 1610.30	Cedar Pines Park	San Bernardino	-117.334	34.250	5,280	6	31.15	8.39	4.72	1.25
W28 1610.35	Cedar Pines Park Ride	San Bernardino	-117.321	34.250	5,280	7	47.91	11.09	6.24	1.65
W28 1613.00	Cedar Springs	San Bernardino	-117.330	34.284	3,275	8	28.57	7.74	4.35	1.15
W28 1812.20	Cleghorn	San Bernardino	-117.368	34.300	3,425	13	33.39	10.56	5.94	1.57
W28 2163.00	Crestline FS	San Bernardino	-117.266	34.233	4,530	52	35.78	8.36	4.70	1.25
W28 2164.00	Crestline FS 2	San Bernardino	-117.290	34.238	4,880	25	35.68	9.92	5.58	1.48
W28 2164.00	Crestline FS 2	San Bernardino	-117.289	34.238	4,880	54	36.77	8.51	4.78	1.27
W28 2255.00	Daguer	San Bernardino	-116.869	34.866	1,975	54	3.77	1.30	0.73	0.19
W28 2259.00	Daguer AP	San Bernardino	-116.783	34.867	1,922	51	3.86	1.70	0.96	0.25
W28 2409.50	Devils Punchbowl 1111	San Bernardino	-117.857	34.413	4,760	33	17.77	7.46	4.19	1.11
W28 2570.00	Dunn Siding	San Bernardino	-116.433	35.050	1,310	12	3.34	1.58	0.89	0.24
W28 2771.00	El Mirage Field	San Bernardino	-117.600	34.600	2,910	32	5.75	2.18	1.21	0.32
W28 3609.00	Green Canyon Springs	San Bernardino	-117.752	34.233	7,000	34	14.71	4.75	2.67	0.71
W28 3612.04	Green Valley Lake	San Bernardino	-117.079	34.239	6,880	15	36.63	11.60	6.52	1.73
W28 3612.30	Green Valley FD	San Bernardino	-117.081	34.234	6,900	21	32.55	8.85	4.98	1.32
W28 3612.30	Green Valley FD 5320	San Bernardino	-117.080	34.234	6,900	18	32.68	9.48	5.33	1.41
W28 3684.50	Heaps Peak 5339	San Bernardino	-117.139	34.225	6,421	10	21.96	8.70	3.77	1.00

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,010-Year Return Period (in)
W28 3864 52	Heaps Peak	San Bernardino	-117.140	34.225	6,421	22	23.92	6.82	3.83	1.02
W28 3935 00	Hesperia	San Bernardino	-117.303	34.421	3,195	35	6.90	2.90	1.83	0.43
W28 3935 01	Hesperia CDF	San Bernardino	-117.300	34.421	3,195	36	6.54	3.07	1.73	0.48
W28 4123 10	Horseshoe Bend	San Bernardino	-117.268	34.219	5,275	7	39.87	7.72	4.34	1.15
W28 4384 20	Job's Peak	San Bernardino	-117.334	34.256	5,160	9	20.81	7.14	4.01	1.06
W28 4606 20	Kelso	San Bernardino	-115.648	35.016	2,148	24	5.27	2.24	1.26	0.33
W28 4606 20	Kramer Junction	San Bernardino	-117.539	34.989	2,477	35	4.58	1.88	1.08	0.28
W28 4671 00	Lake Arrowhead	San Bernardino	-117.187	34.248	5,205	69	41.48	11.47	6.45	1.71
W28 4671 10	Lake Arrowhead Asher	San Bernardino	-117.195	34.247	5,260	24	45.91	11.16	6.28	1.66
W28 4671 20	Lake Arrowhead FS4	San Bernardino	-117.204	34.261	5,205	44	40.68	10.43	5.86	1.55
W28 4671 20	Lake Arrowhead FS4	San Bernardino	-117.204	34.261	5,205	27	40.39	11.25	6.33	1.68
W28 4671 20	Lake Arrowhead FS4 5280	San Bernardino	-117.203	34.261	5,205	46	41.15	10.91	6.13	1.63
W28 4671 20	Lake Arrowhead FS4 5280	San Bernardino	-117.203	34.261	5,205	17	35.45	10.76	6.05	1.60
W28 4671 40	Lake Arrowhead FS2	San Bernardino	-117.182	34.263	5,200	25	33.22	9.66	5.43	1.44
W28 4684 40	Lake Gregory Park	San Bernardino	-117.272	34.240	4,335	36	38.75	10.76	6.05	1.60
W28 4684 45	Lake Gregory Village	San Bernardino	-117.278	34.241	4,350	11	39.33	8.79	4.94	1.31
W28 4684 50	Lake Gregory Dam	San Bernardino	-117.269	34.246	4,540	10	41.36	9.59	5.39	1.43
W28 4711 20	Lake Silverwood St Pt	San Bernardino	-117.351	34.284	3,400	24	35.44	11.09	6.24	1.65
W28 5066 70	Lone Pine Bishop 2331	San Bernardino	-117.546	34.314	4,400	9	15.93	5.78	3.25	0.86
W28 5198 20	Luning Pines	San Bernardino	-117.119	34.208	6,240	11	52.77	12.02	6.76	1.79
W28 5618 20	Male High Ranch 1166	San Bernardino	-117.771	34.411	5,280	19	12.23	4.11	2.31	0.81
W28 5756 00	Mojave River	San Bernardino	-117.247	34.367	3,000	14	8.31	3.23	1.82	0.48
W28 5848 01	Phelan CDF	San Bernardino	-117.572	34.422	4,160	41	7.34	3.33	1.87	0.50
W28 5868 01	Pilot Rock CC	San Bernardino	-117.287	34.272	3,674	34	33.75	10.77	6.06	1.60
W28 7599 11	Running Springs FD	San Bernardino	-117.101	34.204	8,080	26	37.31	10.02	5.83	1.49
W28 7599 11	Running Spri FS 5082	San Bernardino	-117.100	34.204	4,080	18	41.27	9.50	5.34	1.42
W28 7600 00	Running Springs	San Bernardino	-117.083	34.200	5,965	53	38.31	8.41	4.73	1.25
W28 7600 00	Running Springs 1 E	San Bernardino	-117.102	34.204	8,000	53	37.58	10.38	5.83	1.54
W28 7600 00	Running Spri 1E 5184	San Bernardino	-117.101	34.240	8,000	15	38.80	9.71	5.46	1.45
W28 8250 00	Silver Lake AP	San Bernardino	-116.086	34.345	910	7	2.47	1.21	0.68	0.18
W28 8250 00	Silver Lake AP	San Bernardino	-116.083	34.344	920	13	3.33	1.40	0.79	0.21
W28 8479 00	Squirrel Inn	San Bernardino	-117.233	34.233	5,680	74	40.14	10.60	5.96	1.58
W28 8566 00	Stoddard Valley	San Bernardino	-117.002	34.750	2,840	36	4.84	1.97	1.11	0.29
W28 8643 00	Summit valley	San Bernardino	-117.354	34.313	3,280	27	22.87	6.91	3.89	1.03
W28 8643 80	Summit	San Bernardino	-117.423	34.329	3,860	17	11.70	4.53	2.55	0.68
W28 8918 20	Thunderhead Ranch	San Bernardino	-117.266	34.272	4,610	16	34.44	10.21	5.74	1.52
W28 9105 10	Twin Peaks 5356	San Bernardino	-117.233	34.243	5,520	8	28.35	8.96	5.04	1.34
W28 9105 10	Twin Peaks Chalfant	San Bernardino	-117.185	34.233	5,690	19	45.23	11.21	6.30	1.67
W28 9105 15	Twin Peak Calvary	San Bernardino	-117.234	34.243	5,520	7	31.86	9.73	5.47	1.45
W28 9233 20	Valley of the Moon	San Bernardino	-117.256	34.245	4,630	6	42.74	9.95	5.59	1.48
W28 9322 20	Victor Valley STP	San Bernardino	-117.352	34.618	2,600	9	3.36	2.36	1.33	0.35
W28 9325 00	Victorville	San Bernardino	-117.300	34.533	2,859	56	5.32	1.79	1.01	0.27
W28 9325 00	Victorville PP	San Bernardino	-117.300	34.533	2,859	57	5.59	2.29	1.29	0.34
W28 9325 20	Victorville Dale	San Bernardino	-117.348	34.486	3,110	6	7.48	2.80	1.57	0.42
W28 9325 77	Victor Valley STP 4351	San Bernardino	-117.576	34.392	4,838	9	3.08	1.63	0.92	0.24
W28 9716 31	Wrightwood FD 6033	San Bernardino	-117.483	34.371	6,038	40	19.63	6.29	3.54	0.94
W28 9819 31	Wrightwood FD 6033	San Bernardino	-117.483	34.371	6,038	8	18.54	6.06	3.41	0.90
W28 9820 20	Wrightwood Apple	San Bernardino	-117.643	34.361	6,038	14	24.24	7.55	4.25	1.13
W28 9820 25	Wrightwood Pine	San Bernardino	-117.642	34.356	6,038	18	28.08	7.87	4.43	1.17
W28 9830 50	Valley of Enchantment	San Bernardino	-117.309	34.246	4,485	7	42.98	9.00	5.08	1.34
W28 9836 75	Yermo Insp Sta	San Bernardino	-117.792	34.914	1,912	35	3.56	1.60	0.90	0.24
W28 9881 00	Yucca Grove	San Bernardino	-115.782	35.401	3,951	22	6.80	2.17	1.22	0.32
X01 2232 80	Cushenberry Springs	San Bernardino	-116.859	34.358	4,250	36	8.55	3.55	1.94	0.51
X01 4391 80	Johnson Valley	San Bernardino	-116.612	34.419	2,794	17	3.58	1.80	0.98	0.28
X01 5181 85	Lucern Valley FD	San Bernardino	-116.938	34.448	2,957	8	3.00	2.73	1.49	0.38
X01 5182 00	Lucern Valley	San Bernardino	-116.967	34.433	3,015	24	3.86	1.57	0.86	0.22
X01 5182 15	Lucern Valley Modway Pt	San Bernardino	-116.902	34.458	2,910	10	2.85	1.53	0.83	0.22
X05 4467 00	Kae Ranch	San Bernardino	-116.533	34.167	4,325	33	8.10	4.26	2.33	0.61
X08 4405 00	Joshua Tree	San Bernardino	-116.208	34.136	2,730	30	5.61	2.45	1.34	0.36
X08 4405 00	Joshua Valley CDF	San Bernardino	-116.409	34.124	1,420	40	6.49	2.80	1.53	0.40
X08 4405 30	Joshua Tree L S RS	San Bernardino	-116.190	34.019	4,200	8	8.23	3.09	1.69	0.44
X08 9881 08	Yucca Valley	San Bernardino	-116.408	34.124	2,420	6	5.80	2.80	1.53	0.40
X09 2265 00	Dale Lake Crane	San Bernardino	-115.783	34.133	1,315	17	4.67	2.36	1.30	0.34
X09 2265 00	Dales Dry Lake	San Bernardino	-115.193	34.165	1,220	14	2.31	1.55	0.85	0.22
X09 9099 00	Twentynine Palms	San Bernardino	-116.051	34.133	1,973	62	4.15	2.21	1.21	0.32
X09 9099 05	Twentynine Palms 6218	San Bernardino	-116.050	34.150	1,895	7	3.70	1.88	1.03	0.27
X09 9099 05	Twentynine Palms Co Yd	San Bernardino	-116.052	34.150	1,875	23	3.52	2.23	1.22	0.32
X09 9099 25	Twentynine Palms USMC	San Bernardino	-116.151	34.300	2,004	18	3.22	1.97	1.07	0.28
X10 0176 00	Arbory Salus 2	San Bernardino	-115.743	34.475	595	20	3.63	1.98	1.08	0.28
X10 0176 00	Arbory	San Bernardino	-115.750	34.567	635	27	1.97	1.18	0.84	0.17
X10 0176 02	Arbory Salus 1	San Bernardino	-115.895	34.531	625	22	3.38	1.83	1.00	0.28
X10 5722 00	Michael Caveme	San Bernardino	-115.533	34.933	4,308	39	10.18	3.59	1.96	0.51
X12 4297 00	Iron Min	San Bernardino	-115.133	34.133	900	60	3.39	1.75	0.95	0.25

R0006416

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean 2-Year Return Period (in)	1,010-Year Return Period (in)
X12 4297 00	Iron Mtn	San Bernardino	-115.133	34.133	900	53	3.18	1.61	0.88	0.23
X12 5721 00	Carnegie Switch Yard	San Bernardino	-114.967	34.850	2,080	18	4.87	2.24	1.22	0.32
X13 6115 00	Needles	San Bernardino	-114.617	34.833	480	47	3.98	1.71	0.93	0.24
X13 6118 00	Needles	San Bernardino	-114.617	34.767	910	98	4.70	2.13	1.18	0.30
X13 6119 10	Needles Pump	San Bernardino	-114.614	34.688	1,410	27	5.30	2.32	1.27	0.33
X13 6185 00	New York Mtns	San Bernardino	-115.131	35.240	4,630	7	8.18	2.79	1.52	0.40
X13 6697 80	Park Mount Rag Park	San Bernardino	-114.513	32.728	540	23	5.04	2.52	1.37	0.36
X13 8064 80	Searchlight, NV	San Bernardino	-114.917	35.467	3,540	41	7.85	2.84	1.55	0.41
X13 8064 80	Searchlight, NV	San Bernardino	-114.917	35.467	3,540	33	5.96	2.21	1.21	0.32
X14 6699 00	Parker Dam	San Bernardino	-114.167	34.283	738	55	5.48	2.08	1.13	0.30
X14 6699 00	Parker Res	San Bernardino	-114.167	34.283	738	51	4.80	1.98	1.08	0.28
X15 2404 08	Ripley SDF	San Bernardino	-114.856	33.525	250	34	3.98	1.82	0.99	0.26
X17 2598 00	Eagle Mtn Pump	San Bernardino	-115.450	33.811	973	56	3.65	2.04	1.11	0.29
X19 5863 00	Morongo Valley	San Bernardino	-116.582	34.046	2,580	51	9.71	4.60	2.51	0.66
X19 5863 40	Morongo Valley 6354	San Bernardino	-116.549	34.054	2,765	10	8.52	4.82	2.63	0.89
X19 5863 40	Morongo Valley 6354	San Bernardino	-116.538	34.071	2,765	27	10.84	5.63	3.07	0.81
Y01 0264 00	Arrowhead Sp Hotel 2268	San Bernardino	-117.265	34.184	2,000	26	22.97	4.35	2.68	0.90
Y01 0318 00	Arrowhead Sp Hotel 2268	San Bernardino	-117.264	34.184	2,000	16	25.46	5.52	3.40	1.14
Y01 0741 00	Big Bear Lake	San Bernardino	-116.917	34.250	6,750	46	22.12	6.44	3.96	1.33
Y01 0742 00	Big Bear L Dam	San Bernardino	-116.915	34.242	8,815	113	36.76	9.68	5.96	1.99
Y01 0742 00	Big Bear L Dam 6032	San Bernardino	-116.975	34.272	8,815	15	30.29	7.20	4.43	1.48
Y01 0742 00	Big Bear Lake Dam	San Bernardino	-116.975	34.241	8,815	54	33.71	7.73	4.76	1.59
Y01 0743 03	Big Bear Lake CSD	San Bernardino	-116.843	34.261	6,800	47	14.79	3.82	2.23	0.75
Y01 0743 20	Big Bear Ryan	San Bernardino	-116.806	34.806	7,000	13	18.90	2.99	1.84	0.82
Y01 0743 25	Big Bear Hospital	San Bernardino	-116.885	34.246	6,800	17	20.29	5.08	3.13	1.05
Y01 0887 00	Bloomington FD 2106	San Bernardino	-117.398	34.069	1,100	15	14.69	3.62	2.23	0.75
Y01 0887 00	Bloomington FD 2106	San Bernardino	-117.398	34.069	1,100	38	13.01	3.43	2.11	0.71
Y01 0887 00	Bloomington	San Bernardino	-117.417	34.053	3,080	7	13.26	3.12	1.92	0.64
Y01 1267 01	Cajon Junction 2016	San Bernardino	-117.476	34.312	3,118	53	18.13	6.79	4.18	1.40
Y01 1267 01	Cajon Junction 2016	San Bernardino	-117.470	34.300	3,175	41	17.78	5.70	3.51	1.17
Y01 1308 77	Calimesa 3386	San Bernardino	-117.033	34.004	2,620	3	24.10	6.49	4.00	1.34
Y01 1369 00	Camp Angeles 3053	San Bernardino	-116.967	34.150	5,770	12	30.35	6.12	3.77	1.26
Y01 1369 00	Camp Angeles 3053	San Bernardino	-116.968	34.150	5,770	40	30.46	7.42	4.57	1.53
Y01 1369 00	Camp Angeles R	San Bernardino	-116.967	34.150	5,770	56	31.50	7.08	4.36	1.46
Y01 1731 08	Chino FS2 1020	San Bernardino	-117.722	33.983	655	45	14.99	4.49	2.76	0.92
Y01 1731 08	Chino Co AP	San Bernardino	-117.982	33.982	642	16	13.00	3.00	1.85	0.62
Y01 1732 02	Chino Imback 79	San Bernardino	-117.594	34.975	642	54	12.03	3.57	2.20	0.73
Y01 1732 08	Chino FS 1262	San Bernardino	-117.669	34.667	730	43	15.01	4.36	2.68	0.90
Y01 1773 40	City Creek RS 3377	San Bernardino	-117.180	34.199	2,610	8	26.81	6.56	4.04	1.35
Y01 1941 02	Colton 2027	San Bernardino	-117.319	34.071	990	46	12.13	3.38	2.08	0.70
Y01 1941 02	Colton FD	San Bernardino	-117.320	34.071	980	48	12.19	3.44	2.12	0.71
Y01 2116 11	Craton 3024	San Bernardino	-117.124	34.042	2,000	48	14.20	3.72	2.29	0.77
Y01 2116 11	Craton 3024	San Bernardino	-117.893	33.669	55	32	11.67	3.20	1.97	0.66
Y01 2116 11	Craton Schneider	San Bernardino	-117.125	34.042	2,000	31	14.11	3.69	2.27	0.76
Y01 2116 40	Craton Hills 3356	San Bernardino	-117.091	34.034	2,125	17	14.70	3.10	1.91	0.64
Y01 2116 40	Craton Hills 3356	San Bernardino	-117.094	34.034	2,117	14	14.50	3.44	2.12	0.71
Y01 2158 40	Crest Park Lutheran Church	San Bernardino	-117.198	34.237	5,525	16	53.24	9.49	5.84	1.95
Y01 2162 01	Crestline Co Yard	San Bernardino	-117.296	34.236	4,920	16	30.89	8.55	5.26	1.76
Y01 2162 05	Crestline SE 5181	San Bernardino	-117.283	34.233	5,160	17	39.14	8.47	5.21	1.74
Y01 2210 05	Cucamonga Water Co	San Bernardino	-117.594	34.124	1,225	57	17.57	5.13	3.16	1.06
Y01 2210 07	Cucamonga 1376	San Bernardino	-117.614	34.121	1,455	5	11.85	4.00	2.46	0.82
Y01 2210 05	Cucamonga WD Res 5	San Bernardino	-117.178	34.178	2,840	9	28.07	6.25	3.85	1.29
Y01 2210 07	Cucamonga Cyn 1309	San Bernardino	-117.627	34.180	2,840	17	16.27	5.28	3.25	1.09
Y01 2218 03	East Highland 3025	San Bernardino	-117.173	34.121	1,512	15	15.94	2.94	1.81	0.61
Y01 2266 27	Daley Spur 2358	San Bernardino	-117.243	34.182	2,680	14	21.83	5.38	3.31	1.11
Y01 2266 40	Daley Spur 2358	San Bernardino	-117.244	34.182	2,680	17	22.74	4.86	2.99	1.00
Y01 2307 51	Day Canyon 1028	San Bernardino	-117.538	34.175	2,490	14	28.72	6.70	4.12	1.38
Y01 2370 11	Del Rosa RS 2015	San Bernardino	-117.251	34.167	1,580	45	18.49	4.86	2.88	0.96
Y01 2370 11	Del Rosa RS 2015	San Bernardino	-117.250	34.167	1,580	43	17.98	4.55	2.80	0.94
Y01 2370 17	Del Rosa FS6 2361	San Bernardino	-117.251	34.134	1,165	13	14.12	3.69	2.27	0.76
Y01 2412 01	Devore CDF 2118	San Bernardino	-117.404	34.220	2,080	47	27.73	7.32	4.51	1.51
Y01 2412 01	Devore CDF 2118	San Bernardino	-117.403	34.220	2,080	15	30.84	7.58	4.87	1.56
Y01 2412 00	Devore 2011	San Bernardino	-117.398	34.299	2,500	64	29.37	7.57	4.66	1.56
Y01 2407 35	Devils Canyon 2071	San Bernardino	-117.225	34.203	1,870	70	24.00	5.84	3.47	1.16
Y01 2618 03	East Highland Orange	San Bernardino	-117.176	34.121	1,525	30	16.19	3.37	2.07	0.69
Y01 2895 00	Elwanda	San Bernardino	-117.525	34.125	1,390	67	20.25	5.65	3.48	1.16
Y01 2895 00	Elwanda 1327	San Bernardino	-117.482	34.160	1,645	52	18.08	5.01	3.08	1.03
Y01 2964 80	Falleysville 3283	San Bernardino	-116.908	34.082	5,990	18	33.85	9.27	5.71	1.91
Y01 2974 60	Fawnskin 6334	San Bernardino	-116.953	34.267	6,820	3	19.11	5.22	3.21	1.07
Y01 3117 00	Fontana	San Bernardino	-117.427	34.106	1,319	28	15.19	4.05	2.49	0.83
Y01 3117 05	Fontana MY 2206	San Bernardino	-117.417	34.100	1,275	13	14.86	4.23	2.60	0.87
Y01 3117 20	Fontana FS 2 2005	San Bernardino	-117.472	34.075	1,115	52	14.82	4.12	2.54	0.85
Y01 3117 20	Fontana FS 2 2005	San Bernardino	-117.471	34.075	1,115	12	14.67	3.92	2.41	0.81

