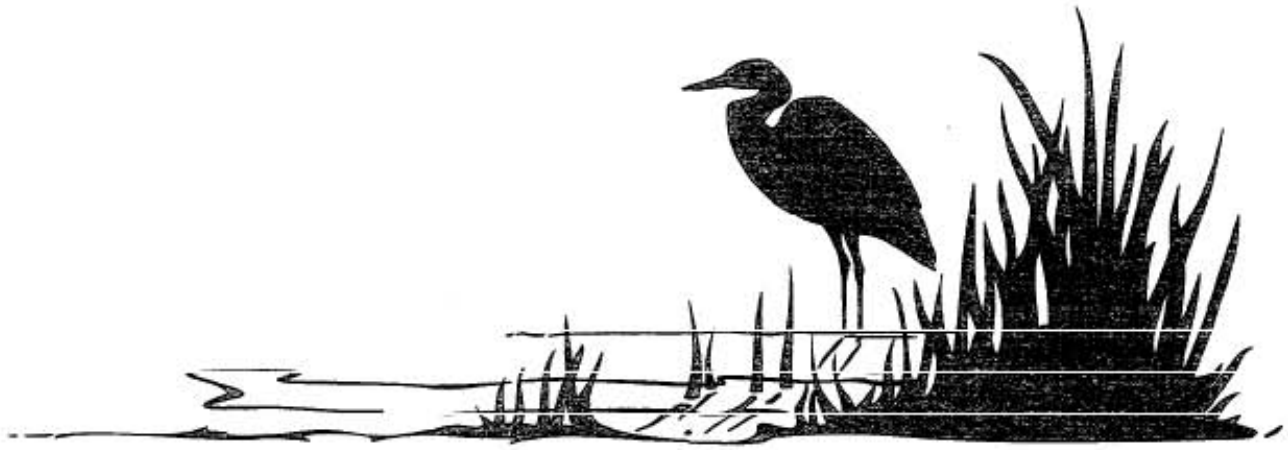
Southwest Florida Water Management District

PART D
PROJECT DESIGN AIDS

ENVIRONMENTAL RESOURCE PERMITTING
INFORMATION MANUAL



MANAGEMENT AND STORAGE OF SURFACE WATERS

JULY 1996

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PART D - PROJECT DESIGN AIDS

1. INTRODUCTION

The Southwest Florida Water Management District has developed "Part D, Project Design Aids" to provide consistency in the parameters used by District Staff in their review for environmental resource permitting of surface water management systems.

The design aids were selected solely on their ability to support the intent of the requirements in the environmental resource permitting rules for management and storage of surface waters and to identify some common and useful techniques for evaluating regulatory aspects of surface water management systems. The use of these design aids for purposes other than those stated in this manual may not be within the realm of their intended use and could result in a sub-standard design in some circumstances. It is therefore, incumbent upon the individual designer to exercise sound engineering judgement in the utilization of the information presented to ensure the overall integrity of the system and regulatory compliance.

2. Rainfall

A. Rainfall Duration

The Southwest Florida Water Management District is utilizing a 24-hour storm event as the standard storm duration for design and analysis purposes for water quantity permitting evaluation of surface water management systems.

B. Determination of Rainfall Depths

The Southwest Florida Water Management District has developed rainfall maps for a 24-hour storm duration for the 2-year, 2.33-year, 5-year, 10-year, 25-year, 50-year, and 100-year return periods, as shown in **FIGURES D-1** through **D-7**. These rainfall maps will be utilized to determine a depth of rainfall in inches for a specific return period. This depth will be used for design and analysis purposes for evaluation of surface water and stormwater management systems.

C. Procedure for Determination of the Appropriate Rainfall Amount

1. The approximate location of the project site is to be located on the appropriate rainfall frequency map.

2. For projects located on an isohyet use the rainfall amount for that line.

3. For projects east of the most eastern isohyet use that eastern most isohyet as the rainfall amount.

4. For projects between two isohyet the rainfall amount is a straight line interpolation between the two isohyet. The next higher isohyet line may be used rather than interpolating.

