PRELIMINARY DRAINAGE REPORT

FOR

TPM 20908
ENVIRONMENTAL LOG NO. 05-02-003
APN 123 - 300 - 06

PREPARED FOR

The Pauline M. Catherine Trust
Jeanette Catherine Nave & Glenn J. Stuart [Co - Trustees]
1471 Solar Drive
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PREPARED BY

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June 12, 2005

Robert Sukup
6/12/05

The proposed 4 Lot Subdivision is located at the southeast corner of Via Monserate and Palomar Drive in Fallbrook. There are 10.3 acres of land. There is an existing house and barn on the lower northeastern portion of the property and a house on the western central portion. Access to the existing and proposed lots would be from Via Monserate and Palomar Drive. Both roads are constructed. Very minor widenings may be necessary in isolated areas if minimum widths do not presently exist. The drainage swale at the southeast corner of Via Monserate and Palomar Drive may have to be "cleaned up" to make sure the drainage works properly.

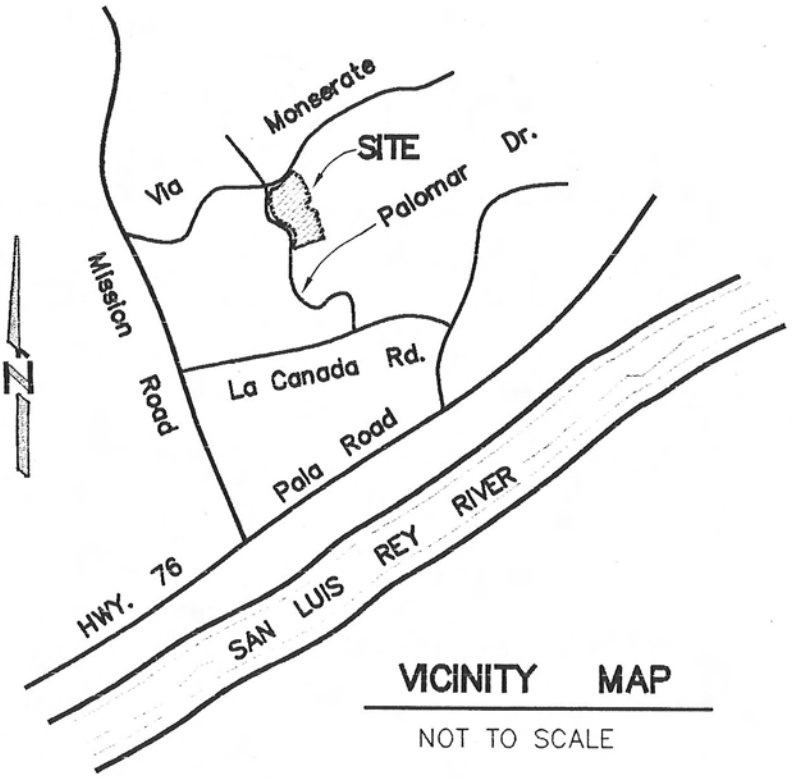
No offsite waters enter the property. The property is basically at the top of a ridge. A small portion of the ridge, designated as Area "A" for the hydrology study, flows to the west to Palomar Drive. The area is about .68 acres and has an existing house on it. I assumed half the water from the existing house would flow to Area "A" and the other half to area "B". Proposed Parcel 1 would have the same distribution of water flow [half to Area "A" and half to Area "B"].

Area "B" for the drainage study is about 9.62 acres and basically sheet flows easterly to a large established natural drainage course. Area "B" has an existing house and barn on the lower portion of the property. Flows from "half" the existing house on the western central portion, half of proposed Parcel 1, and all of proposed Parcel 3 will flow through Area "B". [see hydrology map for clarification].

Per the attached Hydrology Calculations, the projected increase in flow for the proposed development for the 100 year storm is minimal [.63 cfs]. This increase is minimal due to the fact two of the proposed 4 lots already have the houses on them and the proposed improvements create a very small increase in impervious surface when compared to the size of the property. The steepness of a large portion of the property prohibits development. Therefore this area will remain natural and does not lend itself to a higher "C" value.

The two proposed houses are designed to have their easterly flows drain to rip rap swales that follow the contours. It is extremely important the proposed drainage does follow the contours at their exiting points. This greatly reduces erosion potential and allows for soaking into the ground. The contoured rip rap areas are proposed in locations that would not affect the leach field areas.