R0006417

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean 2-Year Return Period (in)	1,0181-Year Return Period (in)
Y01 3121 00	Fontana STP 2236	San Bernardino	-117.465	34.042	960	52	14.50	4.12	2.54	0.85
Y01 3118 00	Fontana SM 2017	San Bernardino	-117.443	34.183	2,020	71	26.52	7.40	4.58	1.52
Y01 3118 00	Fontana SM 2017	San Bernardino	-117.442	34.183	2,020	43	23.91	6.04	3.72	1.24
Y01 3120 00	Fontana Kaiser	San Bernardino	-117.506	34.078	1,090	33	15.12	4.76	2.93	0.98
Y01 3121 00	Fontana STP 2236	San Bernardino	-117.464	34.042	960	25	11.54	3.32	2.04	0.68
Y01 3682 51	Guasti Park 1075	San Bernardino	-117.591	34.072	995	18	17.33	4.99	3.07	1.03
Y01 3888 20	Heart Bar Ph 3259	San Bernardino	-116.795	34.159	6,688	13	17.04	3.75	2.31	0.77
Y01 3951 09	Huston Creek	San Bernardino	-117.264	34.268	4,465	14	39.59	8.70	5.36	1.79
Y01 3951 11	Highgrove SP 2222	San Bernardino	-117.024	34.024	945	20	9.95	2.77	1.71	0.57
Y01 4438 20	Jurpa City Park 2000	San Bernardino	-117.436	34.038	1,460	4	11.18	2.95	1.82	0.61
Y01 4481 20	Kellys Camp 308	San Bernardino	-117.231	34.231	8,300	12	51.02	14.52	8.94	2.99
Y01 4494 60	Kindal Dr FS 2340	San Bernardino	-117.329	34.176	1,488	16	23.88	5.34	3.29	1.10
Y01 5057 00	Loma Linda FD 3355	San Bernardino	-117.247	34.048	1,193	10	10.26	2.85	1.75	0.58
Y01 5212 00	Lytle Cr Football 2159	San Bernardino	-117.332	34.108	1,184	46	14.80	3.72	2.29	0.77
Y01 5215 01	Lytle Creek PH	San Bernardino	-117.450	34.202	2,225	71	33.02	10.27	6.32	2.11
Y01 5218 00	Lytle Cr RS 2037	San Bernardino	-117.474	34.233	2,730	41	29.99	8.26	5.08	1.70
Y01 5218 00	Lytle Creek RS	San Bernardino	-117.474	34.231	2,780	43	34.43	11.41	7.02	2.35
Y01 5218 20	Lytle Creek Beckler	San Bernardino	-117.502	34.260	3,440	35	29.45	10.29	6.33	2.12
Y01 5218 25	Lytle Cr RS 2286	San Bernardino	-117.497	34.258	3,420	19	28.94	9.36	5.76	1.93
Y01 5531 10	Mentone Blue Goose	San Bernardino	-117.133	34.073	1,650	32	14.86	3.74	2.30	0.77
Y01 5531 31	Mentone CDF 3120	San Bernardino	-117.122	34.071	1,765	47	12.61	1.18	1.96	0.65
Y01 5531 31	Mentone CDF 3337	San Bernardino	-117.121	34.071	1,765	18	14.29	3.29	2.03	0.68
Y01 5629 00	Mt Creek 2	San Bernardino	-117.063	34.083	2,940	58	22.15	4.47	2.75	0.92
Y01 5629 00	Mt Creek RS	San Bernardino	-117.047	34.179	2,980	33	19.13	4.16	2.56	0.86
Y01 5632 00	Mt Creek Intake	San Bernardino	-119.939	34.099	4,945	49	27.00	7.00	4.31	1.44
Y01 5632 00	Mt Creek Intake	San Bernardino	-119.939	34.099	4,945	37	24.55	6.22	3.89	1.30
Y01 5708 02	Mira Loma 1021	San Bernardino	-117.537	34.028	827	49	12.31	3.38	2.08	0.70
Y01 5718 25	Mission Creek @ Tippecanoe	San Bernardino	-117.259	34.073	1,060	4	18.44	4.00	2.48	0.82
Y01 5780 51	Monie Vista Co WE	San Bernardino	-117.073	34.073	965	20	17.87	3.12	1.92	0.64
Y01 5787 08	Montclair FD	San Bernardino	-117.696	34.100	1,170	39	16.89	4.26	2.62	0.88
Y01 5901 00	Mt Baldy Notch	San Bernardino	-117.614	34.274	7,735	16	34.28	12.09	7.44	2.49
Y01 5901 20	Mt Baldy Wirtz 1353	San Bernardino	-117.650	34.240	4,435	4	35.12	8.40	5.17	1.73
Y01 6277 50	Norton AFB	San Bernardino	-117.243	34.097	1,095	13	12.16	4.97	3.06	1.02
Y01 6310 07	Oak Glen 3345	San Bernardino	-116.908	34.054	5,680	18	29.31	6.72	4.14	1.38
Y01 6310 11	Oak Glen 3014	San Bernardino	-116.956	34.054	4,680	50	26.88	6.14	3.78	1.25
Y01 6310 12	Oak Glen Wagoner	San Bernardino	-116.958	34.055	4,040	43	22.89	5.68	3.50	1.17
Y01 6310 20	Oak Glen Sample	San Bernardino	-117.201	34.053	3,780	17	24.09	5.65	3.48	1.16
Y01 6457 02	Ontario Sheriff 1226	San Bernardino	-117.537	34.028	827	45	16.51	4.56	2.81	0.94
Y01 6457 10	Ontario FS	San Bernardino	-117.651	34.062	10	62	16.81	5.16	3.18	1.08
Y01 6457 10	Ontario FS3 1335	San Bernardino	-117.651	34.062	986	62	16.81	5.16	3.18	1.08
Y01 6457 10	Ontario FS3 1335	San Bernardino	-117.620	34.040	860	11	11.81	3.50	2.15	0.72
Y01 6754 11	Palton George	San Bernardino	-117.209	34.138	1,375	32	16.81	4.26	2.62	0.88
Y01 6776 21	Panorama Point	San Bernardino	-117.302	34.225	3,775	61	33.86	7.83	4.82	1.61
Y01 7284 20	Reche Canyon Henderson	San Bernardino	-117.282	34.042	1,120	30	12.59	3.05	1.88	0.63
Y01 7284 60	Reche Canyon	San Bernardino	-117.231	33.995	1,750	76	13.74	3.32	2.04	0.68
Y01 7284 60	Reche Canyon	San Bernardino	-117.281	34.042	1,120	20	12.51	3.14	1.93	0.65
Y01 7306 00	Redlands	San Bernardino	-117.191	34.052	1,318	103	14.06	2.90	1.79	0.60
Y01 7306 01	Redlands Roth	San Bernardino	-117.210	34.034	1,285	28	12.84	2.81	1.73	0.58
Y01 7306 50	Redlands Roth 3023	San Bernardino	-117.182	34.042	13	49	12.06	3.08	1.90	0.63
Y01 7311 00	Redlands Bot 3329	San Bernardino	-117.149	34.019	2,080	28	14.00	3.56	2.19	0.73
Y01 7311 00	Redlands CC 3239	San Bernardino	-117.149	34.019	2,080	24	14.00	3.35	2.06	0.69
Y01 7711 00	San Antonio Cyn	San Bernardino	-117.675	34.044	2,394	66	26.95	7.63	4.70	1.57
Y01 7723 00	San Bernardino	San Bernardino	-117.267	34.163	1,125	104	18.12	3.98	2.45	0.82
Y01 7724 03	San Bernardino	San Bernardino	-117.268	34.104	1,042	18	14.50	3.95	2.43	0.81
Y01 7724 02	San Bernardino 2001	San Bernardino	-117.269	34.104	1,525	52	14.50	3.92	2.41	0.81
Y01 7724 45	San Bernardino 2257	San Bernardino	-117.279	34.160	1,288	16	18.58	5.02	3.09	1.03
Y01 7725 75	San Bernardino 2286	San Bernardino	-117.290	34.104	1,030	68	13.92	3.52	2.17	0.72
Y01 7724 40	San Bernardino CSU	San Bernardino	-117.326	34.184	1,525	13	18.63	4.53	2.79	0.93
Y01 7724 77	San Bernardino CDF 2357	San Bernardino	-117.279	34.160	1,288	16	18.58	5.02	3.09	1.03
Y01 7724 77	San Bernardino CDF 2357	San Bernardino	-117.278	34.160	1,047	14	18.86	4.96	3.05	1.02
Y01 7724 77	San Bernardino 2348 CSU	San Bernardino	-117.326	34.184	1,525	11	19.25	5.19	3.20	1.07
Y01 7724 30	San Bernardino Kendall	San Bernardino	-117.330	34.176	1,488	20	22.24	5.36	3.30	1.10
Y01 7725 00	San Bernardino Hosp 2148	San Bernardino	-117.270	34.128	1,128	9	18.09	4.34	2.67	0.89
Y01 7886 20	San Servino LD 1323	San Bernardino	-117.458	34.192	5,230	10	20.26	6.47	3.98	1.33
Y01 7888 30	Santa Ana Canyon	San Bernardino	-117.671	33.873	450	22	14.41	3.29	2.03	0.68
Y01 7891 00	Santa Ana PH 3	San Bernardino	-117.100	34.107	1,980	69	19.86	3.51	2.18	0.72
Y01 7891 00	Santa Ana PH 3 3162	San Bernardino	-117.100	34.107	1,980	50	16.11	3.79	2.33	0.78
Y01 7894 00	Santa Ana PH 1	San Bernardino	-117.872	34.131	2,765	28	22.46	5.34	3.29	1.10
Y01 9157 00	Upland 1290	San Bernardino	-117.670	34.138	1,800	65	22.04	5.43	3.34	1.12
Y01 9157 00	Upland 850	San Bernardino	-117.670	34.138	1,800	65	22.04	5.43	3.34	1.12
Y01 9157 00	Upland 850	San Bernardino	-117.670	34.138	1,800	29	18.02	4.92	3.03	1.01
Y01 9158 00	Upland 3N	San Bernardino	-117.650	34.133	1,610	21	20.27	5.24	3.23	1.08
Y01 9160 12	Upland Chapple 1019	San Bernardino	-117.680	34.136	1,601	50	18.99	5.00	3.08	1.03

