

PRELIMINARY HYDROLOGY STUDY

FOR

PREPARED FOR:

PREPARED BY:

Kier + Wright

163 Technology Drive, Suite 150

Irvine, CA 92618

(949) 508-0202

June 22, 2022

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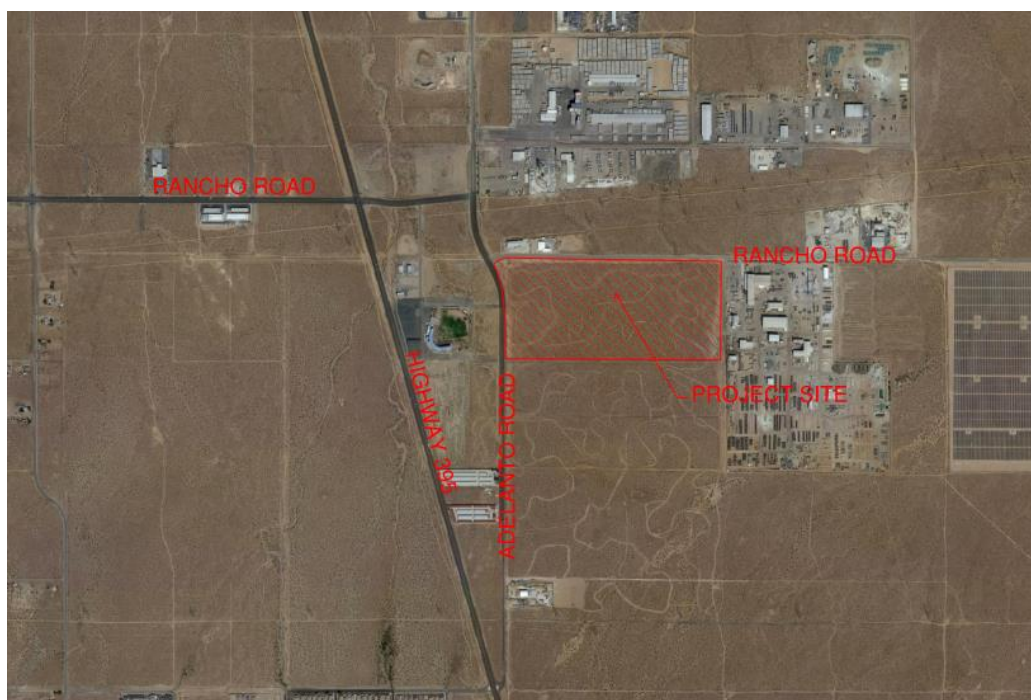
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Purpose

This study will estimate the post-development peak flow rate for the 100-year storm event at the project site. A 100-year 24-hour Unit Hydrograph analysis is also included to satisfy WQMP volume runoff requirements.

Project Description

This hydrology study is for the Rancho Road Development Project in Adelanto, California. The site is in the vacant land southeast of Rancho Road and Adelanto Road in Adelanto, California. The site is mostly undeveloped, vacant land to the north and south. It is bounded by a stadium on the west and commercial/industrial buildings to the east. The site is 35.01 acres.



Location Map

Methodology

Calculations and design criteria contained within this report are consistent with the San Bernadino County Hydrology requirements. The hydrology and storage calculations are per rational method runoff equations and are in accordance with County design criteria as performed in the CivilDesign software.

Rainfall depths contained in this report used for CivilDesign software are based on NOAA Atlas 14 Point Precipitation Frequency Estimates.

The hydrologic soil type for the majority of the site is “A”, with a portion of “C” on the east site of the lot. This value was taken from USDA Web Soil Survey. A “commercial” land use was used for the project site with AMC III for the proposed condition.

Project Site Drainage

Existing Site Drainage Conditions:

Currently, the existing site is undeveloped. The existing site generally slopes from south to north. There are no existing storm drains within the project site. The slopes within the project site range from flat to mild slopes, ranging from 2% to 10% in some areas. With the majority of the site being type A soils, the drainage percolates into the ground, and the remaining runoff flows to Rancho Road.

Proposed Site Drainage Conditions:

In the proposed condition, on site drainage on the south side of the lot will sheet flow within the proposed driveways into catch basins at various locations on site. Off-site drainage from the south sheet flows on-site across the proposed parking lot driveways and into the proposed catch basins. The drainage is then piped to the detention basin on the east side of the lot.

The drainage on the north side of the lot will sheet flow off site onto Rancho Road into catch basins along Rancho Road. Drainage is then piped to the detention basin on the east side of the lot.

Summary

The following table shows the pre-development peak flow rate for the project site at the following nodes:

Node	100-Year Storm Event
101	Q100 = 20.633 cfs
	Tc = 15.230 min
102	Q100 = 82.029 cfs
	Tc = 25.39 min
201	Q100 = 6.640 cfs
	Tc = 17.38 min

Total runoff = 109.302 cfs

The following table shows the post-development peak flow rate for the project site at the following nodes:

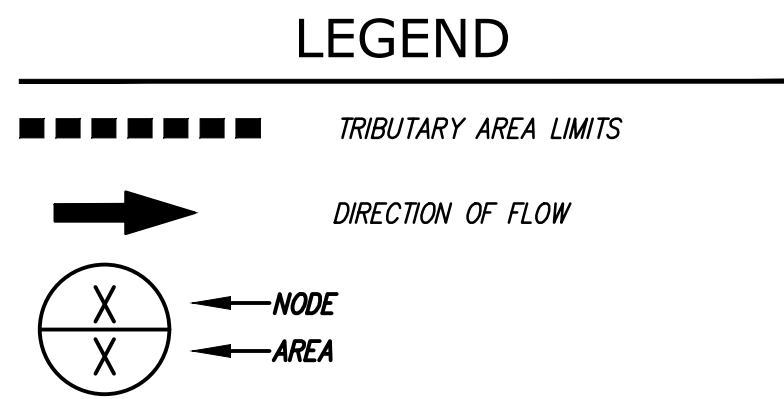
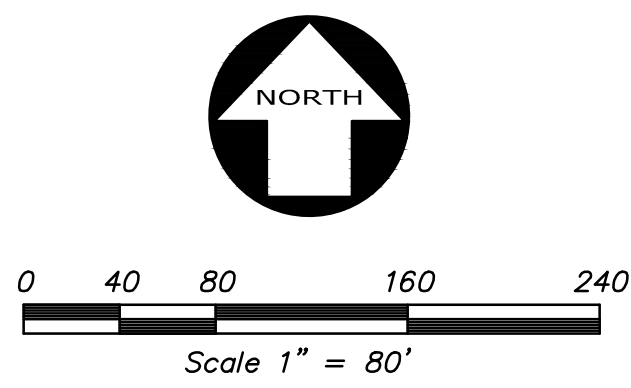
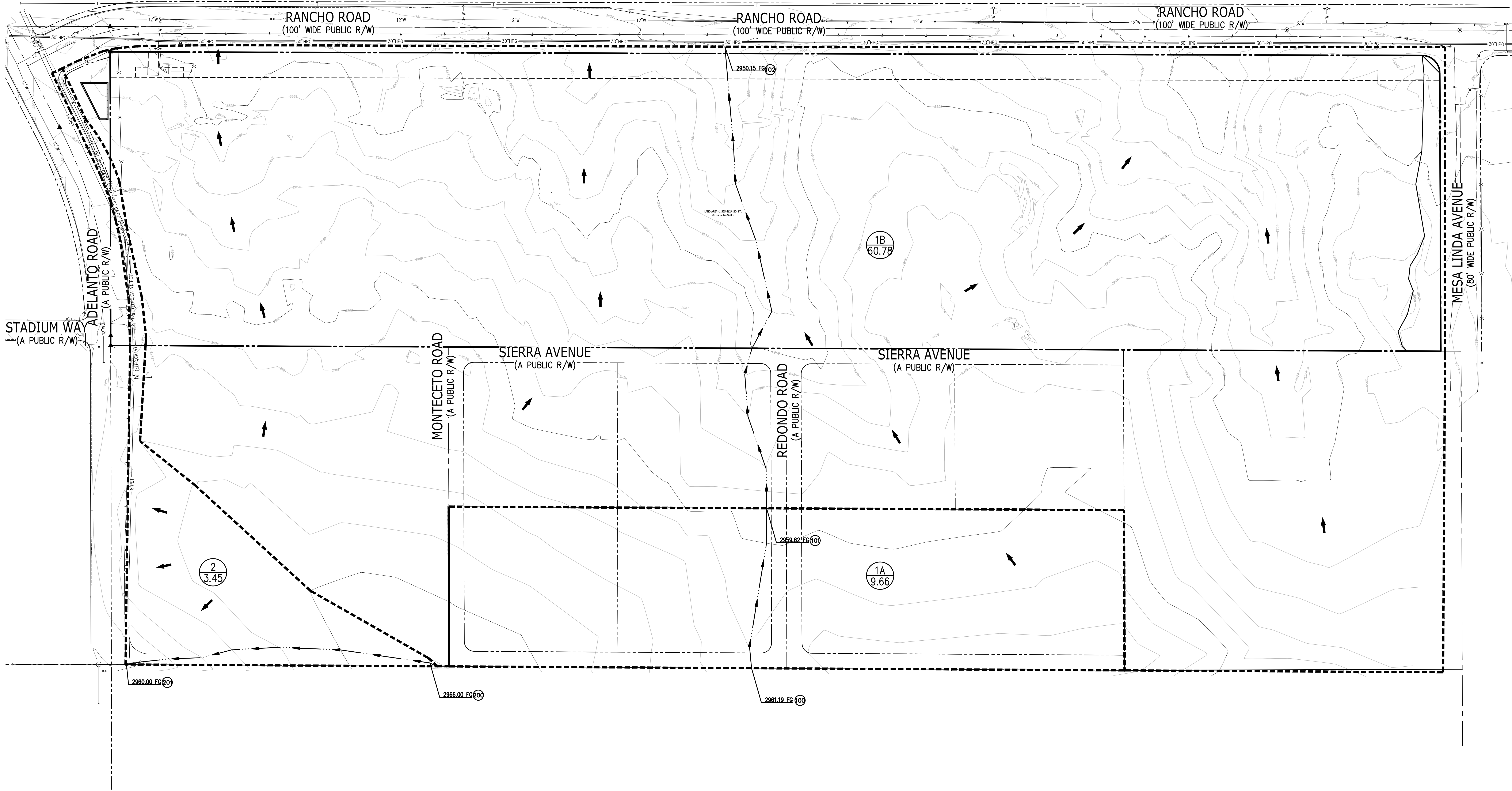
Node	100-Year Storm Event
101	Q100 = 9.913 cfs
	Tc = 9.56 min
102	Q100 = 11.868 cfs
	Tc = 15.84 min
103	Q100 = 12.281 cfs
	Tc = 22.19 min
201	Q100 = 25.140 cfs
	Tc = 10.32 min
202	Q100 = 19.422 cfs
	Tc = 10.70 min
203	Q100 = 87.564 cfs
	Tc = 13.42 min
301	Q100 = 6.053 cfs
	Tc = 17.134 min

Total runoff = 172.241 cfs

Results

The required capture volume is 221,071 cubic feet of storm water per the unit hydrograph and stage storage calculations. The basin has been sized to store 16.14 acre feet and can hold a total of 703,274.30 cubic feet of storm water. Since the runoff of the proposed development is greater than the existing runoff, detention of the additional runoff is required. Unit hydrograph calculations were prepared to establish the baseline Qs for the 100-year 24-hour storm for the project. In order to mitigate the extra runoff, the basin has been sized to prevent extra runoff from leaving the site during the storm event. The basin drains before 72 hours.

Appendix 1: Existing Condition Hydrology Map



**EXISTING HYDROLOGY MAP
OF
RANCHO ROAD DEVELOPMENT
FOR
INDUSTRIAL PROPERTY GROUP**

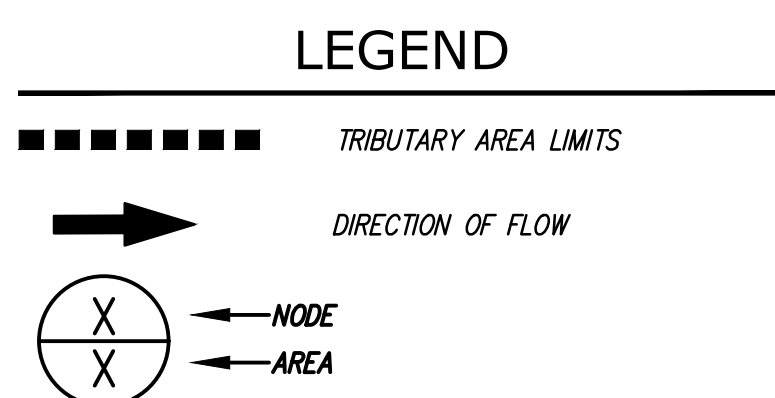
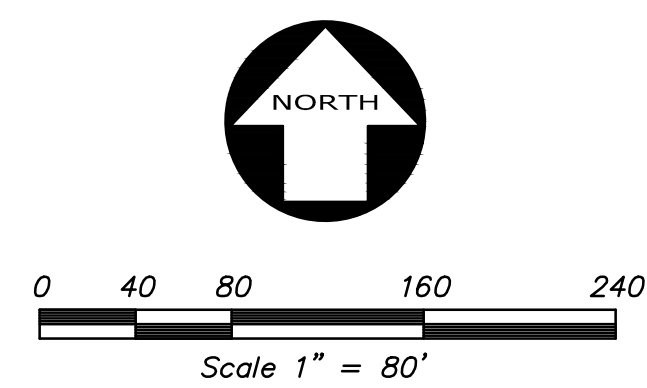
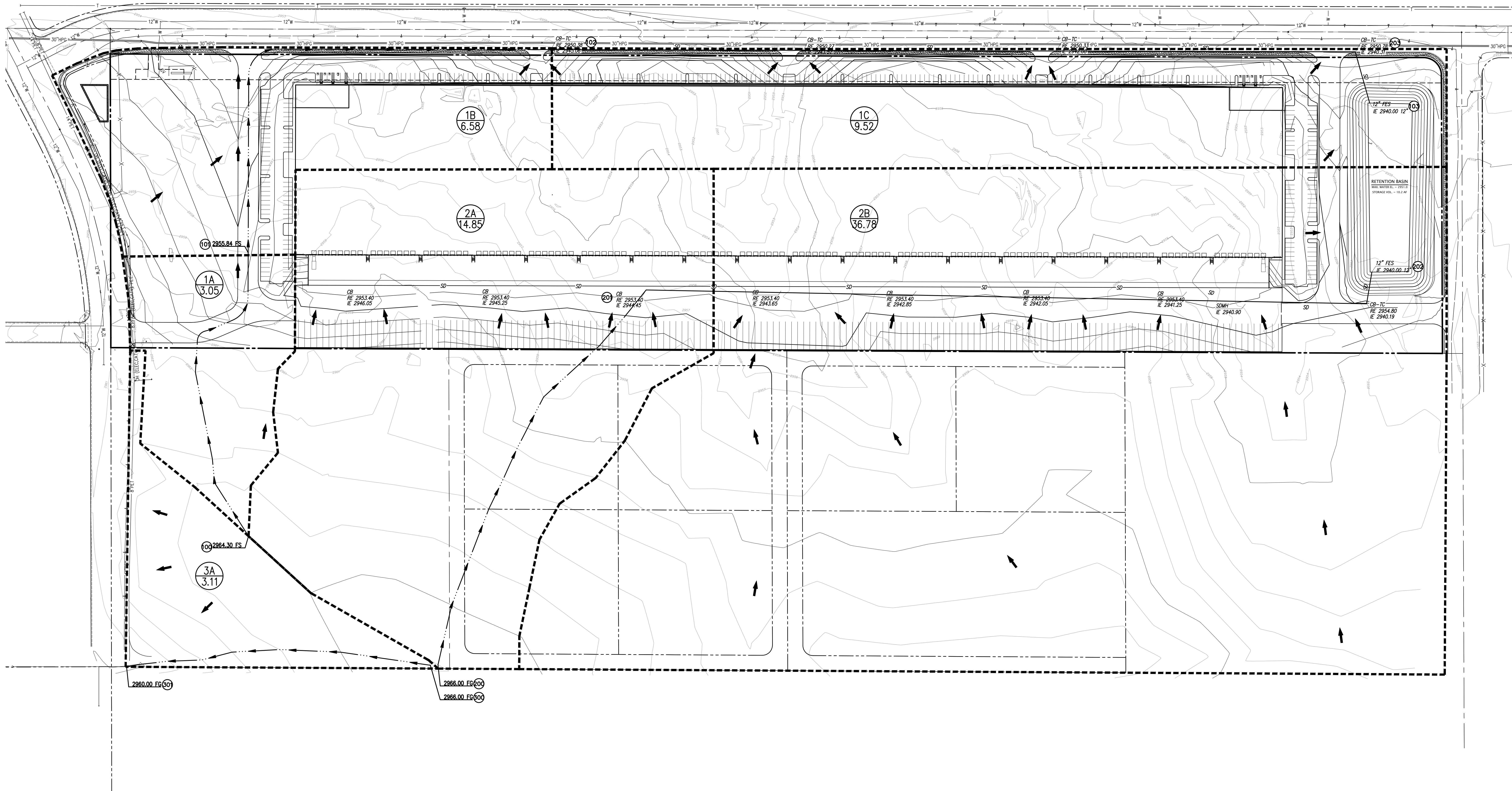
ADELANTO, CALIFORNIA