5. For projects west of the most western isohyet use that western most isohyet as the rainfall amount.

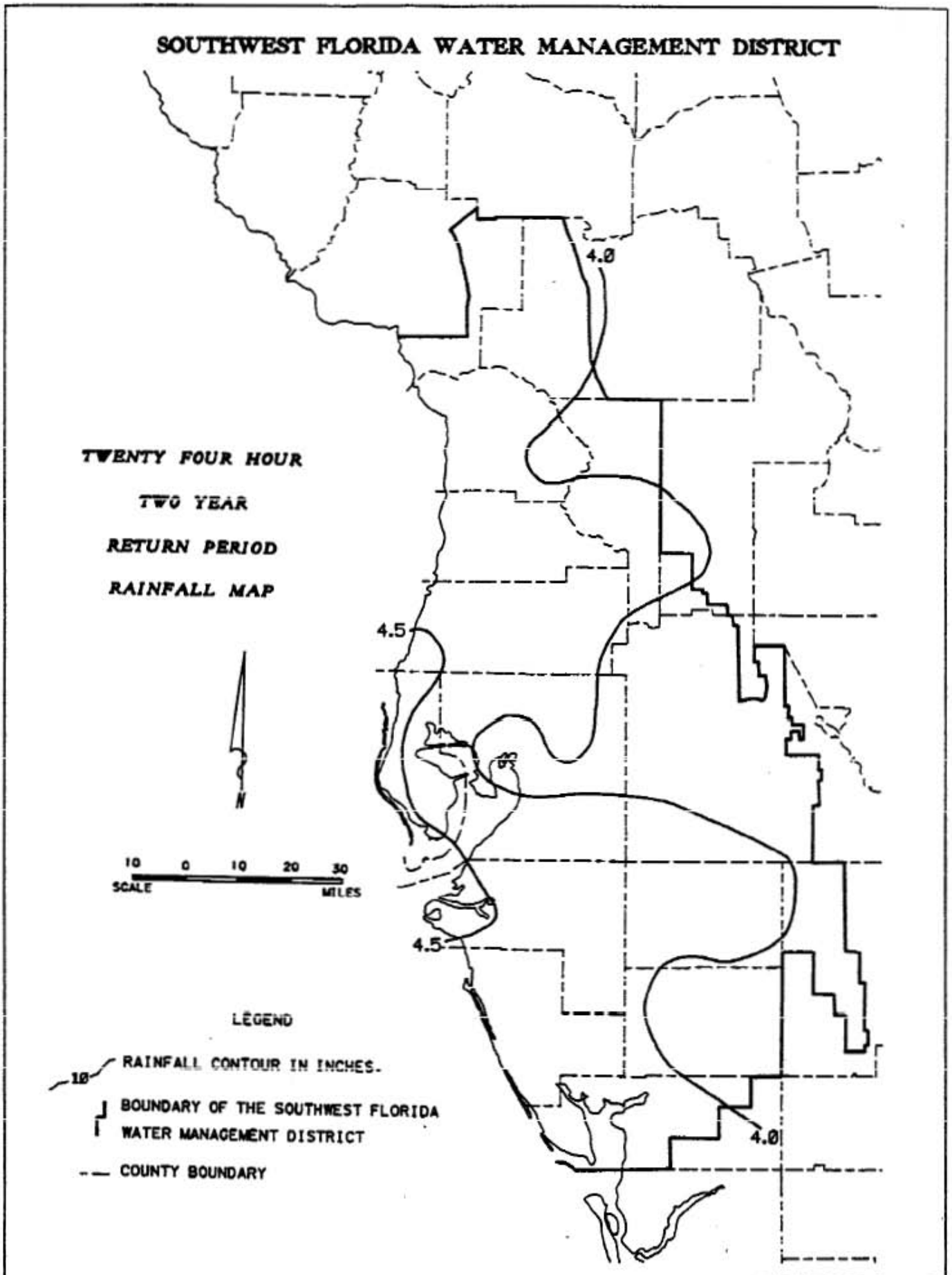
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
TWENTY FOUR HOUR
TWO YEAR
RETURN PERIOD
RAINFALL MAP
4.0
4.5
4.5
4.0
N
10 0 10 20 30
SCALE
MILES
LEGEND
10 RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-1