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Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,9101-Year Return Period (in)
Y01 9323 51	Victoria Loma Linda	San Bernardino	-117.255	34.082	1,063	83	12.37	3.21	1.98	0.66
Y01 9589 50	West San Bernardino 2326	San Bernardino	-117.369	34.121	1,340	17	16.85	4.33	2.67	0.89
Y01 9875 02	Yuccapa CDF 3129	San Bernardino	-117.036	34.040	2,660	80	17.50	4.10	2.52	0.84
Y01 9875 02	Yuccapa CDF 3129	San Bernardino	-117.035	34.040	2,760	14	16.81	3.80	2.22	0.74
Y01 9875 02	Yuccapa WC 3132	San Bernardino	-117.036	34.038	2,710	48	16.36	4.00	2.46	0.82
Y01 9875 04	Yuccapa Co Yard	San Bernardino	-117.103	34.035	2,140	19	14.73	3.85	2.37	0.79
Y01 7284 08	Ruato Henry	San Bernardino	-117.203	34.098	1,220	63	15.77	4.57	2.81	0.94
X22 0983 00	Bornego Desert Park	San Diego	-116.417	33.267	750	48	8.09	2.44	1.33	0.35
X22 0983 00	Bornego Springs JANE	San Diego	-116.350	33.283	6	22	3.37	2.17	1.18	0.31
X22 1009 00	Boulevard	San Diego	-116.283	32.667	3,350	19	12.27	2.89	1.58	0.41
X22 1010 00	Boulevard 2	San Diego	-116.300	32.667	3,800	26	16.83	3.97	2.17	0.57
X22 2139 00	Crawford Ranch	San Diego	-116.275	32.892	1,500	36	4.86	2.95	1.39	0.37
X22 2965 50	Mt Laguna	San Diego	-116.419	32.881	5,960	6	24.20	6.18	3.37	0.88
X22 6383 00	Ocotillo Wells	San Diego	-116.133	33.150	175	25	2.00	1.48	0.80	0.21
X22 6390 00	Ocotillo 2	San Diego	-116.100	32.750	1,410	24	4.42	2.60	1.42	0.37
X01 1557 75	Cave Springs	San Diego	-117.415	33.444	2,365	9	23.81	5.29	3.24	1.35
Z02 2377 70	De Luz	San Diego	-117.325	33.451	485	31	22.77	6.22	3.82	1.59
Z02 3340 00	Howell Ranch	San Diego	-117.280	33.595	1,300	15	18.25	5.98	3.67	1.53
Z02 6042 00	Ohia's Res	San Diego	-117.320	33.330	353	14	10.93	3.00	1.84	0.77
Z02 6319 00	Oak Grove RS	San Diego	-116.790	33.385	2,751	18	19.26	4.89	3.00	1.25
Z02 6319 00	Oak Grove RS	San Diego	-116.790	33.386	2,751	26	19.08	5.14	3.15	1.31
Z02 6657 00	Palomar	San Diego	-116.850	33.350	5,560	57	28.45	6.97	4.28	1.78
Z02 6657 00	Palomar	San Diego	-116.850	33.350	5,560	58	28.12	7.36	4.52	1.88
Z02 6759 66	Pauba Ranch	San Diego	-117.083	33.478	1,060	19	12.23	4.10	2.52	1.05
Z02 2958 00	Fallbrook	San Diego	-117.249	33.365	860	46	15.53	3.72	2.28	0.95
Z02 2958 00	Fallbrook	San Diego	-117.249	33.365	860	30	14.57	3.98	2.44	1.02
Z03 3914 00	Henshaw Dam	San Diego	-116.767	33.233	2,700	84	27.07	6.71	4.12	1.71
Z03 3914 00	Henshaw Dam	San Diego	-116.767	33.233	2,700	48	23.68	5.34	3.28	1.36
Z03 6277 00	Oceanside Marina	San Diego	-117.433	33.217	10	43	10.75	2.59	1.59	0.66
Z03 6277 49	Oceanside CIMIS 49	San Diego	-117.320	33.220	50	9	10.15	2.85	1.75	0.73
Z03 6279 00	Oceanside Pump	San Diego	-117.353	33.210	30	54	11.58	3.01	1.85	0.77
Z03 7244 00	Ranchita	San Diego	-116.533	33.233	4,100	20	12.60	3.24	1.99	0.83
Z03 9228 00	Valley Center 6N	San Diego	-117.032	33.293	1,675	23	15.60	4.26	2.61	1.09
Z03 9232 00	Valley Center 2 HNE	San Diego	-117.018	33.232	1,390	9	12.93	4.39	2.69	1.12
Z03 9378 00	Vista 2HNE	San Diego	-117.233	33.233	510	34	13.61	3.17	1.95	0.81
Z03 9447 00	Warner Springs	San Diego	-116.631	33.285	3,180	67	16.49	3.79	2.33	0.97
Z03 9447 00	Warner Springs	San Diego	-116.631	33.285	3,180	38	14.76	3.19	1.96	0.81
Z04 2833 01	Encinitas	San Diego	-117.283	32.050	300	12	8.41	2.20	1.35	0.56
Z04 2833 01	Encinitas	San Diego	-117.283	32.050	200	6	15.14	4.29	2.63	1.10
Z04 2840 01	E Reservoir	San Diego	-117.217	33.217	752	63	13.30	3.39	2.08	0.87
Z04 2862 00	Escondido	San Diego	-117.083	33.117	660	97	15.63	3.77	2.31	0.96
Z04 2862 00	Escondido	San Diego	-117.083	33.117	660	46	14.32	3.41	2.09	0.87
Z04 4726 00	Lake Wolford	San Diego	-116.999	33.175	1,500	22	18.43	4.47	2.74	1.14
Z04 4726 00	Lake Wolford	San Diego	-116.999	33.175	1,500	37	17.57	3.80	2.33	0.97
Z05 4014 00	Hodges Res	San Diego	-117.133	33.050	320	64	14.31	3.41	2.09	0.87
Z05 5023 00	Lockwood Mesa	San Diego	-117.250	32.983	210	16	8.96	2.31	1.42	0.59
Z05 7228 00	Ramona FD	San Diego	-116.867	33.050	1,450	22	18.17	3.98	2.44	1.02
Z05 7230 50	Ramona	San Diego	-116.858	33.043	2,640	20	16.67	3.73	2.29	0.95
Z05 7231 00	Ramona Scouting	San Diego	-116.850	33.067	1,480	24	14.65	3.32	2.04	0.85
Z05 7744 00	San Diego Dam	San Diego	-117.200	33.033	250	62	13.15	3.31	2.03	0.85
Z05 7874 00	San Pasquel Ana Pt	San Diego	-117.000	33.083	420	17	13.91	3.07	1.88	0.78
Z05 9348 50	Vineyard Ranch	San Diego	-116.900	33.163	2,040	10	16.51	4.80	2.95	1.23
Z06 7111 00	Poway Valley	San Diego	-117.067	32.950	440	21	12.42	3.06	1.88	0.78
Z06 7111 10	Poway CRS	San Diego	-117.063	32.950	500	13	10.21	2.67	1.39	0.58
Z07 0136 00	Alpine	San Diego	-116.767	32.833	1,740	42	15.79	3.62	2.22	0.92
Z07 2239 00	Cuyamaca	San Diego	-116.583	32.983	4,650	108	37.66	7.63	4.68	1.95
Z07 2239 00	Cuyamaca Res	San Diego	-116.588	32.989	4,650	26	34.81	6.17	3.79	1.58
Z07 2702 00	El Cajon SD G&E	San Diego	-116.971	32.795	460	51	12.35	3.44	2.11	0.88
Z07 2709 00	El Capitan Dam	San Diego	-116.817	32.883	600	59	16.16	3.82	2.34	0.98
Z07 2709 00	El Capitan Dam	San Diego	-116.817	32.883	600	32	15.87	3.42	2.10	0.87
Z07 3090 00	Finn Springs	San Diego	-116.858	32.847	390	11	11.12	3.33	2.04	0.85
Z07 3410 00	Gillespie Field	San Diego	-116.967	32.817	390	19	11.53	2.74	1.68	0.70
Z07 4412 00	Julian	San Diego	-116.601	33.078	4,215	26	25.62	4.85	2.98	1.24
Z07 4418 00	Julian Wynola	San Diego	-116.650	33.100	4,650	39	25.81	5.02	3.08	1.28
Z07 4453 50	Kearney Mesa	San Diego	-117.126	32.833	425	11	10.70	3.35	2.05	0.86
Z07 4710 00	Lakeside	San Diego	-116.883	32.850	690	42	14.97	3.49	2.14	0.89
Z07 6039 31	Murray Dam	San Diego	-117.044	32.781	520	27	13.09	3.58	2.20	0.91
Z07 7740 63	San Diego CSU Geo	San Diego	-117.076	32.776	458	30	12.75	3.29	2.02	0.84
Z07 7989 00	San Vicente	San Diego	-116.917	32.917	660	49	14.79	3.52	2.16	0.90
Z08 1747 00	Cholla Res	San Diego	-117.050	32.733	430	65	11.51	2.89	1.77	0.74
Z08 4735 00	La Mesa	San Diego	-117.017	32.767	528	46	12.64	2.97	1.82	0.76
Z08 4735 00	La Mesa	San Diego	-117.017	32.767	528	6	9.20	2.29	1.41	0.58
Z08 7740 00	San Diego NWS	San Diego	-117.167	32.733	19	131	10.26	2.76	1.69	0.70

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,010-Year Return Period (in)
Z08 7740 00	San Diego NWS	San Diego	-117.167	32.733	19	106	10.07	2.79	1.71	0.71
Z09 0968 00	Bonita	San Diego	-117.033	32.667	105	54	10.51	2.69	1.65	0.69
Z09 1252 00	Cabrillo Nat Mon	San Diego	-117.233	32.667	410	14	8.17	2.34	1.44	0.60
Z09 1754 00	Chula Vista	San Diego	-117.100	32.600	9	76	9.75	2.60	1.60	0.66
Z09 2406 00	Descanso	San Diego	-116.823	32.856	2,500	46	24.01	5.06	3.10	1.29
Z09 8226 01	Sweetwater Dam	San Diego	-117.008	32.893	350	105	11.34	2.79	1.71	0.71
Z10 5162 00	Lower Otay	San Diego	-116.933	32.817	540	48	10.73	2.37	1.45	0.61
Z10 5162 00	Lower Otay	San Diego	-116.933	32.817	540	8	10.35	2.37	1.45	0.61
Z11 0514 00	Barred Dam	San Diego	-116.667	32.663	1,823	76	17.42	4.00	2.45	1.02
Z11 1424 00	Campo	San Diego	-116.467	32.817	2,630	95	16.96	4.09	2.51	1.04
Z11 5154 00	Loveland Res	San Diego	-116.800	32.781	350	24	14.08	3.32	2.04	0.85
Z11 5840 00	Morena Reservoir	San Diego	-116.522	32.686	3,073	65	19.30	4.29	2.63	1.10
Z11 5840 00	Morena Reservoir	San Diego	-116.522	32.686	3,073	51	18.21	3.87	2.37	0.99
Z11 7100 00	Potrero	San Diego	-116.820	32.831	2,390	65	18.05	4.22	2.59	1.08
800 0012 01	Acampo Callow Ranch	San Joaquin	-121.133	38.217	125	8	18.92	3.00	2.03	0.95
800 0565 00	Bear Cr N Lockford	San Joaquin	-121.211	38.074	60	8	11.83	1.58	1.07	0.50
800 0637 01	Bellota	San Joaquin	-121.058	38.044	108	20	17.17	3.16	2.14	1.00
800 0639 00	Bellota Anderson	San Joaquin	-121.058	38.044	108	13	15.73	2.75	1.86	0.87
800 1325 05	Camache N	San Joaquin	-121.018	38.229	300	11	16.39	2.51	1.70	0.79
800 1783 00	Clark Ranch	San Joaquin	-121.329	38.131	31	13	16.10	2.78	1.87	0.87
800 1813 00	Clematis	San Joaquin	-121.098	38.204	120	46	17.86	2.84	1.93	0.90
800 2156 00	Crescent Ranch	San Joaquin	-121.334	38.172	33	11	15.20	3.01	2.04	0.95
800 2760 00	Elliot	San Joaquin	-121.194	38.236	92	67	17.60	2.69	1.82	0.85
800 2860 00	Escalon	San Joaquin	-121.000	37.783	125	25	13.05	2.17	1.47	0.69
800 2970 02	Farmington	San Joaquin	-121.000	37.917	111	43	15.00	2.37	1.61	0.75
800 3415 00	Gilmore Ranch	San Joaquin	-120.987	38.045	220	7	9.80	2.61	1.77	0.83
800 4953 01	Linden Orchard	San Joaquin	-121.050	38.050	113	36	15.83	2.73	1.85	0.86
800 4953 02	Linden FS	San Joaquin	-121.082	38.022	89	42	16.15	2.56	1.74	0.81
800 4960 00	Linn Ranch	San Joaquin	-121.102	38.133	120	34	16.50	2.57	1.81	0.84
800 5010 00	Lockford	San Joaquin	-121.148	38.165	108	53	16.96	2.71	1.84	0.86
800 5032 00	Lodi	San Joaquin	-121.289	38.118	40	104	17.19	2.80	1.90	0.89
800 5032 42	Lodi CIMES 42	San Joaquin	-121.345	38.107	23	12	15.41	3.04	2.06	0.96
800 5303 00	Mamieca	San Joaquin	-121.200	37.800	40	44	12.07	2.18	1.48	0.69
800 5368 00	Marshall Ranch	San Joaquin	-121.217	38.100	60	38	15.64	2.61	1.77	0.83
800 7447 80	Ripon	San Joaquin	-121.128	37.743	65	27	13.09	1.98	1.34	0.63
800 7496 00	Robinson Ranch	San Joaquin	-121.031	38.137	315	5	12.47	2.58	1.75	0.82
800 8558 00	Stockton AP	San Joaquin	-121.250	37.900	22	48	13.89	2.37	1.61	0.75
800 8558 00	Stockton AP	San Joaquin	-121.250	37.900	22	22	13.55	2.10	1.42	0.66
800 8560 00	Stockton FS4	San Joaquin	-121.317	38.000	12	99	14.63	2.39	1.62	0.76
800 8999 00	Tracy 2 SSE	San Joaquin	-121.410	37.709	107	41	9.05	1.54	1.11	0.52
800 9302 02	Varanillo 3 SSW	San Joaquin	-121.333	37.625	225	28	8.58	1.62	1.10	0.51
800 9659 00	Youngstown	San Joaquin	-121.241	38.177	65	34	16.50	2.54	1.72	0.80
880 1583 00	Castle Rock	San Joaquin	-121.505	37.634	515	39	10.20	1.83	1.24	0.58
880 1583 00	Castle Rock	San Joaquin	-121.505	37.634	515	31	10.05	1.78	1.21	0.56
880 4508 00	Kerlinger	San Joaquin	-121.430	37.670	172	35	8.75	1.84	1.25	0.58
880 5074 00	Lone Tree Cyn	San Joaquin	-121.380	37.811	420	17	8.09	1.77	1.20	0.56
890 0682 00	Benson's Ferry	San Joaquin	-121.433	38.250	17	37	15.51	2.23	1.51	0.71
890 4041 00	Holt 2 ESE	San Joaquin	-121.392	38.928	-3	18	12.71	1.77	1.20	0.56
890 4823 00	Lathrop	San Joaquin	-121.300	37.783	27	32	11.18	1.86	1.26	0.59
890 5296 00	Mandeville Island	San Joaquin	-121.567	38.033	10	9	11.32	2.49	1.69	0.79
890 8354 00	Stockton Dup Pl	San Joaquin	-121.328	37.938	11	39	13.45	2.32	1.57	0.73
890 8562 00	Stockton Mowry Bridge	San Joaquin	-121.383	37.850	20	10	11.97	2.05	1.39	0.65
890 8995 01	Tracy SP	San Joaquin	-121.413	37.738	105	73	9.57	1.84	1.25	0.58
890 8997 00	Tracy 2 SSE	San Joaquin	-121.417	37.737	105	6	8.62	1.88	1.27	0.59
890 8999 00	Tracy 2 SSE	San Joaquin	-121.410	37.737	105	8	8.62	1.88	1.27	0.59
890 8999 00	Tracy Carbone	San Joaquin	-121.414	37.896	137	62	9.77	1.73	1.21	0.57
890 9001 00	Tracy Pumping Plant	San Joaquin	-121.581	37.796	61	41	11.86	2.18	1.48	0.69
890 9135 39	Union Island	San Joaquin	-121.512	37.841	-6	31	12.56	2.19	1.49	0.69
E60 6859 01	Pigeon Point LH	San Mateo	-122.383	37.183	150	36	16.67	3.02	1.94	0.78
E60 4320 00	Jacking	San Mateo	-122.250	37.363	380	25	32.87	4.96	3.22	1.30
E60 7251 00	Rancho Yerba Buena	San Mateo	-122.738	37.305	7	20	16.10	2.65	1.72	0.75
E60 9792 00	Woodside FS	San Mateo	-121.250	37.433	380	21	29.38	4.05	2.63	1.14
E70 1206 00	Burlingame	San Mateo	-122.350	37.583	10	29	20.38	3.22	2.09	0.91
E70 1474 25	Canada	San Mateo	-122.300	37.450	570	12	29.60	4.57	2.97	1.28
E70 1920 20	Colma	San Mateo	-122.425	37.854	13	5	18.83	3.98	2.58	1.12
E70 2205 00	Crystal Springs Cottage	San Mateo	-122.360	37.500	400	100	25.44	3.81	2.47	1.07
E70 2249 50	Cypress	San Mateo	-122.380	37.570	590	18	28.88	4.21	2.73	1.18
E70 3654 00	High Maint Sta	San Mateo	-122.250	37.417	1,650	11	36.84	4.48	2.91	1.26
E70 5156 00	Lower Crystal Springs	San Mateo	-122.367	37.530	450	100	27.18	4.08	2.63	1.14
E70 5330 20	Memo Park USGS	San Mateo	-122.186	37.451			18.92	2.52	1.64	0.71
E70 5626 80	Milbrae Coastguard	San Mateo	-122.404	37.609	80	4	36.42	5.55	3.60	1.56
E70 6272 50	North San Andreas	San Mateo	-122.440	37.650	590	17	32.47	4.89	3.17	1.37
E70 6586 20	Pacific USCG	San Mateo	-122.465	37.626	930	5	22.27	3.42	2.22	0.96