KIER+WRIGHT
163 Technology Drive
Livermore, CA 94550
Phone: (949) 598-0202
www.kierwright.com

NO.	REVISION	BY
1	PLANNING SUBMITTAL	06/08/2022
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DATE	06/08/2022
SCALE	AS SHOWN
DESIGNER	DGR
DRAWN BY	VB
JOB NO.	A22160
SHEET	EX.1
OF	1 SHEETS

Appendix 2: Proposed Condition Hydrology Map



DATE		06/08/2022	
SCALE		AS SHOWN	
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DRAWN BY		VB	
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SHEET		PR.1	
OF		1 SHEETS	
PROPOSED HYDROLOGY MAP OF RANCHO ROAD DEVELOPMENT FOR INDUSTRIAL PROPERTY GROUP ADELANTO, CALIFORNIA			
		KIER+WRIGHT	
163 Technology Drive Livermore, CA 94550 Phone: (949) 558-0202 www.kierwright.com			
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Appendix 3: Hydrology Calculations

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1
Rational Hydrology Study Date: 06/29/22

A22160 Q100 - EXISTING

Program License Serial Number 6509

***** Hydrology Study Control Information *****

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 0.590(In.)
100 Year storm 1 hour rainfall = 1.020(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.020 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

+++++
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 67.00
Adjusted SCS curve number for AMC 3 = 84.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.290(In/Hr)
Initial subarea data:
Initial area flow distance = 318.340(Ft.)
Top (of initial area) elevation = 2961.190(Ft.)
Bottom (of initial area) elevation = 2959.620(Ft.)
Difference in elevation = 1.570(Ft.)
Slope = 0.00493 s(%)= 0.49
TC = $k(0.525)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 15.230 min.
 Rainfall intensity = 2.663(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area (Q=KCIA) is C = 0.802
 Subarea runoff = 20.633(CFS)
 Total initial stream area = 9.660(Ac.)
 Pervious area fraction = 1.000
 Initial area Fm value = 0.290(In/Hr)

+++++
 Process from Point/Station 101.000 to Point/Station 102.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
 Depth of flow = 0.508(Ft.), Average velocity = 1.543(Ft/s)
 ***** Irregular Channel Data *****

 Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	3.00
2	175.00	0.00
3	225.00	0.00
4	500.00	5.00

Manning's 'N' friction factor = 0.050

Sub-Channel flow = 61.691(CFS)
 ' ' flow top width = 107.542(Ft.)
 ' ' velocity = 1.543(Ft/s)
 ' ' area = 39.994(Sq.Ft)
 ' ' Froude number = 0.446

Upstream point elevation = 2959.620(Ft.)
 Downstream point elevation = 2950.150(Ft.)
 Flow length = 940.050(Ft.)
 Travel time = 10.16 min.
 Time of concentration = 25.39 min.
 Depth of flow = 0.508(Ft.)
 Average velocity = 1.543(Ft/s)
 Total irregular channel flow = 61.691(CFS)
 Irregular channel normal depth above invert elev. = 0.508(Ft.)
 Average velocity of channel(s) = 1.543(Ft/s)
 Adding area flow to channel
 UNDEVELOPED (poor cover) subarea
 Decimal fraction soil group A = 0.800
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.200
 Decimal fraction soil group D = 0.000
 SCS curve number for soil(AMC 2) = 70.80
 Adjusted SCS curve number for AMC 3 = 87.64
 Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.236(In/Hr)

Rainfall intensity = 1.862(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.783
Subarea runoff = 82.029(CFS) for 60.780(Ac.)
Total runoff = 102.662(CFS)
Effective area this stream = 70.44(Ac.)
Total Study Area (Main Stream No. 1) = 70.44(Ac.)
Area averaged Fm value = 0.243(In/Hr)
Depth of flow = 0.659(Ft.), Average velocity = 1.782(Ft/s)

++++
Process from Point/Station 102.000 to Point/Station 102.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 70.440(Ac.)
Runoff from this stream = 102.662(CFS)
Time of concentration = 25.39 min.
Rainfall intensity = 1.862(In/Hr)
Area averaged loss rate (Fm) = 0.2430(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000

++++
Process from Point/Station 200.000 to Point/Station 201.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 67.00
Adjusted SCS curve number for AMC 3 = 84.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.290(In/Hr)
Initial subarea data:
Initial area flow distance = 620.040(Ft.)
Top (of initial area) elevation = 2966.000(Ft.)
Bottom (of initial area) elevation = 2960.000(Ft.)
Difference in elevation = 6.000(Ft.)
Slope = 0.00968 s(%)= 0.97
TC = $k(0.525)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 17.377 min.
Rainfall intensity = 2.428(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.793
Subarea runoff = 6.640(CFS)
Total initial stream area = 3.450(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.290(In/Hr)

+++++
 Process from Point/Station 201.000 to Point/Station 201.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 3.450(Ac.)
 Runoff from this stream = 6.640(CFS)
 Time of concentration = 17.38 min.
 Rainfall intensity = 2.428(In/Hr)
 Area averaged loss rate (Fm) = 0.2900(In/Hr)
 Area averaged Pervious ratio (Ap) = 1.0000
 Summary of stream data:

Stream No.	Flow rate (CFS)	Area (Ac.)	TC (min)	Fm (In/Hr)	Rainfall Intensity (In/Hr)
1	102.66	70.440	25.39	0.243	1.862
2	6.64	3.450	17.38	0.290	2.428

Qmax(1) =

$$1.000 * 102.662 + 0.735 * 6.640 = 107.544$$

 Qmax(2) =

$$1.350 * 70.440 + 1.000 * 6.640 = 101.470$$

Total of 2 streams to confluence:
 Flow rates before confluence point:
 102.662 6.640
 Maximum flow rates at confluence using above data:
 107.544 101.470
 Area of streams before confluence:
 70.440 3.450
 Effective area values after confluence:
 73.890 51.665

Results of confluence:
 Total flow rate = 107.544(CFS)
 Time of concentration = 25.388 min.
 Effective stream area after confluence = 73.890(Ac.)
 Study area average Pervious fraction(Ap) = 1.000
 Study area average soil loss rate(Fm) = 0.245(In/Hr)
 Study area total (this main stream) = 73.89(Ac.)
 End of computations, Total Study Area = 73.89 (Ac.)

The following figures may
 be used for a unit hydrograph study of the same area.
 Note: These figures do not consider reduced effective area
 effects caused by confluences in the rational equation.

Area averaged pervious area fraction(A_p) = 1.000
Area averaged SCS curve number = 70.1

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0

Study date 06/29/22

+++++

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6509

A22160 Q100 UNIT HYDROGRAPH - EXISTING

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
73.89	1	1.02

Rainfall data for year 100		
73.89	6	1.99

Rainfall data for year 100		
73.89	24	3.57

+++++

***** Area-averaged max loss rate, Fm *****

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
70.1	87.1	73.89	1.000	0.246	1.000	0.246

Area-averaged adjusted loss rate Fm (In/Hr) = 0.246

***** Area-Averaged low loss rate fraction, Yb *****

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
73.89	1.000	70.1	87.1	1.48	0.631

Area-averaged catchment yield fraction, Y = 0.631

Area-averaged low loss fraction, Yb = 0.369

User entry of time of concentration = 0.423 (hours)

+++++

Watershed area = 73.89(Ac.)

Catchment Lag time = 0.338 hours

Unit interval = 5.000 minutes

Unit interval percentage of lag time = 24.6257

Hydrograph baseflow = 0.00(CFS)

Average maximum watershed loss rate(Fm) = 0.246(In/Hr)

Average low loss rate fraction (Yb) = 0.369 (decimal)

DESERT S-Graph Selected

Computed peak 5-minute rainfall = 0.484(In)

Computed peak 30-minute rainfall = 0.828(In)

Specified peak 1-hour rainfall = 1.020(In)

Computed peak 3-hour rainfall = 1.537(In)

Specified peak 6-hour rainfall = 1.990(In)

Specified peak 24-hour rainfall = 3.570(In)

Rainfall depth area reduction factors:

Using a total area of 73.89(Ac.) (Ref: fig. E-4)

5-minute factor = 0.997 Adjusted rainfall = 0.482(In)

30-minute factor = 0.997 Adjusted rainfall = 0.826(In)

1-hour factor = 0.997 Adjusted rainfall = 1.016(In)

3-hour factor = 1.000 Adjusted rainfall = 1.536(In)

6-hour factor = 1.000 Adjusted rainfall = 1.990(In)

24-hour factor = 1.000 Adjusted rainfall = 3.570(In)

U n i t H y d r o g r a p h

+++++

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))

	(K = 893.61 (CFS))	
1	1.322	11.817
2	6.408	45.443
3	18.914	111.755
4	40.343	191.496
5	55.307	133.714
6	64.450	81.706
7	70.834	57.050
8	75.688	43.372
9	79.523	34.275
10	82.560	27.138
11	85.119	22.866
12	87.350	19.935
13	89.161	16.183
14	90.615	12.993
15	91.935	11.795
16	93.092	10.340
17	94.108	9.075
18	94.952	7.547
19	95.738	7.017
20	96.385	5.787
21	96.978	5.295
22	97.430	4.042
23	97.830	3.571
24	98.087	2.299
25	98.343	2.289
26	98.635	2.611
27	98.931	2.641
28	99.226	2.641
29	99.499	2.432
30	99.665	1.490
31	99.819	1.375
32	100.000	0.688

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4823	0.4823
2	0.5938	0.1115
3	0.6706	0.0768
4	0.7311	0.0604
5	0.7817	0.0506
6	0.8256	0.0439
7	0.8647	0.0391
8	0.9000	0.0353
9	0.9324	0.0324
10	0.9624	0.0299

11	0.9903	0.0279
12	1.0165	0.0262
13	1.0475	0.0310
14	1.0771	0.0296
15	1.1054	0.0283
16	1.1325	0.0271
17	1.1586	0.0261
18	1.1838	0.0252
19	1.2081	0.0243
20	1.2316	0.0235
21	1.2543	0.0228
22	1.2765	0.0221
23	1.2980	0.0215
24	1.3189	0.0209
25	1.3393	0.0204
26	1.3592	0.0199
27	1.3786	0.0194
28	1.3975	0.0190
29	1.4161	0.0186
30	1.4342	0.0182
31	1.4520	0.0178
32	1.4695	0.0174
33	1.4865	0.0171
34	1.5033	0.0168
35	1.5198	0.0165
36	1.5360	0.0162
37	1.5517	0.0158
38	1.5673	0.0155
39	1.5825	0.0153
40	1.5976	0.0150
41	1.6124	0.0148
42	1.6269	0.0146
43	1.6413	0.0144
44	1.6554	0.0141
45	1.6694	0.0139
46	1.6831	0.0138
47	1.6967	0.0136
48	1.7101	0.0134
49	1.7233	0.0132
50	1.7363	0.0130
51	1.7492	0.0129
52	1.7620	0.0127
53	1.7745	0.0126
54	1.7870	0.0124
55	1.7992	0.0123
56	1.8114	0.0121
57	1.8234	0.0120
58	1.8353	0.0119
59	1.8470	0.0117
60	1.8586	0.0116

61	1.8701	0.0115
62	1.8815	0.0114
63	1.8928	0.0113
64	1.9040	0.0112
65	1.9150	0.0111
66	1.9260	0.0109
67	1.9368	0.0108
68	1.9475	0.0107
69	1.9582	0.0106
70	1.9687	0.0105
71	1.9792	0.0105
72	1.9895	0.0104
73	2.0011	0.0116
74	2.0127	0.0115
75	2.0241	0.0114
76	2.0354	0.0113
77	2.0467	0.0113
78	2.0578	0.0112
79	2.0689	0.0111
80	2.0799	0.0110
81	2.0908	0.0109
82	2.1017	0.0108
83	2.1125	0.0108
84	2.1232	0.0107
85	2.1338	0.0106
86	2.1443	0.0105
87	2.1548	0.0105
88	2.1652	0.0104
89	2.1756	0.0103
90	2.1858	0.0103
91	2.1960	0.0102
92	2.2062	0.0101
93	2.2163	0.0101
94	2.2263	0.0100
95	2.2362	0.0100
96	2.2461	0.0099
97	2.2560	0.0098
98	2.2658	0.0098
99	2.2755	0.0097
100	2.2851	0.0097
101	2.2947	0.0096
102	2.3043	0.0096
103	2.3138	0.0095
104	2.3232	0.0094
105	2.3326	0.0094
106	2.3420	0.0093
107	2.3513	0.0093
108	2.3605	0.0092
109	2.3697	0.0092
110	2.3788	0.0091

111	2.3879	0.0091
112	2.3970	0.0090
113	2.4060	0.0090
114	2.4149	0.0090
115	2.4239	0.0089
116	2.4327	0.0089
117	2.4415	0.0088
118	2.4503	0.0088
119	2.4591	0.0087
120	2.4678	0.0087
121	2.4764	0.0087
122	2.4850	0.0086
123	2.4936	0.0086
124	2.5021	0.0085
125	2.5106	0.0085
126	2.5190	0.0084
127	2.5275	0.0084
128	2.5358	0.0084
129	2.5442	0.0083
130	2.5525	0.0083
131	2.5607	0.0083
132	2.5690	0.0082
133	2.5771	0.0082
134	2.5853	0.0082
135	2.5934	0.0081
136	2.6015	0.0081
137	2.6095	0.0080
138	2.6176	0.0080
139	2.6255	0.0080
140	2.6335	0.0079
141	2.6414	0.0079
142	2.6493	0.0079
143	2.6571	0.0079
144	2.6650	0.0078
145	2.6727	0.0078
146	2.6805	0.0078
147	2.6882	0.0077
148	2.6959	0.0077
149	2.7036	0.0077
150	2.7112	0.0076
151	2.7188	0.0076
152	2.7264	0.0076
153	2.7340	0.0075
154	2.7415	0.0075
155	2.7490	0.0075
156	2.7564	0.0075
157	2.7639	0.0074
158	2.7713	0.0074
159	2.7787	0.0074
160	2.7860	0.0074

161	2.7934	0.0073
162	2.8007	0.0073
163	2.8079	0.0073
164	2.8152	0.0073
165	2.8224	0.0072
166	2.8296	0.0072
167	2.8368	0.0072
168	2.8439	0.0072
169	2.8511	0.0071
170	2.8582	0.0071
171	2.8652	0.0071
172	2.8723	0.0071
173	2.8793	0.0070
174	2.8863	0.0070
175	2.8933	0.0070
176	2.9003	0.0070
177	2.9072	0.0069
178	2.9141	0.0069
179	2.9210	0.0069
180	2.9279	0.0069
181	2.9347	0.0068
182	2.9416	0.0068
183	2.9484	0.0068
184	2.9552	0.0068
185	2.9619	0.0068
186	2.9687	0.0067
187	2.9754	0.0067
188	2.9821	0.0067
189	2.9888	0.0067
190	2.9954	0.0067
191	3.0021	0.0066
192	3.0087	0.0066
193	3.0153	0.0066
194	3.0218	0.0066
195	3.0284	0.0066
196	3.0349	0.0065
197	3.0415	0.0065
198	3.0480	0.0065
199	3.0544	0.0065
200	3.0609	0.0065
201	3.0674	0.0064
202	3.0738	0.0064
203	3.0802	0.0064
204	3.0866	0.0064
205	3.0929	0.0064
206	3.0993	0.0064
207	3.1056	0.0063
208	3.1120	0.0063
209	3.1183	0.0063
210	3.1245	0.0063

211	3.1308	0.0063
212	3.1370	0.0062
213	3.1433	0.0062
214	3.1495	0.0062
215	3.1557	0.0062
216	3.1619	0.0062
217	3.1680	0.0062
218	3.1742	0.0061
219	3.1803	0.0061
220	3.1864	0.0061
221	3.1925	0.0061
222	3.1986	0.0061
223	3.2047	0.0061
224	3.2107	0.0061
225	3.2168	0.0060
226	3.2228	0.0060
227	3.2288	0.0060
228	3.2348	0.0060
229	3.2408	0.0060
230	3.2467	0.0060
231	3.2527	0.0059
232	3.2586	0.0059
233	3.2645	0.0059
234	3.2704	0.0059
235	3.2763	0.0059
236	3.2822	0.0059
237	3.2880	0.0059
238	3.2939	0.0058
239	3.2997	0.0058
240	3.3055	0.0058
241	3.3113	0.0058
242	3.3171	0.0058
243	3.3229	0.0058
244	3.3286	0.0058
245	3.3344	0.0057
246	3.3401	0.0057
247	3.3458	0.0057
248	3.3515	0.0057
249	3.3572	0.0057
250	3.3629	0.0057
251	3.3686	0.0057
252	3.3742	0.0057
253	3.3799	0.0056
254	3.3855	0.0056
255	3.3911	0.0056
256	3.3967	0.0056
257	3.4023	0.0056
258	3.4079	0.0056
259	3.4134	0.0056
260	3.4190	0.0056