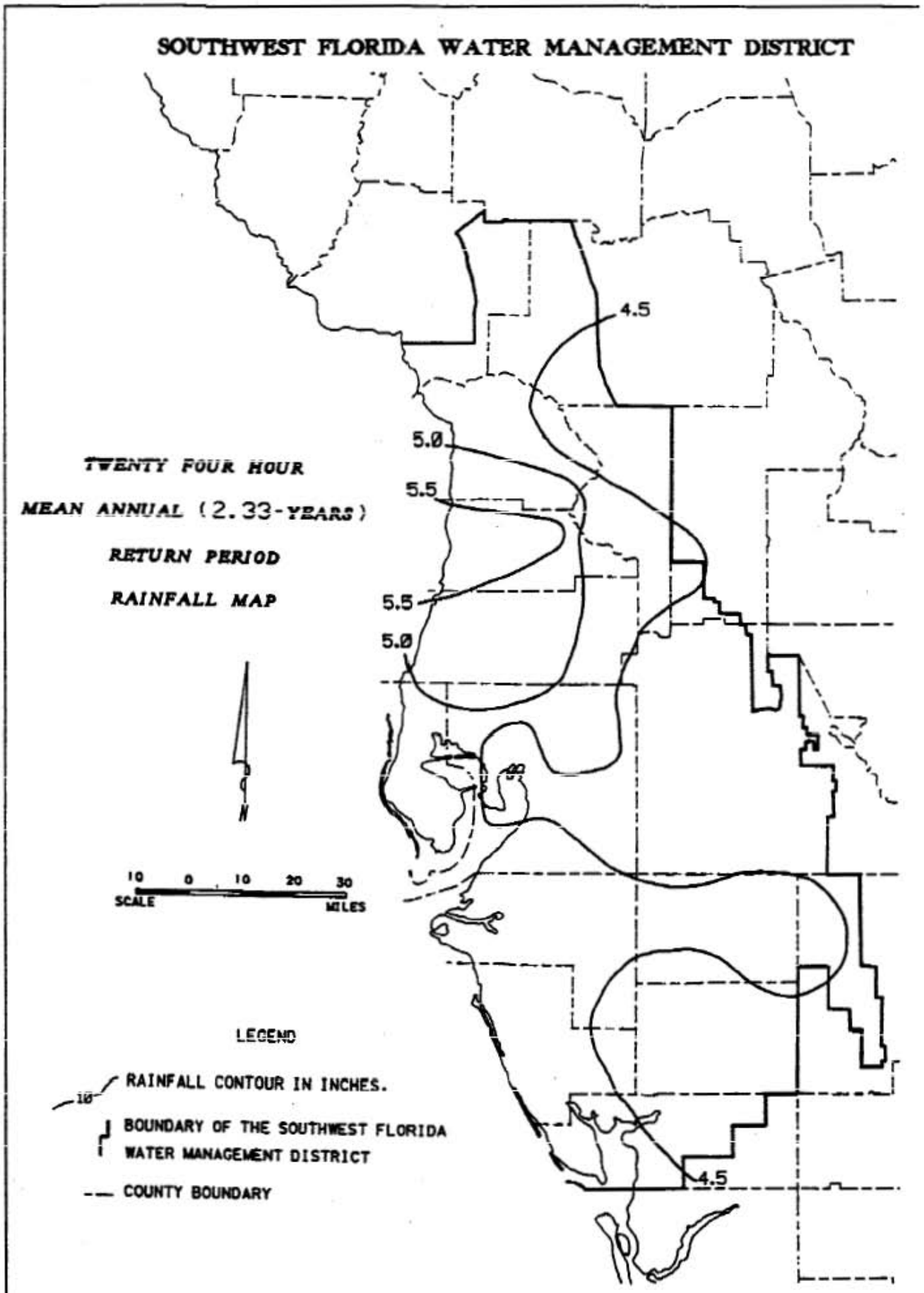
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
TWENTY FOUR HOUR
MEAN ANNUAL (2.33-YEARS)
RETURN PERIOD
RAINFALL MAP
4.5
5.0
5.5
5.5
5.0
4.5
N
10 0 10 20 30
SCALE
MILES
LEGEND
10
RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-2