R0006420

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								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,010-Year Return Period (in)
E70 7704 00	San Andreas Lake	San Mateo	-122.400	37.583	377	127	34.76	5.56	3.61	1.56
E70 7726 00	San Bruno Mtn	San Mateo	-122.447	37.692	950	6	12.89	2.56	1.66	0.72
E70 7728 05	San Carlos FS	San Mateo	-122.262	37.489	110	17	20.40	3.11	2.02	0.87
E70 7769 00	San Francisco AP	San Mateo	-122.363	37.817	8	59	19.78	3.29	2.13	0.93
E70 7769 00	San Francisco AP	San Mateo	-122.363	37.817	8	53	19.36	3.44	2.23	0.97
E70 7864 00	San Mateo	San Mateo	-122.317	37.567	30	29	19.21	2.90	1.86	0.82
E70 8025 50	Sawyer Camp	San Mateo	-122.390	37.560	360	18	33.30	5.12	3.32	1.44
E70 9163 00	Upper Crystal Springs	San Mateo	-122.350	37.500	300	120	29.33	4.51	2.93	1.27
E80 2303 50	Davis Tunnel	San Mateo	-122.430	37.580	650	18	38.03	5.86	3.80	1.65
E80 2535 35	Grohnada	San Mateo	-122.463	37.514	660	5	21.06	3.75	2.43	1.05
E80 3714 00	Hall Moon Bay	San Mateo	-122.430	37.480	60	56	25.85	3.92	2.54	1.10
E80 4660 25	La Honda RRng	San Mateo	-122.271	37.319	405	7	34.55	5.26	3.48	1.51
E80 4660 50	La Honda Honor Camp	San Mateo	-122.247	37.263	350	37	36.11	5.66	3.67	1.59
E80 6585 41	Pacific Valley	San Mateo	-122.477	37.640	220	34	27.44	4.18	2.71	1.18
E80 6599 00	Pacific 4 SSE	San Mateo	-122.467	37.583	480	13	27.44	4.18	2.71	1.18
E80 6821 25	Pascadero	San Mateo	-122.408	37.254	40	7	21.14	3.58	2.32	1.01
E80 6863 00	Pascadero	San Mateo	-122.400	37.550	625	131	42.97	8.49	4.21	1.82
E80 7019 01	Pont Lotos	San Mateo	-122.212	37.245	422	43	18.99	2.94	1.91	0.83
E80 7086 00	Poncha RW SP	San Mateo	-122.493	37.503	11	7	40.29	6.60	4.28	1.86
E80 7153 40	Poncha Pump Sta	San Mateo	-122.367	37.300	280	39	25.56	4.67	3.03	1.31
E80 7807 00	San Gregorio 2 SE	San Mateo	-122.426	37.529	1,930	7	28.42	4.42	2.87	1.24
E80 8033 20	Scarpers Peak	San Mateo	-122.426	37.529	1,930	7	35.40	5.21	3.36	1.46
D00 2308 00	Day Valley	Santa Clara	-121.688	36.998	373	4	32.15	5.78	3.71	1.45
D00 4987 00	Little Uvas Creek	Santa Clara	-121.750	37.100	700	18	34.08	7.54	4.85	1.90
D00 5863 00	Morgan Hill	Santa Clara	-121.575	37.178	320	39	19.55	4.23	2.72	1.06
D10 1584 10	Castro Valley	Santa Clara	-121.600	36.960	735	22	25.78	5.08	3.27	1.28
D10 1584 10	Castro Valley	Santa Clara	-121.606	36.958	755	28	23.86	4.47	2.88	1.13
D10 2143 00	Creekside	Santa Clara	-121.701	37.072	400	36	29.04	5.93	3.82	1.49
D10 2232 00	Cunehier Ranch	Santa Clara	-121.868	37.467	619	10	15.78	3.03	1.95	0.78
D10 3417 00	Gilroy	Santa Clara	-121.567	37.000	194	121	20.32	4.05	2.61	1.02
D10 3419 00	Gilroy 8 NE	Santa Clara	-121.450	37.033	1,050	54	20.50	3.43	2.21	0.86
D10 4987 00	Little Uvas Creek	Santa Clara	-121.750	37.100	700	18	34.08	7.54	4.85	1.90
D10 5846 00	Morgan Hill 6 WSW	Santa Clara	-121.742	37.094	640	30	26.80	6.27	4.04	1.58
D10 5847 00	Morgan Hill Bossana	Santa Clara	-121.782	37.150	770	21	27.70	6.27	4.04	1.58
D10 5853 00	Morgan Hill SCS	Santa Clara	-121.650	37.133	350	44	20.18	4.16	2.68	1.05
D10 6689 01	Paradise Valley	Santa Clara	-121.642	37.083	425	27	21.81	5.10	3.28	1.28
D10 6770 00	Peabody Ranch	Santa Clara	-121.510	37.030	472	13	20.63	4.25	2.74	1.07
D10 6770 00	Peabody Ranch	Santa Clara	-121.509	37.046	472	49	19.91	3.64	2.34	0.92
D10 7755 00	San Felipe HMS	Santa Clara	-121.333	37.013	365	29	17.13	3.74	2.41	0.94
D10 7863 01	San Martin	Santa Clara	-121.587	37.107	312	47	17.11	4.18	2.69	1.05
D10 9196 00	Uvas Reservoir	Santa Clara	-121.690	37.060	488	10	30.61	6.43	4.14	1.62
D10 9196 00	Uvas Reservoir	Santa Clara	-121.688	37.066	488	23	29.87	6.30	4.05	1.59
D10 9197 00	Uvas	Santa Clara	-121.693	37.070	410	42	28.78	6.06	3.90	1.53
D10 9197 20	Uvas Park	Santa Clara	-121.797	37.114	1,100	18	46.74	8.80	5.66	2.22
D10 9446 00	Ward	Santa Clara	-121.633	36.117	325	36	25.37	4.99	3.21	1.26
D20 5846 00	Morgan Hill 6 WSW	Santa Clara	-122.742	37.094	640	13	25.44	6.20	3.99	1.56
E50 0319 02	Arroyo Mocho	Santa Clara	-121.517	37.458	2,700	42	12.75	2.60	1.69	0.73
E50 1387 00	Gerber Ranch	Santa Clara	-121.486	37.367	2,140	80	18.17	3.48	2.26	0.98
E50 5933 00	MA Hamilton	Santa Clara	-121.333	37.333	4,206	108	25.87	3.90	2.53	1.10
E50 5933 70	MA Hamilton	Santa Clara	-121.650	37.333	4,206	55	28.62	3.82	2.48	1.07
E50 7246 11	Rancho Arroyo Bayo	Santa Clara	-121.750	37.601	1,250	10	20.45	3.48	2.26	0.98
E50 7526 00	Rockey Ridge	Santa Clara	-121.750	37.601	1,250	47	15.66	2.44	1.58	0.69
E50 8130 00	Shanti Ashrama	Santa Clara	-121.472	37.317	2,300	19	22.60	3.06	1.99	0.86
E50 8130 00	Shanti Ashrama	Santa Clara	-121.470	37.310	2,300	57	20.47	3.21	2.08	0.90
E60 0053 00	Alamitos Perc Pond	Santa Clara	-121.870	37.250	184	6	21.23	5.60	3.63	1.57
E60 0053 00	Alamitos Perc Pond	Santa Clara	-121.870	37.250	184	30	16.06	3.24	2.10	0.91
E60 0121 00	Alma College	Santa Clara	-121.995	37.180	900	22	17.33	6.15	3.99	1.73
E60 0121 00	Alma College 2	Santa Clara	-121.995	37.180	900	58	34.93	6.19	4.02	1.74
E60 0126 00	Almaden Rest	Santa Clara	-121.833	37.167	640	38	30.11	5.94	3.85	1.67
E60 0126 00	Almaden Watershed	Santa Clara	-121.840	37.160	630	22	32.98	5.23	3.30	1.47
E60 0126 00	Almaden Watershed	Santa Clara	-121.840	37.160	630	22	32.98	5.23	3.30	1.47
E60 0167 00	Alviso	Santa Clara	-121.978	37.421	8	20	14.07	2.34	1.52	0.66
E60 0167 00	Alviso	Santa Clara	-121.967	37.433	8	30	12.02	2.34	1.52	0.66
E60 0564 00	Bear Gulch	Santa Clara	-122.225	37.432	180	20	19.97	2.43	1.58	0.68
E60 0706 00	Bettyessa 1 E	Santa Clara	-121.833	37.467	3,399	20	15.90	2.39	1.55	0.87
E60 0728 50	Biel Ranch	Santa Clara	-121.530	37.470	3,399	28	18.52	3.05	1.98	0.86
E60 0740 00	Big Basin Way	Santa Clara	-122.050	37.250	577	80	17.45	2.77	1.80	0.78
E60 0850 00	Black Mtn 2 WSW	Santa Clara	-122.167	37.300	2,331	40	36.37	5.76	3.74	1.82
E60 0863 00	Black Road	Santa Clara	-122.030	37.200	1,893	45	46.14	8.08	5.23	2.27
E60 0863 00	Black Road	Santa Clara	-122.030	37.200	1,893	21	12.72	3.33	2.18	0.94
E60 1285 02	Calero Watershed	Santa Clara	-121.730	37.170	581	7	29.77	6.56	4.28	1.84
E60 1285 02	Calero Watershed	Santa Clara	-121.730	37.170	581	7	29.77	6.18	4.01	1.74

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,0181-Year Return Period (in)
E60 1377 01	Campbell	Santa Clara	-121.950	37.283	192	75	15.98	2.85	1.85	0.80
E60 1891 00	Chemetala Park	Santa Clara	-121.983	37.167	1,020	8	49.87	10.18	6.61	2.86
E60 1881 43	Coe Park	Santa Clara	-121.550	37.180	2,740	14	32.25	6.21	4.03	1.75
E60 1881 43	Coe Park	Santa Clara	-121.550	37.180	2,740	34	27.06	4.07	2.64	1.14
E60 1885 43	Coe Ranch	Santa Clara	-121.420	37.150	1,696	16	24.81	4.98	3.23	1.40
E60 1885 43	Coe Ranch	Santa Clara	-121.420	37.150	1,696	36	23.38	3.83	2.49	1.08
E60 2093 30	Coe Ridge	Santa Clara	-121.650	37.260	2,999	6	33.67	6.52	4.23	1.83
E60 2093 30	Coe Ridge	Santa Clara	-121.650	37.260	2,999	6	33.67	4.55	2.95	1.28
E60 2098 00	Cox Ave	Santa Clara	-122.019	37.286	200	41	20.09	4.08	2.85	1.15
E60 2109 00	Coyote Reservoir	Santa Clara	-121.540	37.085	800	10	20.03	4.50	2.92	1.27
E60 2109 00	Coyote Reservoir	Santa Clara	-121.540	37.090	800	57	19.80	3.45	2.24	0.97
E60 2230 00	Cupertino	Santa Clara	-122.033	37.317	215	80	16.35	2.95	1.91	0.83
E60 2232 10	Curtner Ranch	Santa Clara	-121.870	37.470	640	20	17.52	3.16	2.05	0.88
E60 2232 10	Curtner Ranch	Santa Clara	-121.876	37.487	640	41	16.85	2.47	1.60	0.69
E60 2258 00	Dahl Ranch	Santa Clara	-122.170	37.340	1,680	28	32.75	4.79	3.11	1.35
E60 2258 00	Dahl Ranch	Santa Clara	-122.170	37.340	1,680	20	32.11	7.04	4.57	1.98
E60 2519 00	Evergreen	Santa Clara	-122.033	37.317	340	39	13.87	2.40	1.56	0.67
E60 3319 02	Garay 9 WNW	Santa Clara	-121.725	37.050	1,000	23	45.75	7.53	4.89	2.12
E60 3347 75	Garred Ranch	Santa Clara	-122.058	37.276	900	38	26.98	4.99	3.24	1.40
E60 3419 00	Garay 8 NE	Santa Clara	-122.433	37.633	1,050	24	19.28	4.70	3.05	1.32
E60 3421 00	Garay 14 NE	Santa Clara	-121.367	37.117	1,900	24	18.59	3.36	2.18	0.94
E60 3691 20	Guadalupe Watershed	Santa Clara	-121.880	37.200	1,401	6	30.78	5.10	3.31	1.43
E60 3691 20	Guadalupe Watershed	Santa Clara	-121.880	37.200	1,401	11	30.78	6.77	4.39	1.90
E60 3710 43	Hastons Ranch	Santa Clara	-121.784	37.395	1,900	21	22.82	4.54	2.95	1.28
E60 3810 43	Hastons Ranch	Santa Clara	-121.780	37.400	1,900	27	21.70	3.30	2.14	0.93
E60 4350 01	Johnson Ranch	Santa Clara	-121.931	37.221	755	17	24.72	5.17	4.00	1.73
E60 4350 01	Johnson Ranch	Santa Clara	-121.931	37.221	755	24	22.56	4.13	2.68	1.18
E60 4655 43	Laguna Seca	Santa Clara	-121.732	37.200	256	18	20.98	5.19	3.37	1.48
E60 4655 43	Laguna Seca	Santa Clara	-121.730	37.200	256	23	19.13	3.31	2.15	0.93
E60 4682 00	Lake Elmore	Santa Clara	-121.925	37.130	1,000	43	38.79	6.15	3.99	1.72
E60 4686 00	Lake Elmore	Santa Clara	-122.017	37.183	1,400	80	40.86	6.71	4.35	1.89
E60 4688 00	Lake Elmore	Santa Clara	-122.067	37.217	1,809	46	45.97	7.11	4.61	2.00
E60 4916 00	Leroy Anderson Dam	Santa Clara	-121.620	37.160	666	35	20.04	4.97	3.23	1.40
E60 4916 00	Leroy Anderson Dam	Santa Clara	-121.628	37.165	666	35	20.04	4.18	2.71	1.18
E60 4922 00	Lexington Reservoir	Santa Clara	-121.990	37.184	696	33	38.08	7.63	4.95	2.15
E60 4922 00	Lexington Reservoir	Santa Clara	-121.990	37.180	699	33	37.16	10.10	6.55	2.84
E60 5058 01	Loma Prieta	Santa Clara	-121.843	37.110	3,789	23	46.08	8.54	5.54	2.40
E60 5058 01	Loma Prieta	Santa Clara	-121.830	37.110	3,789	23	46.08	9.43	6.12	2.65
E60 5108 00	Los Altos Cal Water	Santa Clara	-122.086	37.693	550	20	16.30	2.70	1.75	0.78
E60 5108 02	Los Altos 2	Santa Clara	-122.106	37.365	250	28	17.74	3.05	1.96	0.88
E60 5108 07	Los Altos Fire Dept	Santa Clara	-122.113	37.385	160	16	15.59	2.62	1.70	0.74
E60 5108 10	Los Altos Hamilton WTP	Santa Clara	-122.060	37.350	200	6	17.26	3.73	2.42	1.06
E60 5108 15	Los Altos Reilly	Santa Clara	-122.107	37.373	230	7	15.54	2.38	1.54	0.67
E60 5108 15	Los Altos Reilly	Santa Clara	-121.983	37.217	428	48	24.89	4.42	2.87	1.24
E60 5123 01	Los Gatos Reservoir	Santa Clara	-121.950	37.217	205	78	26.62	4.88	3.17	1.37
E60 5123 02	Los Gatos Summit	Santa Clara	-121.967	37.150	1,800	19	41.24	6.87	4.46	1.93
E60 5124 35	Los Gatos Francis	Santa Clara	-121.936	37.238	320	17	19.36	3.56	2.31	1.00
E60 5268 00	Main Station SJWW	Santa Clara	-121.883	37.333	100	81	13.84	2.09	1.36	0.59
E60 5384 00	Maryknoll	Santa Clara	-122.080	37.330	440	21	17.16	3.30	2.14	0.93
E60 5384 01	Maryknoll	Santa Clara	-121.083	37.333	440	25	16.06	2.97	1.93	0.84
E60 5612 00	McGuire Ave Station	Santa Clara	-121.817	37.383	470	66	16.02	2.11	1.37	0.59
E60 5637 00	McGuire	Santa Clara	-121.919	37.117	1,750	33	44.97	7.42	4.81	2.09
E60 5674 00	Milpitas	Santa Clara	-121.883	37.433	175	41	16.33	2.67	1.73	0.75
E60 5803 00	Montevina Filter Plant	Santa Clara	-121.883	37.433	175	80	30.97	5.51	3.58	1.55
E60 5844 01	Morgan Hill 2 E	Santa Clara	-121.617	37.133	225	27	19.55	3.43	2.23	0.98
E60 5848 00	Morgan Hill 8 WSW	Santa Clara	-121.742	37.094	640	15	24.47	5.21	3.36	1.48
E60 5849 00	Morgan Hill Outfall	Santa Clara	-121.565	37.174	1,950	11	22.51	2.98	1.93	0.84
E60 5887 22	Montebello Ridge	Santa Clara	-122.108	37.290	2,000	43	40.86	7.11	4.61	2.00
E60 5896 40	Mountain View Corp Yard	Santa Clara	-122.054	37.405	56	10	14.30	2.92	1.89	0.82
E60 5896 40	Mt View Yard	Santa Clara	-122.050	37.400	58	10	15.14	2.68	1.74	0.75
E60 5897 01	Mountain View	Santa Clara	-122.383	37.383	75	89	15.04	2.58	1.68	0.72
E60 5999 50	Mt Umunhum	Santa Clara	-121.900	37.150	1,091	18	39.80	6.71	4.35	1.89
E60 5999 50	Mt Umunhum	Santa Clara	-121.900	37.150	1,091	18	37.43	7.96	5.18	2.24
E60 6648 00	Palo Alto City Hall	Santa Clara	-122.139	37.450	43	42	14.99	2.68	1.74	0.75
E60 6648 00	Palo Alto City Hall	Santa Clara	-122.139	37.450	23	22	14.90	3.49	2.26	0.98
E60 6791 90	Parks Ranch	Santa Clara	-121.460	37.052	1,050	9	24.12	3.40	2.21	0.98
E60 6791 90	Peralta	Santa Clara	-121.830	37.240	489	21	17.36	2.70	1.75	0.78
E60 6791 90	Peralta	Santa Clara	-121.833	37.401	489	18	17.10	3.17	2.08	0.88
E60 7309 00	Redwood City	Santa Clara	-122.233	37.483	31	56	19.38	3.50	2.27	0.98
E60 7309 01	Redwood City Leslie Salt	Santa Clara	-122.209	37.500	10	17	15.95	2.74	1.78	0.77
E60 7436 15	Rinconada WTP	Santa Clara	-121.980	37.230	450	9	21.69	5.89	3.62	1.64
E60 7436 15	Rinconada WTP	Santa Clara	-121.980	37.230	450	15	20.92	4.29	2.78	1.21
E60 7533 00	Rolph	Santa Clara	-122.790	37.435	1,650	15	34.73	3.86	2.50	1.09