261	3.4245	0.0055
262	3.4301	0.0055
263	3.4356	0.0055
264	3.4411	0.0055
265	3.4466	0.0055
266	3.4520	0.0055
267	3.4575	0.0055
268	3.4630	0.0055
269	3.4684	0.0054
270	3.4738	0.0054
271	3.4793	0.0054
272	3.4847	0.0054
273	3.4901	0.0054
274	3.4954	0.0054
275	3.5008	0.0054
276	3.5062	0.0054
277	3.5115	0.0054
278	3.5169	0.0053
279	3.5222	0.0053
280	3.5275	0.0053
281	3.5328	0.0053
282	3.5381	0.0053
283	3.5434	0.0053
284	3.5487	0.0053
285	3.5539	0.0053
286	3.5592	0.0053
287	3.5644	0.0052
288	3.5697	0.0052

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0052	0.0019	0.0033
2	0.0052	0.0019	0.0033
3	0.0053	0.0019	0.0033
4	0.0053	0.0019	0.0033
5	0.0053	0.0020	0.0033
6	0.0053	0.0020	0.0033
7	0.0053	0.0020	0.0034
8	0.0053	0.0020	0.0034
9	0.0054	0.0020	0.0034
10	0.0054	0.0020	0.0034
11	0.0054	0.0020	0.0034
12	0.0054	0.0020	0.0034
13	0.0054	0.0020	0.0034
14	0.0054	0.0020	0.0034
15	0.0055	0.0020	0.0034
16	0.0055	0.0020	0.0035
17	0.0055	0.0020	0.0035

18	0.0055	0.0020	0.0035
19	0.0055	0.0020	0.0035
20	0.0056	0.0020	0.0035
21	0.0056	0.0021	0.0035
22	0.0056	0.0021	0.0035
23	0.0056	0.0021	0.0035
24	0.0056	0.0021	0.0035
25	0.0057	0.0021	0.0036
26	0.0057	0.0021	0.0036
27	0.0057	0.0021	0.0036
28	0.0057	0.0021	0.0036
29	0.0057	0.0021	0.0036
30	0.0057	0.0021	0.0036
31	0.0058	0.0021	0.0036
32	0.0058	0.0021	0.0037
33	0.0058	0.0021	0.0037
34	0.0058	0.0022	0.0037
35	0.0059	0.0022	0.0037
36	0.0059	0.0022	0.0037
37	0.0059	0.0022	0.0037
38	0.0059	0.0022	0.0037
39	0.0059	0.0022	0.0038
40	0.0060	0.0022	0.0038
41	0.0060	0.0022	0.0038
42	0.0060	0.0022	0.0038
43	0.0060	0.0022	0.0038
44	0.0061	0.0022	0.0038
45	0.0061	0.0022	0.0038
46	0.0061	0.0023	0.0038
47	0.0061	0.0023	0.0039
48	0.0061	0.0023	0.0039
49	0.0062	0.0023	0.0039
50	0.0062	0.0023	0.0039
51	0.0062	0.0023	0.0039
52	0.0062	0.0023	0.0039
53	0.0063	0.0023	0.0040
54	0.0063	0.0023	0.0040
55	0.0063	0.0023	0.0040
56	0.0064	0.0023	0.0040
57	0.0064	0.0024	0.0040
58	0.0064	0.0024	0.0040
59	0.0064	0.0024	0.0041
60	0.0065	0.0024	0.0041
61	0.0065	0.0024	0.0041
62	0.0065	0.0024	0.0041
63	0.0066	0.0024	0.0041
64	0.0066	0.0024	0.0042
65	0.0066	0.0024	0.0042
66	0.0066	0.0024	0.0042
67	0.0067	0.0025	0.0042

68	0.0067	0.0025	0.0042
69	0.0067	0.0025	0.0043
70	0.0068	0.0025	0.0043
71	0.0068	0.0025	0.0043
72	0.0068	0.0025	0.0043
73	0.0069	0.0025	0.0043
74	0.0069	0.0025	0.0043
75	0.0069	0.0026	0.0044
76	0.0070	0.0026	0.0044
77	0.0070	0.0026	0.0044
78	0.0070	0.0026	0.0044
79	0.0071	0.0026	0.0045
80	0.0071	0.0026	0.0045
81	0.0072	0.0026	0.0045
82	0.0072	0.0026	0.0045
83	0.0072	0.0027	0.0046
84	0.0073	0.0027	0.0046
85	0.0073	0.0027	0.0046
86	0.0073	0.0027	0.0046
87	0.0074	0.0027	0.0047
88	0.0074	0.0027	0.0047
89	0.0075	0.0028	0.0047
90	0.0075	0.0028	0.0047
91	0.0075	0.0028	0.0048
92	0.0076	0.0028	0.0048
93	0.0076	0.0028	0.0048
94	0.0077	0.0028	0.0048
95	0.0077	0.0029	0.0049
96	0.0078	0.0029	0.0049
97	0.0078	0.0029	0.0049
98	0.0079	0.0029	0.0050
99	0.0079	0.0029	0.0050
100	0.0079	0.0029	0.0050
101	0.0080	0.0030	0.0051
102	0.0080	0.0030	0.0051
103	0.0081	0.0030	0.0051
104	0.0082	0.0030	0.0051
105	0.0082	0.0030	0.0052
106	0.0083	0.0030	0.0052
107	0.0083	0.0031	0.0053
108	0.0084	0.0031	0.0053
109	0.0084	0.0031	0.0053
110	0.0085	0.0031	0.0054
111	0.0086	0.0032	0.0054
112	0.0086	0.0032	0.0054
113	0.0087	0.0032	0.0055
114	0.0087	0.0032	0.0055
115	0.0088	0.0033	0.0056
116	0.0089	0.0033	0.0056
117	0.0090	0.0033	0.0057

118	0.0090	0.0033	0.0057
119	0.0091	0.0034	0.0057
120	0.0091	0.0034	0.0058
121	0.0092	0.0034	0.0058
122	0.0093	0.0034	0.0059
123	0.0094	0.0035	0.0059
124	0.0094	0.0035	0.0060
125	0.0096	0.0035	0.0060
126	0.0096	0.0035	0.0061
127	0.0097	0.0036	0.0061
128	0.0098	0.0036	0.0062
129	0.0099	0.0037	0.0062
130	0.0100	0.0037	0.0063
131	0.0101	0.0037	0.0064
132	0.0101	0.0037	0.0064
133	0.0103	0.0038	0.0065
134	0.0103	0.0038	0.0065
135	0.0105	0.0039	0.0066
136	0.0105	0.0039	0.0067
137	0.0107	0.0039	0.0067
138	0.0108	0.0040	0.0068
139	0.0109	0.0040	0.0069
140	0.0110	0.0041	0.0069
141	0.0112	0.0041	0.0070
142	0.0113	0.0042	0.0071
143	0.0114	0.0042	0.0072
144	0.0115	0.0042	0.0073
145	0.0104	0.0038	0.0065
146	0.0105	0.0039	0.0066
147	0.0106	0.0039	0.0067
148	0.0107	0.0040	0.0068
149	0.0109	0.0040	0.0069
150	0.0111	0.0041	0.0070
151	0.0113	0.0042	0.0071
152	0.0114	0.0042	0.0072
153	0.0116	0.0043	0.0073
154	0.0117	0.0043	0.0074
155	0.0120	0.0044	0.0076
156	0.0121	0.0045	0.0077
157	0.0124	0.0046	0.0078
158	0.0126	0.0046	0.0079
159	0.0129	0.0048	0.0081
160	0.0130	0.0048	0.0082
161	0.0134	0.0049	0.0084
162	0.0136	0.0050	0.0086
163	0.0139	0.0051	0.0088
164	0.0141	0.0052	0.0089
165	0.0146	0.0054	0.0092
166	0.0148	0.0055	0.0093
167	0.0153	0.0056	0.0096

168	0.0155	0.0057	0.0098
169	0.0162	0.0060	0.0102
170	0.0165	0.0061	0.0104
171	0.0171	0.0063	0.0108
172	0.0174	0.0064	0.0110
173	0.0182	0.0067	0.0115
174	0.0186	0.0068	0.0117
175	0.0194	0.0072	0.0122
176	0.0199	0.0073	0.0125
177	0.0209	0.0077	0.0132
178	0.0215	0.0079	0.0136
179	0.0228	0.0084	0.0144
180	0.0235	0.0087	0.0148
181	0.0252	0.0093	0.0159
182	0.0261	0.0096	0.0165
183	0.0283	0.0104	0.0178
184	0.0296	0.0109	0.0187
185	0.0262	0.0097	0.0165
186	0.0279	0.0103	0.0176
187	0.0324	0.0119	0.0204
188	0.0353	0.0130	0.0223
189	0.0439	0.0162	0.0277
190	0.0506	0.0187	0.0319
191	0.0768	0.0205	0.0563
192	0.1115	0.0205	0.0910
193	0.4823	0.0205	0.4619
194	0.0604	0.0205	0.0400
195	0.0391	0.0144	0.0247
196	0.0299	0.0111	0.0189
197	0.0310	0.0115	0.0196
198	0.0271	0.0100	0.0171
199	0.0243	0.0090	0.0153
200	0.0221	0.0082	0.0140
201	0.0204	0.0075	0.0129
202	0.0190	0.0070	0.0120
203	0.0178	0.0066	0.0112
204	0.0168	0.0062	0.0106
205	0.0158	0.0058	0.0100
206	0.0150	0.0055	0.0095
207	0.0144	0.0053	0.0091
208	0.0138	0.0051	0.0087
209	0.0132	0.0049	0.0083
210	0.0127	0.0047	0.0080
211	0.0123	0.0045	0.0077
212	0.0119	0.0044	0.0075
213	0.0115	0.0042	0.0073
214	0.0112	0.0041	0.0070
215	0.0108	0.0040	0.0068
216	0.0105	0.0039	0.0067
217	0.0116	0.0043	0.0073

218	0.0113	0.0042	0.0072
219	0.0111	0.0041	0.0070
220	0.0108	0.0040	0.0068
221	0.0106	0.0039	0.0067
222	0.0104	0.0038	0.0066
223	0.0102	0.0038	0.0064
224	0.0100	0.0037	0.0063
225	0.0098	0.0036	0.0062
226	0.0097	0.0036	0.0061
227	0.0095	0.0035	0.0060
228	0.0093	0.0034	0.0059
229	0.0092	0.0034	0.0058
230	0.0090	0.0033	0.0057
231	0.0089	0.0033	0.0056
232	0.0088	0.0032	0.0055
233	0.0087	0.0032	0.0055
234	0.0085	0.0031	0.0054
235	0.0084	0.0031	0.0053
236	0.0083	0.0031	0.0052
237	0.0082	0.0030	0.0052
238	0.0081	0.0030	0.0051
239	0.0080	0.0029	0.0050
240	0.0079	0.0029	0.0050
241	0.0078	0.0029	0.0049
242	0.0077	0.0028	0.0049
243	0.0076	0.0028	0.0048
244	0.0075	0.0028	0.0047
245	0.0074	0.0027	0.0047
246	0.0074	0.0027	0.0046
247	0.0073	0.0027	0.0046
248	0.0072	0.0027	0.0045
249	0.0071	0.0026	0.0045
250	0.0071	0.0026	0.0045
251	0.0070	0.0026	0.0044
252	0.0069	0.0026	0.0044
253	0.0068	0.0025	0.0043
254	0.0068	0.0025	0.0043
255	0.0067	0.0025	0.0042
256	0.0067	0.0025	0.0042
257	0.0066	0.0024	0.0042
258	0.0065	0.0024	0.0041
259	0.0065	0.0024	0.0041
260	0.0064	0.0024	0.0041
261	0.0064	0.0024	0.0040
262	0.0063	0.0023	0.0040
263	0.0063	0.0023	0.0040
264	0.0062	0.0023	0.0039
265	0.0062	0.0023	0.0039
266	0.0061	0.0023	0.0039
267	0.0061	0.0022	0.0038

268	0.0060	0.0022	0.0038
269	0.0060	0.0022	0.0038
270	0.0059	0.0022	0.0037
271	0.0059	0.0022	0.0037
272	0.0058	0.0022	0.0037
273	0.0058	0.0021	0.0037
274	0.0058	0.0021	0.0036
275	0.0057	0.0021	0.0036
276	0.0057	0.0021	0.0036
277	0.0056	0.0021	0.0036
278	0.0056	0.0021	0.0035
279	0.0056	0.0021	0.0035
280	0.0055	0.0020	0.0035
281	0.0055	0.0020	0.0035
282	0.0055	0.0020	0.0034
283	0.0054	0.0020	0.0034
284	0.0054	0.0020	0.0034
285	0.0054	0.0020	0.0034
286	0.0053	0.0020	0.0034
287	0.0053	0.0020	0.0033
288	0.0053	0.0019	0.0033

Total soil rain loss = 1.13(In)
Total effective rainfall = 2.44(In)
Peak flow rate in flood hydrograph = 117.76(CFS)

+++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0003	0.04	Q					
0+10	0.0016	0.19	Q					
0+15	0.0054	0.56	Q					
0+20	0.0136	1.19	Q					
0+25	0.0249	1.64	Q					
0+30	0.0381	1.91	Q					
0+35	0.0526	2.11	Q					
0+40	0.0681	2.25	Q					
0+45	0.0844	2.37	Q					
0+50	0.1015	2.47	Q					
0+55	0.1191	2.55	Q					
1+ 0	0.1372	2.63	Q					
1+ 5	0.1557	2.69	Q					
1+10	0.1746	2.74	Q					

1+15	0.1938	2.79	Q
1+20	0.2133	2.83	Q
1+25	0.2331	2.87	Q
1+30	0.2531	2.91	Q
1+35	0.2733	2.94	Q
1+40	0.2937	2.97	Q
1+45	0.3143	2.99	Q
1+50	0.3351	3.02	Q
1+55	0.3560	3.04	Q
2+ 0	0.3771	3.06	QV
2+ 5	0.3983	3.07	QV
2+10	0.4196	3.09	QV
2+15	0.4410	3.11	QV
2+20	0.4625	3.13	QV
2+25	0.4842	3.15	QV
2+30	0.5060	3.17	QV
2+35	0.5279	3.18	QV
2+40	0.5499	3.19	QV
2+45	0.5720	3.21	QV
2+50	0.5942	3.22	QV
2+55	0.6164	3.23	QV
3+ 0	0.6387	3.24	QV
3+ 5	0.6611	3.25	QV
3+10	0.6836	3.26	QV
3+15	0.7061	3.27	QV
3+20	0.7288	3.29	QV
3+25	0.7515	3.30	Q V
3+30	0.7743	3.31	Q V
3+35	0.7972	3.32	Q V
3+40	0.8201	3.34	Q V
3+45	0.8432	3.35	Q V
3+50	0.8663	3.36	Q V
3+55	0.8896	3.37	Q V
4+ 0	0.9129	3.39	Q V
4+ 5	0.9363	3.40	Q V
4+10	0.9598	3.41	Q V
4+15	0.9834	3.43	Q V
4+20	1.0071	3.44	Q V
4+25	1.0309	3.45	Q V
4+30	1.0547	3.47	Q V
4+35	1.0787	3.48	Q V
4+40	1.1028	3.50	Q V
4+45	1.1270	3.51	Q V
4+50	1.1512	3.52	Q V
4+55	1.1756	3.54	Q V
5+ 0	1.2001	3.55	Q V
5+ 5	1.2246	3.57	Q V
5+10	1.2493	3.58	Q V
5+15	1.2741	3.60	Q V
5+20	1.2990	3.61	Q V