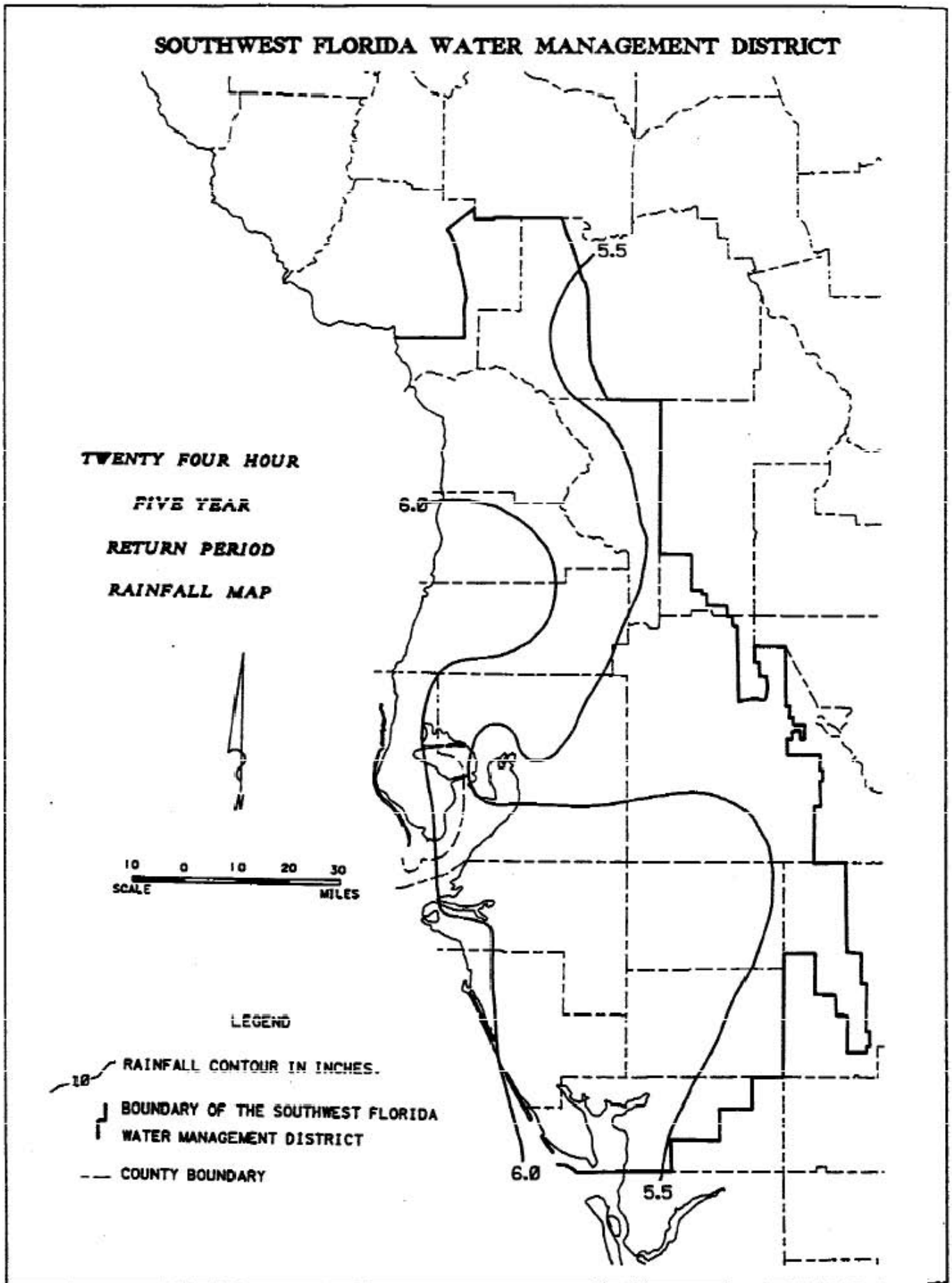
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
TWENTY FOUR HOUR
FIVE YEAR
RETURN PERIOD
RAINFALL MAP
5.5
6.0
6.0
5.5
N
10 0 10 20 30
SCALE
MILES
LEGEND
10 RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-3