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,000-Year Return Period (in)
E60 7821 00	San Jose	Santa Clara	-121.900	37.340	95	99	14.08	2.08	1.35	0.58
E60 7821 00	San Jose	Santa Clara	-121.900	37.340	95	89	13.81	2.16	1.40	0.61
E60 7824 01	San Jose Deciduous Fruit Sta	Santa Clara	-121.950	37.317	90	45	14.29	2.77	1.80	0.78
E60 7912 00	Santa Clara University	Santa Clara	-121.941	37.348	85	79	14.54	2.42	1.57	0.68
E60 7974 43	Santa Teresa Park	Santa Clara	-121.778	37.224	210	17	18.39	3.36	2.18	0.94
E60 7998 01	Saratoga Clark	Santa Clara	-121.995	37.280	292	26	19.61	3.68	2.39	1.03
E60 7998 02	Saratoga Gap	Santa Clara	-122.122	37.250	2,600	44	54.53	7.83	5.08	2.20
E60 7998 03	Saratoga Knags	Santa Clara	-122.033	37.250	290	9	17.90	3.89	2.52	1.09
E60 7998 43	Saratoga	Santa Clara	-122.028	37.272	420	36	29.21	5.35	3.47	1.50
E60 8038 10	Schilling	Santa Clara	-122.248	37.396	400	25	30.94	4.34	2.82	1.22
E60 8068 00	Searsville Lake	Santa Clara	-122.233	37.400	350	44	28.79	3.98	2.58	1.12
E60 8107 00	Seven Mile Run	Santa Clara	-121.953	37.253	322	80	20.09	3.94	2.54	1.11
E60 8109 00	Seven Springs Ranch	Santa Clara	-122.033	37.300	200	14	19.34	3.96	2.57	1.11
E60 8423 00	South San Francisco Bay	Santa Clara	-122.019	37.464	7	19	10.78	2.85	1.85	0.80
E60 8423 00	South San Francisco Bay	Santa Clara	-122.019	37.464	7	7	9.74	1.44	0.93	0.40
E60 8495 01	Stanford University	Santa Clara	-122.172	37.431	50	26	15.82	2.54	1.65	0.71
E60 8519 00	Stevens Creek Reservoir	Santa Clara	-122.090	37.300	499	10	31.83	7.79	5.05	2.19
E60 8519 00	Stevens Creek Reservoir	Santa Clara	-122.090	37.300	499	48	27.85	5.02	3.28	1.41
E60 8666 00	Sunnyvale	Santa Clara	-122.033	37.367	97	31	13.63	2.73	1.77	0.77
E60 8666 43	Sunnyvale Hamilton WTP	Santa Clara	-122.262	37.350	200	10	17.26	3.67	2.36	1.03
E60 8666 43	Sunnyvale Hindicks	Santa Clara	-122.030	37.340	175	11	16.73	2.70	1.75	0.78
E60 8978 50	Touristlot	Santa Clara	-121.686	37.243	950	19	19.37	2.85	1.85	0.80
E60 8984 20	Toyon Ave	Santa Clara	-121.833	37.833	240	40	15.77	2.30	1.49	0.65
E60 9148 00	UTC	Santa Clara	-121.670	37.220	735	21	19.41	3.06	1.99	0.86
E60 9148 00	UTC	Santa Clara	-121.670	37.220	735	8	16.20	3.08	2.00	0.87
E60 9148 00	Vasona Reservoir	Santa Clara	-121.675	37.223	735	12	19.64	3.82	2.48	1.07
E60 9228 03	Valley Christian School	Santa Clara	-122.070	37.240	1,490	18	42.32	7.88	5.11	2.22
E60 9228 03	Valley Christian School	Santa Clara	-122.070	37.240	1,490	29	41.23	6.96	4.52	1.96
E60 9269 50	Vasona Pump Plant	Santa Clara	-121.970	37.250	249	8	20.49	4.02	2.61	1.13
E60 9269 50	Vasona Pump Plant	Santa Clara	-121.970	37.250	249	12	19.64	3.82	2.48	1.03
E60 9600 43	West Yard	Santa Clara	-121.990	37.320	174	13	15.07	3.68	2.39	1.03
E60 9600 43	West Yard	Santa Clara	-121.990	37.320	174	23	15.07	3.23	2.20	0.95
E60 9600 43	Wilcox Glen	Santa Clara	-121.900	37.300	282	40	14.42	2.23	1.45	0.63
E60 9680 50	Wilcox Reservoir	Santa Clara	-121.908	37.120	1,222	26	37.45	6.24	4.05	1.75
E60 9814 00	Wrights	Santa Clara	-121.950	37.133	282	83	44.65	7.30	4.74	2.05
A00 4712 00	Lake Solano	Solano	-122.053	38.492	180	34	23.90	4.31	2.93	1.35
A00 4712 00	Lake Solano	Solano	-122.053	38.492	180	32	22.98	3.78	2.57	1.19
A00 5805 00	Montezuma Hills	Solano	-121.804	38.076	20	42	12.76	2.77	1.54	0.71
A00 9200 00	Vacaville	Solano	-121.950	38.360	104	97	24.34	4.47	3.04	1.40
A90 6977 00	Pleasant Valley	Solano	-122.043	38.468	250	30	29.47	5.66	3.85	1.78
B90 7446 00	Rio Vista	Solano	-121.693	38.149	40	83	16.12	2.80	1.90	0.89
B90 7446 02	Rio Vista 4 NW	Solano	-121.750	38.200	63	14	16.72	3.46	2.35	1.09
E30 0670 20	Benicia Barracks	Solano	-122.133	38.033	64	36	16.68	3.49	2.26	0.98
E30 0814 48	Birds Landing	Solano	-121.869	38.138	60	69	15.79	2.91	1.89	0.82
E30 1919 00	Colusa	Solano	-121.855	38.091	34	22	14.18	2.52	1.64	0.71
E30 2199 48	Devonport 1 S	Solano	-121.891	38.206	22	16	16.66	2.94	1.91	0.83
E30 2934 00	Fairfield FS	Solano	-122.041	38.260	341	45	21.84	3.89	2.52	1.09
E30 2935 00	Fairfield JHNE	Solano	-122.034	38.289	110	9	24.86	5.19	3.37	1.46
E30 2935 00	Fairfield JHNE	Solano	-122.034	38.289	110	54	22.28	3.88	2.52	1.09
E30 3612 00	Green Valley	Solano	-122.170	38.280	414	57	30.13	5.12	3.32	1.44
E30 3650 00	Grozzley Island	Solano	-121.967	38.150	1	20	17.81	3.15	2.04	0.89
E30 4685 00	Lake Herman	Solano	-122.150	38.090	42	45	17.83	2.83	1.84	0.80
E30 5333 00	Mare Island	Solano	-122.270	38.100	52	35	19.22	3.32	2.15	0.93
E30 6354 00	Grozzley Island	Solano	-121.967	38.150	1	20	17.81	3.15	2.04	0.89
E30 7519 48	Rockville Russell	Solano	-122.100	38.240	40	88	21.52	3.91	2.54	1.10
E30 8142 48	Shilo	Solano	-122.888	38.188	40	19	16.05	2.69	1.75	0.76
E30 9012 00	Travis AFB	Solano	-121.917	38.250	50	53	17.36	3.15	2.04	0.89
E30 9218 50	Vallejo 4N	Solano	-121.160	38.150	23	17	20.34	3.24	2.10	0.91
E20	Pangrove Jones	Sonoma	-122.658	38.308	140	7	34.39	5.65	3.67	1.59
E20	Petaluma Carlson	Sonoma	-122.633	38.242	20	22	27.54	5.02	3.26	1.41
E20 2822 00	El Verno CY	Sonoma	-122.483	38.300	100	18	36.01	4.71	3.06	1.32
E20 3455 04	Glen Ellen S W	Sonoma	-122.633	38.367	1,100	21	40.43	7.28	4.72	2.05
E20 4319 19	Jack London State Park	Sonoma	-122.372	38.545	720	15	45.81	7.78	5.05	2.19
E20 6792 04	Pangrove Fire Station	Sonoma	-122.664	38.296	90	19	29.71	5.12	3.32	1.44
E20 6826 50	Petaluma Weddle	Sonoma	-122.631	38.220	120	11	22.95	3.58	2.32	1.01
E20 6826 00	Petaluma	Sonoma	-122.629	38.241	16	84	23.93	3.76	2.44	1.06
E20 6826 00	Petaluma FS2	Sonoma	-122.829	38.241	16	52	23.73	3.70	2.40	1.04
E20 6826 06	Petaluma Pendleton	Sonoma	-122.633	38.243	12	15	22.56	3.50	2.27	0.98
E20 6826 40	Petaluma Cooley	Sonoma	-122.625	38.181	300	20	29.36	4.89	3.17	1.37
E20 6826 77	Petaluma Jewell	Sonoma	-122.724	38.279	86	8	26.48	4.74	3.08	1.33
E20 6826 00	Sheepy Hollow Dairy	Sonoma	-122.498	38.158	50	30	22.61	3.79	2.46	1.07
E20 8351 00	Sonoma	Sonoma	-122.470	38.300	97	75	29.04	4.65	3.02	1.31
E20 8351 03	Sonoma State Hospital	Sonoma	-122.520	38.350	440	39	45.08	7.96	5.17	2.24

R0006423

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Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,0191-Year Return Period (in)
E20 8351 08	Sonoma 4 W	Sonoma	-122.533	38.283	500	24	43.19	7.05	4.57	1.98
E20 8634 30	Sugarloaf Ridge	Sonoma	-122.510	38.600	1,240	19	46.49	7.57	4.91	2.13
F80 3161 00	Fort Ross	Sonoma	-123.250	38.517	118	122	43.22	6.16	4.18	1.83
F80 8063 49	Sea Ranch	Sonoma	-123.433	38.700	75	25	43.51	5.90	4.01	1.75
F80 8540 01	Stewarts Point ZZNNE	Sonoma	-123.370	38.674	1,215	3	40.77	6.45	4.38	1.91
F80 8540 02	Stewarts Point 2 NE	Sonoma	-123.367	38.663	860	23	47.97	6.61	4.49	1.98
F80 8542 50	Seaview	Sonoma	-123.227	38.548	1,200	8	48.47	7.03	4.77	2.09
F80 8542 50	Seaview Cail	Sonoma	-123.208	38.525	1,500	13	64.53	7.92	5.38	2.35
F80 8542 50	Silverstar Cove	Sonoma	-123.293	38.550	100	8	39.78	5.87	3.98	1.74
F80 9651 00	Yorville	Sonoma	-123.313	38.905	1,120	37	48.36	6.45	4.38	1.91
F90	Calistoga 5 S	Sonoma	-122.570	38.510	2,000	18	49.51	9.06	6.15	2.89
F90	Calistoga 5 WSW	Sonoma	-121.700	38.559	729	24	59.70	8.78	5.96	2.60
F90 0196 45	Anchor Bay 1.5 N	Sonoma	-123.583	38.833	100	7	56.09	8.25	5.60	2.45
F90 1312 02	Calistoga 4 NW	Sonoma	-122.650	38.601	944	33	40.78	6.43	4.37	1.91
F90 1602 00	Cazadero	Sonoma	-123.290	38.530	1,040	43	71.31	10.23	6.94	3.03
F90 1602 00	Cazadero Potter	Sonoma	-123.007	38.500	1,000	12	63.95	9.83	6.54	2.86
F90 1837 00	Cloverdale	Sonoma	-123.017	38.817	315	61	38.71	5.52	3.75	1.84
F90 1838 00	Cloverdale 3 SSE	Sonoma	-122.980	38.770	320	43	45.01	6.51	4.42	1.93
F90 1839 00	Cloverdale 1S	Sonoma	-123.016	38.789	340	24	42.17	5.32	3.61	1.58
F90 1840 00	Cloverdale 11 W	Sonoma	-123.209	38.772	1,820	20	64.11	9.13	6.20	2.71
F90 1840 00	Cloverdale 11 W	Sonoma	-123.217	38.767	122	27	60.55	8.48	5.78	2.52
F90 2061 02	Coast Fire Station	Sonoma	-122.706	38.327	102	21	30.59	4.54	3.08	1.35
F90 2550 00	Duncan Mills	Sonoma	-123.067	38.450	85	38	42.08	6.07	4.12	1.80
F90 3089 00	Flat Ridge Ranch	Sonoma	-123.177	38.767	1,150	14	73.51	10.04	6.82	2.98
F90 3137 00	Forestville Parney	Sonoma	-122.950	38.467	200	42	40.17	6.21	4.22	1.84
F90 3395 06	Geyserville 2 N	Sonoma	-122.899	38.737	420	13	62.83	8.18	5.55	2.43
F90 3395 06	Geyserville 1.5 SSE	Sonoma	-122.883	38.700	400	14	47.13	5.91	4.01	1.75
F90 3577 00	Graton	Sonoma	-122.850	38.430	200	93	39.75	6.35	4.31	1.88
F90 3684 00	Guerneville	Sonoma	-123.000	38.500	55	73	45.08	6.99	4.75	2.07
F90 3685 49	Guerneville 2 N	Sonoma	-123.020	38.530	200	19	58.90	9.32	6.33	2.76
F90 3697 00	Guadalupe Point Park	Sonoma	-123.517	38.767	100	8	38.92	5.90	4.01	1.75
F90 3873 00	Healdsburg	Sonoma	-122.830	38.620	101	99	40.58	6.27	4.26	1.86
F90 3873 40	Healdsburg SE	Sonoma	-122.754	38.625	200	6	41.51	7.35	4.99	2.18
F90 3873 40	Healdsburg Mann	Sonoma	-122.893	38.619	150	18	41.87	6.54	4.44	1.94
F90 4480 00	Kellogg	Sonoma	-122.667	38.667	1,800	30	47.13	7.51	5.10	2.23
F90 4504 01	Kennwood	Sonoma	-122.583	38.408	800	18	32.62	5.25	3.56	1.58
F90 6370 00	Occidental	Sonoma	-122.970	38.420	960	55	53.94	7.54	5.12	2.24
F90 6370 20	Occidental SE	Sonoma	-122.913	38.407	700	29	47.35	6.73	4.57	2.00
F90 6792 03	Purvisgrove 1.5 N	Sonoma	-122.658	38.329	205	33	26.59	3.96	2.69	1.17
F90 6828 05	Petaluma 8 WNW	Sonoma	-122.767	38.267	200	13	28.15	4.32	2.93	1.28
F90 7964 00	Santa Rosa STP	Sonoma	-122.753	38.440	20	33	28.48	4.27	2.90	1.27
F90 7964 49	Santa Rosa Laguna	Sonoma	-122.762	38.378	75	27	30.03	4.47	3.03	1.33
F90 7965 00	Santa Rosa	Sonoma	-122.700	38.450	167	95	29.98	4.57	3.10	1.36
F90 7965 05	Santa Rosa 2 SE	Sonoma	-122.700	38.400	160	14	29.07	4.78	3.24	1.42
F90 7965 25	Santa Rosa SCWA	Sonoma	-122.727	38.469	110	7	30.72	5.56	3.77	1.65
F90 7965 35	Santa Rosa Krauss	Sonoma	-122.695	38.438	150	15	32.34	4.86	3.30	1.44
F90 8072 00	Sebastopol	Sonoma	-122.812	38.352	145	48	33.15	5.04	3.42	1.50
F90 8072 00	Sebastopol 4 SSE	Sonoma	-122.812	38.352	145	24	32.18	4.77	3.24	1.42
F90 8072 01	Sebastopol 1 SE	Sonoma	-122.800	38.383	100	25	33.78	5.07	3.44	1.50
F90 8072 02	Sebastopol 3 NW	Sonoma	-122.980	39.432	150	16	36.78	5.82	3.95	1.73
F90 8272 00	Skaggs Springs Las Lomas	Sonoma	-123.134	38.677	1,930	27	61.59	8.57	5.82	2.54
F90 8272 02	Skaggs Sp 2 WSW	Sonoma	-123.070	38.708	455	17	49.60	8.51	5.78	2.52
F90 8351 01	Sonoma Co Adm Bldg	Sonoma	-122.717	39.467	150	17	26.02	4.50	3.05	1.33
F90 8351 40	Sonoma Min	Sonoma	-122.607	39.346	1,300	8	44.25	6.34	4.30	1.88
F90 8885 00	The Geysers	Sonoma	-122.826	38.801	1,668	46	54.55	8.36	5.68	2.48
F90 8885 00	The Geysers	Sonoma	-122.826	38.801	1,668	55	53.46	8.15	5.53	2.42
F90 9117 02	Two Rock USCG	Sonoma	-122.792	38.250	150	38	29.37	4.48	3.04	1.33
F90 9221 02	Valley Ford	Sonoma	-122.897	38.305	80	39	36.33	5.54	3.78	1.64
F90 9221 21	Valley Ford 2N	Sonoma	-122.864	38.351	400	20	54.16	7.97	5.41	2.38
F90 9273 00	Verado	Sonoma	-123.017	38.617	1,280	56	58.74	8.42	5.72	2.50
F90 9273 00	Verado	Sonoma	-123.017	38.617	1,280	38	58.58	8.79	5.97	2.61
B00 2389 00	Davis 3 NNE	Stanislaus	-120.783	37.567	137	82	11.36	1.97	1.34	0.62
B00 2820 00	El Solito	Stanislaus	-121.238	37.623	50	19	10.53	2.08	1.41	0.68
B00 2909 00	Eugene Stuart	Stanislaus	-120.857	37.921	175	43	14.94	2.30	1.58	0.73
B00 3099 02	Flowers Min	Stanislaus	-121.550	37.500	1,565	25	21.82	2.94	1.99	0.93
B00 3940 11	Hickman	Stanislaus	-121.750	37.617	105	14	12.03	2.17	1.47	0.69
B00 4183 00	Hunt Ranch	Stanislaus	-120.924	38.068	190	23	18.41	2.81	1.91	0.89
B00 4590 00	Knight's Ferry 2 ESE	Stanislaus	-120.845	37.800	215	34	17.55	2.60	1.78	0.82
B00 4642 00	La Grange	Stanislaus	-120.433	37.667	300	21	16.22	2.54	1.72	0.80
B00 5736 35	Modesto 6 SW	Stanislaus	-121.067	37.625	91	20	11.78	2.05	1.39	0.65
B00 5736 00	Modesto	Stanislaus	-121.001	37.647	91	107	11.94	2.00	1.36	0.63
B00 5736 00	Modesto	Stanislaus	-121.001	37.647	91	52	11.58	1.95	1.32	0.62
B00 5819 11	Montpelier	Stanislaus	-120.700	37.550	225	27	12.44	2.47	1.68	0.78