5+25	1.3240	3.63	Q	V				
5+30	1.3491	3.65	Q	V				
5+35	1.3743	3.66	Q	V				
5+40	1.3996	3.68	Q	V				
5+45	1.4251	3.69	Q	V				
5+50	1.4506	3.71	Q	V				
5+55	1.4763	3.73	Q	V				
6+ 0	1.5021	3.74	Q	V				
6+ 5	1.5280	3.76	Q	V				
6+10	1.5540	3.78	Q	V				
6+15	1.5801	3.80	Q	V				
6+20	1.6064	3.81	Q	V				
6+25	1.6328	3.83	Q	V				
6+30	1.6593	3.85	Q	V				
6+35	1.6860	3.87	Q	V				
6+40	1.7127	3.89	Q	V				
6+45	1.7397	3.91	Q	V				
6+50	1.7667	3.93	Q	V				
6+55	1.7939	3.95	Q	V				
7+ 0	1.8212	3.97	Q	V				
7+ 5	1.8486	3.99	Q	V				
7+10	1.8762	4.01	Q	V				
7+15	1.9040	4.03	Q	V				
7+20	1.9319	4.05	Q	V				
7+25	1.9599	4.07	Q	V				
7+30	1.9881	4.09	Q	V				
7+35	2.0164	4.11	Q	V				
7+40	2.0449	4.14	Q	V				
7+45	2.0735	4.16	Q	V				
7+50	2.1023	4.18	Q	V				
7+55	2.1313	4.20	Q	V				
8+ 0	2.1604	4.23	Q	V				
8+ 5	2.1897	4.25	Q	V				
8+10	2.2191	4.28	Q	V				
8+15	2.2488	4.30	Q	V				
8+20	2.2786	4.33	Q	V				
8+25	2.3086	4.35	Q	V				
8+30	2.3387	4.38	Q	V				
8+35	2.3690	4.41	Q	V				
8+40	2.3996	4.43	Q	V				
8+45	2.4303	4.46	Q	V				
8+50	2.4612	4.49	Q	V				
8+55	2.4923	4.52	Q	V				
9+ 0	2.5236	4.54	Q	V				
9+ 5	2.5551	4.57	Q	V				
9+10	2.5868	4.60	Q	V				
9+15	2.6187	4.63	Q	V				
9+20	2.6508	4.67	Q	V				
9+25	2.6832	4.70	Q	V				
9+30	2.7158	4.73	Q	V				

9+35	2.7485	4.76	Q	V				
9+40	2.7816	4.79	Q	V				
9+45	2.8148	4.83	Q	V				
9+50	2.8483	4.86	Q	V				
9+55	2.8820	4.90	Q	V				
10+ 0	2.9160	4.93	Q	V				
10+ 5	2.9503	4.97	Q	V				
10+10	2.9848	5.01	Q	V				
10+15	3.0195	5.05	Q	V				
10+20	3.0546	5.09	Q	V				
10+25	3.0899	5.13	Q	V				
10+30	3.1255	5.17	Q	V				
10+35	3.1613	5.21	Q	V				
10+40	3.1975	5.25	Q	V				
10+45	3.2340	5.30	Q	V				
10+50	3.2708	5.34	Q	V				
10+55	3.3079	5.39	Q	V				
11+ 0	3.3453	5.43	Q	V				
11+ 5	3.3830	5.48	Q	V				
11+10	3.4211	5.53	Q	V				
11+15	3.4595	5.58	Q	V				
11+20	3.4983	5.63	Q	V				
11+25	3.5375	5.68	Q	V				
11+30	3.5770	5.74	Q	V				
11+35	3.6169	5.80	Q	V				
11+40	3.6572	5.85	Q	V				
11+45	3.6979	5.91	Q	V				
11+50	3.7391	5.97	Q	V				
11+55	3.7806	6.03	Q	V				
12+ 0	3.8226	6.10	Q	V				
12+ 5	3.8650	6.15	Q	V				
12+10	3.9076	6.18	Q	V				
12+15	3.9500	6.16	Q	V				
12+20	3.9918	6.07	Q	V				
12+25	4.0334	6.03	Q	V				
12+30	4.0750	6.04	Q	V				
12+35	4.1167	6.07	Q	V				
12+40	4.1588	6.11	Q	V				
12+45	4.2013	6.16	Q	V				
12+50	4.2442	6.23	Q	V				
12+55	4.2875	6.30	Q	V				
13+ 0	4.3314	6.37	Q	V				
13+ 5	4.3759	6.45	Q	V				
13+10	4.4209	6.54	Q	V				
13+15	4.4666	6.64	Q	V				
13+20	4.5130	6.74	Q	V				
13+25	4.5602	6.84	Q	V				
13+30	4.6081	6.95	Q	V				
13+35	4.6568	7.07	Q	V				
13+40	4.7063	7.20	Q	V				

13+45	4.7568	7.33	Q		V				
13+50	4.8082	7.47	Q		V				
13+55	4.8607	7.61	Q		V				
14+ 0	4.9142	7.77	Q		V				
14+ 5	4.9689	7.94	Q		V				
14+10	5.0248	8.12	Q		V				
14+15	5.0820	8.31	Q		V				
14+20	5.1407	8.52	Q		V				
14+25	5.2009	8.74	Q		V				
14+30	5.2628	8.98	Q		V				
14+35	5.3263	9.23	Q		V				
14+40	5.3917	9.50	Q		V				
14+45	5.4591	9.78	Q		V				
14+50	5.5286	10.10	Q		V				
14+55	5.6005	10.43	Q		V				
15+ 0	5.6750	10.81	Q		V				
15+ 5	5.7522	11.22	Q		V				
15+10	5.8327	11.68	Q		V				
15+15	5.9165	12.18	Q		V				
15+20	6.0044	12.76	Q		V				
15+25	6.0964	13.36	Q		V				
15+30	6.1923	13.93	Q		V				
15+35	6.2910	14.33	Q		V				
15+40	6.3915	14.59	Q		V				
15+45	6.4966	15.26	Q		V				
15+50	6.6103	16.50	Q		V				
15+55	6.7374	18.47	Q		V				
16+ 0	6.8896	22.09	Q		V				
16+ 5	7.1149	32.72	Q		V				
16+10	7.4899	54.45		Q	V				
16+15	8.0915	87.35			Q	V			
16+20	8.9025	117.76				Q			
16+25	9.5179	89.35			Q		V		
16+30	9.9527	63.14		Q			V		
16+35	10.2924	49.32		Q			V		
16+40	10.5763	41.23		Q			V		
16+45	10.8201	35.40		Q			V		
16+50	11.0313	30.67		Q			V		
16+55	11.2197	27.36		Q			V		
17+ 0	11.3901	24.74	Q				V		
17+ 5	11.5415	21.97	Q				V		
17+10	11.6766	19.63	Q				V		
17+15	11.8021	18.22	Q				V		
17+20	11.9178	16.80	Q				V		
17+25	12.0248	15.53	Q				V		
17+30	12.1228	14.24	Q				V		
17+35	12.2151	13.40	Q				V		
17+40	12.3000	12.33	Q				V		
17+45	12.3799	11.59	Q				V		
17+50	12.4528	10.60	Q				V		

17+55	12.5214	9.95	Q				V	
18+ 0	12.5839	9.08	Q				V	
18+ 5	12.6446	8.80	Q				V	
18+10	12.7046	8.71	Q				V	
18+15	12.7635	8.56	Q				V	
18+20	12.8216	8.44	Q				V	
18+25	12.8778	8.16	Q				V	
18+30	12.9300	7.57	Q				V	
18+35	12.9801	7.29	Q				V	
18+40	13.0269	6.79	Q				V	
18+45	13.0705	6.33	Q				V	
18+50	13.1130	6.18	Q				V	
18+55	13.1547	6.04	Q				V	
19+ 0	13.1954	5.92	Q				V	
19+ 5	13.2354	5.80	Q				V	
19+10	13.2746	5.69	Q				V	
19+15	13.3130	5.59	Q				V	
19+20	13.3508	5.49	Q				V	
19+25	13.3880	5.39	Q				V	
19+30	13.4245	5.30	Q				V	
19+35	13.4604	5.22	Q				V	
19+40	13.4958	5.13	Q				V	
19+45	13.5306	5.06	Q				V	
19+50	13.5649	4.98	Q				V	
19+55	13.5987	4.91	Q				V	
20+ 0	13.6320	4.84	Q				V	
20+ 5	13.6648	4.77	Q				V	
20+10	13.6972	4.70	Q				V	
20+15	13.7292	4.64	Q				V	
20+20	13.7608	4.58	Q				V	
20+25	13.7920	4.53	Q				V	
20+30	13.8227	4.47	Q				V	
20+35	13.8531	4.42	Q				V	
20+40	13.8832	4.36	Q				V	
20+45	13.9129	4.31	Q				V	
20+50	13.9422	4.26	Q				V	
20+55	13.9712	4.21	Q				V	
21+ 0	13.9999	4.17	Q				V	
21+ 5	14.0283	4.12	Q				V	
21+10	14.0564	4.08	Q				V	
21+15	14.0841	4.03	Q				V	
21+20	14.1116	3.99	Q				V	
21+25	14.1388	3.95	Q				V	
21+30	14.1658	3.91	Q				V	
21+35	14.1924	3.87	Q				V	
21+40	14.2188	3.84	Q				V	
21+45	14.2450	3.80	Q				V	
21+50	14.2709	3.76	Q				V	
21+55	14.2966	3.73	Q				V	
22+ 0	14.3220	3.70	Q				V	

22+ 5	14.3473	3.66	Q				V
22+10	14.3723	3.63	Q				V
22+15	14.3971	3.60	Q				V
22+20	14.4216	3.57	Q				V
22+25	14.4460	3.54	Q				V
22+30	14.4702	3.51	Q				V
22+35	14.4942	3.48	Q				V
22+40	14.5179	3.45	Q				V
22+45	14.5415	3.43	Q				V
22+50	14.5649	3.40	Q				V
22+55	14.5882	3.37	Q				V
23+ 0	14.6112	3.35	Q				V
23+ 5	14.6341	3.32	Q				V
23+10	14.6568	3.30	Q				V
23+15	14.6794	3.27	Q				V
23+20	14.7018	3.25	Q				V
23+25	14.7240	3.23	Q				V
23+30	14.7461	3.20	Q				V
23+35	14.7680	3.18	Q				V
23+40	14.7897	3.16	Q				V
23+45	14.8114	3.14	Q				V
23+50	14.8328	3.12	Q				V
23+55	14.8542	3.10	Q				V
24+ 0	14.8754	3.08	Q				V

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1
Rational Hydrology Study Date: 06/29/22

A22160 Q100 POST-DEVELOPMENT

Program License Serial Number 6509

***** Hydrology Study Control Information *****

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 0.590(In.)
100 Year storm 1 hour rainfall = 1.020(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.020 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++++
Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.079(In/Hr)
Initial subarea data:
Initial area flow distance = 638.400(Ft.)
Top (of initial area) elevation = 2964.300(Ft.)
Bottom (of initial area) elevation = 2955.840(Ft.)
Difference in elevation = 8.460(Ft.)

Slope = 0.01325 s(%)= 1.33
TC = $k(0.304)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 9.560 min.
Rainfall intensity = 3.690(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.881
Subarea runoff = 9.913(CFS)
Total initial stream area = 3.050(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.079(In/Hr)

+++++
Process from Point/Station 101.000 to Point/Station 102.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 2955.840(Ft.)
End of street segment elevation = 2950.380(Ft.)
Length of street segment = 975.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 40.000(Ft.)
Distance from crown to crossfall grade break = 38.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.020
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 15.891(CFS)
Depth of flow = 0.605(Ft.), Average velocity = 2.589(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property = 5.27(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 23.942(Ft.)
Flow velocity = 2.59(Ft/s)
Travel time = 6.28 min. TC = 15.84 min.
Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.079(In/Hr)
Rainfall intensity = 2.592(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified

rational method)(Q=KCIA) is C = 0.873
Subarea runoff = 11.868(CFS) for 6.580(Ac.)
Total runoff = 21.781(CFS)
Effective area this stream = 9.63(Ac.)
Total Study Area (Main Stream No. 1) = 9.63(Ac.)
Area averaged Fm value = 0.079(In/Hr)
Street flow at end of street = 21.781(CFS)
Half street flow at end of street = 21.781(CFS)
Depth of flow = 0.662(Ft.), Average velocity = 2.740(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property = 8.10(Ft.)
Flow width (from curb towards crown)= 26.771(Ft.)

+++++
Process from Point/Station 102.000 to Point/Station 103.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 2945.060(Ft.)
Downstream point/station elevation = 2940.000(Ft.)
Pipe length = 1691.00(Ft.) Manning's N = 0.015
No. of pipes = 1 Required pipe flow = 21.781(CFS)
Given pipe size = 30.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
1.745(Ft.) at the headworks or inlet of the pipe(s)
Pipe friction loss = 6.346(Ft.)
Minor friction loss = 0.459(Ft.) K-factor = 1.50
Pipe flow velocity = 4.44(Ft/s)
Travel time through pipe = 6.35 min.
Time of concentration (TC) = 22.19 min.

+++++
Process from Point/Station 102.000 to Point/Station 103.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.670
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.330
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 44.21
Adjusted SCS curve number for AMC 3 = 64.21
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.062(In/Hr)
Time of concentration = 22.19 min.
Rainfall intensity = 2.047(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.869
Subarea runoff = 12.281(CFS) for 9.520(Ac.)

Total runoff = 34.062(CFS)
Effective area this stream = 19.15(Ac.)
Total Study Area (Main Stream No. 1) = 19.15(Ac.)
Area averaged Fm value = 0.070(In/Hr)

++++
Process from Point/Station 102.000 to Point/Station 103.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 19.150(Ac.)
Runoff from this stream = 34.062(CFS)
Time of concentration = 22.19 min.
Rainfall intensity = 2.047(In/Hr)
Area averaged loss rate (Fm) = 0.0703(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000

++++
Process from Point/Station 200.000 to Point/Station 201.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.079(In/Hr)
Initial subarea data:
Initial area flow distance = 710.520(Ft.)
Top (of initial area) elevation = 2966.000(Ft.)
Bottom (of initial area) elevation = 2958.040(Ft.)
Difference in elevation = 7.960(Ft.)
Slope = 0.01120 s(%)= 1.12
TC = $k(0.304)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 10.319 min.
Rainfall intensity = 3.498(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff = 25.140(CFS)
Total initial stream area = 8.170(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.079(In/Hr)

++++
Process from Point/Station 201.000 to Point/Station 202.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 2958.040(Ft.)
 End of street segment elevation = 2953.400(Ft.)
 Length of street segment = 152.330(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 133.700(Ft.)
 Distance from crown to crossfall grade break = 116.200(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.030
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 0.000(Ft.)
 Slope from curb to property line (v/hz) = 0.020
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 34.888(CFS)
 Depth of flow = 0.581(Ft.), Average velocity = 6.712(Ft/s)
 Warning: depth of flow exceeds top of curb
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 20.980(Ft.)
 Flow velocity = 6.71(Ft/s)
 Travel time = 0.38 min. TC = 10.70 min.
 Adding area flow to street
 COMMERCIAL subarea type
 Decimal fraction soil group A = 1.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 SCS curve number for soil(AMC 2) = 32.00
 Adjusted SCS curve number for AMC 3 = 52.00
 Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.079(In/Hr)
 Rainfall intensity = 3.410(In/Hr) for a 100.0 year storm
 Effective runoff coefficient used for area,(total area with modified
 rational method)(Q=KCIA) is C = 0.879
 Subarea runoff = 19.422(CFS) for 6.690(Ac.)
 Total runoff = 44.562(CFS)
 Effective area this stream = 14.86(Ac.)
 Total Study Area (Main Stream No. 1) = 34.01(Ac.)
 Area averaged Fm value = 0.079(In/Hr)
 Street flow at end of street = 44.562(CFS)
 Half street flow at end of street = 44.562(CFS)
 Depth of flow = 0.627(Ft.), Average velocity = 7.203(Ft/s)
 Warning: depth of flow exceeds top of curb
 Flow width (from curb towards crown)= 22.496(Ft.)

++++++
 Process from Point/Station 202.000 to Point/Station 203.000

**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 2944.450(Ft.)
Downstream point/station elevation = 2940.000(Ft.)
Pipe length = 1484.12(Ft.) Manning's N = 0.015
No. of pipes = 1 Required pipe flow = 44.562(CFS)
Given pipe size = 30.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
20.783(Ft.) at the headworks or inlet of the pipe(s)
Pipe friction loss = 23.314(Ft.)
Minor friction loss = 1.920(Ft.) K-factor = 1.50
Pipe flow velocity = 9.08(Ft/s)
Travel time through pipe = 2.72 min.
Time of concentration (TC) = 13.42 min.