A reduced copy of the tentative map is enclosed with the hydrology areas shown as well as the large 200 scale County Topo showing the relationship of the proposed development with the surrounding area.



VICINITY MAP

NOT TO SCALE

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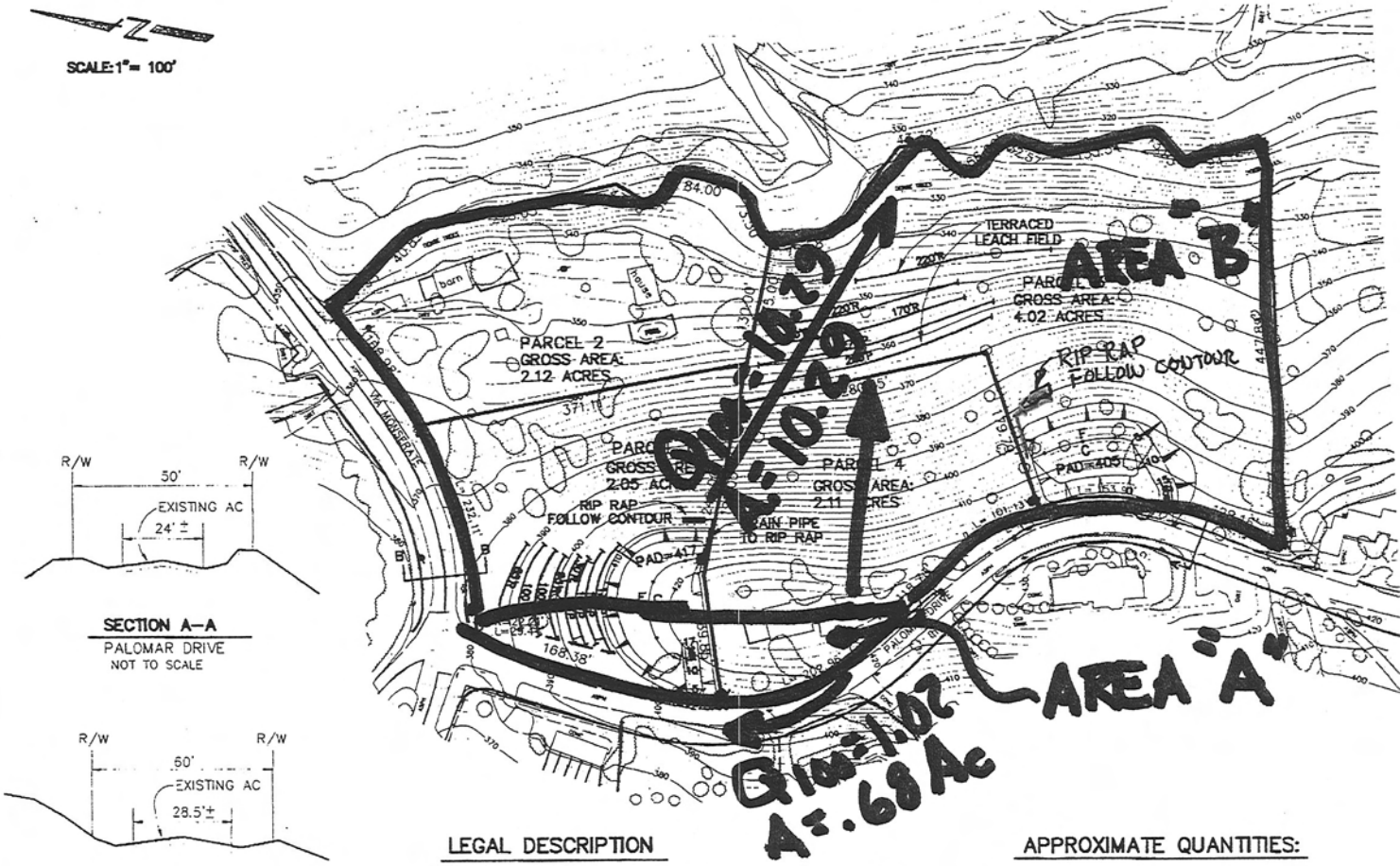
SCALE: 1" = 100'



SECTION A–A
PALOMAR DRIVE
NOT TO SCALE

SECTION B–B
VIA MONSERATE
NOT TO SCALE

LEGAL DESCRIPTION

BEING LOT 50 OF SAN LUIS REY HEIGHTS TRACT, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFRONIA, ACCORDING TO MAP THEREOF NO. 2323, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY 4–26–1946.