R0006424

Table C-20
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storms		
								16-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,0181-Year Return Period (in)
800 6170 00	Newman	Stanislaus	-121.017	38.317	214	97	10.53	2.08	1.41	0.68
800 6305 00	Oakdale Woodward	Stanislaus	-120.867	37.867	220	39	13.11	2.26	1.53	0.71
800 6305 01	Oakdale Erickson	Stanislaus	-120.833	37.867	250	12	14.16	2.07	1.40	0.65
800 6306 00	Oakdale	Stanislaus	-120.848	37.769	155	86	14.79	2.21	1.50	0.70
800 6490 00	Oswimba	Stanislaus	-121.063	37.362	110	89	10.24	1.97	1.34	0.62
800 8679 05	Patterson	Stanislaus	-121.117	37.467	100	80	10.71	2.21	1.50	0.70
800 8322 00	Snow Ranch	Stanislaus	-120.821	37.946	240	51	17.56	2.41	1.63	0.78
800 8322 00	Snow Ranch	Stanislaus	-120.821	37.946	240	16	16.83	2.58	1.75	0.82
800 9073 00	Turlock	Stanislaus	-120.850	37.491	115	102	11.77	2.04	1.38	0.65
800 9073 01	Turlock 5 SW	Stanislaus	-120.911	37.464	76	31	12.71	1.97	1.34	0.62
800 9563 00	Wesley	Stanislaus	-121.200	37.550	85	44	10.76	2.28	1.55	0.72
880 2369 00	Del Puerto Road Camp	Stanislaus	-121.378	37.423	1,125	26	14.53	2.81	1.91	0.89
880 2369 00	Del Puerto Road Camp	Stanislaus	-121.378	37.423	1,125	9	13.92	2.48	1.67	0.78
880 3690 03	Gustine 5 WSW	Stanislaus	-121.100	37.242	240	12	12.98	1.96	1.33	0.62
880 6309 00	Oak Flat Ranch	Stanislaus	-121.262	37.385	1,035	10	12.24	2.40	1.63	0.78
900 5740 00	Modesto KTRB	Stanislaus	-120.978	37.670	83	16	11.11	2.14	1.45	0.68
C70 1754 00	Chuchupelle RS	Ventura	-118.011	34.808	5,260	54	13.31	3.22	2.05	0.86
T12 6576 00	Ozema	Ventura	-118.317	34.700	3,705	38	16.48	4.87	3.09	1.28
T12 6576 00	Ozema	Ventura	-118.317	34.700	3,705	62	12.64	4.05	2.57	1.05
T12 9813 10	Apache Camp	Ventura	-119.333	34.867	4,965	29	9.91	2.06	1.31	0.53
T12 9813 10	Apache Camp	Ventura	-119.333	34.867	4,965	30	9.66	1.85	1.18	0.48
U02 1472 11	Canada Largo 85	Ventura	-119.228	34.381	760	27	21.34	6.26	3.78	1.18
U02 1472 11	Canada Largo 85	Ventura	-119.228	34.381	760	33	19.83	5.85	3.53	1.10
U02 1558 00	Last Chance ALERT	Ventura	-119.050	34.500	4,520	7	46.18	7.66	4.83	1.44
U02 1558 12	Cactus Ranch 4	Ventura	-119.337	34.369	400	60	22.76	6.87	4.15	1.29
U02 1559 00	Lake Cactus 204	Ventura	-119.337	34.415	400	28	23.33	7.21	4.36	1.35
U02 2399 00	Dennison Rch Updr Oja	Ventura	-119.189	34.438	1,320	8	21.60	5.23	3.16	0.98
U02 4568 51	Kingsdon Res	Ventura	-119.295	34.343	215	53	18.51	5.77	3.49	1.08
U02 5408 01	Matija Dam	Ventura	-119.307	34.484	1,040	70	24.98	7.47	4.51	1.40
U02 5408 01	Matija Dam 207	Ventura	-119.377	34.507	1,540	22	34.94	11.73	7.09	2.20
U02 5408 06	Matija Canyon	Ventura	-119.355	34.504	1,400	27	35.54	11.42	6.90	2.15
U02 5509 50	Meniers Oaks 218	Ventura	-119.284	34.444	1,040	23	23.19	6.93	4.19	1.30
U02 6353 11	Oak View FS 140	Ventura	-119.300	34.395	520	38	21.76	6.82	4.12	1.28
U02 6353 11	Oak View FS 140	Ventura	-119.068	34.212	27	12	18.87	4.69	2.83	0.88
U02 6399 00	Ojai	Ventura	-119.242	34.347	750	90	21.34	6.18	3.73	1.16
U02 6399 00	Ojai Barnett 153	Ventura	-119.242	34.447	750	36	20.72	5.94	3.59	1.12
U02 6399 01	Ojai Makory	Ventura	-119.246	34.450	750	79	18.57	5.50	3.32	1.03
U02 6399 01	Ojai Thacher 59	Ventura	-119.246	34.450	750	72	21.12	6.02	3.64	1.13
U02 6399 01	Rancho Matija W 20	Ventura	-119.246	34.450	750	60	21.54	7.33	4.43	1.38
U02 6399 01	Sea Cliff 221	Ventura	-119.209	34.268	226	26	15.40	4.18	2.53	0.79
U02 6399 01	Sea Cliff 221	Ventura	-119.209	34.268	226	21	14.87	3.99	2.41	0.75
U02 7247 75	Lion Canyon ALERT	Ventura	-119.133	34.500	5,200	5	33.83	6.62	4.00	1.24
U02 8068 02	Santa Ana Vly Selby 44	Ventura	-119.354	34.425	660	36	24.05	7.21	4.36	1.35
U02 8095 01	Selby Rch Santa Ana 44	Ventura	-119.354	34.425	660	59	24.05	7.12	4.30	1.34
U02 8513 20	Stanton Canyon 254	Ventura	-119.370	34.370	630	14	24.12	6.88	4.16	1.29
U02 8536 11	Stewart Canyon 165	Ventura	-119.247	34.461	960	31	20.85	5.52	3.34	1.04
U02 8536 11	Stewart Canyon 165	Ventura	-119.247	34.461	960	37	20.84	5.87	3.55	1.10
U02 9182 77	Upper Ojai 64	Ventura	-119.189	34.044	1,320	14	21.96	5.63	3.40	1.06
U02 9182 77	Upper Ojai 64	Ventura	-119.189	34.044	1,320	85	21.79	6.60	3.99	1.24
U02 9285 00	Ventura School 66	Ventura	-119.291	34.281	60	68	14.95	4.08	2.47	0.77
U02 9285 07	Ventura Wood 260	Ventura	-119.316	34.282	15	11	14.38	3.52	2.13	0.66
U02 9615 00	Wheeler Springs 2 SSW	Ventura	-119.294	34.483	875	29	24.42	7.22	4.36	1.36
U03	Tommy's Creek ALERT	Ventura	-119.217	34.600	5,250	7	16.46	4.25	2.57	0.80
U03 0179 10	Camurillo J. Am Sugar	Ventura	-118.968	34.205	60	85	13.38	3.71	2.24	0.70
U03 0450 10	Sonia Fuller 206	Ventura	-118.979	34.311	730	26	17.53	4.33	2.62	0.81
U03 0450 18	Balcom Cyn	Ventura	-118.973	34.314	800	21	16.60	4.91	2.97	0.92
U03 0495 00	Bard Reservoir	Ventura	-118.828	34.242	1,010	20	15.01	4.20	2.54	0.79
U03 0495 00	Bard Reservoir 227	Ventura	-118.828	34.242	1,010	26	14.95	3.89	2.35	0.73
U03 0506 11	Bardsdale Lander 96	Ventura	-118.275	34.492	2,920	55	18.67	5.79	3.50	1.09
U03 1339 00	Camurillo 194	Ventura	-119.012	34.205	130	36	12.30	3.52	2.13	0.66
U03 1339 00	Camurillo Hooker 214	Ventura	-119.055	34.219	122	89	13.55	4.04	2.44	0.76
U03 1339 20	Camurillo Hauser 219	Ventura	-119.026	34.237	1,352	23	14.78	3.59	2.17	0.67
U03 1471 18	Camurillo Rch 101	Ventura	-118.756	34.406	725	34	17.52	5.05	3.05	0.95
U03 1658 50	Channel Islands Harbor 215	Ventura	-119.222	34.160	5	24	14.40	3.42	2.07	0.64
U03 1747 30	Chorro 80 AKERT	Ventura	-119.333	34.600	4,350	7	20.24	7.78	4.70	1.46
U03 2211 50	Cuddy Valley	Ventura	-119.059	34.840	5,500	13	14.65	3.77	2.28	0.71
U03 2231 80	Deals Flat 232	Ventura	-118.968	34.088	1,430	19	20.64	5.89	3.56	1.11
U03 2231 80	Deals Flat 232	Ventura	-118.968	34.088	1,430	25	20.06	5.56	3.36	1.04
U03 2303 11	Camurillo Davis 177	Ventura	-119.076	34.157	20	31	12.17	3.57	2.16	0.67
U03 2303 11	Double HN Ranch 94	Ventura	-118.847	34.398	600	55	18.44	5.52	3.34	1.04
U03 2785 50	El Rico 231	Ventura	-119.117	34.241	79	21	16.44	4.14	2.50	0.78
U03 2785 50	El Rico Spreading Ground	Ventura	-119.177	34.241	79	15	16.93	3.76	2.27	0.71
U03 3036 15	Femdale Rch 173	Ventura	-119.090	34.428	980	29	22.84	6.96	4.21	1.31

Table C-26
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft. above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,918-Year Return Period (in)
U03 3036 15	Ferrdale Rich 173	Ventura	-119.090	34.428	980	37	22.09	6.50	3.93	1.22
U03 3050 00	Filmore 1 WNW	Ventura	-118.926	34.403	435	20	18.50	5.99	3.62	1.13
U03 3050 13	Filmore Hatchery 171	Ventura	-118.884	34.394	470	37	18.88	5.30	3.20	1.00
U03 3050 13	Filmore Hatchery 171	Ventura	-118.884	34.394	470	31	18.47	5.04	3.05	0.95
U03 3050 50	Filmore Sausage 224	Ventura	-118.881	34.479	2,750	21	26.02	8.29	5.01	1.56
U03 3050 50	Filmore Sausage 224	Ventura	-118.881	34.479	2,750	25	27.64	7.94	4.80	1.49
U03 3511 11	Hall Canyon 167	Ventura	-119.258	34.280	180	37	15.64	4.48	2.71	0.84
U03 3715 00	Hall Canyon 167	Ventura	-119.258	34.280	180	31	15.73	4.49	2.71	0.84
U03 3715 00	Hall Canyon 167	Ventura	-119.258	34.280	180	37	15.64	4.48	2.71	0.84
U03 4708 11	Lake Sherwood	Ventura	-118.875	34.141	960	26	20.48	6.07	3.67	1.14
U03 4749 05	Lang Ranch ALERT	Ventura	-118.800	34.200	1,600	8	18.83	5.42	3.27	1.02
U03 4803 90	Las Flores Hills ALERT	Ventura	-118.917	34.250	860	5	11.71	3.12	1.89	0.59
U03 4804 70	Las Lajas 234	Ventura	-118.690	34.301	1,150	25	15.67	4.50	2.72	0.85
U03 4804 70	Las Lajas 234	Ventura	-118.690	34.301	1,150	19	15.61	4.11	2.48	0.77
U03 4943 00	Limoneros Rich	Ventura	-119.124	34.334	335	63	16.95	5.02	3.03	0.94
U03 5024 10	Lockwood Valley 209	Ventura	-119.102	34.734	5,150	31	15.14	4.20	2.54	0.79
U03 5024 10	Lockwood Valley 209	Ventura	-119.102	34.734	5,150	25	14.03	4.17	2.52	0.78
U03 5408 06	Majada Canyon 207	Ventura	-119.355	34.504	1,400	34	34.95	11.36	6.86	2.13
U03 5825 00	Moorepark J E 192	Ventura	-118.848	34.258	835	30	13.67	3.54	2.14	0.67
U03 5825 00	Moorepark J E 192	Ventura	-118.845	34.256	835	34	13.33	3.60	2.18	0.68
U03 5826 00	Moorepark 191	Ventura	-118.895	34.328	1,060	31	17.33	4.20	2.54	0.79
U03 5826 00	Moorepark 191	Ventura	-118.895	34.328	1,060	35	17.07	4.56	2.78	0.86
U03 5826 00	Moorepark Happy Camp 250	Ventura	-118.895	34.328	1,060	11	20.09	4.42	2.67	0.83
U03 5826 00	Moorepark Happy Camp 250	Ventura	-118.895	34.328	1,060	16	19.86	4.64	2.80	0.87
U03 5826 51	Moorepark 1 SSE 141	Ventura	-118.847	34.279	520	60	15.60	3.86	2.33	0.73
U03 6147 00	Newberry Park 188	Ventura	-118.950	34.188	1,665	35	14.80	4.68	2.82	0.88
U03 6147 00	Newberry Park 188	Ventura	-118.950	34.188	1,665	60	14.62	4.66	2.82	0.88
U03 6147 00	Newberry Park 2 WSW	Ventura	-118.948	34.185	665	60	14.62	4.66	2.82	0.88
U03 6149 00	Newberry Park 4 SW	Ventura	-118.967	34.150	685	10	14.30	4.55	2.75	0.85
U03 6149 40	Newberry Park 182	Ventura	-118.981	34.153	810	22	18.50	4.53	2.74	0.85
U03 6403 11	Old Adobe Ventura 216	Ventura	-119.274	34.249	5	23	15.54	3.53	2.13	0.68
U03 6486 70	Orcutt Ranch 31	Ventura	-118.571	34.324	2,850	31	26.22	7.39	4.47	1.39
U03 6543 40	Ortega Hills ALERT	Ventura	-119.217	34.600	5,270	7	26.29	7.81	4.72	1.47
U03 6559 01	Oxnard 32	Ventura	-119.175	34.221	5	94	14.75	4.05	2.45	0.76
U03 6572 00	Oxnard AP 168	Ventura	-119.208	34.201	34	31	14.38	4.24	2.56	0.80
U03 6572 00	Oxnard AP 168	Ventura	-119.204	34.201	34	37	14.11	4.36	2.83	0.82
U03 6573 00	Oxnard Vancos 257	Ventura	-119.192	34.172	27	8	13.80	3.09	1.87	0.58
U03 6862 01	Piedra Blanca GS 152	Ventura	-119.116	34.561	3,085	33	25.54	8.17	4.94	1.53
U03 6862 01	Piedra Blanca GS 152	Ventura	-119.116	34.561	3,085	35	23.68	8.48	5.12	1.59
U03 6910 00	Pine Men Inn	Ventura	-119.364	34.609	4,200	29	26.41	7.11	4.30	1.34
U03 6940 00	Piru 2 ESE	Ventura	-118.759	34.408	730	66	18.81	4.97	3.00	0.93
U03 6940 00	Piru Canyon 172	Ventura	-118.758	34.513	1,150	35	19.51	5.90	3.56	1.11
U03 6940 00	Piru Canyon 172	Ventura	-118.758	34.513	1,150	31	19.21	5.74	3.47	1.08
U03 6940 03	Piru FS 36	Ventura	-118.795	34.413	700	61	17.28	5.08	3.07	0.95
U03 6942 00	Point Mugu 223	Ventura	-119.107	34.118	9	41	11.77	3.18	1.92	0.60
U03 6942 00	Piru Telemetry	Ventura	-118.700	34.400	800	22	17.80	4.49	2.71	0.84
U03 7020 70	Point Mugu 223	Ventura	-119.107	34.118	9	41	11.77	3.18	1.92	0.60
U03 7080 00	Port Hueneme 17	Ventura	-119.208	34.144	20	96	13.79	3.99	2.41	0.75
U03 7249 51	Filmore Rancho 39	Ventura	-118.963	34.384	360	75	18.49	5.43	3.28	1.02
U03 7370 30	Reservoir, Las Posas ALERT	Ventura	-119.080	34.230	300	5	13.25	3.31	2.00	0.62
U03 7425 01	Ridge Route	Ventura	-118.783	34.678	2,500	43	18.50	5.84	3.53	1.10
U03 7957 05	Santa Paula 19	Ventura	-119.063	34.354	290	56	17.21	6.86	4.15	1.29
U03 7957 40	Santa Paula 243	Ventura	-119.106	34.343	325	14	20.03	6.34	3.83	1.19
U03 7958 00	Santa Paula Section 230	Ventura	-119.227	34.315	185	15	21.04	6.07	3.67	1.14
U03 7958 50	Santa Paula	Ventura	-119.077	34.345	260	96	19.61	5.39	3.26	1.01
U03 7958 50	Santa Paula 245	Ventura	-119.077	34.345	260	18	18.78	4.95	2.99	0.93
U03 7970 14	Santa Rosa Valley	Ventura	-118.933	34.236	275	58	13.02	3.77	2.28	0.71
U03 7973 00	Santa Susana AP 193	Ventura	-118.698	34.328	1,520	34	13.99	4.33	2.62	0.81
U03 7973 02	Santa Susana AP 193	Ventura	-118.707	34.271	985	31	13.84	3.98	2.40	0.75
U03 8008 03	Sanicoy Del Mar 6	Ventura	-119.203	34.278	300	83	15.93	4.58	2.77	0.86
U03 8008 04	Sanicoy FS 175	Ventura	-119.155	34.288	185	30	15.99	4.53	2.74	0.85
U03 8008 04	Sanicoy FS 175	Ventura	-119.155	34.288	185	37	15.99	4.88	2.95	0.92
U03 8258 05	Simi FS 154	Ventura	-118.708	34.294	1,758	40	14.08	4.15	2.51	0.78
U03 8258 30	Simi Hills 248	Ventura	-118.709	34.229	1,750	10	21.51	5.84	3.41	1.08
U03 8258 30	Simi Hills 248	Ventura	-118.709	34.245	1,750	16	20.50	5.56	3.38	1.04
U03 8261 00	Simi Hills Sanitation Plant	Ventura	-118.817	34.267	660	21	18.98	3.88	2.22	0.68
U03 8347 00	Simi Bend 190	Ventura	-119.007	34.283	460	31	14.85	3.91	2.38	0.73
U03 8347 00	Simi Bend 190	Ventura	-119.007	34.283	480	37	14.83	4.17	2.52	0.78
U03 8347 01	Simi Snyder 54	Ventura	-118.996	34.263	325	82	13.79	4.08	2.47	0.77
U03 8347 07	Simi Fuller 208	Ventura	-118.981	34.318	870	26	17.53	4.33	2.82	0.81
U03 8347 07	Simi Fuller 208	Ventura	-118.981	34.318	870	33	17.08	4.67	2.82	0.86
U03 8347 35	Simi Deboni 189	Ventura	-119.072	34.285	520	31	15.87	4.16	2.51	0.78
U03 8347 35	Simi 188	Ventura	-119.072	34.285	520	34	15.57	4.55	2.75	0.85

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Table C-28
Statewide Rainfall Data

Station Number	Station Name	County	Longitude (degrees)	Latitude (degrees)	Elevation (ft above MSL)	Period of Record (yr)	Mean Annual Precipitation (in)	Rainfall Quantities for 24-Hour Duration Storm		
								10-Year Return Period (in)	Mean (2-Year Return Period) (in)	1,0101-Year Return Period (in)
18410 20	South Mtn East ALERT	Ventura	-119.050	34.300	1,020	5	16.19	3.86	2.33	0.73
18411 50	South Mtn Z38	Ventura	-119.008	34.331	1,630	21	20.38	5.36	3.24	1.01
18411 50	South Mtn Z38	Ventura	-119.008	34.331	1,630	17	20.25	6.75	4.08	1.27
18638 50	Sulphur Mtn 163	Ventura	-119.169	34.411	2,570	31	24.27	7.23	4.37	1.36
18700 00	Susana Knolls FS 187	Ventura	-118.669	34.262	1,085	32	16.68	5.12	3.09	0.98
18727 20	Sycamore Canyon ALERT	Ventura	-119.100	34.550	4,350	7	20.16	5.45	3.29	1.02
18784 03	Tapo Canyon 196	Ventura	-118.718	34.326	1,525	22	20.99	5.12	3.09	0.96
18784 06	Tapo Water Co 62	Ventura	-118.721	34.298	1,080	43	14.44	4.35	2.63	0.82
18784 06	Temescal GS 160	Ventura	-118.721	34.298	1,080	32	20.05	6.20	3.75	1.16
18905 00	Thousand Oaks 128	Ventura	-118.849	34.179	810	35	15.76	5.03	3.04	0.95
18905 00	Thousand Oaks 128	Ventura	-118.849	34.179	810	37	14.94	4.82	2.91	0.91
19025 50	Tripp Canyon 242	Ventura	-118.763	34.368	2,500	12	25.49	5.77	3.49	1.08
19025 50	Tripp Canyon 242	Ventura	-118.763	34.368	2,500	15	24.00	5.18	3.13	0.97
19182 05	Upper Ojai 65	Ventura	-119.140	34.438	1,540	63	23.03	7.20	4.35	1.35
19285 80	Ventura 222	Ventura	-119.209	34.268	226	65	15.31	4.49	2.71	0.84
19285 85	Ventura 230	Ventura	-119.229	34.315	226	21	20.25	5.68	3.43	1.07
19610 00	Wheeler Springs 63	Ventura	-119.189	34.439	1,320	36	22.59	8.29	5.01	1.58
19612 20	Wheeler Canyon 225	Ventura	-119.189	34.439	1,320	27	22.20	6.90	4.17	1.30
19612 20	Wheeler Canyon 225	Ventura	-119.189	34.439	1,320	27	22.20	7.92	4.79	1.49
19618 00	Wheeler Springs	Ventura	-119.325	34.597	4,150	25	20.71	6.93	4.19	1.30
19618 07	Wheeler Gorge 204	Ventura	-119.383	35.367	1,900	8	25.37	8.93	5.40	1.68
14708 11	Lake Serwood	Ventura	-118.875	34.141	1,320	53	20.25	6.17	3.73	1.16
14708 11	Lake Serwood	Ventura	-118.875	34.141	1,320	53	18.75	6.19	3.74	1.16
10188 00	Anacapa Island	Ventura	-119.367	34.017	140	6	7.00	2.62	1.58	0.49
57870 00	San Nicolas Island	Ventura	-119.450	33.233	502	19	6.89	2.02	1.22	0.38

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APPENDIX D

GIS DATABASE METADATA DESCRIPTIONS

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APPENDIX D

GIS DATABASE METADATA DESCRIPTIONS

This appendix contains the descriptions of data sources used in the development of the GIS database. The data sources include:

- Land Use and Land Cover Data from the U. S. Geological Survey
- Hydrobasins Coverage from the California Department of Fish and Game
- Urbanized Area Designations in California from the U. S. Census Bureau

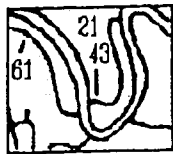
USGS Land Use and Land Cover Data

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Background

The Land Use and Land Cover (LULC) data files describe the vegetation, water, natural surface, and cultural features on the land surface. The United States Geological Survey (USGS) provides these data sets and associated maps as a part of its National Mapping Program. The LULC mapping program is designed so that standard topographic maps of a scale of 1:250,000 can be used for compilation and organization of the land use and land cover data. In some cases, such as Hawaii, 1:100,000 scale maps are also used.