+++++
Process from Point/Station 202.000 to Point/Station 203.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.670
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.330
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 44.21
Adjusted SCS curve number for AMC 3 = 64.21
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.062(In/Hr)
Time of concentration = 13.42 min.
Rainfall intensity = 2.910(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.879
Subarea runoff = 87.564(CFS) for 36.780(Ac.)
Total runoff = 132.125(CFS)
Effective area this stream = 51.64(Ac.)
Total Study Area (Main Stream No. 1) = 70.79(Ac.)
Area averaged Fm value = 0.067(In/Hr)

+++++
Process from Point/Station 203.000 to Point/Station 203.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 51.640(Ac.)
Runoff from this stream = 132.125(CFS)
Time of concentration = 13.42 min.
Rainfall intensity = 2.910(In/Hr)
Area averaged loss rate (Fm) = 0.0667(In/Hr)

Area averaged Pervious ratio (Ap) = 0.1000

+++++
Process from Point/Station 300.000 to Point/Station 301.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 67.00
Adjusted SCS curve number for AMC 3 = 84.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.290(In/Hr)
Initial subarea data:
Initial area flow distance = 605.640(Ft.)
Top (of initial area) elevation = 2966.000(Ft.)
Bottom (of initial area) elevation = 2960.000(Ft.)
Difference in elevation = 6.000(Ft.)
Slope = 0.00991 s(%)= 0.99
TC = $k(0.525)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 17.134 min.
Rainfall intensity = 2.452(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.794
Subarea runoff = 6.053(CFS)
Total initial stream area = 3.110(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.290(In/Hr)

+++++
Process from Point/Station 301.000 to Point/Station 301.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
Stream flow area = 3.110(Ac.)
Runoff from this stream = 6.053(CFS)
Time of concentration = 17.13 min.
Rainfall intensity = 2.452(In/Hr)
Area averaged loss rate (Fm) = 0.2900(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

Stream No.	Flow rate (CFS)	Area (Ac.)	TC (min)	Fm (In/Hr)	Rainfall Intensity (In/Hr)
1	34.06	19.150	22.19	0.070	2.047
2	132.13	51.640	13.42	0.067	2.910

3	6.05	3.110	17.13	0.290	2.452
---	------	-------	-------	-------	-------

$Q_{max}(1) =$
 $1.000 * 1.000 * 34.062) +$
 $0.696 * 1.000 * 132.125) +$
 $0.812 * 1.000 * 6.053) + = 130.996$

$Q_{max}(2) =$
 $1.437 * 0.605 * 34.062) +$
 $1.000 * 1.000 * 132.125) +$
 $1.211 * 0.783 * 6.053) + = 167.473$

$Q_{max}(3) =$
 $1.205 * 0.772 * 34.062) +$
 $0.839 * 1.000 * 132.125) +$
 $1.000 * 1.000 * 6.053) + = 148.639$

Total of 3 streams to confluence:

Flow rates before confluence point:

34.062 132.125 6.053

Maximum flow rates at confluence using above data:

130.996 167.473 148.639

Area of streams before confluence:

19.150 51.640 3.110

Effective area values after confluence:

73.900 65.661 69.539

Results of confluence:

Total flow rate = 167.473(CFS)

Time of concentration = 13.422 min.

Effective stream area after confluence = 65.661(Ac.)

Study area average Pervious fraction(A_p) = 0.138

Study area average soil loss rate(F_m) = 0.077(In/Hr)

Study area total (this main stream) = 73.90(Ac.)

End of computations, Total Study Area = 73.90 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(A_p) = 0.138

Area averaged SCS curve number = 41.1

Unit Hydrograph Analysis

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Study date 06/29/22

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6509

A22160 Q100 POST-DEVELOPMENT UNIT HYDROGRAPH

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
73.90	1	1.02

Rainfall data for year 100		
73.90	6	1.99

Rainfall data for year 100		
73.90	24	3.57

+++++

***** Area-averaged max loss rate, Fm *****

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
82.9	95.8	73.90	1.000	0.084	0.590	0.049

Area-averaged adjusted loss rate Fm (In/Hr) = 0.049

***** Area-Averaged low loss rate fraction, Yb *****

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
43.60	0.590	82.9	95.8	0.44	0.865
30.30	0.410	98.0	98.0	0.20	0.935

Area-averaged catchment yield fraction, Y = 0.893

Area-averaged low loss fraction, Yb = 0.107

User entry of time of concentration = 0.224 (hours)

+++++

Watershed area = 73.90(Ac.)

Catchment Lag time = 0.179 hours

Unit interval = 5.000 minutes

Unit interval percentage of lag time = 46.5030

Hydrograph baseflow = 0.00(CFS)

Average maximum watershed loss rate(Fm) = 0.049(In/Hr)

Average low loss rate fraction (Yb) = 0.107 (decimal)

VALLEY DEVELOPED S-Graph proportion = 0.750

VALLEY UNDEVELOPED S-Graph proportion = 0.000

FOOTHILL S-Graph proportion = 0.250

MOUNTAIN S-Graph proportion = 0.000

DESERT S-Graph proportion = 0.000

Computed peak 5-minute rainfall = 0.484(In)

Computed peak 30-minute rainfall = 0.828(In)

Specified peak 1-hour rainfall = 1.020(In)

Computed peak 3-hour rainfall = 1.537(In)

Specified peak 6-hour rainfall = 1.990(In)

Specified peak 24-hour rainfall = 3.570(In)

Rainfall depth area reduction factors:

Using a total area of 73.90(Ac.) (Ref: fig. E-4)

5-minute factor = 0.997 Adjusted rainfall = 0.482(In)

30-minute factor = 0.997 Adjusted rainfall = 0.826(In)

1-hour factor = 0.997 Adjusted rainfall = 1.016(In)

3-hour factor = 1.000 Adjusted rainfall = 1.536(In)

6-hour factor = 1.000 Adjusted rainfall = 1.990(In)
 24-hour factor = 1.000 Adjusted rainfall = 3.570(In)

U n i t H y d r o g r a p h

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
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(K = 893.73 (CFS))

1	3.958	35.373
2	24.585	184.355
3	61.780	332.415
4	83.621	195.202
5	92.616	80.392
6	96.156	31.638
7	97.798	14.674
8	99.025	10.965
9	99.427	3.593
10	99.599	1.539
11	99.719	1.074
12	99.803	0.744
13	99.887	0.758
14	99.953	0.585
15	99.987	0.307
16	100.000	0.115

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4823	0.4823
2	0.5938	0.1115
3	0.6706	0.0768
4	0.7311	0.0604
5	0.7817	0.0506
6	0.8256	0.0439
7	0.8647	0.0391
8	0.9000	0.0353
9	0.9324	0.0324
10	0.9624	0.0299
11	0.9903	0.0279
12	1.0165	0.0262
13	1.0475	0.0310
14	1.0771	0.0296
15	1.1054	0.0283
16	1.1325	0.0271
17	1.1586	0.0261
18	1.1838	0.0252
19	1.2080	0.0243
20	1.2316	0.0235

21	1.2543	0.0228
22	1.2765	0.0221
23	1.2980	0.0215
24	1.3189	0.0209
25	1.3393	0.0204
26	1.3592	0.0199
27	1.3786	0.0194
28	1.3975	0.0190
29	1.4161	0.0186
30	1.4342	0.0182
31	1.4520	0.0178
32	1.4695	0.0174
33	1.4865	0.0171
34	1.5033	0.0168
35	1.5198	0.0165
36	1.5360	0.0162
37	1.5517	0.0158
38	1.5673	0.0155
39	1.5825	0.0153
40	1.5976	0.0150
41	1.6124	0.0148
42	1.6269	0.0146
43	1.6413	0.0144
44	1.6554	0.0141
45	1.6694	0.0139
46	1.6831	0.0138
47	1.6967	0.0136
48	1.7101	0.0134
49	1.7233	0.0132
50	1.7363	0.0130
51	1.7492	0.0129
52	1.7620	0.0127
53	1.7745	0.0126
54	1.7870	0.0124
55	1.7992	0.0123
56	1.8114	0.0121
57	1.8234	0.0120
58	1.8353	0.0119
59	1.8470	0.0117
60	1.8586	0.0116
61	1.8701	0.0115
62	1.8815	0.0114
63	1.8928	0.0113
64	1.9040	0.0112
65	1.9150	0.0111
66	1.9260	0.0109
67	1.9368	0.0108
68	1.9475	0.0107
69	1.9582	0.0106
70	1.9687	0.0105

71	1.9792	0.0105
72	1.9895	0.0104
73	2.0011	0.0116
74	2.0127	0.0115
75	2.0241	0.0114
76	2.0354	0.0113
77	2.0467	0.0113
78	2.0578	0.0112
79	2.0689	0.0111
80	2.0799	0.0110
81	2.0908	0.0109
82	2.1017	0.0108
83	2.1125	0.0108
84	2.1232	0.0107
85	2.1338	0.0106
86	2.1443	0.0105
87	2.1548	0.0105
88	2.1652	0.0104
89	2.1756	0.0103
90	2.1858	0.0103
91	2.1960	0.0102
92	2.2062	0.0101
93	2.2163	0.0101
94	2.2263	0.0100
95	2.2362	0.0100
96	2.2461	0.0099
97	2.2560	0.0098
98	2.2658	0.0098
99	2.2755	0.0097
100	2.2851	0.0097
101	2.2947	0.0096
102	2.3043	0.0096
103	2.3138	0.0095
104	2.3232	0.0094
105	2.3326	0.0094
106	2.3420	0.0093
107	2.3513	0.0093
108	2.3605	0.0092
109	2.3697	0.0092
110	2.3788	0.0091
111	2.3879	0.0091
112	2.3970	0.0090
113	2.4060	0.0090
114	2.4149	0.0090
115	2.4239	0.0089
116	2.4327	0.0089
117	2.4415	0.0088
118	2.4503	0.0088
119	2.4591	0.0087
120	2.4678	0.0087

121	2.4764	0.0087
122	2.4850	0.0086
123	2.4936	0.0086
124	2.5021	0.0085
125	2.5106	0.0085
126	2.5190	0.0084
127	2.5275	0.0084
128	2.5358	0.0084
129	2.5442	0.0083
130	2.5525	0.0083
131	2.5607	0.0083
132	2.5690	0.0082
133	2.5771	0.0082
134	2.5853	0.0082
135	2.5934	0.0081
136	2.6015	0.0081
137	2.6095	0.0080
138	2.6176	0.0080
139	2.6255	0.0080
140	2.6335	0.0079
141	2.6414	0.0079
142	2.6493	0.0079
143	2.6571	0.0079
144	2.6650	0.0078
145	2.6727	0.0078
146	2.6805	0.0078
147	2.6882	0.0077
148	2.6959	0.0077
149	2.7036	0.0077
150	2.7112	0.0076
151	2.7188	0.0076
152	2.7264	0.0076
153	2.7340	0.0075
154	2.7415	0.0075
155	2.7490	0.0075
156	2.7564	0.0075
157	2.7639	0.0074
158	2.7713	0.0074
159	2.7787	0.0074
160	2.7860	0.0074
161	2.7934	0.0073
162	2.8007	0.0073
163	2.8079	0.0073
164	2.8152	0.0073
165	2.8224	0.0072
166	2.8296	0.0072
167	2.8368	0.0072
168	2.8439	0.0072
169	2.8511	0.0071
170	2.8582	0.0071

171	2.8652	0.0071
172	2.8723	0.0071
173	2.8793	0.0070
174	2.8863	0.0070
175	2.8933	0.0070
176	2.9003	0.0070
177	2.9072	0.0069
178	2.9141	0.0069
179	2.9210	0.0069
180	2.9279	0.0069
181	2.9347	0.0068
182	2.9416	0.0068
183	2.9484	0.0068
184	2.9552	0.0068
185	2.9619	0.0068
186	2.9687	0.0067
187	2.9754	0.0067
188	2.9821	0.0067
189	2.9888	0.0067
190	2.9954	0.0067
191	3.0021	0.0066
192	3.0087	0.0066
193	3.0153	0.0066
194	3.0218	0.0066
195	3.0284	0.0066
196	3.0349	0.0065
197	3.0415	0.0065
198	3.0480	0.0065
199	3.0544	0.0065
200	3.0609	0.0065
201	3.0674	0.0064
202	3.0738	0.0064
203	3.0802	0.0064
204	3.0866	0.0064
205	3.0929	0.0064
206	3.0993	0.0064
207	3.1056	0.0063
208	3.1120	0.0063
209	3.1183	0.0063
210	3.1245	0.0063
211	3.1308	0.0063
212	3.1370	0.0062
213	3.1433	0.0062
214	3.1495	0.0062
215	3.1557	0.0062
216	3.1619	0.0062
217	3.1680	0.0062
218	3.1742	0.0061
219	3.1803	0.0061
220	3.1864	0.0061

221	3.1925	0.0061
222	3.1986	0.0061
223	3.2047	0.0061
224	3.2107	0.0061
225	3.2168	0.0060
226	3.2228	0.0060
227	3.2288	0.0060
228	3.2348	0.0060
229	3.2408	0.0060
230	3.2467	0.0060
231	3.2527	0.0059
232	3.2586	0.0059
233	3.2645	0.0059
234	3.2704	0.0059
235	3.2763	0.0059
236	3.2822	0.0059
237	3.2880	0.0059
238	3.2939	0.0058
239	3.2997	0.0058
240	3.3055	0.0058
241	3.3113	0.0058
242	3.3171	0.0058
243	3.3229	0.0058
244	3.3286	0.0058
245	3.3344	0.0057
246	3.3401	0.0057
247	3.3458	0.0057
248	3.3515	0.0057
249	3.3572	0.0057
250	3.3629	0.0057
251	3.3686	0.0057
252	3.3742	0.0057
253	3.3799	0.0056
254	3.3855	0.0056
255	3.3911	0.0056
256	3.3967	0.0056
257	3.4023	0.0056
258	3.4079	0.0056
259	3.4134	0.0056
260	3.4190	0.0056
261	3.4245	0.0055
262	3.4301	0.0055
263	3.4356	0.0055
264	3.4411	0.0055
265	3.4466	0.0055
266	3.4520	0.0055
267	3.4575	0.0055
268	3.4630	0.0055
269	3.4684	0.0054
270	3.4738	0.0054

271	3.4793	0.0054
272	3.4847	0.0054
273	3.4901	0.0054
274	3.4954	0.0054
275	3.5008	0.0054
276	3.5062	0.0054
277	3.5115	0.0054
278	3.5169	0.0053
279	3.5222	0.0053
280	3.5275	0.0053
281	3.5328	0.0053
282	3.5381	0.0053
283	3.5434	0.0053
284	3.5487	0.0053
285	3.5539	0.0053
286	3.5592	0.0053
287	3.5644	0.0052
288	3.5697	0.0052

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0052	0.0006	0.0047
2	0.0052	0.0006	0.0047
3	0.0053	0.0006	0.0047
4	0.0053	0.0006	0.0047
5	0.0053	0.0006	0.0047
6	0.0053	0.0006	0.0047
7	0.0053	0.0006	0.0048
8	0.0053	0.0006	0.0048
9	0.0054	0.0006	0.0048
10	0.0054	0.0006	0.0048
11	0.0054	0.0006	0.0048
12	0.0054	0.0006	0.0048
13	0.0054	0.0006	0.0049
14	0.0054	0.0006	0.0049
15	0.0055	0.0006	0.0049
16	0.0055	0.0006	0.0049
17	0.0055	0.0006	0.0049
18	0.0055	0.0006	0.0049
19	0.0055	0.0006	0.0049
20	0.0056	0.0006	0.0050
21	0.0056	0.0006	0.0050
22	0.0056	0.0006	0.0050
23	0.0056	0.0006	0.0050
24	0.0056	0.0006	0.0050
25	0.0057	0.0006	0.0051
26	0.0057	0.0006	0.0051
27	0.0057	0.0006	0.0051

28	0.0057	0.0006	0.0051
29	0.0057	0.0006	0.0051
30	0.0057	0.0006	0.0051
31	0.0058	0.0006	0.0052
32	0.0058	0.0006	0.0052
33	0.0058	0.0006	0.0052
34	0.0058	0.0006	0.0052
35	0.0059	0.0006	0.0052
36	0.0059	0.0006	0.0052
37	0.0059	0.0006	0.0053
38	0.0059	0.0006	0.0053
39	0.0059	0.0006	0.0053
40	0.0060	0.0006	0.0053
41	0.0060	0.0006	0.0054
42	0.0060	0.0006	0.0054
43	0.0060	0.0006	0.0054
44	0.0061	0.0006	0.0054
45	0.0061	0.0006	0.0054
46	0.0061	0.0006	0.0054
47	0.0061	0.0007	0.0055
48	0.0061	0.0007	0.0055
49	0.0062	0.0007	0.0055
50	0.0062	0.0007	0.0055
51	0.0062	0.0007	0.0056
52	0.0062	0.0007	0.0056
53	0.0063	0.0007	0.0056
54	0.0063	0.0007	0.0056
55	0.0063	0.0007	0.0057
56	0.0064	0.0007	0.0057
57	0.0064	0.0007	0.0057
58	0.0064	0.0007	0.0057
59	0.0064	0.0007	0.0058
60	0.0065	0.0007	0.0058
61	0.0065	0.0007	0.0058
62	0.0065	0.0007	0.0058
63	0.0066	0.0007	0.0059
64	0.0066	0.0007	0.0059
65	0.0066	0.0007	0.0059
66	0.0066	0.0007	0.0059
67	0.0067	0.0007	0.0060
68	0.0067	0.0007	0.0060
69	0.0067	0.0007	0.0060
70	0.0068	0.0007	0.0060
71	0.0068	0.0007	0.0061
72	0.0068	0.0007	0.0061
73	0.0069	0.0007	0.0061
74	0.0069	0.0007	0.0062
75	0.0069	0.0007	0.0062
76	0.0070	0.0007	0.0062
77	0.0070	0.0007	0.0063