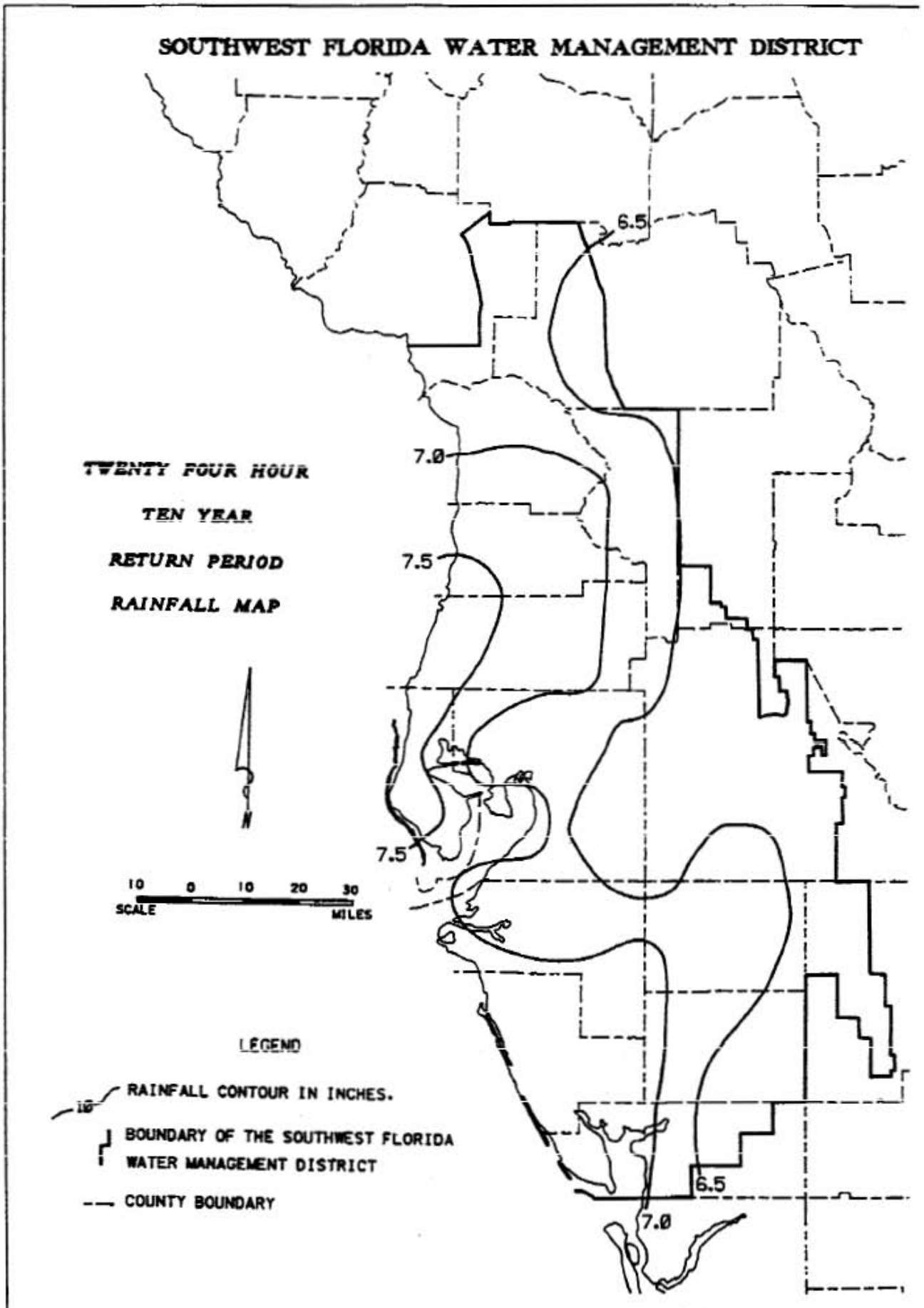
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
TWENTY FOUR HOUR
TEN YEAR
RETURN PERIOD
RAINFALL MAP
6.5
7.0
7.5
7.5
7.0
6.5
N
10 0 10 20 30
SCALE
MILES
LEGEND
RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-4