Land Use and Land Cover Example (6.8 kb)

Compilation is based upon a classification scheme identified in the [Appendix](#).

Extent of Coverage

Land Use and Land Cover (LULC) data are available for most of the contiguous United States and Hawaii.

Acquisition

Processing Steps

Manual interpretation of aerial photographs acquired from NASA high-altitude missions and other sources were first used to compile the land use land cover maps. Secondary sources from earlier land use maps and field surveys were also incorporated into the LULC maps as needed. At a later time, the LULC maps were digitized to create a national digital LULC database. The evolution of this process resulted in the creation of the Geographic Information Retrieval Analysis System ([GIRAS](#)).

Initial source preparation involves the transfer of field survey information, photo classification detail and associated line work to a base map for digitization. This may be done through stereo compilation or monoscopic transfer techniques. Adjacent maps are also checked to ensure continuity. The maps are digitized and the appropriate classification codes are assigned for processing through GIRAS and

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checked for accuracy. All LULC data conform to the Universal Transverse Mercator (UTM) projection.

Data Characteristics

All LULC features are delineated by curved or straight lines that depict the actual boundary of an area, commonly referred to as a polygon. These polygons have a minimum size of 10 acres or 4 hectares. Each polygon represents a homogeneous element in the mapping scheme that is labeled with an integer or attribute code. The arcs and nodes of the polygon are further defined by an X,Y point or string of points that provide direction and location for the polygon. This relationship may be defined by the labeled area within the polygon or outside of it. Such positional data can be manipulated to meet a variety of user needs by reprojecting the data or re-scaling them.

Spatial Resolution

The minimum area representing the man made features of the LULC polygons are 10 acres (4 hectares) that have a minimum width of 660 feet (200 meters). This minimum width precludes the existence of very narrow or long tracts of data classification. Non-urban and non-man made features may be mapped with polygons with a minimal area of 40 acres (16 hectares) that have a minimum width of 1320 feet (400 meters).

Data Organization

The LULC data are available in two different formats. The first format was developed as a part of the Geographic Information Retrieval and Analysis System (GIRAS). This data structure evolved as the USGS developed the LULC program in the late 70's. The other format is the Composite Theme Grid (CTG) format. This format is grid cell oriented instead of polygonal. Both formats are further defined in the Appendix under GIRAS and CTG.

Data Availability

The LULC data are available (at no cost) through an Internet anonymous File Transfer Protocol (FTP) account at the EDC. The data are also available (at cost of reproduction) on magnetic tape from the U.S. Geological Survey's Earth Science Information Centers.

Procedures for Obtaining Data

FTP Instructions

To access the account:

- FTP to edcftp.cr.usgs.gov
- Enter "anonymous" at the Name prompt.
- Enter your complete e-mail address at the Password prompt.
- Change (cd) to the "pub/data/LULC/250K" subdirectory to access 1:250,000-scale LULC data, or cd to the "pub/data/LULC/100K" subdirectory to access 1:100,000-scale data.
- Set the file transfer mode to binary by typing the word "binary".
- Use the "get" and "mget" commands to download the 00README or data files.
- The 00README file located under "/pub/data/LULC/250K" and "/pub/data/LULC/100K" contains an explanation of the directory structure and instructions for uncompressing data files.

The FTP files are also available sorted by state:

- 1:250,000-scale sorted by state,
- 1:100,000-scale sorted by state,

The data on magnetic tape are ordered by 1:250,000-scale map name or by southeast latitude and longitude of the 1:250,000-scale map.

To place magnetic tape orders and to obtain additional information regarding technical details and price schedules, contact:

Customer Services, EROS Data Center
Earth Science Information Centers (ESICs)

Online requests for these data can be placed via the USGS Global Land Information System (GLIS) interactive query system. The GLIS system contains metadata and online samples of Earth science data. With GLIS, you may review metadata, determine product availability, and place online requests for products.

Products and Services

LULC data are distributed in the GIRAS or CTG formats through an anonymous FTP account or as ANSI-standard ASCII labeled or unlabeled magnetic tape. Published maps and other hard copy photo products are also available upon request.

Applications and Related Data Sets

The LULC data sets are intended to be compatible with a variety of digital data prepared by the USGS and other government agencies. For example, socioeconomic data compiled by the Bureau of Census can be compared to LULC data of the same area. LULC data can also be used in conjunction with DLG and DEM data to assist river basin planning, barrier island change analysis, environmental impact statement preparation and urban development studies.

References

Anderson, J. R., Hardy, E. E., Roach, J. T. and Witmer, R. E., 1976, "A Land Use and Land Cover Classification System for Use with Remote Sensor Data," U.S. Geological Survey, Professional Paper 964, p 28, Reston, VA.

DOI, USGS, 1991. 'Land Use and Land Cover and Associated Maps Factsheet,' U.S. Geological Survey, Reston, VA.

DOI, USGS, 1986. 'Land Use Land Cover Digital Data from 1:250,000 and 1:100,000-Scale Maps' Data User Guide 4, U.S. Geological Survey, Reston, VA.

Loelkes, G. L. Jr., Howard, G. E. Jr., Schwartz, E. L. Jr., Lampert, P. D., and Miller, S. W., 1983, "Land Use/Land Cover and Environmental Photointerpretation Keys," U.S. Geological Survey, Reston VA.

Mitchell, W. B., Guphill, S. C., Anderson, K. E., Fegeas, R. G., and Hallam, C. A., 1977, "GIRAS--A Geographic Information and Analysis System for Handling Land Use and Land Cover Data," U.S. Geological Survey, Professional Paper 1059, p 16, Reston, VA.

Appendix

- Classification Codes
- Record Descriptions

Classification Codes

Classification Codes--first and second level categories

- I Urban or Built-Up Land
 - 11 Residential
 - 12 Commercial Services

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- 13 Industrial
- 14 Transportation, Communications
- 15 Industrial and Commercial
- 16 Mixed Urban or Built-Up Land
- 17 Other Urban or Built-Up Land
- 2 Agricultural Land
 - 21 Cropland and Pasture
 - 22 Orchards, Groves, Vineyards, Nurseries
 - 23 Confined Feeding Operations
 - 24 Other Agricultural Land
- 3 Rangeland
 - 31 Herbaceous Rangeland
 - 32 Shrub and Brush Rangeland
 - 33 Mixed Rangeland
- 4 Forest Land
 - 41 Deciduous Forest Land
 - 42 Evergreen Forest Land
 - 43 Mixed Forest Land
- 5 Water
 - 51 Streams and Canals
 - 52 Lakes
 - 53 Reservoirs
 - 54 Bays and Estuaries
- 6 Wetland
 - 61 Forested Wetlands
 - 62 Nonforested Wetlands
- 7 Barren Land
 - 71 Dry Salt Flats
 - 72 Beaches
 - 73 Sandy Areas Other than Beaches
 - 74 Bare Exposed Rock
 - 75 Strip Mines, Quarries, and Gravel Pits
 - 76 Transitional Areas
 - 77 Mixed Barren Land
- 8 Tundra
 - 81 Shrub and Brush Tundra
 - 82 Herbaceous Tundra
 - 83 Bare Ground
 - 84 Wet Tundra
 - 85 Mixed Tundra
- 9 Perennial Snow and Ice
 - 91 Perennial Snowfields
 - 92 Glaciers

Record Descriptions

Geographic Information Retrieval and Analysis System (GIRAS)

- The GIRAS format involves a standard character fixed length record (usually ASCII-coded, 80 character card images). Each record may consist of 1 to 16 data-element fields. Each data-element field may be one of three different types: 1) 16 bit binary integer; 2) 32 bit binary integer or 3) a string of text characters. The GIRAS file structure is comprised of a map header, section header, arc records subfile, coordinate subfile, polygon records subfile, file of arcs by polygon (FAP) subfile, text subfile and an associated data subfile.

Composite Theme Grid (CTG)

- The CTG files are sequential and consist of fixed length records (except for header files) with one grid cell for each logical record. The grid cells are actually a regular point sample of the quad

where the center point of each cell is 200 meters apart from other center points in adjacent cells.
The cells are mapped to the UTM projection, oriented in the north-south, east-west directions and sequenced by row from north to south, within each row, by column east to west.

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LIBRARY : COUNTY, CA
LAYER NAME : HYDROBASINS
COVERAGE NAME : HBASA2

COVERAGE DESCRIPTION

The coverage hbas2 was prepared by the California Department of Fish and Game (DFG) as a task within an interagency agreement for geographic information system (GIS) support to the California State Water Resources Control Board (SWRCB) Non-Point Source (NPS) Unit. Hbas2 is a statewide version of the Teale GIS Technology Center (Teale) County Library data layer for hydrologic basins, called hbas. DFG performed various corrections to the original data, such as basin coding, sliver polygon removal, and digitizing of missing boundaries. The intended use of hbas2 is as an interim reference in digital form, accurately (but not precisely) corresponding to SWRCB-delineated basins, and as a cross-reference to Department of Water Resources (DWR) basin codes as presented in the Areal Designation map of February 10, 1981 and in "Hydrologic Data", Bulletin 130-85 (DWR, May 1988).

See the related database swrcbhc.dbf, which contains all Regional Water Quality Control Board (RWQCB) surface hydrologic basin names and codes as published by the SWRCB on the Hydrologic Basin Planning Area (HBPA) map series (1:500,000-scale; SWRCB, 1973, as revised). Metadata on this database is contained in the file swrcbhc.txt.

See also metadata (documentation) file calwater.txt for a description of the California Department of Forestry and Fire Protection (CDF) Planning Watersheds (CALWATER), which are further subdivisions of the SWRCB basin delineations. See also California Teale GIS Technology Center (Teale) ARC/INFO coverages and metadata (hbas.txt) and DFG refinements of federal hydrologic unit codes (USGS HUCs, 1978) (hucdfgl.txt).

CALWATER, USGS, and SWRCB surface hydrologic basin delineations are being reviewed by the California Interagency Hydrologic Basin Map Committee, Chaired by the California Department of Water Resources. Basin names, codes, and boundary delineation reviews are expected to be completed within fiscal year 95/96. This coverage and the 1:500,000-scale SWRCB maps and the Teale GIS library "hbas" coverages will be superceded by the CALWATER system, digitized on a 1:24,000-scale base (USGS 7.5'-series quadrangles), as modified by DWR and Teale.

VITAL STATISTICS

Datum:	NAD 27
Projection:	Albers
Units:	Meters
1st Std. Parallel:	34 00 00 (34.0 degrees N)
2nd Std. Parallel:	40 30 00 (40.5 degrees N)
Longitude of Origin:	-120 00 00 (120.0 degrees W)
Latitude of Origin:	00 00 00 (0.0 degrees)
False Easting (X shift):	0
False Northing (Y shift):	-4,000,000
Source:	Teale GIS Technology Center "hbas"

Hbas2.txt

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Source Media:	ARC/INFO coverages, tiled by county
Source Projection:	as above
Source Units:	as above
Source Scale:	1:500,000
Capture Method:	manual digitizing
Conversion Software:	ARC/INFO rev. 7.0.3
Data Structure:	Vector
ARC/INFO Coverage Type:	Polygon
ARC/INFO Precision:	Single
ARC/INFO Tolerances:	N/A
Number of Features:	1004
Layer Size:	appx. 3.3 megabytes (uncompressed export)
Data Updated:	under development (November 1995)

DATA DICTIONARY

Structure of table HBASA2.PAT

(standard ARC/INFO fields AREA, PERIMETER, HBASA2#, and HBASA2-ID are not described here)

COL	ITEM	NAME	WIDTH	TYPE	N.DEC	DESCRIPTION
-----	------	------	-------	------	-------	-------------

17	BASIN	5	I	-		integer form of SWRCB code (w/o decimal)
22	NHCODE	6	N	2		numeric representation of SWRCB HSA code
28	ADCODE	6	C	-		DWR Areal Designation code (Bulletin 130-85)
34	CHBPA	2	C	-		Hydrologic Basin Planning Area code
36	CHUNAME	50	C	-		SWRCB Hydrologic Unit (HU) name
86	CHANAME	50	C	-		SWRCB Hydrologic Area (HA) name
136	CHSANAME	50	C	-		SWRCB Hydrologic Sub-Area (HSA) name
186	CHUCODE	6	C	-		SWRCB HU code as character string
192	CHACODE	6	C	-		SWRCB HA code as character string
198	CHSACODE	6	C	-		SWRCB HSA code as character string
204	R	1	I	-		integer code for SWRCB Hydrologic Region
205	RU	3	I	-		integer combining Region and HU codes
208	RUA	4	I	-		combines Region, HU, and HA
212	RUAS	5	I	-		combines Region, HU, HA, and HSA

(same as BASIN, as present in original
Teale "hbasa" coverage)

SWRCB HYDROLOGIC BASIN CODES

SWRCB Hydrologic codes are 6-byte strings composed of numbers and a decimal point. The meanings associated with each byte position, and the decoding of a typical code are shown below. Allowable value ranges shown in parentheses.

The first byte (first position in the code string) indicates the Hydrologic Region (there are 9 statewide). Other byte positions are described below. A code ending in .00 indicates an entire major river basin, called a Hydrologic Unit (HU) (e.g. 105.00 - KLAMATH RIVER HYDROLOGIC UNIT). Large tributaries of major rivers are designated as Hydrologic Areas (HA), and their codes end in a single zero. In turn, HAs are subdivided into Hydrologic Sub-Areas (HSA), and a single digit replaces the last zero in the HA code. HSA codes ending in zero or double zeroes indicates that the HA or HU is not subdivided (see

Hbasa2.txt

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further explanations under CHSNAME below).

Byte(s)	Meaning	Value Range
1	Hydrologic Region (R)	(1 <= R <= 9)
2,3	HYDROLOGIC UNIT (HU)	(00<= HU <=59); (=81)•
4	always a decimal point	(.)
5	Hydrologic Area (HA)	(0 <= HA <= 9)
6	Hydrologic Sub-Area (HSA)	(0 <= HSA<= 9)

Example: Scott Bar HSA (105.41)

1 = North Coast
05 = KLAMATH RIVER (1-digit HUs include leading zero)
4 = Scott River Hydrologic Area
1 = Scott Bar

NOTE:

Regions 4 and 8 use county lines to "split" some of their HUs. * See 481.21, 845.15, etc and REMARKS(4). In Region 5, HU values 28, 29, 30, 46 thru 50 inclusive, are skipped.

Normally, HUs and HAs are subdivided into lower categories (HUs are divided into HAs, HAs are divided into HSAs). Some HUs and HAs are not subdivided. Examples:

Name	Code	Name	Code
LUCERNE LAKE HU	701.00	Blue Lake HA	109.10
JOHNSON HU	702.00	Ruth HA	109.40
BESSEMER HU	703.00	Suisun Bay HA	207.10

Byte position 1 contains the numeric code of the SWRCB Hydrologic Regions:

R	Hydrologic Region Name	CHBPA (Hydrologic Basin Planning Area)
1	= North Coast	NC
2	= San Francisco Bay	SF
3	= Central Coast	CC
4	= Los Angeles	LA
5	= Central Valley	SB = Sacramento
5	= Central Valley	SJ = San Joaquin
5	= Central Valley	TL = Tulare Lake
6	= Lahontan	NL = North Lahontan
6	= Lahontan	SL = South Lahontan
7	= Colorado River Basin	CR
8	= Santa Ana	SA
9	= San Diego	SD

Note: The Central Valley and Lahontan Hydrologic Regions are subdivided into Hydrologic Basin Planning Areas (HBPA), each with separate names and maps. All other HBPA names are the same as Hydrologic Region names. The numeric sequence of Hydrologic Unit (HU) codes is continuous across Central Valley HBPA's, except for skipped values 528, 529, 530, and 546 through 550 inclusive. HUs 535 and 545 have the same name (San Joaquin Valley Floor), as do HUs 551, 557, and 558 (South Valley Floor).