78	0.0070	0.0007	0.0063
79	0.0071	0.0008	0.0063
80	0.0071	0.0008	0.0063
81	0.0072	0.0008	0.0064
82	0.0072	0.0008	0.0064
83	0.0072	0.0008	0.0065
84	0.0073	0.0008	0.0065
85	0.0073	0.0008	0.0065
86	0.0073	0.0008	0.0065
87	0.0074	0.0008	0.0066
88	0.0074	0.0008	0.0066
89	0.0075	0.0008	0.0067
90	0.0075	0.0008	0.0067
91	0.0075	0.0008	0.0067
92	0.0076	0.0008	0.0068
93	0.0076	0.0008	0.0068
94	0.0077	0.0008	0.0068
95	0.0077	0.0008	0.0069
96	0.0078	0.0008	0.0069
97	0.0078	0.0008	0.0070
98	0.0079	0.0008	0.0070
99	0.0079	0.0008	0.0071
100	0.0079	0.0008	0.0071
101	0.0080	0.0009	0.0072
102	0.0080	0.0009	0.0072
103	0.0081	0.0009	0.0073
104	0.0082	0.0009	0.0073
105	0.0082	0.0009	0.0073
106	0.0083	0.0009	0.0074
107	0.0083	0.0009	0.0074
108	0.0084	0.0009	0.0075
109	0.0084	0.0009	0.0075
110	0.0085	0.0009	0.0076
111	0.0086	0.0009	0.0077
112	0.0086	0.0009	0.0077
113	0.0087	0.0009	0.0078
114	0.0087	0.0009	0.0078
115	0.0088	0.0009	0.0079
116	0.0089	0.0009	0.0079
117	0.0090	0.0010	0.0080
118	0.0090	0.0010	0.0080
119	0.0091	0.0010	0.0081
120	0.0091	0.0010	0.0082
121	0.0092	0.0010	0.0083
122	0.0093	0.0010	0.0083
123	0.0094	0.0010	0.0084
124	0.0094	0.0010	0.0084
125	0.0096	0.0010	0.0085
126	0.0096	0.0010	0.0086
127	0.0097	0.0010	0.0087

128	0.0098	0.0010	0.0087
129	0.0099	0.0011	0.0088
130	0.0100	0.0011	0.0089
131	0.0101	0.0011	0.0090
132	0.0101	0.0011	0.0091
133	0.0103	0.0011	0.0092
134	0.0103	0.0011	0.0092
135	0.0105	0.0011	0.0094
136	0.0105	0.0011	0.0094
137	0.0107	0.0011	0.0096
138	0.0108	0.0011	0.0096
139	0.0109	0.0012	0.0098
140	0.0110	0.0012	0.0098
141	0.0112	0.0012	0.0100
142	0.0113	0.0012	0.0101
143	0.0114	0.0012	0.0102
144	0.0115	0.0012	0.0103
145	0.0104	0.0011	0.0093
146	0.0105	0.0011	0.0093
147	0.0106	0.0011	0.0095
148	0.0107	0.0011	0.0096
149	0.0109	0.0012	0.0098
150	0.0111	0.0012	0.0099
151	0.0113	0.0012	0.0101
152	0.0114	0.0012	0.0102
153	0.0116	0.0012	0.0104
154	0.0117	0.0013	0.0105
155	0.0120	0.0013	0.0107
156	0.0121	0.0013	0.0108
157	0.0124	0.0013	0.0111
158	0.0126	0.0013	0.0112
159	0.0129	0.0014	0.0115
160	0.0130	0.0014	0.0117
161	0.0134	0.0014	0.0120
162	0.0136	0.0014	0.0121
163	0.0139	0.0015	0.0125
164	0.0141	0.0015	0.0126
165	0.0146	0.0016	0.0130
166	0.0148	0.0016	0.0132
167	0.0153	0.0016	0.0136
168	0.0155	0.0017	0.0139
169	0.0162	0.0017	0.0145
170	0.0165	0.0018	0.0147
171	0.0171	0.0018	0.0153
172	0.0174	0.0019	0.0156
173	0.0182	0.0019	0.0162
174	0.0186	0.0020	0.0166
175	0.0194	0.0021	0.0173
176	0.0199	0.0021	0.0178
177	0.0209	0.0022	0.0187

178	0.0215	0.0023	0.0192
179	0.0228	0.0024	0.0204
180	0.0235	0.0025	0.0210
181	0.0252	0.0027	0.0225
182	0.0261	0.0028	0.0233
183	0.0283	0.0030	0.0253
184	0.0296	0.0032	0.0264
185	0.0262	0.0028	0.0234
186	0.0279	0.0030	0.0249
187	0.0324	0.0034	0.0289
188	0.0353	0.0038	0.0316
189	0.0439	0.0041	0.0398
190	0.0506	0.0041	0.0465
191	0.0768	0.0041	0.0727
192	0.1115	0.0041	0.1074
193	0.4823	0.0041	0.4782
194	0.0604	0.0041	0.0563
195	0.0391	0.0041	0.0350
196	0.0299	0.0032	0.0268
197	0.0310	0.0033	0.0277
198	0.0271	0.0029	0.0242
199	0.0243	0.0026	0.0217
200	0.0221	0.0024	0.0198
201	0.0204	0.0022	0.0182
202	0.0190	0.0020	0.0169
203	0.0178	0.0019	0.0159
204	0.0168	0.0018	0.0150
205	0.0158	0.0017	0.0141
206	0.0150	0.0016	0.0134
207	0.0144	0.0015	0.0128
208	0.0138	0.0015	0.0123
209	0.0132	0.0014	0.0118
210	0.0127	0.0014	0.0114
211	0.0123	0.0013	0.0110
212	0.0119	0.0013	0.0106
213	0.0115	0.0012	0.0103
214	0.0112	0.0012	0.0100
215	0.0108	0.0012	0.0097
216	0.0105	0.0011	0.0094
217	0.0116	0.0012	0.0104
218	0.0113	0.0012	0.0101
219	0.0111	0.0012	0.0099
220	0.0108	0.0012	0.0097
221	0.0106	0.0011	0.0095
222	0.0104	0.0011	0.0093
223	0.0102	0.0011	0.0091
224	0.0100	0.0011	0.0090
225	0.0098	0.0010	0.0088
226	0.0097	0.0010	0.0086
227	0.0095	0.0010	0.0085

228	0.0093	0.0010	0.0083
229	0.0092	0.0010	0.0082
230	0.0090	0.0010	0.0081
231	0.0089	0.0009	0.0080
232	0.0088	0.0009	0.0078
233	0.0087	0.0009	0.0077
234	0.0085	0.0009	0.0076
235	0.0084	0.0009	0.0075
236	0.0083	0.0009	0.0074
237	0.0082	0.0009	0.0073
238	0.0081	0.0009	0.0072
239	0.0080	0.0009	0.0071
240	0.0079	0.0008	0.0070
241	0.0078	0.0008	0.0070
242	0.0077	0.0008	0.0069
243	0.0076	0.0008	0.0068
244	0.0075	0.0008	0.0067
245	0.0074	0.0008	0.0066
246	0.0074	0.0008	0.0066
247	0.0073	0.0008	0.0065
248	0.0072	0.0008	0.0064
249	0.0071	0.0008	0.0064
250	0.0071	0.0008	0.0063
251	0.0070	0.0007	0.0062
252	0.0069	0.0007	0.0062
253	0.0068	0.0007	0.0061
254	0.0068	0.0007	0.0061
255	0.0067	0.0007	0.0060
256	0.0067	0.0007	0.0059
257	0.0066	0.0007	0.0059
258	0.0065	0.0007	0.0058
259	0.0065	0.0007	0.0058
260	0.0064	0.0007	0.0057
261	0.0064	0.0007	0.0057
262	0.0063	0.0007	0.0056
263	0.0063	0.0007	0.0056
264	0.0062	0.0007	0.0056
265	0.0062	0.0007	0.0055
266	0.0061	0.0007	0.0055
267	0.0061	0.0006	0.0054
268	0.0060	0.0006	0.0054
269	0.0060	0.0006	0.0053
270	0.0059	0.0006	0.0053
271	0.0059	0.0006	0.0053
272	0.0058	0.0006	0.0052
273	0.0058	0.0006	0.0052
274	0.0058	0.0006	0.0051
275	0.0057	0.0006	0.0051
276	0.0057	0.0006	0.0051
277	0.0056	0.0006	0.0050

278	0.0056	0.0006	0.0050
279	0.0056	0.0006	0.0050
280	0.0055	0.0006	0.0049
281	0.0055	0.0006	0.0049
282	0.0055	0.0006	0.0049
283	0.0054	0.0006	0.0048
284	0.0054	0.0006	0.0048
285	0.0054	0.0006	0.0048
286	0.0053	0.0006	0.0048
287	0.0053	0.0006	0.0047
288	0.0053	0.0006	0.0047

 Total soil rain loss = 0.32(In)
 Total effective rainfall = 3.25(In)
 Peak flow rate in flood hydrograph = 200.03(CFS)

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24 - H O U R S T O R M
 R u n o f f H y d r o g r a p h

 Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	75.0	150.0	225.0	300.0
0+ 5	0.0011	0.17	Q					
0+10	0.0082	1.03	Q					
0+15	0.0260	2.58	Q					
0+20	0.0501	3.50	Q					
0+25	0.0769	3.89	Q					
0+30	0.1048	4.05	Q					
0+35	0.1333	4.13	Q					
0+40	0.1621	4.19	Q					
0+45	0.1912	4.22	Q					
0+50	0.2205	4.24	Q					
0+55	0.2498	4.26	Q					
1+ 0	0.2793	4.28	Q					
1+ 5	0.3089	4.30	Q					
1+10	0.3386	4.31	Q					
1+15	0.3684	4.33	Q					
1+20	0.3983	4.34	Q					
1+25	0.4283	4.36	Q					
1+30	0.4584	4.37	Q					
1+35	0.4886	4.39	Q					
1+40	0.5189	4.40	QV					
1+45	0.5493	4.41	QV					
1+50	0.5798	4.43	QV					
1+55	0.6104	4.44	QV					
2+ 0	0.6411	4.46	QV					

2+ 5	0.6719	4.47	QV
2+10	0.7029	4.49	QV
2+15	0.7339	4.50	QV
2+20	0.7650	4.52	QV
2+25	0.7963	4.54	QV
2+30	0.8276	4.55	QV
2+35	0.8591	4.57	QV
2+40	0.8906	4.58	QV
2+45	0.9223	4.60	QV
2+50	0.9541	4.62	QV
2+55	0.9860	4.63	QV
3+ 0	1.0181	4.65	Q V
3+ 5	1.0502	4.67	Q V
3+10	1.0825	4.68	Q V
3+15	1.1148	4.70	Q V
3+20	1.1473	4.72	Q V
3+25	1.1800	4.74	Q V
3+30	1.2127	4.75	Q V
3+35	1.2456	4.77	Q V
3+40	1.2786	4.79	Q V
3+45	1.3117	4.81	Q V
3+50	1.3450	4.83	Q V
3+55	1.3783	4.85	Q V
4+ 0	1.4118	4.87	Q V
4+ 5	1.4455	4.89	Q V
4+10	1.4793	4.90	Q V
4+15	1.5132	4.92	Q V
4+20	1.5472	4.94	Q V
4+25	1.5814	4.96	Q V
4+30	1.6157	4.98	Q V
4+35	1.6502	5.01	Q V
4+40	1.6848	5.03	Q V
4+45	1.7196	5.05	Q V
4+50	1.7545	5.07	Q V
4+55	1.7895	5.09	Q V
5+ 0	1.8247	5.11	Q V
5+ 5	1.8601	5.13	Q V
5+10	1.8956	5.16	Q V
5+15	1.9313	5.18	Q V
5+20	1.9671	5.20	Q V
5+25	2.0030	5.22	Q V
5+30	2.0392	5.25	Q V
5+35	2.0755	5.27	Q V
5+40	2.1119	5.29	Q V
5+45	2.1486	5.32	Q V
5+50	2.1854	5.34	Q V
5+55	2.2223	5.37	Q V
6+ 0	2.2595	5.39	Q V
6+ 5	2.2968	5.42	Q V
6+10	2.3343	5.44	Q V

6+15	2.3720	5.47	Q	V				
6+20	2.4098	5.50	Q	V				
6+25	2.4479	5.52	Q	V				
6+30	2.4861	5.55	Q	V				
6+35	2.5245	5.58	Q	V				
6+40	2.5632	5.61	Q	V				
6+45	2.6020	5.64	Q	V				
6+50	2.6410	5.66	Q	V				
6+55	2.6802	5.69	Q	V				
7+ 0	2.7196	5.72	Q	V				
7+ 5	2.7592	5.75	Q	V				
7+10	2.7990	5.78	Q	V				
7+15	2.8391	5.81	Q	V				
7+20	2.8793	5.84	Q	V				
7+25	2.9198	5.88	Q	V				
7+30	2.9605	5.91	Q	V				
7+35	3.0014	5.94	Q	V				
7+40	3.0426	5.97	Q	V				
7+45	3.0840	6.01	Q	V				
7+50	3.1256	6.04	Q	V				
7+55	3.1674	6.08	Q	V				
8+ 0	3.2095	6.11	Q	V				
8+ 5	3.2519	6.15	Q	V				
8+10	3.2945	6.19	Q	V				
8+15	3.3373	6.22	Q	V				
8+20	3.3804	6.26	Q	V				
8+25	3.4238	6.30	Q	V				
8+30	3.4675	6.34	Q	V				
8+35	3.5114	6.38	Q	V				
8+40	3.5556	6.42	Q	V				
8+45	3.6001	6.46	Q	V				
8+50	3.6448	6.50	Q	V				
8+55	3.6899	6.54	Q	V				
9+ 0	3.7353	6.59	Q	V				
9+ 5	3.7809	6.63	Q	V				
9+10	3.8269	6.67	Q	V				
9+15	3.8732	6.72	Q	V				
9+20	3.9198	6.77	Q	V				
9+25	3.9667	6.82	Q	V				
9+30	4.0140	6.86	Q	V				
9+35	4.0616	6.91	Q	V				
9+40	4.1096	6.96	Q	V				
9+45	4.1579	7.01	Q	V				
9+50	4.2065	7.07	Q	V				
9+55	4.2556	7.12	Q	V				
10+ 0	4.3050	7.17	Q	V				
10+ 5	4.3548	7.23	Q	V				
10+10	4.4050	7.29	Q	V				
10+15	4.4556	7.35	Q	V				
10+20	4.5066	7.40	Q	V				

10+25	4.5580	7.47	Q	V				
10+30	4.6098	7.53	Q	V				
10+35	4.6621	7.59	Q	V				
10+40	4.7149	7.66	Q	V				
10+45	4.7681	7.72	Q	V				
10+50	4.8217	7.79	Q	V				
10+55	4.8759	7.86	Q	V				
11+ 0	4.9305	7.93	Q	V				
11+ 5	4.9857	8.01	Q	V				
11+10	5.0413	8.08	Q	V				
11+15	5.0975	8.16	Q	V				
11+20	5.1543	8.24	Q	V				
11+25	5.2116	8.32	Q	V				
11+30	5.2695	8.40	Q	V				
11+35	5.3280	8.49	Q	V				
11+40	5.3870	8.58	Q	V				
11+45	5.4468	8.67	Q	V				
11+50	5.5071	8.76	Q	V				
11+55	5.5682	8.86	Q	V				
12+ 0	5.6299	8.96	Q	V				
12+ 5	5.6920	9.02	Q	V				
12+10	5.7533	8.91	Q	V				
12+15	5.8127	8.62	Q	V				
12+20	5.8712	8.49	Q	V				
12+25	5.9299	8.51	Q	V				
12+30	5.9890	8.59	Q	V				
12+35	6.0489	8.70	Q	V				
12+40	6.1096	8.81	Q	V				
12+45	6.1711	8.93	Q	V				
12+50	6.2335	9.07	Q	V				
12+55	6.2970	9.21	Q	V				
13+ 0	6.3614	9.35	Q	V				
13+ 5	6.4268	9.51	Q	V				
13+10	6.4934	9.66	Q	V				
13+15	6.5611	9.83	Q	V				
13+20	6.6299	10.00	Q	V				
13+25	6.7001	10.19	Q	V				
13+30	6.7716	10.38	Q	V				
13+35	6.8444	10.58	Q	V				
13+40	6.9187	10.79	Q	V				
13+45	6.9946	11.02	Q	V				
13+50	7.0721	11.25	Q	V				
13+55	7.1513	11.50	Q	V				
14+ 0	7.2322	11.76	Q	V				
14+ 5	7.3152	12.05	Q	V				
14+10	7.4003	12.36	Q	V				
14+15	7.4879	12.71	Q	V				
14+20	7.5779	13.07	Q	V				
14+25	7.6705	13.45	Q	V				
14+30	7.7658	13.84	Q	V				