HEALTH DEPARTMENT CERTIFICATE

APPROXIMATE QUANTITIES:

PARCEL 1

CUT: 1225 CUBIC YARDS
FILL: 1225 CUBIC YARDS

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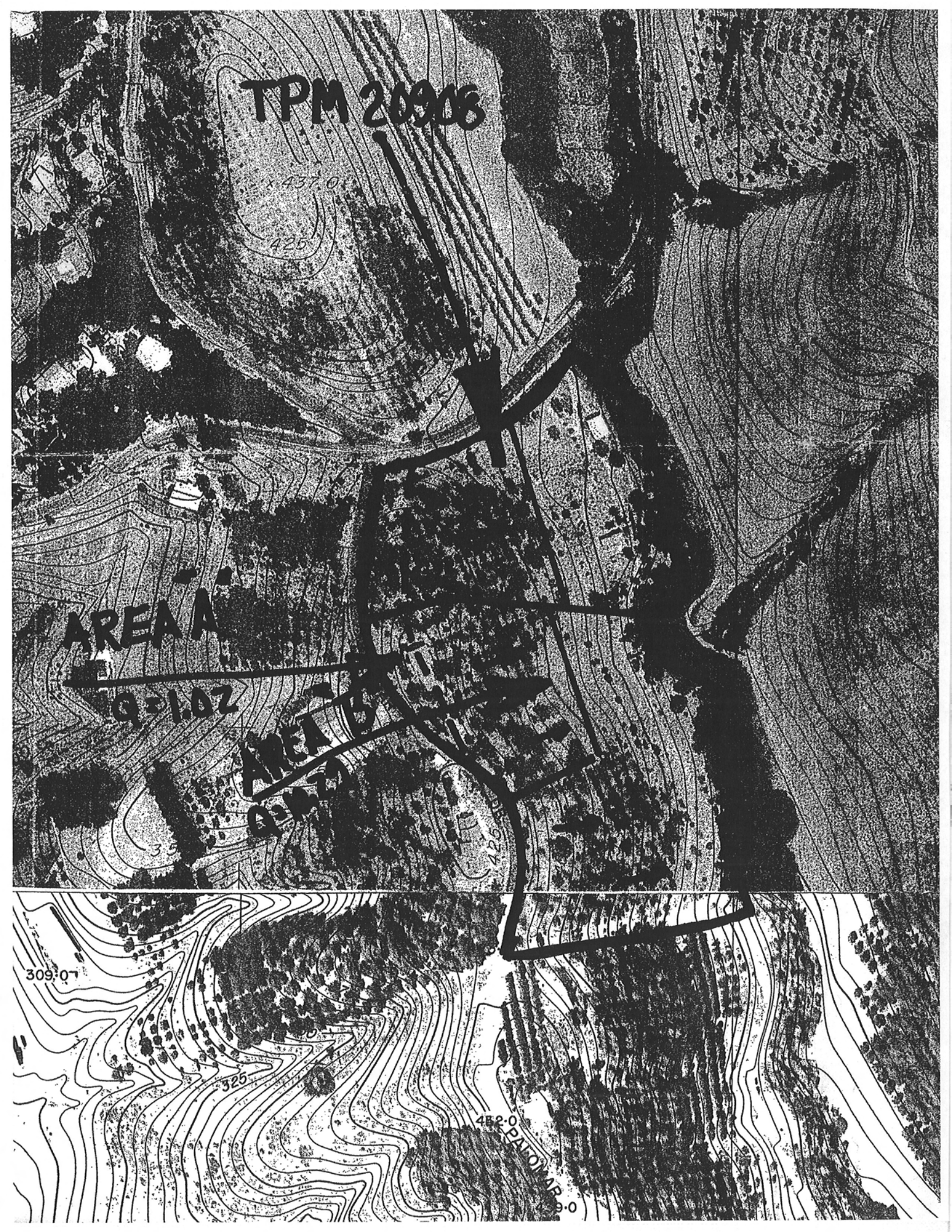
TPM 20903
437.0
425
AREA A
Q=1.02
AREA B
Q=.20
309.0
325
452.0
PALOMAR

HYDROLOGY CALCULATIONS

AREA "A"