Hbasa2.txt

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DWR AREAL DESIGNATION CODES

Areal Designation codes used in coverage hbase2 were copied from a hardcopy DWR map dated February 10, 1981. The map codes were cross-checked with those contained in "Hydrologic Data", DWR Bulletin 130-85 (DWR, May 1988). Other versions of the DWR system may be in use (see DWR Bulletin 230 and other series). Discrepancies between the above two sources are listed in the table below.

DWR uses one letter to designate a "Hydrologic Basin" (HB) in byte position 1 of item ADCODE. These letter codes correspond to the SWRCB Hydrologic Regions (HR) and Hydrologic Basin Planning Areas (HBPA, see table below).

As with the SWRCB system, the DWR Areal Designation codes ending in .00 indicate entire Hydrologic Units (HU) (e.g. W14.00 - CHEMEHUEVIS HYDROLOGIC UNIT), and codes ending in a single zero indicate undivided Hydrologic Areas.

DWR Areal Designation

Byte(s)	Meaning	Value Range
1	Hydrologic Basin (HB)	(A <= HB <= Z) see below
2,3	Hydrologic Unit (HU)	(00 <= HU <= ??)
4	always a decimal point	(.)
5	Hydrologic Area (HA)	(0 <= HA <= 2)
6	Hydrologic Sub-Area (HSA)	(0 <= HSA <= 9)

DWR HB	SWRCB HR	HBPA	SWRCB HR / HBPA Name
F	1	NC	North Coast
E	2	SF	San Francisco Bay
T	3	CC	Central Coast
U	4	LA	Los Angeles
A	5	SB	Central Valley / Sacramento Basin
B	5	SJ	Central Valley / San Joaquin
C	5	TL	Central Valley / Tulare Lake
G	6	NL	Lahontan / North Lahontan
W	6	SL	Lahontan / South Lahontan
X	7	CR	Colorado River Basin
Y	8	SA	Santa Ana
Z	9	SD	San Diego

Examples:

F05.D1 = 105.41 = Scott Bar HSA
 A07.B1 = 520.21 = Colusa Trough HSA
 B06.B0 = 541.20 = Los Banos HA
 C01.T0 = 558.80 = North Kern HA
 Z07.D3 = 907.43 = Cuyamaca HSA

Byte positions 2 and 3 of the Areal Designation do not always match

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in numeric value to the corresponding SWRCB HU codes.

In byte position 5 of the DWR code, the letters A, B, C, etc sometimes correspond with SWRCB HA codes 1, 2, 3, but not always. The table below shows the discrepancies discovered to-date among three sources:

AREA DESIGNATION	HYDROLOGIC DATA	REGIONAL WATER QUALITY
MAP OF CALIFORNIA	Bulletin 130-85	CONTROL BOARD
(DWR, 2-10-81)	(DWR, May 1988)	(12 maps, SWRCB, 1986)
F02.A0	F02.A0	102.20
F02.B0	F02.B0	102.30
F11.B2	F11.B2	111.23
F11.B3	F11.B3	111.22
T09.X0	T09.X0	317.00
T14.E2	--	314.52
T14.E1	T14.E0	314.51
T15.B1	T15.C1	315.31
T15.B2	T15.C2	315.32
T15.B3	T15.C3	315.33
T15.B4	T15.C4	315.34
U05.F1	U05.F1	845.61
U05.F2	U05.F2	845.62
U05.F3	U05.F3	405.62
		845.63
		405.63
Z02.J1	Z02.I1	902.91
Z02.J2	Z02.I2	902.92
Z02.J3	Z02.I3	902.93
Z02.J4	Z02.I4	902.94
Z02.G4	--	902.74
Z06.D0		
Z07.A1		
Z06.E0		
A14.A2	A14.A2	522.11
A14.A1	A14.A1	522.12
A14.B2	A14.B2	522.24
A14.B3	A14.B3	522.22
A14.C2	A14.C2	522.33
A14.C3	A14.C3	522.32
B09.B1	B09.B1	534.22
B09.B2	B09.B2	534.21
B08.K0	B08.K0	545.10
B08.L0	B08.L0	545.20
B08.M0	B08.M0	545.30
C03.B1	C03.B1	552.35 **
C04.B2	C04.B2	553.45 **
W02.B0	W02.00	602.20
W02.A0	--	602.10

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W26.DC	W26.A4	626.40
W26.CO	W26.A3	626.30
W26.A0	W26.A1	626.10
W26.B0	W26.A2	626.20
W26.G0	W26.A7	626.70
W26.H0	W26.A8	626.80
W26.E0	W26.A5	626.50
W26.F0 ***	W26.A6	626.60
W28.J0	W28.I0	628.90
X13.A0	X13.A0	713.40
X13.B0	X13.B0	713.10
X13.D0	--	713.20
X08.A0	X08.A0	708.20
X08.B0	X08.B0	708.10
X17.D0	X17.00	717.40
X15.D0	X15.00	715.40

- * Mission Bay, expect resolution of boundary discrepancies by RWQCB.
- ** Reservoir created another polygon under this code.
- *** Polygon doesn't appear on original hbasa coverage from Teale.

Additional metadata on the Areal Designation system may be available from DWR.

SWRCB MAP REVISION HISTORY

CALWATER, USGS, and SWRCB surface hydrologic basin delineations are being reviewed by the California Interagency Hydrologic Basin Map Committee, Chaired by the California Department of Water Resources. Basin names, codes, and boundary delineation reviews are expected to be completed within fiscal year 95/96. The 1:500,000-scale SWRCB maps and their digital representations in the Teale GIS library will be superceded by the CALWATER system, which is digitized on a 1:24,000-scale base (USGS 7.5"-series quadrangles).

The 12 SWRCB HBPA maps whose legend indexes of hydrologic names were used to compile the coverage hbasa2 and the database swrcbhc.dbf also contain revision information. This information is reproduced here for reference.

This portion of the revision history is the same on each of the 12 maps: ("Standard Revisions" hereafter)

April 1973
 Revised: July 1976
 Revised: August 1986
 State Water Resources Control Board
 Surveillance and Monitoring Section
 T.E. Lavenda, P.E. (signature)

Beyond the above annotation, individual map sheets differ in their content of additional revisions and notes. Text sections beginning with "REMARKS(n):" are comments by metadata author by Region, not part of the map contents.

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North Coast Region (1)

The North Coast HBPA map available at this writing contained an additional revision entry and notes:

Revised: July 1991
California Regional Water Quality Control Board
North Coast Region
Surveillance, Monitoring, and Planning
Don F. Hoirup, Jr. (no signature)

NOTE:

1. The names and areas shown on this map are the same as used by the Department of Water Resources (DWR) in their Bulletin 94 Series.
2. The 1980 updated names and areas shown on this map are in accordance with an agreement with DWR and U.S. Geological Survey.
3. Boundaries have been modified in areas 5.81, 5.82, 5.83; 7.10, 7.20; 11.21, 11.22, 11.23; 11.31, 11.32; 11.41, 11.42. These modifications are adjustments in boundary locations from map revision August 1986.

REMARKS(1): The North Coast revisions do not result in code changes. The full Hydrologic Area (HA) and Hydrologic Sub-Area (HSA) codes involved are listed below by HYDROLOGIC UNIT for consistency with hbsa2.pat and with swrcbhc.dbf:

KLAMATH RIVER	REDWOOD CREEK	EEL RIVER
105.81	107.10	111.21
105.82	107.20	111.22
105.83		111.23
		111.31
	111.32	
	111.41	
	111.42	

As of July 20, 1995 the above boundary changes have not yet been included in the coverage hbsa2, nor in Teale's hbsa data layer, nor in CDF's CALWATER digital coverage of SWRCB boundaries. Expect additional boundary modifications in other SWRCB Hydrologic Regions. Note 2 may be referring to August 1986 revision, not 1980; or to a 1978 Interagency Agreement on basin names. Boundaries of DWR Bulletins 94-, 130-, and 230-series maps and those of the SWRCB do not always agree.

San Francisco Bay Hydrologic Region (2)

Standard Revisions; no additional Notes.

Central Coast Region (3)

Standard Revisions; no additional Notes.

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Los Angeles Region (4)

Standard Revisions; additional Notes:

NOTE:

1. The names and areas shown on this map are the same as used by the Department of Water Resources (DWR) in their Bulletin 130 Series except as noted below.
2. The numbering system used on this map is an adaptation of the numbering system used in the 130 Series.
3. The boundary between Region 8 and Region 4 follows the boundary between Los Angeles County and Orange or San Bernardino Counties, not the Hydrologic Boundary. The San Bernardino County line splits Hydrologic Unit 1 (Santa Ana River HU) so that Sub-Areas 481.21, 481.22, and 481.23 are legally in Region 4 but drain into Region 8. The Orange County line splits Hydrologic Unit 5 (Los Angeles-San Gabriel River HU) so that Sub-Areas 845.15, 845.61, 845.62, and 845.63 are legally in Region 8 but drain into Region 4. Therefore, a 5-digit number on the map indicates that a Regional Boundary divides a Hydrologic Unit, area, or subarea. In these cases the second digit is the number of the region from which the hydrologic area has been separated by the regional boundary. All other digits are described in the legend.
4. The 1986 updated names and boundaries shown on the map are in accordance with an agreement with DWR and US Geological Survey.

REMARKS(4): Note 1 refers to DWR Bulletin 130 Series, titled "Hydrologic Data". See also DWR Bulletin series 94- and 230-. Note 2 refers to SWRCB code adaptation of the DWR "Areal Designation" system of basin coding as used in Bulletins 94, 130, and 230 (see Areal Designation system description in DATA DICTIONARY above).

Central Valley Region (5), Sacramento Basin (SB) HBPA

Standard Revisions; additional Notes:

NOTE:

1. The 1986 revised numbers and boundaries shown on this map are in accordance with an interagency agreement between the State Board, the Department of Water Resources, and the U.S. Geological Survey.

Central Valley Region (5), San Joaquin (SJ) HBPA

Standard Revisions; additional Notes:

NOTE:

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1. (same as for SB HBPA above)

2. San Joaquin Valley Floor Hydrologic Unit includes Hydrologic Unit numbers 535 and 545.

REMARKS(5/SJ): HU codes 535 and 545 have the same name. HU codes 528, 529, and 530 are skipped in the Central Valley sequence.

Central Valley Region (5), Tulare Lake (TL) HBPA

Standard Revisions; additional Notes:

NOTE:

1. (same as for SB HBPA above)

2. South Valley Floor Hydrologic Unit includes Hydrologic Unit numbers 551, 557, and 558 due to the large number of Hydrologic Areas contained in this unit.

REMARKS(5/TL): HU codes 551, 557 and 558 have the same name. HU codes 546 through 550 inclusive are skipped in the Central Valley sequence.

Lahontan Region (6), North Lahontan (NL) HBPA

Standard Revisions; additional Notes:

NOTE:

1. The 1986 updated names and boundaries shown on this map are in accordance with an agreement with the Department of Water Resources and the U.S. Geological Survey.

Lahontan Region (6), South Lahontan (SL) HBPA

Standard Revisions; additional Notes:

NOTE:

1. The names and areas shown on this map are the same as used by the Department of Water Resources (DWR) in their Bulletin 130 Series except as explained below.

2. The numbering system used on this map is an adaptation of the numbering system used in the 130 Series.

3. The 1986 updated names and boundaries shown on the map are in accordance with an agreement with DWR and the U.S. Geological Survey.

REMARKS(6/SL): Note 1 refers to DWR Bulletin 130 Series, titled "Hydrologic Data". See also DWR Bulletins 94 and 230. Note 2 refers to SWRCB code adaptation of the DWR "Areal Designation" system of basin coding as used in Bulletin 230 and elsewhere. See REMARKS(4).

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Colorado River Basin Region (7)

Standard Revisions; additional Notes, REMARKS: same as SL HBPA above.

Santa Ana Region (8)

Standard Revisions; additional Notes, REMARKS: same as Region 4 above.

San Diego Region (9)

Standard Revisions; additional Notes, REMARKS: same as SL HBPA above.

DATA QUALITY ASSESSMENT

All SWRCB hydrologic names and codes were verified for consistency with 1:500,000-scale, SWRCB-published maps as of their August 1986 revision. Regional (RWQCB) and State (SWRCB) Boards have performed subsequent revisions. Expect updates of the database swrcbhc.dbf and this metadata file (see also REVISION HISTORY section above).

Several discrepancies among alternative basin coding systems with respect to the coverage hbasa2 are described in the DATA DICTIONARY above. Users are cautioned to also examine the boundaries of the following SWRCB basins for consistency with CALWATER delineations (other discrepancies may also exist as CALWATER is under development):

See field HCODE in the polygon attribute table HBASA2.PAT:

111.21
526.44
637.31
518.41
508.10
509.63
536.20
537.10
535.90
405.62
845.62
405.63
845.62
630.30
506.10
515.10
535.40

Users should contact their local Regional Water Quality Control Board offices to obtain the most current basin delineations and codes.

CONTACTS

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Revised: November 29, 1995

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LIBRARY : COUNTY
LAYER NAME : URBANIZEDAREAS
COVERAGE NAME : URBAREA

COVERAGE DESCRIPTION:

The 'URBANIZEDAREAS' layer contains arcs and polygons that correspond to the U.S Census Bureau's urbanized area designations in California. These files were derived from the 1992 TIGER files (TIGER V5) for Teale Data Center by Geographic Data Technology, Inc. in September 1994.

An excerpt from the TIGER technical documentation which discusses urbanized areas and urban/rural areas is included below.

VITAL STATISTICS:

Datum:	NAD 27
Projection:	Albers
Units:	Meters
1st Std. Parallel:	34 00 00 (34.0 degrees N)
2nd Std. Parallel:	40 30 00 (40.5 degrees N)
Longitude of Origin:	-120 00 00 (120.0 degrees W)
Latitude of Origin:	00 00 00 (0.0 degrees)
False Easting (X shift):	0
False Northing (Y shift):	-4,000,000
Source:	US Dep't of Commerce Census Bureau TIGER/Line Version 5
Source Media:	Magnetic Tape
Source Projection:	Geographic
Source Units:	Decimal degrees
Source Scale:	Unknown
Capture Method:	Unknown
Conversion Software:	ARC/INFO rev. unknown
Data Structure:	Vector
ARC/INFO Coverage Type:	Polygon
ARC/INFO Precision:	Double
ARC/INFO Tolerances:	106.388 fuzzy / 0.0 dangle
Number of Features:	393 polygons
Layer Size:	8.819 megabytes
Data Updated:	September 1994 (creation date)

DATA DICTIONARY:

DATAFILE: URBAREA.PAT
RECORD LENGTH: 94

COLUMN	ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC
1	AREA	8	18	F	5
9	PERIMETER	8	18	F	5
17	URBAREA#	4	5	B	-
21	URBAREA-ID	4	5	B	-
25	STATE	2	2	C	-

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27	COUNTY	3	3	C	-
30	UA	5	5	C	-
35	NAME	56	56	C	-
91	CENSUS	3	3	C	-
94	FLAG	1	1	C	-
** REDEFINED ITEMS **					
30	FLAGN	5	5	I	-

AREA : The area of the polygon in square coverage units.

PERIMETER : The length of the polygon perimeter of the polygon in coverage units.

URBAREA# : The software-assigned unique integer identification number.

URBAREA-ID : A user-assigned identification number.

STATE: 06 (California)

COUNTY: Federal FIPS county code (odd numbers from 001 - 115)

UA: Urbanized area code

NAME: Name of urbanized area

CENSUS: unknown - all records contain blanks for this item.

FLAG: (0 or 1) 0 = non-urbanized area; 1 = urbanized area

FLAGN: Numeric version of item FLAG.

TIGER TECHNICAL DOCUMENTATION EXCERPT:

Urbanized Areas (UA's)

Identification

A UA comprises a place and the adjacent densely-settled surrounding territory that together have a minimum population of 50,000 people. The densely-settled surrounding territory generally consists of an area with continuous residential development and an overall population density of at least 1,000 people per square mile. The TIGER/Line(TM) files identify UA's with a 4-character numeric code field.

All polygons that have a UA code (other than blank) will have a U/R flag equal "U." See the discussion on U/R flags.

Record Locations: UA Codes

RT	Field Name	Description
A	UA	1990 census UA code (polygon)

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Codes: UA's

The UA code is a 4-character numeric census code. The names associated with the code appear in the TIGER/GICS product. Appendix G lists the UA names and codes.

Urban/Rural Designation (U/R)

Identification

The TIGER/Line(TM) files include a 1-character U/R flag:

"R" Rural, not urban
"U" Urban, in a UA or an urban place

The Census Bureau defines "urban" for the 1990 census as comprising all territory and population in UA's and in places of 2,500 or more people located outside of the UA's.

The Census Bureau also distinguishes the urban and rural population, within incorporated places whose boundaries contain large, sparsely populated--or even unpopulated--area. These "extended cities" have either 25 percent of their land area or at least 25 square miles classified as "sparsely-settled." The sparsely-settled area must consist of at least one group of one or more contiguous census blocks. Each group must be at least 5 square miles in area and have an overall population density of less than 100 people per square mile. Polygons in the group of sparsely-settled blocks will have a flag equal to "R;" the densely-populated blocks will have a flag equal to "U." Incorporated places (based on 1990 census boundaries) with both urban and rural flagged polygons are extended cities. For the 1990 census, 280 incorporated places were defined as extended cities. Extended cities exist both inside and outside of UA's.

The Census Bureau assigns the U/R flag to tabulation blocks, so all GT-polygons within a block have the same U/R flag. All blocks that have a UA code (other than blank) will have an U/R flag equal "U." Blocks in places that qualify as urban places, but not in a UA, do not have a UA code, but do have a U/R flag equal to "U." Rural areas are identified by a "R" flag and will not have a UA code.

Record Locations: U/R Flags

RT	Field Name	Description
A	URBFLAG	1990 census U/R flag (polygon)

Codes: U/R Flags

Urban:	"U"
Rural:	"R"

***** END OF TIGER TECHNICAL DOCUMENTATION EXCERPT *****

Urbarea.txt

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