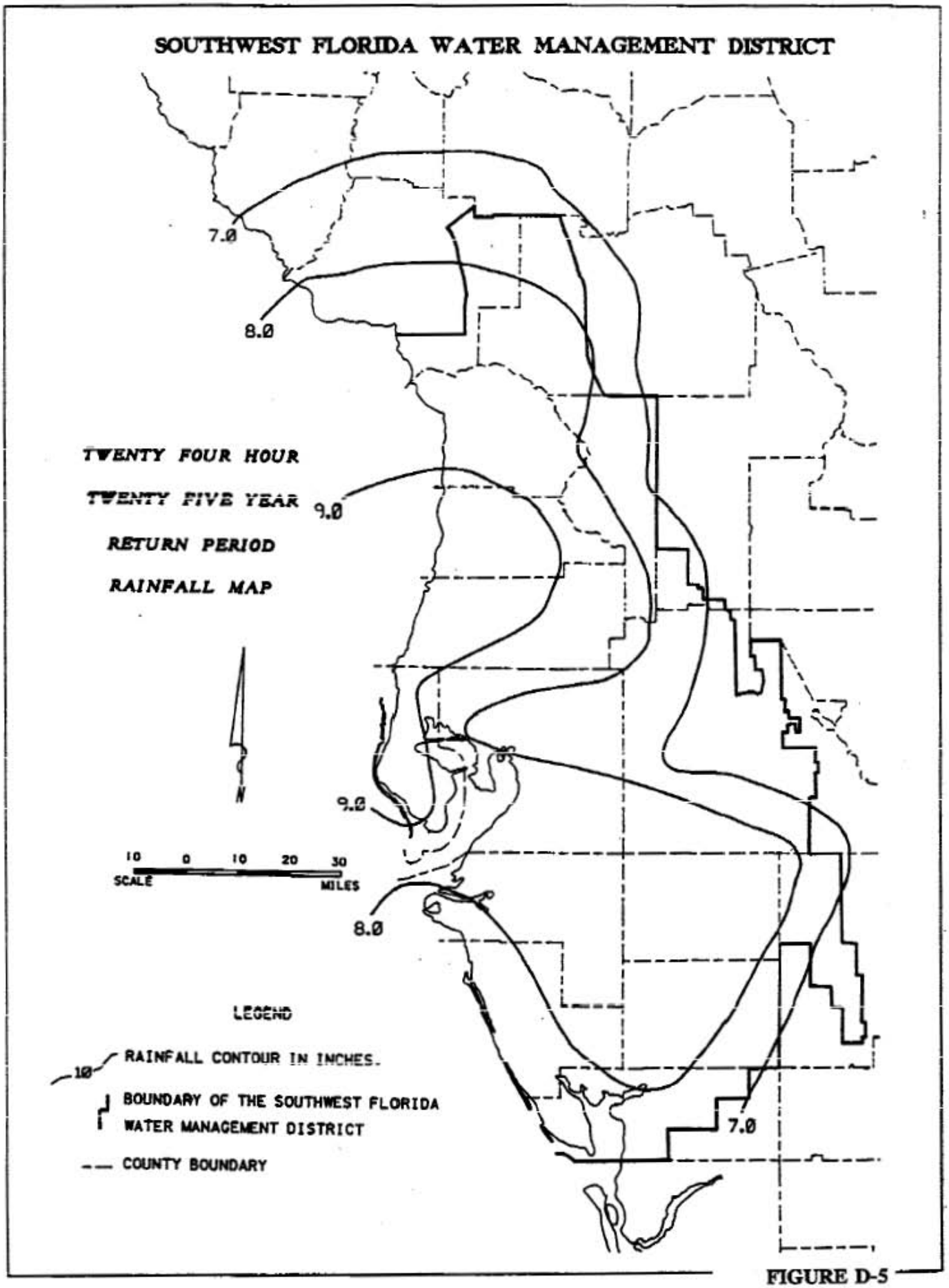
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
7.0
8.0
9.0
9.0
8.0
7.0
TWENTY FOUR HOUR
TWENTY FIVE YEAR
RETURN PERIOD
RAINFALL MAP
N
10 0 10 20 30
SCALE
MILES
LEGEND
10
RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-5