AREA = .68 ACRES
SOIL GROUP = A (SEE SOIL MAP)
I = 4.4 (SEE TABLE 3-2 & FIGURES 3-4 & 3-1)
C VALUE : PRE DEVELOPMENT : % IMPERVIOUS = 11.8% = .28 (TABLE 3-1)
POST DEVELOPMENT % IMPERVIOUS = 20.0% = .34 (TABLE 3-1)

$Q_{(PRE\ DEV)} = C\,I\,A = .28 \times 4.4 \times .68 = .84$ cfs
$Q_{POST\ DEV} = C\,I\,A = .34 \times 4.4 \times .68 = 1.02$ cfs

AREA "B"

AREA = 9.62 ACRES
SOIL GROUP = A (SEE SOIL MAP) ; I = 4.4
C VALUE : PRE DEVELOPMENT : % IMPERVIOUS = 02% = .22 (TABLE 3.1)
POST DEVELOPMENT : % IMPERVIOUS = 04% = .23 (TABLE 3.1)
I = 4.65 (SEE TABLE 3-2 & FIGURES 3-4 & 3-1)

$Q_{(PRE\ DEV.)} = C\,I\,A = .22 \times 4.65 \times 9.62 = 9.84$ cfs
$Q_{(POST\ DEV)} = C\,I\,A = .23 \times 4.65 \times 9.62 = 10.29$ cfs

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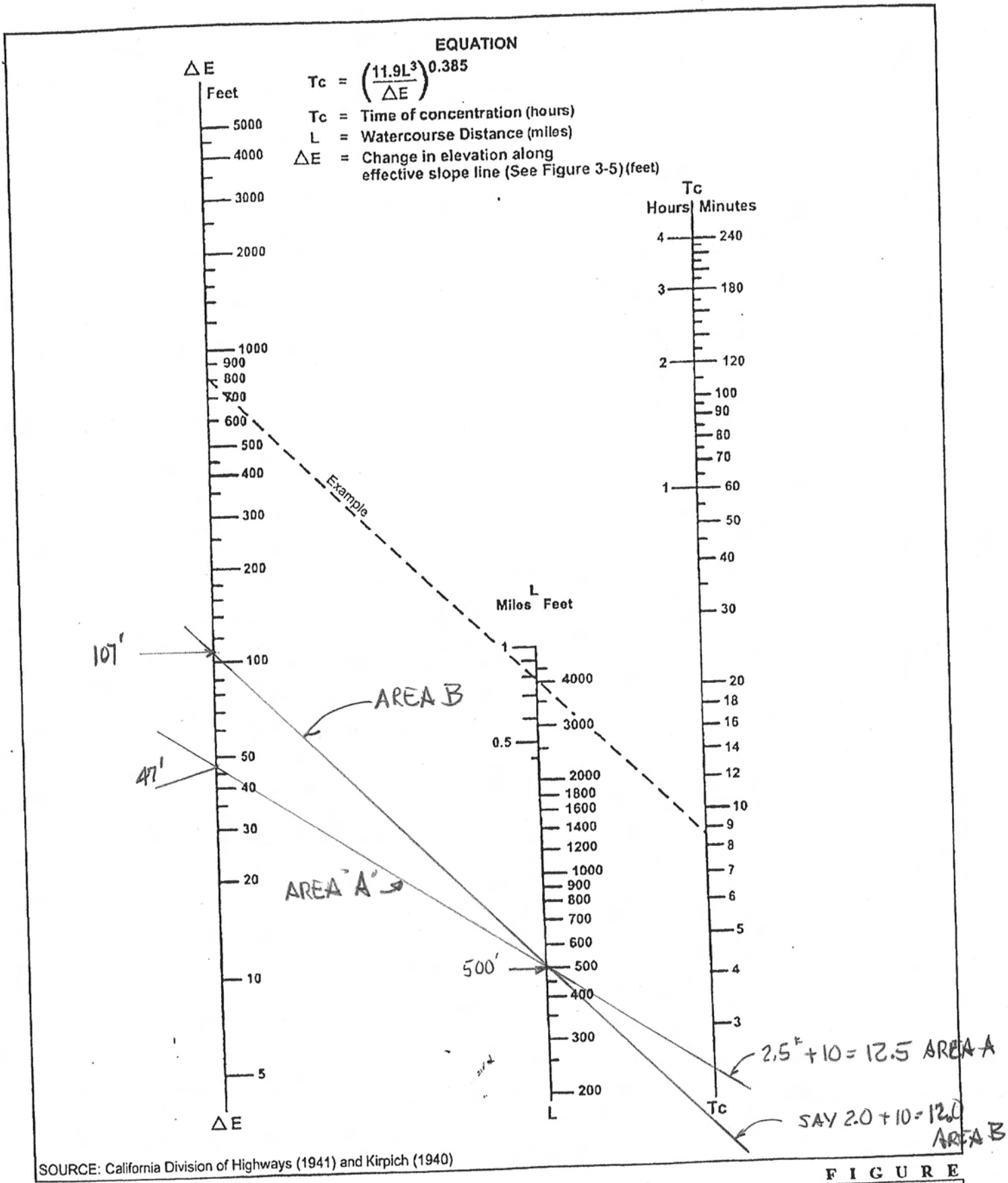

SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE 3-4

Nomograph for Determination of Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds

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SOIL MAP #12 - BONSAL
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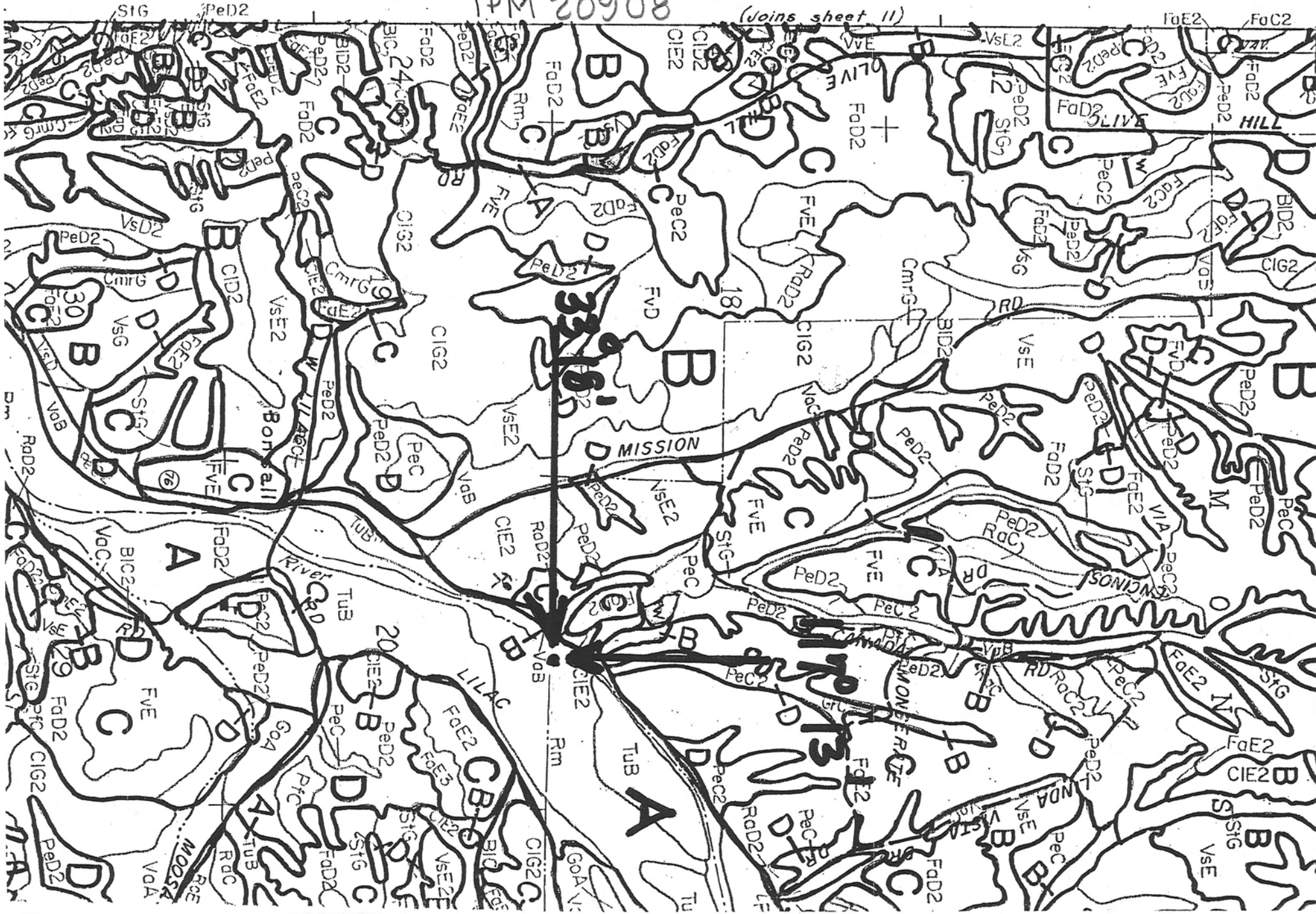