14+35	7.8641	14.27	Q		V			
14+40	7.9655	14.73	Q		V			
14+45	8.0704	15.24	Q		V			
14+50	8.1791	15.78	Q		V			
14+55	8.2921	16.40	Q		V			
15+ 0	8.4095	17.06	Q		V			
15+ 5	8.5323	17.82	Q		V			
15+10	8.6607	18.65	Q		V			
15+15	8.7958	19.62	Q		V			
15+20	8.9384	20.70	Q		V			
15+25	9.0884	21.79	Q		V			
15+30	9.2413	22.19	Q		V			
15+35	9.3931	22.05	Q		V			
15+40	9.5515	22.99	Q		V			
15+45	9.7253	25.24	Q		V			
15+50	9.9232	28.73	Q		V			
15+55	10.1608	34.50	Q		V			
16+ 0	10.4688	44.72	Q		V			
16+ 5	10.9857	75.06		Q	V			
16+10	11.9915	146.03			Q	V		
16+15	13.3691	200.03				Q		
16+20	14.2766	131.77			Q		V	
16+25	14.7741	72.24		Q			V	
16+30	15.0774	44.05		Q			V	
16+35	15.3041	32.91		Q			V	
16+40	15.4978	28.13		Q			V	
16+45	15.6528	22.50	Q				V	
16+50	15.7874	19.55	Q				V	
16+55	15.9094	17.72	Q				V	
17+ 0	16.0216	16.29	Q				V	
17+ 5	16.1263	15.20	Q				V	
17+10	16.2239	14.17	Q				V	
17+15	16.3149	13.22	Q				V	
17+20	16.4006	12.44	Q				V	
17+25	16.4817	11.79	Q				V	
17+30	16.5593	11.26	Q				V	
17+35	16.6336	10.79	Q				V	
17+40	16.7051	10.38	Q				V	
17+45	16.7740	10.00	Q				V	
17+50	16.8405	9.66	Q				V	
17+55	16.9048	9.34	Q				V	
18+ 0	16.9671	9.05	Q				V	
18+ 5	17.0279	8.83	Q				V	
18+10	17.0886	8.80	Q				V	
18+15	17.1503	8.97	Q				V	
18+20	17.2122	8.98	Q				V	
18+25	17.2733	8.87	Q				V	
18+30	17.3333	8.71	Q				V	
18+35	17.3921	8.54	Q				V	
18+40	17.4499	8.38	Q				V	

18+45	17.5065	8.22	Q				V	
18+50	17.5620	8.07	Q				V	
18+55	17.6166	7.92	Q				V	
19+ 0	17.6702	7.78	Q				V	
19+ 5	17.7228	7.65	Q				V	
19+10	17.7746	7.52	Q				V	
19+15	17.8256	7.40	Q				V	
19+20	17.8757	7.28	Q				V	
19+25	17.9250	7.17	Q				V	
19+30	17.9736	7.06	Q				V	
19+35	18.0215	6.95	Q				V	
19+40	18.0688	6.86	Q				V	
19+45	18.1153	6.76	Q				V	
19+50	18.1612	6.67	Q				V	
19+55	18.2065	6.58	Q				V	
20+ 0	18.2513	6.49	Q				V	
20+ 5	18.2954	6.41	Q				V	
20+10	18.3390	6.33	Q				V	
20+15	18.3821	6.25	Q				V	
20+20	18.4246	6.18	Q				V	
20+25	18.4667	6.11	Q				V	
20+30	18.5083	6.04	Q				V	
20+35	18.5494	5.97	Q				V	
20+40	18.5900	5.90	Q				V	
20+45	18.6302	5.84	Q				V	
20+50	18.6700	5.78	Q				V	
20+55	18.7094	5.72	Q				V	
21+ 0	18.7484	5.66	Q				V	
21+ 5	18.7870	5.60	Q				V	
21+10	18.8252	5.55	Q				V	
21+15	18.8630	5.49	Q				V	
21+20	18.9004	5.44	Q				V	
21+25	18.9375	5.39	Q				V	
21+30	18.9743	5.34	Q				V	
21+35	19.0107	5.29	Q				V	
21+40	19.0469	5.24	Q				V	
21+45	19.0826	5.20	Q				V	
21+50	19.1181	5.15	Q				V	
21+55	19.1533	5.11	Q				V	
22+ 0	19.1882	5.06	Q				V	
22+ 5	19.2227	5.02	Q				V	
22+10	19.2570	4.98	Q				V	
22+15	19.2911	4.94	Q				V	
22+20	19.3248	4.90	Q				V	
22+25	19.3583	4.86	Q				V	
22+30	19.3915	4.82	Q				V	
22+35	19.4245	4.79	Q				V	
22+40	19.4572	4.75	Q				V	
22+45	19.4897	4.72	Q				V	
22+50	19.5219	4.68	Q				V	

22+55	19.5539	4.65	Q				V
23+ 0	19.5857	4.61	Q				V
23+ 5	19.6173	4.58	Q				V
23+10	19.6486	4.55	Q				V
23+15	19.6797	4.52	Q				V
23+20	19.7106	4.49	Q				V
23+25	19.7413	4.46	Q				V
23+30	19.7718	4.43	Q				V
23+35	19.8020	4.40	Q				V
23+40	19.8321	4.37	Q				V
23+45	19.8620	4.34	Q				V
23+50	19.8917	4.31	Q				V
23+55	19.9212	4.28	Q				V
24+ 0	19.9505	4.26	Q				V

Basin
Project: A22160
Basin Description: Basin

Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)	Incremental Volume Conic (cu. ft)	Cumulative Volume Conic (cu. ft)
2,940.00	27,232.67	N/A	N/A	0	N/A	0
2,940.50	28,482.28	0.5	13928.74	13928.74	13927.57	13927.57
2,941.00	29,746.68	0.5	14557.24	28485.98	14556.1	28483.67
2,941.50	31,025.85	0.5	15193.13	43679.11	15192.01	43675.68
2,942.00	32,319.81	0.5	15836.42	59515.53	15835.31	59510.99
2,942.50	33,628.55	0.5	16487.09	76002.62	16486.01	75997
2,943.00	34,952.07	0.5	17145.15	93147.77	17144.09	93141.09
2,943.50	36,290.37	0.5	17810.61	110958.4	17809.56	110950.7
2,944.00	37,643.45	0.5	18483.46	129441.8	18482.42	129433.1
2,944.50	39,011.32	0.5	19163.69	148605.5	19162.68	148595.8
2,945.00	40,393.96	0.5	19851.32	168456.9	19850.32	168446.1
2,945.50	41,791.39	0.5	20546.34	189003.2	20545.35	188991.4
2,946.00	43,203.60	0.5	21248.75	210251.9	21247.77	210239.2
2,946.50	44,630.60	0.5	21958.55	232210.5	21957.58	232196.8
2,947.00	46,072.37	0.5	22675.74	254886.2	22674.79	254871.6
2,947.50	47,528.92	0.5	23400.32	278286.6	23399.38	278270.9
2,948.00	49,000.26	0.5	24132.3	302418.9	24131.36	302402.3
2,948.50	50,486.38	0.5	24871.66	327290.5	24870.73	327273
2,949.00	51,987.28	0.5	25618.41	352908.9	25617.5	352890.5
2,949.50	53,502.96	0.5	26372.56	379281.5	26371.65	379262.2
2,950.00	55,033.42	0.5	27134.1	406415.6	27133.2	406395.4
2,950.50	56,578.67	0.5	27903.02	434318.6	27902.13	434297.5
2,951.00	58,138.70	0.5	28679.34	462997.9	28678.46	462976
2,951.50	59,713.50	0.5	29463.05	492461	29462.17	492438.1
2,952.00	61,303.10	0.5	30254.15	522715.1	30253.28	522691.4
2,952.50	62,907.47	0.5	31052.64	553767.8	31051.78	553743.2
2,953.00	64,526.62	0.5	31858.52	585626.3	31857.66	585600.9
2,953.50	66,164.04	0.5	32672.17	617950.5	32671.15	617925
2,954.00	67,820.60	0.5	33506.41	647856.9	33505.11	647797.1
2,954.50	69,496.40	0.5	34363.93	677149.9	34362.36	677102.5
2,955.00	71,191.15	0.5	35239.14	7069039	35238.61	7068800.1
2,955.50	72,904.23	0.5	36148.35	7369487.4	36147.5	7369013.6
2,956.00	74,635.01	0.5	37085.81	76703463.2	37084.09	76702636.7
2,956.50	76,384.91	0.5	38042.98	79704186.2	38041.61	79703274.3



NOAA Atlas 14, Volume 6, Version 2
Location name: Adelanto, California, USA*
Latitude: 34.5558°, Longitude: -117.3946°
Elevation: 2957.24 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.086 (0.071-0.105)	0.119 (0.098-0.146)	0.166 (0.136-0.204)	0.205 (0.167-0.254)	0.261 (0.206-0.334)	0.306 (0.236-0.400)	0.353 (0.266-0.473)	0.404 (0.296-0.556)	0.475 (0.335-0.682)	0.533 (0.362-0.791)
10-min	0.123 (0.101-0.150)	0.171 (0.141-0.210)	0.237 (0.195-0.292)	0.294 (0.239-0.364)	0.374 (0.295-0.478)	0.438 (0.339-0.573)	0.506 (0.382-0.678)	0.579 (0.425-0.797)	0.681 (0.480-0.977)	0.764 (0.520-1.13)
15-min	0.148 (0.123-0.182)	0.207 (0.171-0.253)	0.287 (0.236-0.353)	0.355 (0.290-0.440)	0.452 (0.357-0.579)	0.530 (0.410-0.693)	0.612 (0.462-0.820)	0.700 (0.513-0.964)	0.824 (0.580-1.18)	0.924 (0.628-1.37)
30-min	0.203 (0.168-0.249)	0.283 (0.233-0.347)	0.393 (0.323-0.483)	0.486 (0.396-0.602)	0.619 (0.488-0.792)	0.725 (0.561-0.948)	0.838 (0.632-1.12)	0.958 (0.703-1.32)	1.13 (0.794-1.62)	1.26 (0.860-1.88)
60-min	0.246 (0.203-0.302)	0.343 (0.283-0.421)	0.477 (0.392-0.586)	0.590 (0.481-0.730)	0.750 (0.592-0.961)	0.880 (0.680-1.15)	1.02 (0.767-1.36)	1.16 (0.853-1.60)	1.37 (0.963-1.96)	1.53 (1.04-2.28)
2-hr	0.343 (0.283-0.420)	0.463 (0.381-0.567)	0.628 (0.516-0.771)	0.768 (0.626-0.951)	0.968 (0.764-1.24)	1.13 (0.873-1.48)	1.30 (0.981-1.74)	1.48 (1.09-2.04)	1.74 (1.22-2.49)	1.94 (1.32-2.88)
3-hr	0.413 (0.341-0.505)	0.551 (0.454-0.675)	0.741 (0.609-0.910)	0.903 (0.737-1.12)	1.14 (0.896-1.45)	1.32 (1.02-1.73)	1.52 (1.15-2.04)	1.73 (1.27-2.38)	2.03 (1.43-2.91)	2.26 (1.54-3.36)
6-hr	0.553 (0.457-0.677)	0.734 (0.605-0.899)	0.982 (0.808-1.21)	1.19 (0.974-1.48)	1.50 (1.18-1.91)	1.74 (1.34-2.27)	1.99 (1.50-2.67)	2.27 (1.66-3.12)	2.65 (1.87-3.80)	2.96 (2.01-4.39)
12-hr	0.691 (0.571-0.846)	0.937 (0.772-1.15)	1.27 (1.05-1.56)	1.55 (1.27-1.92)	1.95 (1.54-2.50)	2.27 (1.75-2.97)	2.60 (1.96-3.49)	2.95 (2.17-4.07)	3.45 (2.43-4.94)	3.84 (2.61-5.70)
24-hr	0.896 (0.794-1.03)	1.25 (1.11-1.44)	1.72 (1.52-1.99)	2.12 (1.86-2.47)	2.67 (2.27-3.22)	3.11 (2.58-3.83)	3.57 (2.89-4.50)	4.05 (3.19-5.25)	4.72 (3.57-6.38)	5.26 (3.84-7.35)
2-day	1.00 (0.888-1.15)	1.41 (1.25-1.63)	1.97 (1.74-2.27)	2.43 (2.13-2.83)	3.08 (2.61-3.71)	3.60 (2.98-4.42)	4.13 (3.35-5.20)	4.70 (3.70-6.08)	5.48 (4.14-7.40)	6.10 (4.46-8.53)
3-day	1.08 (0.959-1.24)	1.53 (1.36-1.76)	2.15 (1.90-2.48)	2.66 (2.33-3.10)	3.37 (2.86-4.06)	3.94 (3.27-4.84)	4.53 (3.67-5.70)	5.15 (4.06-6.67)	6.02 (4.55-8.13)	6.72 (4.90-9.38)
4-day	1.15 (1.02-1.32)	1.63 (1.44-1.88)	2.29 (2.02-2.64)	2.84 (2.49-3.30)	3.60 (3.05-4.33)	4.20 (3.49-5.16)	4.83 (3.91-6.08)	5.49 (4.33-7.11)	6.41 (4.85-8.66)	7.15 (5.22-9.99)
7-day	1.22 (1.08-1.40)	1.72 (1.53-1.99)	2.42 (2.14-2.80)	3.00 (2.63-3.50)	3.81 (3.23-4.59)	4.45 (3.69-5.47)	5.10 (4.13-6.42)	5.78 (4.55-7.49)	6.72 (5.08-9.07)	7.45 (5.44-10.4)
10-day	1.28 (1.14-1.47)	1.81 (1.61-2.09)	2.55 (2.25-2.95)	3.16 (2.77-3.69)	4.02 (3.41-4.85)	4.70 (3.90-5.77)	5.39 (4.36-6.78)	6.10 (4.81-7.90)	7.09 (5.36-9.58)	7.86 (5.74-11.0)
20-day	1.46 (1.30-1.68)	2.10 (1.86-2.42)	3.00 (2.65-3.46)	3.75 (3.29-4.37)	4.83 (4.09-5.82)	5.68 (4.72-6.99)	6.57 (5.32-8.27)	7.49 (5.90-9.70)	8.74 (6.60-11.8)	9.71 (7.09-13.6)
30-day	1.64 (1.46-1.89)	2.37 (2.10-2.73)	3.42 (3.02-3.95)	4.33 (3.79-5.04)	5.63 (4.77-6.78)	6.67 (5.54-8.20)	7.75 (6.28-9.76)	8.88 (6.99-11.5)	10.4 (7.88-14.1)	11.6 (8.48-16.2)
45-day	1.90 (1.68-2.18)	2.76 (2.44-3.18)	4.01 (3.54-4.64)	5.12 (4.48-5.96)	6.74 (5.71-8.12)	8.07 (6.70-9.92)	9.46 (7.66-11.9)	10.9 (8.60-14.1)	12.9 (9.78-17.5)	14.5 (10.6-20.3)
60-day	2.09 (1.85-2.40)	3.03 (2.69-3.49)	4.44 (3.92-5.13)	5.70 (4.99-6.63)	7.56 (6.41-9.11)	9.12 (7.57-11.2)	10.8 (8.72-13.6)	12.5 (9.85-16.2)	15.0 (11.3-20.2)	16.9 (12.3-23.6)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