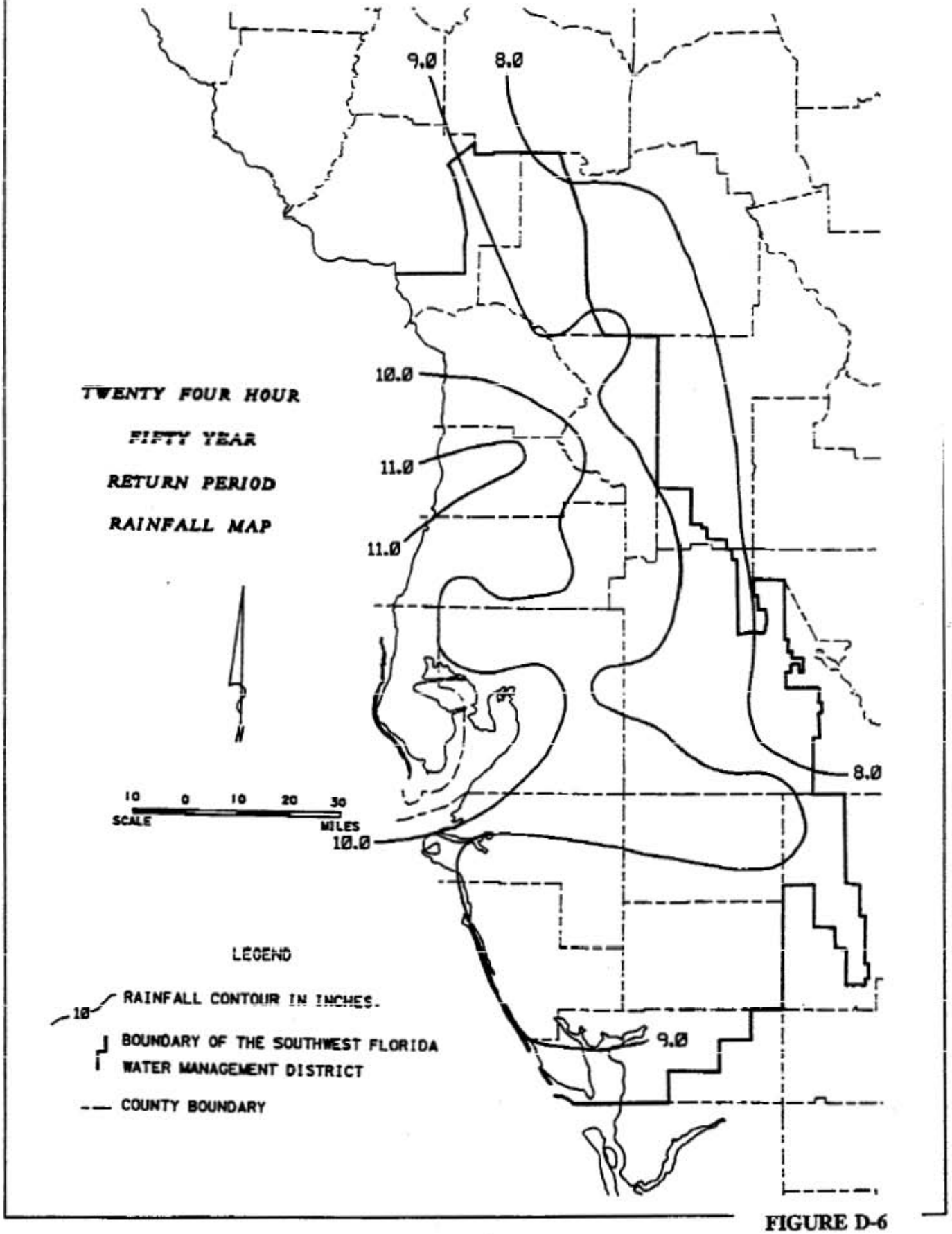
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
9.0
8.0
10.0
11.0
11.0
8.0
10.0
9.0
TWENTY FOUR HOUR
FIFTY YEAR
RETURN PERIOD
RAINFALL MAP
N
10 0 10 20 30
SCALE
MILES
LEGEND
10 RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-6

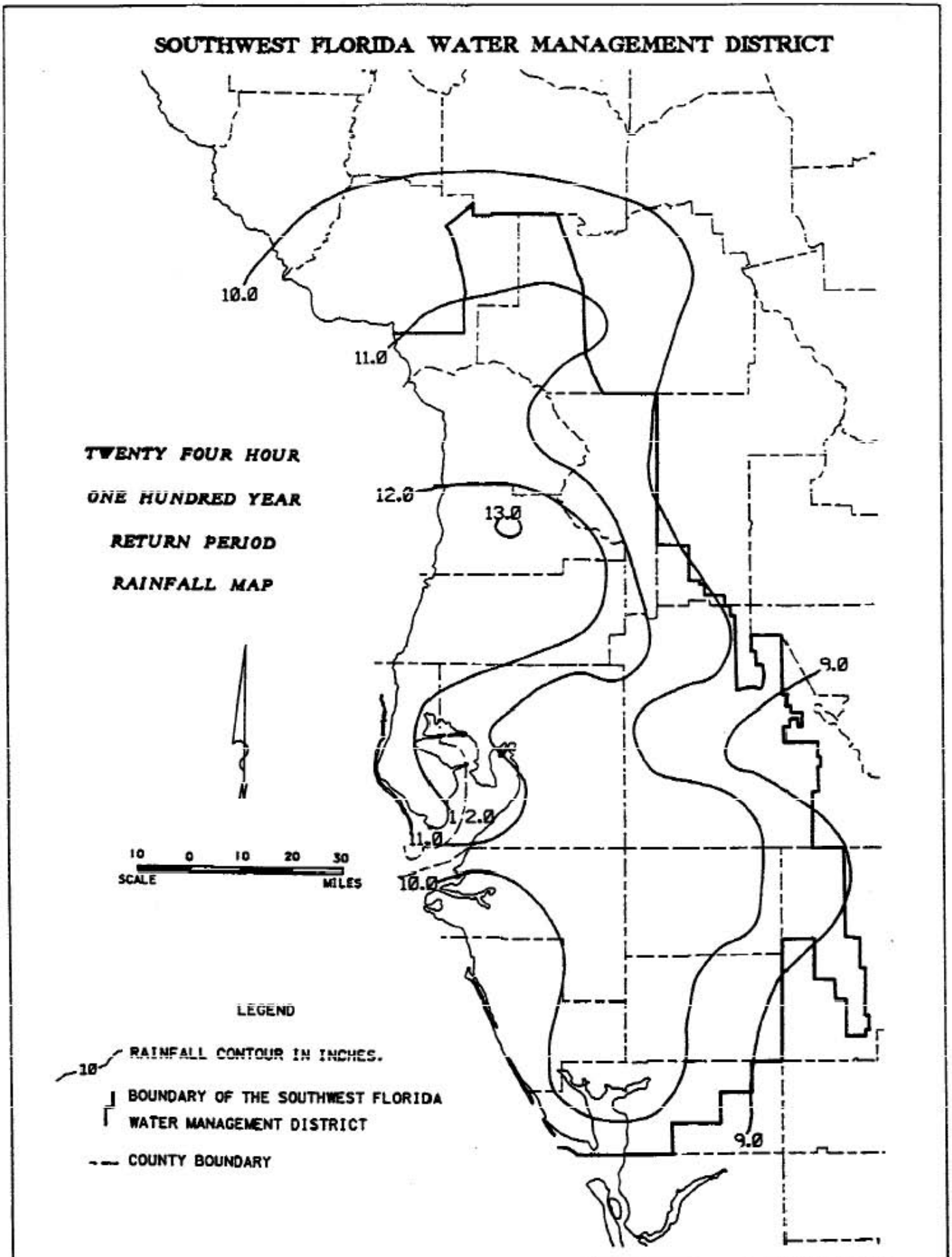
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
TWENTY FOUR HOUR
ONE HUNDRED YEAR
RETURN PERIOD
RAINFALL MAP
10.0
11.0
12.0
13.0
9.0
12.0
11.0
10.0
9.0
N
10 0 10 20 30
SCALE
MILES
LEGEND
10
RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-7

D. Rainfall Distribution

The USDA-Natural Resources Conservation Service [formerly Soil Conservation Service (SCS)] Type II Florida Modified Rainfall distribution shown in **TABLE D-1** is recommended for use in the analysis of the water quantity portion of the rule. Other distributions which produce similar results may also be used if appropriate.

TABLE D-1

RAINFALL RATIOS (ACCUMULATED 24-HOUR TOTAL)

TIME (HR.)	SCS TYPE II FL. MODIFIED
0.0	.000
0.5	.006
1.0	.012
1.5	.019
2.0	.025
2.5	.032
3.0	.039
3.5	.047
4.0	.054
4.5	.062
5.0	.071
5.5	.080
6.0	.089
6.5	.099
7.0	.110
7.5	.122
8.0	.134
8.5	.148
9.0	.164
9.5	.181
10.0	.201
10.5	.226
11.0	.258
11.5	.308
12.0	.607
12.5	.719
13.0	.757
13.5	.785
14.0	.807
14.5	.826
15.0	.842
15.5	.857
16.0	.870
16.5	.882
17.0	.893
17.5	.904
18.0	.913
18.5	.923
19.0	.931
19.5	.940
20.0	.948
20.5	.955
21.0	.962
21.5	.969
22.0	.976
22.5	.983
23.0	.989
23.5	.995
24.0	1.000