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0* 2% = .22	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10 4% = .23 11.8% = .28	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20 →	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

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Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the I d Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

$T_i = 10.0$ (EXISTING & PROPOSED LOTS)

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M) & INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description

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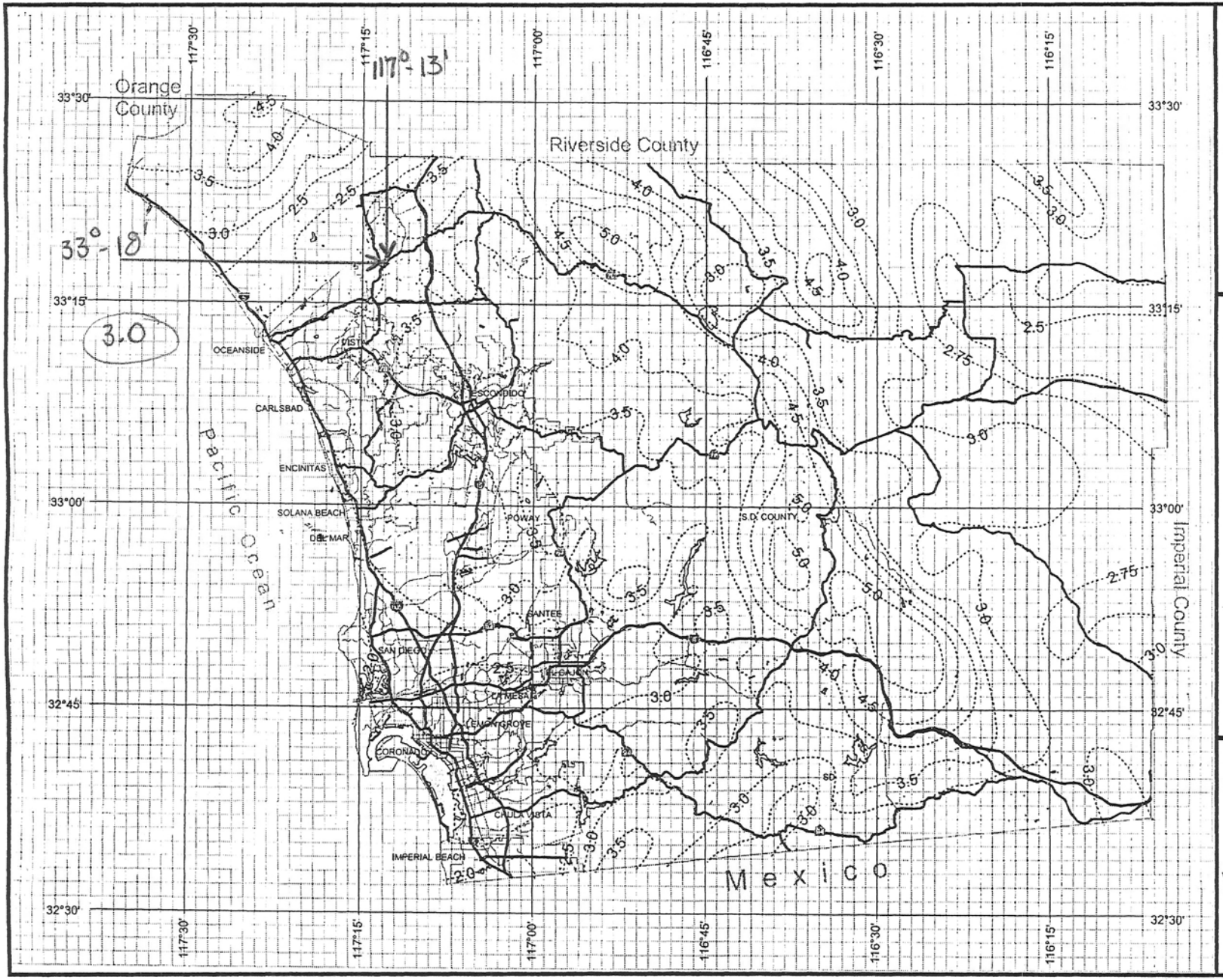

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

DPW GIS

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N W E S

3 0 3 Miles

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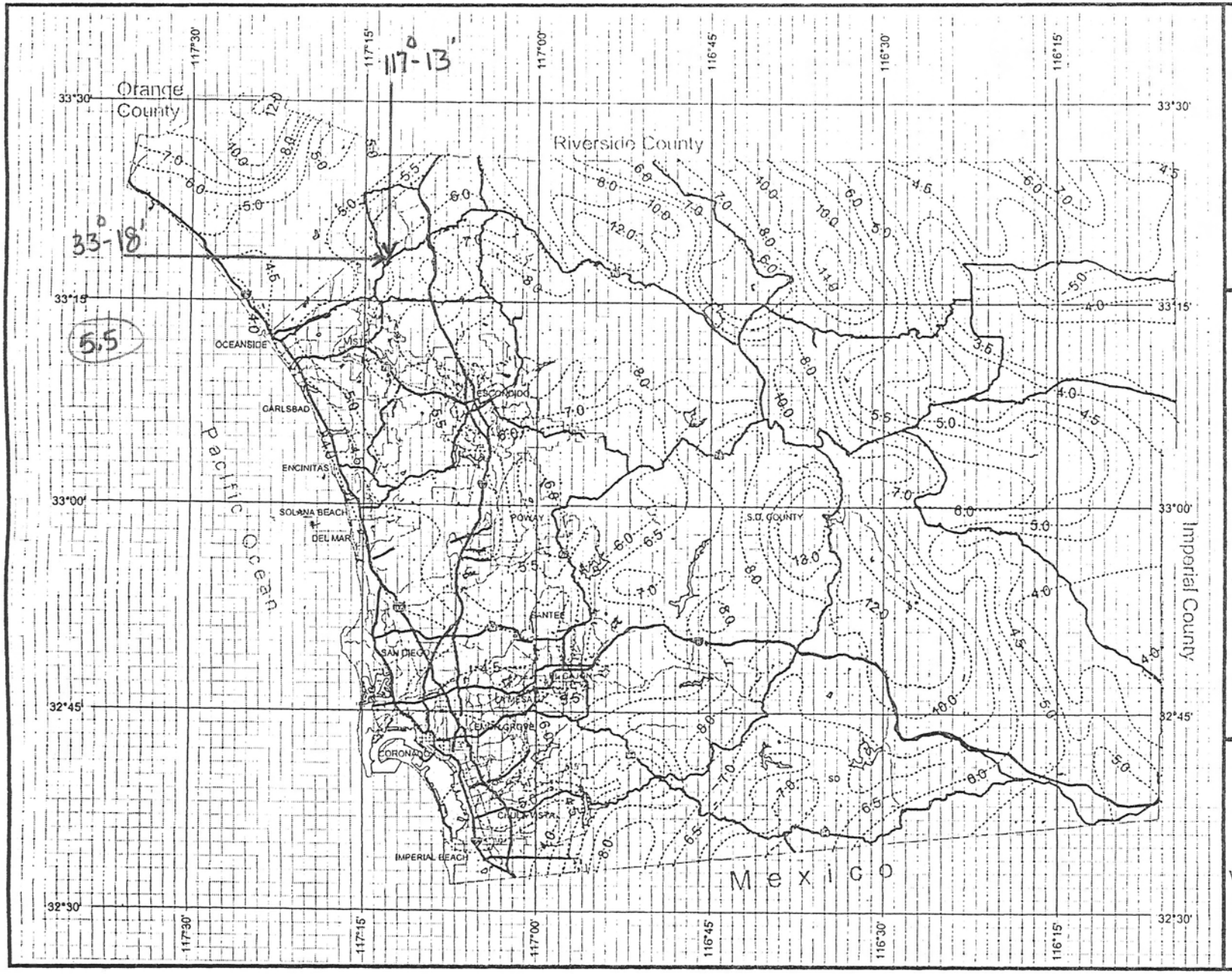

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

DPW GIS

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N W E S

3 0 3 Miles

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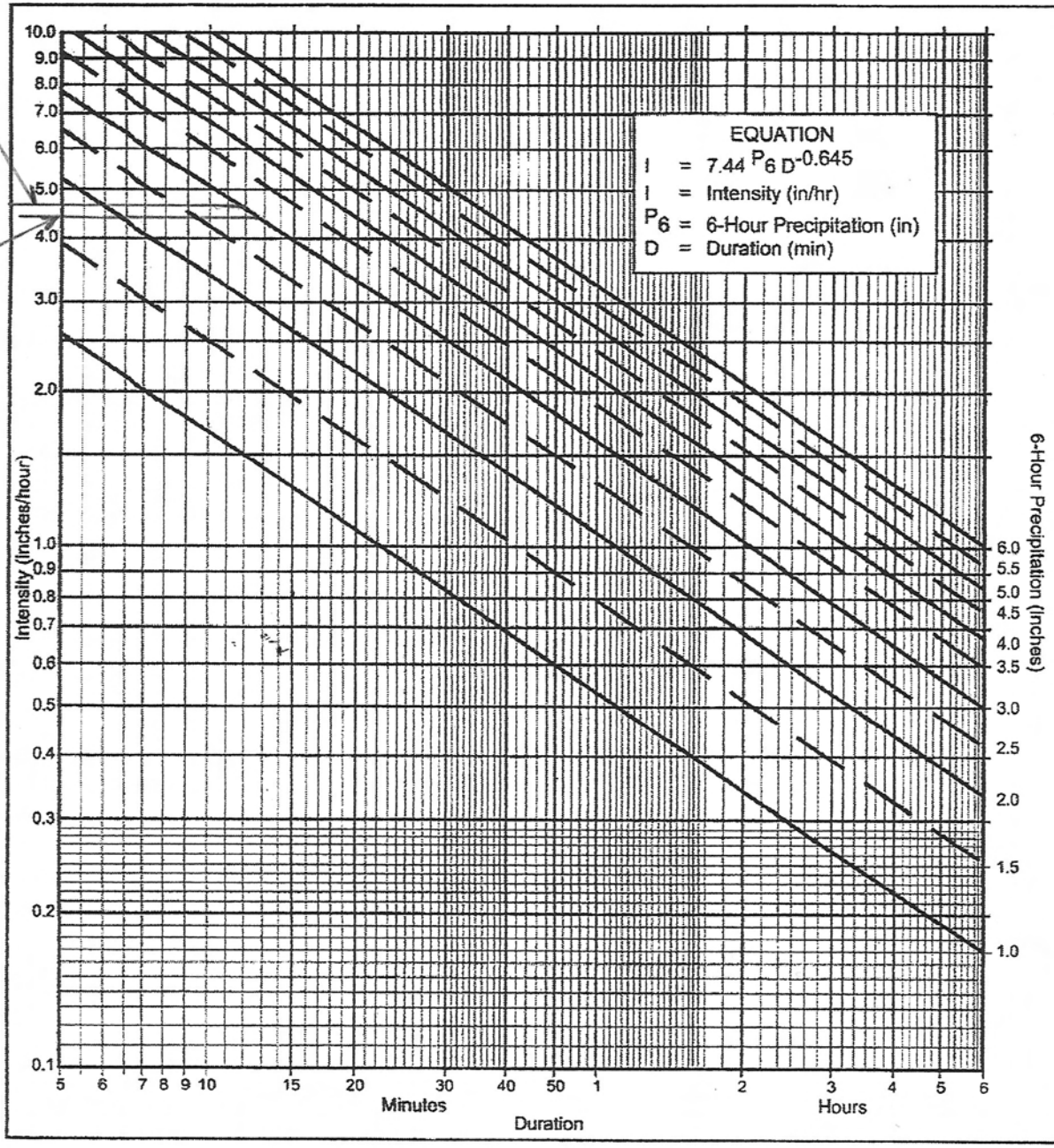

"B" 4.65

4.4 = "A"

Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location bei[illegible]alyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 3.0 in., P_{24} = 5.5, $\frac{P_6}{P_{24}}$ = 55 %(2)

(c) Adjusted P_6(2) = 3.0 in.

(d) t_x = _____ min. AREA A = 12.5 : 4.4 = I

(e) I = _____ in./hr. AREA B = 12.0 : 4.65 = I

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

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FIGURE 3-1