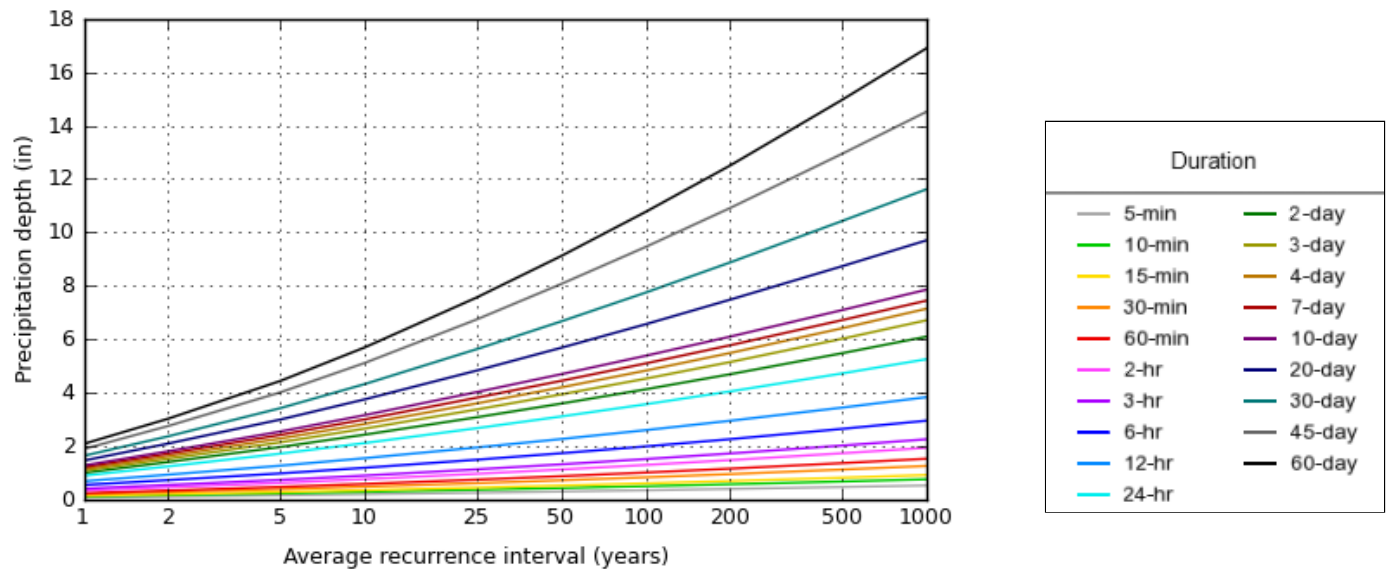
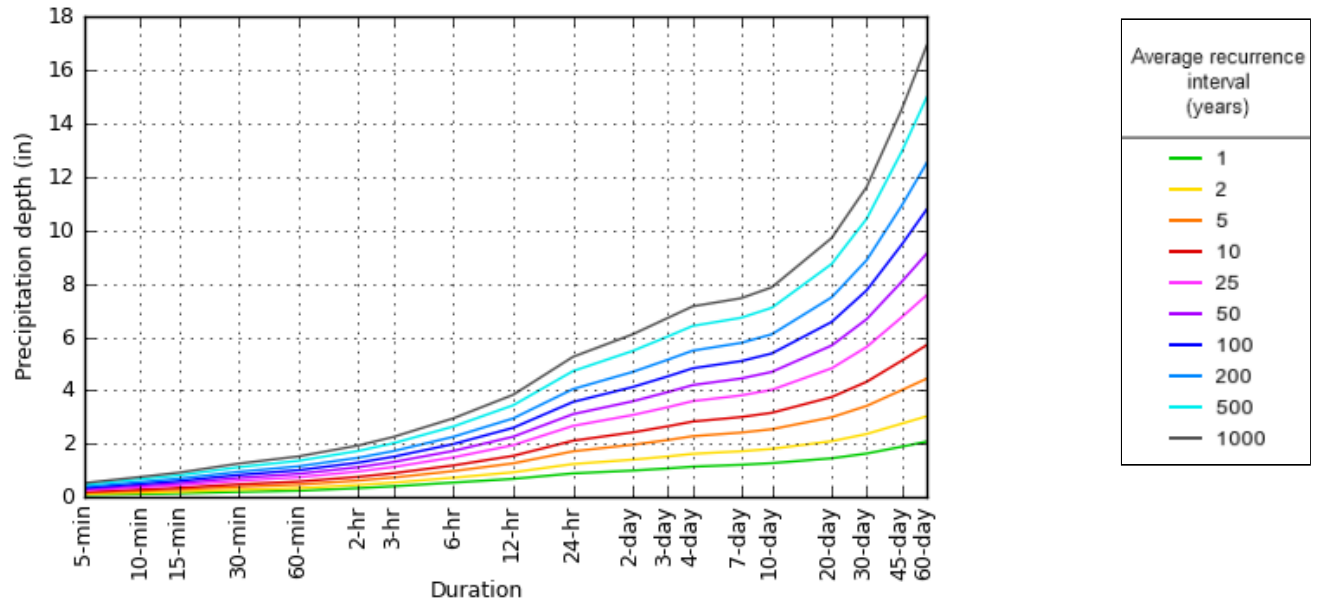
Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves

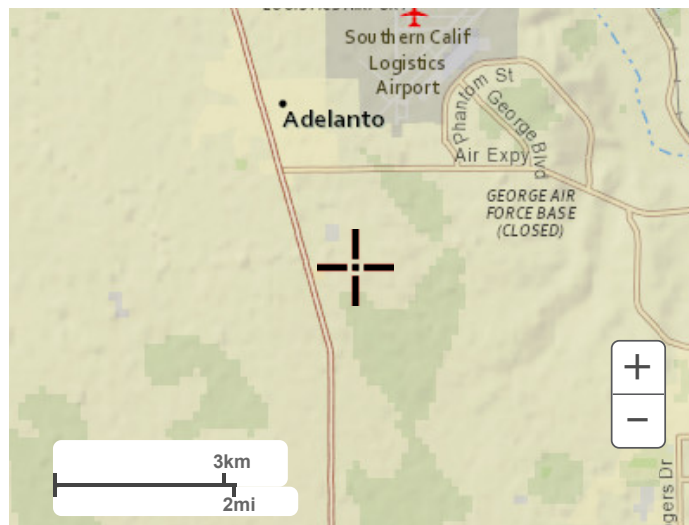
Latitude: 34.5558°, Longitude: -117.3946°



NOAA Atlas 14, Volume 6, Version 2

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Large scale terrain



Large scale map



Large scale aerial



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NOAA Atlas 14, Volume 6, Version 2
Location name: Adelanto, California, USA*
Latitude: 34.5558°, Longitude: -117.3946°
Elevation: 2957.24 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

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NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.03 (0.852-1.26)	1.43 (1.18-1.75)	1.99 (1.63-2.45)	2.46 (2.00-3.05)	3.13 (2.47-4.01)	3.67 (2.83-4.80)	4.24 (3.19-5.68)	4.85 (3.55-6.67)	5.70 (4.02-8.18)	6.40 (4.34-9.49)
10-min	0.738 (0.606-0.900)	1.03 (0.846-1.26)	1.42 (1.17-1.75)	1.76 (1.43-2.18)	2.24 (1.77-2.87)	2.63 (2.03-3.44)	3.04 (2.29-4.07)	3.47 (2.55-4.78)	4.09 (2.88-5.86)	4.58 (3.12-6.80)
15-min	0.592 (0.492-0.728)	0.828 (0.684-1.01)	1.15 (0.944-1.41)	1.42 (1.16-1.76)	1.81 (1.43-2.32)	2.12 (1.64-2.77)	2.45 (1.85-3.28)	2.80 (2.05-3.86)	3.30 (2.32-4.73)	3.70 (2.51-5.48)
30-min	0.406 (0.336-0.498)	0.566 (0.466-0.694)	0.786 (0.646-0.966)	0.972 (0.792-1.20)	1.24 (0.976-1.58)	1.45 (1.12-1.90)	1.68 (1.26-2.24)	1.92 (1.41-2.64)	2.26 (1.59-3.24)	2.53 (1.72-3.75)
60-min	0.246 (0.203-0.302)	0.343 (0.283-0.421)	0.477 (0.392-0.586)	0.590 (0.481-0.730)	0.750 (0.592-0.961)	0.880 (0.680-1.15)	1.02 (0.767-1.36)	1.16 (0.853-1.60)	1.37 (0.963-1.96)	1.53 (1.04-2.28)
2-hr	0.172 (0.142-0.210)	0.232 (0.190-0.284)	0.314 (0.258-0.386)	0.384 (0.313-0.476)	0.484 (0.382-0.620)	0.565 (0.436-0.738)	0.650 (0.490-0.870)	0.741 (0.544-1.02)	0.868 (0.612-1.25)	0.970 (0.660-1.44)
3-hr	0.138 (0.114-0.168)	0.183 (0.151-0.225)	0.247 (0.203-0.303)	0.301 (0.245-0.373)	0.378 (0.298-0.484)	0.441 (0.340-0.576)	0.506 (0.382-0.678)	0.576 (0.423-0.793)	0.674 (0.475-0.968)	0.753 (0.512-1.12)
6-hr	0.092 (0.076-0.113)	0.123 (0.101-0.150)	0.164 (0.135-0.202)	0.199 (0.163-0.247)	0.250 (0.197-0.320)	0.290 (0.224-0.379)	0.333 (0.251-0.446)	0.378 (0.278-0.521)	0.443 (0.311-0.635)	0.494 (0.336-0.733)
12-hr	0.057 (0.047-0.070)	0.078 (0.064-0.095)	0.106 (0.087-0.130)	0.129 (0.105-0.160)	0.162 (0.128-0.207)	0.188 (0.146-0.246)	0.216 (0.163-0.289)	0.245 (0.180-0.338)	0.286 (0.201-0.410)	0.318 (0.217-0.473)
24-hr	0.037 (0.033-0.043)	0.052 (0.046-0.060)	0.072 (0.063-0.083)	0.088 (0.077-0.103)	0.111 (0.094-0.134)	0.130 (0.108-0.159)	0.149 (0.121-0.187)	0.169 (0.133-0.219)	0.197 (0.149-0.266)	0.219 (0.160-0.306)
2-day	0.021 (0.018-0.024)	0.029 (0.026-0.034)	0.041 (0.036-0.047)	0.051 (0.044-0.059)	0.064 (0.054-0.077)	0.075 (0.062-0.092)	0.086 (0.070-0.108)	0.098 (0.077-0.127)	0.114 (0.086-0.154)	0.127 (0.093-0.178)
3-day	0.015 (0.013-0.017)	0.021 (0.019-0.024)	0.030 (0.026-0.034)	0.037 (0.032-0.043)	0.047 (0.040-0.056)	0.055 (0.045-0.067)	0.063 (0.051-0.079)	0.072 (0.056-0.093)	0.084 (0.063-0.113)	0.093 (0.068-0.130)
4-day	0.012 (0.011-0.014)	0.017 (0.015-0.020)	0.024 (0.021-0.028)	0.030 (0.026-0.034)	0.038 (0.032-0.045)	0.044 (0.036-0.054)	0.050 (0.041-0.063)	0.057 (0.045-0.074)	0.067 (0.050-0.090)	0.074 (0.054-0.104)
7-day	0.007 (0.006-0.008)	0.010 (0.009-0.012)	0.014 (0.013-0.017)	0.018 (0.016-0.021)	0.023 (0.019-0.027)	0.026 (0.022-0.033)	0.030 (0.025-0.038)	0.034 (0.027-0.045)	0.040 (0.030-0.054)	0.044 (0.032-0.062)
10-day	0.005 (0.005-0.006)	0.008 (0.007-0.009)	0.011 (0.009-0.012)	0.013 (0.012-0.015)	0.017 (0.014-0.020)	0.020 (0.016-0.024)	0.022 (0.018-0.028)	0.025 (0.020-0.033)	0.030 (0.022-0.040)	0.033 (0.024-0.046)
20-day	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.006 (0.006-0.007)	0.008 (0.007-0.009)	0.010 (0.009-0.012)	0.012 (0.010-0.015)	0.014 (0.011-0.017)	0.016 (0.012-0.020)	0.018 (0.014-0.025)	0.020 (0.015-0.028)
30-day	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.005-0.007)	0.008 (0.007-0.009)	0.009 (0.008-0.011)	0.011 (0.009-0.014)	0.012 (0.010-0.016)	0.014 (0.011-0.020)	0.016 (0.012-0.023)
45-day	0.002 (0.002-0.002)	0.003 (0.002-0.003)	0.004 (0.003-0.004)	0.005 (0.004-0.006)	0.006 (0.005-0.008)	0.007 (0.006-0.009)	0.009 (0.007-0.011)	0.010 (0.008-0.013)	0.012 (0.009-0.016)	0.013 (0.010-0.019)
60-day	0.001 (0.001-0.002)	0.002 (0.002-0.002)	0.003 (0.003-0.004)	0.004 (0.003-0.005)	0.005 (0.004-0.006)	0.006 (0.005-0.008)	0.007 (0.006-0.009)	0.009 (0.007-0.011)	0.010 (0.008-0.014)	0.012 (0.009-0.016)

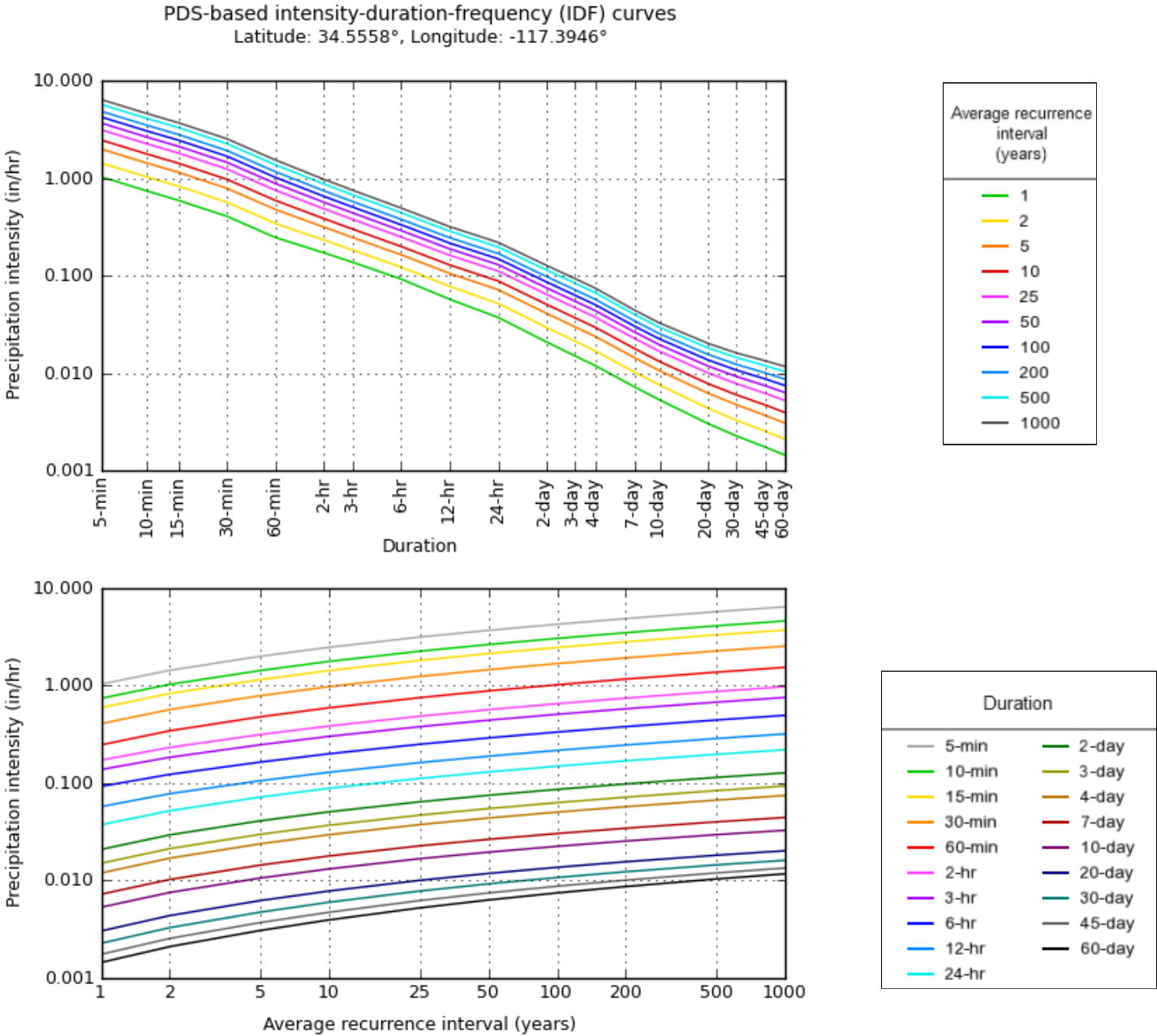
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



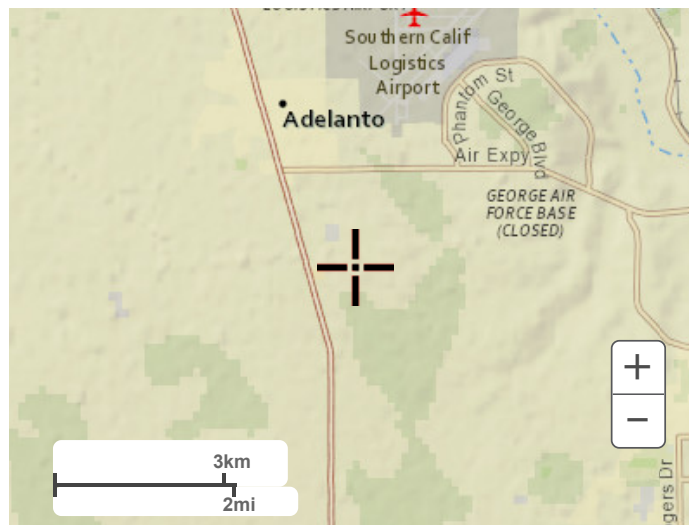
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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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Hydrologic Soil Group—San Bernardino County, California, Mojave River Area



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Bernardino County, California, Mojave River Area
 Survey Area Data: Version 13, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 27, 2021—May 24, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
105	BRYMAN LOAMY FINE SAND, 0 TO 2 PERCENT SLOPES	C	12.7	15.7%
112	CAJON SAND, 0 TO 2 PERCENT SLOPES	A	68.1	84.3%
Totals for Area of Interest			80.8	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher