Watershed Evaluation

West Fork Fourmile Creek at 21st Street

Prepared by Mid-Kansas Engineering Consultants

November 19, 1996

Watershed Evaluation
West Fork Fourmile Creek at 21st Street

Purpose

This evaluation of the West Fork Fourmile Creek was undertaken to provide a more detailed assessment of the watershed than has been previously completed. Previous analyses used a variety of analysis methods, and either evaluated the watershed as a gross area (~800 ac) or were limited to smaller portions of the watershed, such as parcels for residential and commercial development and watersheds for specific culverts under K-96.

A meeting was held on October 24 to discuss the evaluation with all concerned parties. Those attending included representatives from Sedgwick County, the City of Wichita, Professional Engineering Consultants, P.A., Baughman Company, Ritchie Development, and Mid-Kansas Engineering Consultants.

At that meeting the following purposes were established:

- To provide a planning level analysis of the entire watershed using a single method
- To assess the overall effects of K-96 on detention within the watershed.
- To establish a logical approach for protecting downstream property through planned detention in upstream areas.
- To attempt to distribute detention responsibility among watershed properties.

In addition, the following baseline conditions were established:

- As there is no record of roadway overtopping at 21st St. the 100-year peak flow through the culvert under existing conditions is to be 1080 cfs, or the approximate capacity of the existing culvert.
- Culverts under K-96 are to be fully functional during the 100-year event at their approximate design flows.
- The culvert under 21st St. will be lengthened to accommodate road widening, but otherwise will not be changed.

A second meeting was held on November 12 to present preliminary results of the evaluation, solicit comments, and discuss appropriate recommendations. Comments received from that meeting have been incorporated into the watershed model, and additional calibration and analyses completed. The results are presented in this report.

Approach

Watersheds used for analysis are shown on the attached Figure. These correspond in general with those established by Professional Engineering Consultants, P.A. (PEC) for drainage designs of K-96 construction and 21st Street improvements. Capacities of culverts under K-96 and 21st Street were roughly verified using standard FHWA analysis procedures.

The analysis was completed using the Penn State Runoff Model. A list of sources of information for model parameters is included in the appendix.

The model was calibrated using the overland flow Manning's "n" value, which affects the shape, peak value, and time to peak of the runoff hydrograph. As basins 1 and 2 are already developed as Tallgrass East (residential) and the Kansas Surgery and Recovery Center, Manning's 'n" was established on the basis of reasonable values that produce peak flowrates approximately equal to those shown in the drainage report for the detention basin that serves both areas (Storm Drain # 106). Manning's "n" for the other undeveloped watersheds was modified within a reasonable

range to achieve the desired peak flowrate through the 21st St. culvert. Pertinent results are shown in the accompanying table.

Evaluation of Results

The Penn State Runoff Model procedure calculates peak flow rates at the K-96 culverts somewhat higher than the values calculated by other methods. To ensure that the culvert capacities are not exceeded, conceptual detention basins were incorporated into each basin that discharges directly to a K-96 culvert. The approximate storage volumes required to reduce flood peaks to culvert design flowrates are shown on the table. The affected watersheds include 161 acres in the south portion of Jabara Airport (#6), a 110 acre watershed for which soccer fields are planned (#10), and a 212 acre watershed currently in agricultural use (#11). At this time, each of these watersheds offers opportunity to develop the indicated detention facilities. Analysis indicates that the 100-year flood will flow over a series of ditch plugs and get to the Greenwich Road underpass.

Evaluation of the hydrographs from the different basins indicates that peak flows from north of K-96 would be delayed by the detention facilities. Undeveloped basins peak more quickly, and peaks from basins in the lower portion of the watershed pass through the discharge point before peak flows from the upper basins arrive. As a result, using detention in subsequent development should be done carefully. If 100-year discharges from detention basins are delayed yet allowed at pre-development rates, the delay may increase the peak flow to the 21st St. culvert.

Recommendations

The following recommendations are offered to the City of Wichita and Sedgwick County:

1. Detention facilities should be constructed as soon as possible in drainage area 6 (the south portion of Jabara Airport) to limit the 100-year discharge to less than 122 cfs.
2. Detention facilities should be constructed in conjunction with soccer field development in Basin 10 (near the northeast quarter of Section 4, north of K-96 and west of Greenwich Road), to limit the 100-year discharge to less than 87 cfs.
3. Detention facilities should be required as a platting condition for land in Watershed 11. The watershed drainage system should be planned so that one of two criteria are met. First, the entire watershed could be served by a single detention facility. If a single facility is not feasible due to partial development, individual developments should be required to provide detention that limits the individual peak discharge to one half of the pre-development flowrate.

APPENDIX

INFORMATION SOURCES FOR MODEL PARAMETERS

- USGS 7.5' Topographic Map - Andover Quadrangle
- K-96 Construction Plans - PEC
- Preliminary Construction Plans: 21st Street E. of Rock Rd- PEC
- Drainage Plan and Supporting Calculations for Kansas Surgery and Recovery Center - PEC
- Stormwater Drain No 106 Design Computations - PEC
- Drainage Plan and Supporting Calculations for Tallgrass East 3rd Addition - PEC
- Drainage Plan and Supporting Calculations for The Manhattan Addition - PEC
- Preliminary Development Plans: Regency Lakes - Baughman Co.
- Preliminary Development Plans: Greenwich Business Park - MKEC
- Preliminary Development Plans: Warren Theaters
- Soil Survey for Sedgwick County, Kansas - SCS

```
*****************************************
*                                       *
*  Penn State Runoff Model  -  PSRM-88  *
*       IBM-PC Version, Jan. 1988       *
*     G. Aron, Dept. of Civil Engr.     *
*   The Pennsylvania State University   *
* Storm Options: User-Defined Storms    *
*          Std. SCS or PDT-IDF Storms   *
*****************************************
```

W. Fork Fourmile Cr at 21st St Storage Allocation Study

Pre-development conditions w/K-96 & 21st culverts & 21st St Detention

MKEC Project 96066 14NOV96

Pre-Development Model With Compensating Detention in 6 10 & 11

Modified to include 15 ac @ K-96 and 14 ac @ sw cor Regency Lakes

********** General Watershed Information **********

No. of Subareas = 20 No. of Reservoirs = 4 No. of Obs. Hydrog. = 0

No. of Raingages, recording = 1 nonrecording = 0

Time Interv, min.; Routing 5.0 Printing 5.0 Rainfall 5.0 Total = 360.0
Residual Infiltration Time = 360 min.

1 Raingages used in Weighting, with Exp. 1.0

Std. Parameters:	Manning n		Depression Storage		SCS CN,	IA	CTS Ratio
	Imp=0.040	Prv=0.040	Imp=0.06	Prv=0.00	98.0	79.0	.10	1.5

Baseflow Coefficient = 0.0010 cfs/ac.

Raingage No. 1 STD, Coordinates = 1.00 1.00
Total rain = 5.71 inches, Starting Time and Centroid = 0.0 188.7 min.

0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05
0.06	0.09	0.11	0.14	0.16	0.18	0.26	0.37	0.66	0.95
0.46	0.29	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.04
0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02								

Hydrographs will be printed for all Subareas

Reservoirs are located on Subareas:
3 6 10 11

Peak Flow Presentations Requested for Subareas:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Subarea Properties and Dimensions

I.D. No.	Area ac.	Length ft.	Slope ft/ft	Manning's n Imp.	Manning's n Perv.	Imperv. Fract.	SCS. CN. Imp	SCS. CN. Perv	IA	Coordinates x	Coordinates y	
1	76.0	2000.	0.016	0.040	0.030	0.01	98.0	89.0	0.10	1.0	1.0	5.7
2	57.0	2500.	0.013	0.040	0.020	0.01	98.0	89.0	0.10	1.0	1.0	5.9
3	0.0	50.	0.020	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	—
4	27.5	1800.	0.002	0.040	0.020	0.01	98.0	93.0	0.10	1.0	1.0	4.9
5	0.0	50.	0.020	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	—
6	161.0	5600.	0.009	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	1.8
7	0.0	50.	0.020	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	—
8	50.6	2500.	0.006	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	2.7
9	0.0	50.	0.020	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	—
10	110.0	3500.	0.006	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	2.1
11	212.0	5500.	0.006	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	1.6
12	21.0	1200.	0.007	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	4.1
13	7.0	1500.	0.007	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	4.0
14	0.0	50.	0.020	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	—
15	26.9	1500.	0.002	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	2.6
16	0.0	50.	0.020	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	—
17	14.0	1100.	0.002	0.040	0.030	0.01	98.0	89.0	0.10	1.0	1.0	4.7
18	59.3	2500.	0.010	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	4.0
19	17.9	1400.	0.009	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	4.6
20	0.0	50.	0.020	0.040	0.040	0.01	98.0	79.0	0.10	1.0	1.0	

I.D. No.	Depr.Storage Imp.	Depr.Storage Perv.	Incoming Drainage Elements			Drainage Element Cap,cfs	Tt,min	CTS
1	0.060	0.000	0	0	0	228.0	0.1	1.5
2	0.060	0.000	0	0	0	739.0	0.1	1.5
3	0.060	0.000	1	2	0	450.0	0.1	1.5
4	0.060	0.000	0	0	0	200.0	12.6	1.5
5	0.060	0.000	3	4	0	450.0	3.5	1.5
6	0.060	0.000	0	0	0	96.0	0.1	1.5
7	0.060	0.000	5	6	0	550.0	8.3	1.5
8	0.060	0.000	0	0	0	80.0	0.1	1.5
9	0.060	0.000	7	8	0	650.0	0.1	1.5
10	0.060	0.000	0	0	0	90.0	0.1	1.5
11	0.060	0.000	0	0	0	210.0	0.1	1.5
12	0.060	0.000	0	0	0	80.0	0.1	1.5
13	0.060	0.000	12	0	0	100.0	0.1	1.5
14	0.060	0.000	10	11	13	350.0	6.7	1.5
15	0.060	0.000	0	0	0	200.0	0.1	1.5
16	0.060	0.000	9	14	15	1100.0	5.0	1.5
17	0.060	0.000	0	0	0	70.0	8.0	1.5
18	0.060	0.000	17	0	0	300.0	0.1	1.5
19	0.060	0.000	0	0	0	70.0	4.5	1.5
20	0.060	0.000	16	18	19	1100.0	2.0	1.5

Reservoir No. 1 in Area No. 3 of Type 2 with 0 cfs Bypass

Elevation ft.	Storage ac-ft	Outflow cfs
1377.4	0.0	0.0
1379.4	1.3	100.0
1381.4	5.8	240.0
1382.4	9.9	320.0
1384.4	21.2	460.0

Reservoir No. 2 in Area No. 6 of Type 1 with 0 cfs Bypass

Elevation ft.	Storage ac-ft	Outflow cfs
1370.0	0.0	0.0
1370.5	0.3	4.5

75.0	0.330	0.296	0.5	0.5	0.0
80.0	0.360	0.317	0.8	0.8	0.0
85.0	0.390	0.337	1.0	1.0	0.0
90.0	0.420	0.356	1.4	1.4	0.0
95.0	0.450	0.375	1.8	1.8	0.0
100.0	0.480	0.393	2.2	2.2	0.0
105.0	0.510	0.410	2.7	2.7	0.0
110.0	0.540	0.427	3.3	3.3	0.0
115.0	0.580	0.448	4.0	4.0	0.0
120.0	0.620	0.468	4.9	4.9	0.0
125.0	0.660	0.487	5.9	5.9	0.0
130.0	0.700	0.506	7.0	7.0	0.0
135.0	0.750	0.527	8.3	8.3	0.0
140.0	0.800	0.548	9.9	9.9	0.0
145.0	0.850	0.568	11.6	11.6	0.0
150.0	0.900	0.586	13.3	13.3	0.0
155.0	0.960	0.608	15.3	15.3	0.0
160.0	1.050	0.637	18.8	18.8	0.0
165.0	1.160	0.669	24.3	24.3	0.0
170.0	1.300	0.705	32.4	32.4	0.0
175.0	1.460	0.742	43.4	43.4	0.0
180.0	1.640	0.778	56.9	56.9	0.0
185.0	1.900	0.821	77.5	77.5	0.0
190.0	2.270	0.870	113.7	113.7	0.0
195.0	2.930	0.931	191.6	191.6	0.0
200.0	3.880	0.989	342.1	228.0	114.1
205.0	4.340	1.012	435.6	228.0	207.6
210.0	4.630	1.026	397.3	228.0	169.3
215.0	4.720	1.030	319.4	228.0	91.4
220.0	4.800	1.033	243.2	228.0	15.2
225.0	4.870	1.036	192.6	192.6	0.0
230.0	4.930	1.039	156.7	156.7	0.0
235.0	4.980	1.041	129.9	129.9	0.0
240.0	5.020	1.044	108.9	108.9	0.0
245.0	5.060	1.046	92.6	92.6	0.0
250.0	5.100	1.049	80.6	80.6	0.0
255.0	5.140	1.051	71.5	71.5	0.0
260.0	5.180	1.054	64.5	64.5	0.0
265.0	5.220	1.056	59.1	59.1	0.0
270.0	5.250	1.059	53.9	53.9	0.0
275.0	5.280	1.061	49.1	49.1	0.0
280.0	5.310	1.063	45.2	45.2	0.0
285.0	5.340	1.065	42.0	42.0	0.0
290.0	5.370	1.068	39.4	39.4	0.0
295.0	5.400	1.070	37.3	37.3	0.0
300.0	5.430	1.072	35.6	35.6	0.0
305.0	5.460	1.074	34.1	34.1	0.0
310.0	5.490	1.076	32.9	32.9	0.0
315.0	5.520	1.078	31.8	31.8	0.0
320.0	5.550	1.080	31.0	31.0	0.0
325.0	5.570	1.082	29.6	29.6	0.0
330.0	5.590	1.084	27.8	27.8	0.0
335.0	5.610	1.086	26.3	26.3	0.0
340.0	5.630	1.088	25.0	25.0	0.0
345.0	5.650	1.090	23.9	23.9	0.0
350.0	5.670	1.092	23.0	23.0	0.0
355.0	5.690	1.094	22.2	22.2	0.0
360.0	5.710	1.096	21.6	21.6	0.0

Runoff = 4.32 inches, Runoff Peak = 435.5 cfs Peak Timing = 205.0 min.
Runoff Volume = 331.2 cfs-hrs

Hydrograph for Subarea 2 Dr.A = 57.0 ac. Cum. Dr.A = 57.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.1			0.1	0.0	
10.0	0.040	0.040	0.1			0.1	0.0	
15.0	0.060	0.060	0.1			0.1	0.0	
20.0	0.080	0.080	0.1			0.1	0.0	
25.0	0.100	0.100	0.1			0.1	0.0	
30.0	0.120	0.120	0.1			0.1	0.0	
35.0	0.140	0.139	0.1			0.1	0.0	
40.0	0.160	0.158	0.1			0.1	0.0	
45.0	0.180	0.176	0.1			0.1	0.0	
50.0	0.200	0.194	0.1			0.1	0.0	
55.0	0.220	0.211	0.1			0.1	0.0	
60.0	0.240	0.227	0.1			0.1	0.0	
65.0	0.270	0.251	0.1			0.1	0.0	
70.0	0.300	0.274	0.1			0.1	0.0	
75.0	0.330	0.296	0.2			0.2	0.0	
80.0	0.360	0.317	0.4			0.4	0.0	
85.0	0.390	0.337	0.8			0.8	0.0	
90.0	0.420	0.356	1.1			1.1	0.0	
95.0	0.450	0.375	1.4			1.4	0.0	
100.0	0.480	0.393	1.8			1.8	0.0	
105.0	0.510	0.410	2.2			2.2	0.0	
110.0	0.540	0.427	2.6			2.6	0.0	
115.0	0.580	0.448	3.2			3.2	0.0	
120.0	0.620	0.468	3.9			3.9	0.0	
125.0	0.660	0.487	4.7			4.7	0.0	
130.0	0.700	0.506	5.5			5.5	0.0	
135.0	0.750	0.527	6.5			6.5	0.0	
140.0	0.800	0.548	7.8			7.8	0.0	
145.0	0.850	0.568	9.1			9.1	0.0	
150.0	0.900	0.586	10.4			10.4	0.0	
155.0	0.960	0.608	12.0			12.0	0.0	
160.0	1.050	0.637	14.7			14.7	0.0	
165.0	1.160	0.669	19.0			19.0	0.0	
170.0	1.300	0.705	25.3			25.3	0.0	
175.0	1.460	0.742	33.9			33.9	0.0	
180.0	1.640	0.778	44.3			44.3	0.0	
185.0	1.900	0.821	60.3			60.3	0.0	
190.0	2.270	0.870	88.4			88.4	0.0	
195.0	2.930	0.931	149.1			149.1	0.0	
200.0	3.880	0.989	266.1			266.1	0.0	
205.0	4.340	1.012	336.1			336.1	0.0	
210.0	4.630	1.026	302.5			302.5	0.0	
215.0	4.720	1.030	240.0			240.0	0.0	
220.0	4.800	1.033	180.6			180.6	0.0	
225.0	4.870	1.036	141.8			141.8	0.0	
230.0	4.930	1.039	114.8			114.8	0.0	
235.0	4.980	1.041	94.8			94.8	0.0	
240.0	5.020	1.044	79.2			79.2	0.0	
245.0	5.060	1.046	67.2			67.2	0.0	
250.0	5.100	1.049	58.5			58.5	0.0	
255.0	5.140	1.051	51.9			51.9	0.0	
260.0	5.180	1.054	46.8			46.8	0.0	
265.0	5.220	1.056	42.9			42.9	0.0	

270.0	5.250	1.059	39.2		39.2	0.0
275.0	5.280	1.061	35.7		35.7	0.0
280.0	5.310	1.063	32.9		32.9	0.0
285.0	5.340	1.065	30.6		30.6	0.0
290.0	5.370	1.068	28.7		28.7	0.0
295.0	5.400	1.070	27.2		27.2	0.0
300.0	5.430	1.072	26.0		26.0	0.0
305.0	5.460	1.074	25.0		25.0	0.0
310.0	5.490	1.076	24.1		24.1	0.0
315.0	5.520	1.078	23.4		23.4	0.0
320.0	5.550	1.080	22.8		22.8	0.0
325.0	5.570	1.082	21.8		21.8	0.0
330.0	5.590	1.084	20.5		20.5	0.0
335.0	5.610	1.086	19.4		19.4	0.0
340.0	5.630	1.088	18.4		18.4	0.0
345.0	5.650	1.090	17.6		17.6	0.0
350.0	5.670	1.092	17.0		17.0	0.0
355.0	5.690	1.094	16.4		16.4	0.0
360.0	5.710	1.096	15.9		15.9	0.0

Runoff = 4.34 inches, Runoff Peak = 336.0 cfs Peak Timing = 205.0 min.
Runoff Volume = 249.3 cfs-hrs

Hydrograph for Subarea 3 Dr.A = 0.0 ac. Cum. Dr.A = 133.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0	0.1	0.0	0.1	0.0	
10.0	0.040	0.040	0.0	0.1	1377.4	0.0	0.0	
15.0	0.060	0.060	0.0	0.1	1377.4	0.1	0.0	
20.0	0.080	0.080	0.0	0.1	1377.4	0.1	0.0	
25.0	0.100	0.100	0.0	0.1	1377.4	0.1	0.0	
30.0	0.120	0.120	0.0	0.1	1377.4	0.1	0.0	
35.0	0.140	0.139	0.0	0.1	1377.4	0.1	0.0	
40.0	0.160	0.159	0.0	0.1	1377.4	0.1	0.0	
45.0	0.180	0.179	0.0	0.1	1377.4	0.1	0.0	
50.0	0.200	0.199	0.0	0.1	1377.4	0.1	0.0	
55.0	0.220	0.219	0.0	0.1	1377.4	0.1	0.0	
60.0	0.240	0.239	0.0	0.2	1377.4	0.1	0.0	
65.0	0.270	0.269	0.0	0.2	1377.4	0.2	0.0	
70.0	0.300	0.298	0.0	0.4	1377.4	0.2	0.0	
75.0	0.330	0.328	0.0	0.7	1377.4	0.4	0.0	
80.0	0.360	0.358	0.0	1.2	1377.4	0.6	0.0	
85.0	0.390	0.388	0.0	1.8	1377.4	1.0	0.0	
90.0	0.420	0.417	0.0	2.5	1377.4	1.5	0.0	
95.0	0.450	0.447	0.0	3.2	1377.4	2.0	0.0	
100.0	0.480	0.477	0.0	4.0	1377.5	2.7	0.0	
105.0	0.510	0.506	0.0	4.9	1377.5	3.4	0.0	
110.0	0.540	0.536	0.0	5.8	1377.5	4.2	0.0	
115.0	0.580	0.568	0.0	7.1	1377.5	5.2	0.0	
120.0	0.620	0.599	0.0	8.8	1377.5	6.3	0.0	
125.0	0.660	0.629	0.0	10.6	1377.6	7.7	0.0	
130.0	0.700	0.658	0.0	12.4	1377.6	9.3	0.0	
135.0	0.750	0.693	0.0	14.8	1377.6	11.1	0.0	
140.0	0.800	0.728	0.0	17.7	1377.7	13.3	0.0	
145.0	0.850	0.761	0.0	20.6	1377.7	15.7	0.0	
150.0	0.900	0.793	0.0	23.6	1377.8	18.4	0.0	
155.0	0.960	0.831	0.0	27.2	1377.8	21.3	0.0	
160.0	1.050	0.884	0.0	33.3	1377.9	25.1	0.0	

165.0	1.160	0.945	0.0	43.1	1378.0	30.6	0.0
170.0	1.300	1.017	0.0	57.5	1378.2	38.8	0.0
175.0	1.460	1.092	0.0	76.9	1378.4	50.7	0.0
180.0	1.640	1.170	0.0	100.8	1378.7	66.7	0.0
185.0	1.900	1.268	0.0	137.0	1379.2	88.6	0.0
190.0	2.270	1.387	0.0	200.9	1379.5	110.3	0.0
195.0	2.930	1.550	0.0	338.0	1380.0	141.1	0.0
200.0	3.880	1.719	0.1	601.8	1380.9	204.7	0.0
205.0	4.340	1.790	0.1	767.5	1381.9	277.5	0.0
210.0	4.630	1.832	0.0	701.7	1382.5	329.8	0.0
215.0	4.720	1.844	0.1	563.0	1382.9	354.5	0.0
220.0	4.800	1.855	0.0	427.2	1383.1	366.0	0.0
225.0	4.870	1.866	0.0	336.3	1383.1	367.3	0.0
230.0	4.930	1.876	0.0	272.8	1383.0	362.2	0.0
235.0	4.980	1.887	0.0	225.6	1382.9	352.9	0.0
240.0	5.020	1.897	0.0	188.8	1382.7	341.0	0.0
245.0	5.060	1.908	0.0	160.4	1382.5	327.4	0.0
250.0	5.100	1.918	0.0	139.5	1382.3	309.0	0.0
255.0	5.140	1.928	0.0	123.7	1382.0	286.7	0.0
260.0	5.180	1.937	0.0	111.6	1381.7	265.4	0.0
265.0	5.220	1.947	0.0	102.2	1381.5	245.5	0.0
270.0	5.250	1.957	0.0	93.3	1381.1	219.8	0.0
275.0	5.280	1.966	0.0	84.9	1380.8	194.5	0.0
280.0	5.310	1.975	0.0	78.2	1380.4	172.6	0.0
285.0	5.340	1.984	0.0	72.7	1380.2	153.8	0.0
290.0	5.370	1.993	0.0	68.3	1379.9	137.7	0.0
295.0	5.400	2.002	0.0	64.6	1379.7	123.9	0.0
300.0	5.430	2.011	0.0	61.6	1379.6	112.1	0.0
305.0	5.460	2.020	0.0	59.1	1379.4	102.1	0.0
310.0	5.490	2.028	0.0	57.0	1379.1	86.1	0.0
315.0	5.520	2.037	0.0	55.3	1378.9	73.6	0.0
320.0	5.550	2.045	0.0	53.8	1378.7	65.6	0.0
325.0	5.570	2.053	0.0	51.4	1378.6	60.2	0.0
330.0	5.590	2.061	0.0	48.3	1378.5	55.9	0.0
335.0	5.610	2.069	0.0	45.7	1378.4	52.2	0.0
340.0	5.630	2.077	0.0	43.5	1378.4	49.0	0.0
345.0	5.650	2.085	0.0	41.6	1378.3	46.3	0.0
350.0	5.670	2.092	0.0	40.0	1378.3	44.0	0.0
355.0	5.690	2.100	0.0	38.6	1378.2	42.0	0.0
360.0	5.710	2.107	0.0	37.5	1378.2	40.4	0.0

Runoff = 3.58 inches, Runoff Peak = 0.1 cfs Peak Timing = 200.0 min.
Runoff Volume = 0.0 cfs-hrs

Hydrograph for Subarea 4 Dr.A = 27.5 ac. Cum. Dr.A = 27.5 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.0	0.0	
10.0	0.040	0.040	0.0			0.0	0.0	
15.0	0.060	0.060	0.0			0.0	0.0	
20.0	0.080	0.080	0.0			0.0	0.0	
25.0	0.100	0.098	0.0			0.0	0.0	
30.0	0.120	0.116	0.0			0.0	0.0	
35.0	0.140	0.133	0.0			0.0	0.0	
40.0	0.160	0.149	0.0			0.0	0.0	
45.0	0.180	0.164	0.0			0.0	0.0	
50.0	0.200	0.179	0.0			0.0	0.0	
55.0	0.220	0.193	0.0			0.0	0.0	

60.0	0.240	0.206	0.0	0.0	0.0
65.0	0.270	0.225	0.1	0.1	0.0
70.0	0.300	0.243	0.1	0.1	0.0
75.0	0.330	0.259	0.2	0.2	0.0
80.0	0.360	0.275	0.4	0.4	0.0
85.0	0.390	0.290	0.6	0.6	0.0
90.0	0.420	0.304	0.8	0.8	0.0
95.0	0.450	0.317	1.0	1.0	0.0
100.0	0.480	0.330	1.2	1.2	0.0
105.0	0.510	0.342	1.4	1.4	0.0
110.0	0.540	0.353	1.6	1.6	0.0
115.0	0.580	0.367	1.9	1.9	0.0
120.0	0.620	0.381	2.3	2.3	0.0
125.0	0.660	0.393	2.7	2.7	0.0
130.0	0.700	0.405	3.1	3.1	0.0
135.0	0.750	0.419	3.6	3.6	0.0
140.0	0.800	0.432	4.2	4.2	0.0
145.0	0.850	0.444	4.8	4.8	0.0
150.0	0.900	0.455	5.5	5.5	0.0
155.0	0.960	0.468	6.2	6.2	0.0
160.0	1.050	0.484	7.4	7.4	0.0
165.0	1.160	0.503	9.3	9.3	0.0
170.0	1.300	0.523	11.9	11.9	0.0
175.0	1.460	0.543	15.5	15.5	0.0
180.0	1.640	0.561	19.8	19.8	0.0
185.0	1.900	0.583	26.3	26.3	0.0
190.0	2.270	0.607	37.3	37.3	0.0
195.0	2.930	0.636	59.9	59.9	0.0
200.0	3.880	0.661	103.3	103.3	0.0
205.0	4.340	0.672	134.6	134.6	0.0
210.0	4.630	0.677	131.3	131.3	0.0
215.0	4.720	0.679	113.8	113.8	0.0
220.0	4.800	0.681	93.3	93.3	0.0
225.0	4.870	0.682	77.9	77.9	0.0
230.0	4.930	0.683	66.1	66.1	0.0
235.0	4.980	0.684	56.6	56.6	0.0
240.0	5.020	0.685	48.7	48.7	0.0
245.0	5.060	0.686	42.4	42.4	0.0
250.0	5.100	0.687	37.5	37.5	0.0
255.0	5.140	0.687	33.5	33.5	0.0
260.0	5.180	0.688	30.3	30.3	0.0
265.0	5.220	0.689	27.7	27.7	0.0
270.0	5.250	0.690	25.4	25.4	0.0
275.0	5.280	0.691	23.2	23.2	0.0
280.0	5.310	0.691	21.3	21.3	0.0
285.0	5.340	0.692	19.8	19.8	0.0
290.0	5.370	0.693	18.5	18.5	0.0
295.0	5.400	0.694	17.4	17.4	0.0
300.0	5.430	0.694	16.5	16.5	0.0
305.0	5.460	0.695	15.7	15.7	0.0
310.0	5.490	0.696	15.0	15.0	0.0
315.0	5.520	0.697	14.4	14.4	0.0
320.0	5.550	0.697	13.8	13.8	0.0
325.0	5.570	0.698	13.2	13.2	0.0
330.0	5.590	0.699	12.5	12.5	0.0
335.0	5.610	0.699	11.8	11.8	0.0
340.0	5.630	0.700	11.2	11.2	0.0
345.0	5.650	0.701	10.7	10.7	0.0
350.0	5.670	0.701	10.3	10.3	0.0
355.0	5.690	0.702	9.9	9.9	0.0

360.0 5.710 0.703 9.6 9.6 0.0

Runoff = 4.55 inches, Runoff Peak = 134.5 cfs Peak Timing = 205.0 min.

Runoff Volume = 126.2 cfs-hrs

Hydrograph for Subarea 5 Dr.A = 0.0 ac. Cum. Dr.A = 160.5 ac.

Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.1	0.0	
10.0	0.040	0.040	0.0			0.0	0.0	
15.0	0.060	0.060	0.0			0.1	0.0	
20.0	0.080	0.080	0.0			0.1	0.0	
25.0	0.100	0.100	0.0			0.1	0.0	
30.0	0.120	0.120	0.0			0.1	0.0	
35.0	0.140	0.139	0.0			0.2	0.0	
40.0	0.160	0.159	0.0			0.2	0.0	
45.0	0.180	0.179	0.0			0.2	0.0	
50.0	0.200	0.199	0.0			0.2	0.0	
55.0	0.220	0.219	0.0			0.2	0.0	
60.0	0.240	0.239	0.0			0.2	0.0	
65.0	0.270	0.269	0.0			0.2	0.0	
70.0	0.300	0.298	0.0			0.3	0.0	
75.0	0.330	0.328	0.0			0.4	0.0	
80.0	0.360	0.358	0.0			0.7	0.0	
85.0	0.390	0.388	0.0			1.1	0.0	
90.0	0.420	0.417	0.0			1.7	0.0	
95.0	0.450	0.447	0.0			2.5	0.0	
100.0	0.480	0.477	0.0			3.4	0.0	
105.0	0.510	0.506	0.0			4.3	0.0	
110.0	0.540	0.536	0.0			5.3	0.0	
115.0	0.580	0.568	0.0			6.4	0.0	
120.0	0.620	0.599	0.0			7.8	0.0	
125.0	0.660	0.629	0.0			9.5	0.0	
130.0	0.700	0.658	0.0			11.4	0.0	
135.0	0.750	0.693	0.0			13.6	0.0	
140.0	0.800	0.728	0.0			16.1	0.0	
145.0	0.850	0.761	0.0			19.0	0.0	
150.0	0.900	0.793	0.0			22.3	0.0	
155.0	0.960	0.831	0.0			25.8	0.0	
160.0	1.050	0.884	0.0			30.1	0.0	
165.0	1.160	0.945	0.0			36.3	0.0	
170.0	1.300	1.017	0.0			45.5	0.0	
175.0	1.460	1.092	0.0			58.8	0.0	
180.0	1.640	1.170	0.0			77.0	0.0	
185.0	1.900	1.268	0.0			101.8	0.0	
190.0	2.270	1.387	0.0			127.4	0.0	
195.0	2.930	1.550	0.0			163.4	0.0	
200.0	3.880	1.719	0.1			235.1	0.0	
205.0	4.340	1.790	0.1			324.2	0.0	
210.0	4.630	1.832	0.0			409.5	0.0	
215.0	4.720	1.844	0.1			450.0	22.4	
220.0	4.800	1.855	0.0			450.0	48.8	
225.0	4.870	1.866	0.0			450.0	40.2	
230.0	4.930	1.876	0.0			450.0	16.2	
235.0	4.980	1.887	0.0			439.0	0.0	
240.0	5.020	1.897	0.0			413.5	0.0	
245.0	5.060	1.908	0.0			389.2	0.0	
250.0	5.100	1.918	0.0			362.2	0.0	

255.0	5.140	1.928	0.0	332.9	0.0
260.0	5.180	1.937	0.0	305.9	0.0
265.0	5.220	1.947	0.0	281.4	0.0
270.0	5.250	1.957	0.0	252.3	0.0
275.0	5.280	1.966	0.0	224.1	0.0
280.0	5.310	1.975	0.0	199.7	0.0
285.0	5.340	1.984	0.0	178.5	0.0
290.0	5.370	1.993	0.0	160.3	0.0
295.0	5.400	2.002	0.0	144.8	0.0
300.0	5.430	2.011	0.0	131.6	0.0
305.0	5.460	2.020	0.0	120.3	0.0
310.0	5.490	2.028	0.0	103.4	0.0
315.0	5.520	2.037	0.0	89.9	0.0
320.0	5.550	2.045	0.0	81.1	0.0
325.0	5.570	2.053	0.0	75.0	0.0
330.0	5.590	2.061	0.0	70.1	0.0
335.0	5.610	2.069	0.0	65.8	0.0
340.0	5.630	2.077	0.0	61.9	0.0
345.0	5.650	2.085	0.0	58.5	0.0
350.0	5.670	2.092	0.0	55.6	0.0
355.0	5.690	2.100	0.0	53.1	0.0
360.0	5.710	2.107	0.0	50.9	0.0

Runoff = 3.58 inches, Runoff Peak = 0.1 cfs Peak Timing = 200.0 min.
Runoff Volume = 0.0 cfs-hrs

Hydrograph for Subarea 6 Dr.A = 161.0 ac. Cum. Dr.A = 161.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.2	0.2	0.0	0.2	0.0	
10.0	0.040	0.040	0.2	0.2	1370.0	0.0	0.0	
15.0	0.060	0.060	0.2	0.2	1370.0	0.0	0.0	
20.0	0.080	0.080	0.2	0.2	1370.0	0.0	0.0	
25.0	0.100	0.100	0.2	0.2	1370.0	0.0	0.0	
30.0	0.120	0.120	0.2	0.2	1370.0	0.1	0.0	
35.0	0.140	0.139	0.2	0.2	1370.0	0.1	0.0	
40.0	0.160	0.159	0.2	0.2	1370.0	0.1	0.0	
45.0	0.180	0.179	0.2	0.2	1370.0	0.1	0.0	
50.0	0.200	0.199	0.2	0.2	1370.0	0.1	0.0	
55.0	0.220	0.219	0.2	0.2	1370.0	0.1	0.0	
60.0	0.240	0.239	0.2	0.2	1370.0	0.1	0.0	
65.0	0.270	0.269	0.2	0.2	1370.0	0.1	0.0	
70.0	0.300	0.298	0.2	0.2	1370.0	0.1	0.0	
75.0	0.330	0.328	0.2	0.2	1370.0	0.1	0.0	
80.0	0.360	0.358	0.2	0.2	1370.0	0.1	0.0	
85.0	0.390	0.388	0.2	0.2	1370.0	0.1	0.0	
90.0	0.420	0.417	0.2	0.2	1370.0	0.1	0.0	
95.0	0.450	0.447	0.2	0.2	1370.0	0.1	0.0	
100.0	0.480	0.477	0.2	0.2	1370.0	0.2	0.0	
105.0	0.510	0.506	0.2	0.2	1370.0	0.2	0.0	
110.0	0.540	0.536	0.2	0.2	1370.0	0.2	0.0	
115.0	0.580	0.568	0.3	0.3	1370.0	0.2	0.0	
120.0	0.620	0.599	0.3	0.3	1370.0	0.2	0.0	
125.0	0.660	0.629	0.4	0.4	1370.0	0.2	0.0	
130.0	0.700	0.658	0.5	0.5	1370.0	0.2	0.0	
135.0	0.750	0.693	0.7	0.7	1370.0	0.3	0.0	
140.0	0.800	0.728	1.0	1.0	1370.0	0.3	0.0	
145.0	0.850	0.761	1.3	1.3	1370.0	0.4	0.0	

150.0	0.900	0.793	1.7	1.7	1370.1	0.5	0.0
155.0	0.960	0.831	2.2	2.2	1370.1	0.7	0.0
160.0	1.050	0.884	3.1	3.1	1370.1	0.8	0.0
165.0	1.160	0.945	4.5	4.5	1370.1	1.1	0.0
170.0	1.300	1.017	6.8	6.8	1370.2	1.6	0.0
175.0	1.460	1.092	10.4	10.4	1370.3	2.3	0.0
180.0	1.640	1.170	15.5	15.5	1370.4	3.3	0.0
185.0	1.900	1.268	24.0	24.0	1370.5	5.0	0.0
190.0	2.270	1.387	40.1	40.1	1370.7	7.9	0.0
195.0	2.930	1.550	77.2	77.2	1371.0	13.2	0.0
200.0	3.880	1.719	159.5	159.5	1371.4	20.6	0.0
205.0	4.340	1.790	245.2	245.2	1371.9	33.4	0.0
210.0	4.630	1.832	281.7	281.7	1372.3	44.5	0.0
215.0	4.720	1.844	285.3	285.3	1372.6	54.1	0.0
220.0	4.800	1.855	271.1	271.1	1372.9	62.2	0.0
225.0	4.870	1.866	256.9	256.9	1373.1	69.3	0.0
230.0	4.930	1.876	242.5	242.5	1373.3	75.4	0.0
235.0	4.980	1.887	228.0	228.0	1373.4	80.9	0.0
240.0	5.020	1.897	213.4	213.4	1373.6	85.6	0.0
245.0	5.060	1.908	199.7	199.7	1373.7	89.6	0.0
250.0	5.100	1.918	187.5	187.5	1373.8	93.0	0.0
255.0	5.140	1.928	176.6	176.6	1373.8	96.0	0.0
260.0	5.180	1.937	166.9	166.9	1373.9	96.0	2.5
265.0	5.220	1.947	158.2	158.2	1374.0	96.0	4.6
270.0	5.250	1.957	149.6	149.6	1374.0	96.0	6.3
275.0	5.280	1.966	141.1	141.1	1374.0	96.0	7.5
280.0	5.310	1.975	133.5	133.5	1374.1	96.0	8.5
285.0	5.340	1.984	126.6	126.6	1374.1	96.0	9.3
290.0	5.370	1.993	120.4	120.4	1374.1	96.0	9.8
295.0	5.400	2.002	114.8	114.8	1374.1	96.0	10.1
300.0	5.430	2.011	109.6	109.6	1374.1	96.0	10.3
305.0	5.460	2.020	105.0	105.0	1374.1	96.0	10.4
310.0	5.490	2.028	100.7	100.7	1374.1	96.0	10.2
315.0	5.520	2.037	96.8	96.8	1374.1	96.0	10.0
320.0	5.550	2.045	93.2	93.2	1374.1	96.0	9.7
325.0	5.570	2.053	89.3	89.3	1374.1	96.0	9.3
330.0	5.590	2.061	85.1	85.1	1374.1	96.0	8.8
335.0	5.610	2.069	81.3	81.3	1374.1	96.0	8.1
340.0	5.630	2.077	77.8	77.8	1374.0	96.0	7.4
345.0	5.650	2.085	74.5	74.5	1374.0	96.0	6.6
350.0	5.670	2.092	71.5	71.5	1374.0	96.0	5.7
355.0	5.690	2.100	68.8	68.8	1374.0	96.0	4.7
360.0	5.710	2.107	66.3	66.3	1373.9	96.0	3.6

Runoff = 2.65 inches, Runoff Peak = 106.4 cfs Peak Timing = 305.0 min.
Runoff Volume = 430.1 cfs-hrs

Hydrograph for Subarea 7 Dr.A = 0.0 ac. Cum. Dr.A = 321.5 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.3	0.0	
10.0	0.040	0.040	0.0			0.1	0.0	
15.0	0.060	0.060	0.0			0.1	0.0	
20.0	0.080	0.080	0.0			0.1	0.0	
25.0	0.100	0.100	0.0			0.2	0.0	
30.0	0.120	0.120	0.0			0.2	0.0	
35.0	0.140	0.139	0.0			0.2	0.0	
40.0	0.160	0.159	0.0			0.2	0.0	

45.0	0.180	0.179	0.0	0.2	0.0
50.0	0.200	0.199	0.0	0.3	0.0
55.0	0.220	0.219	0.0	0.3	0.0
60.0	0.240	0.239	0.0	0.3	0.0
65.0	0.270	0.269	0.0	0.3	0.0
70.0	0.300	0.298	0.0	0.3	0.0
75.0	0.330	0.328	0.0	0.4	0.0
80.0	0.360	0.358	0.0	0.6	0.0
85.0	0.390	0.388	0.0	1.0	0.0
90.0	0.420	0.417	0.0	1.5	0.0
95.0	0.450	0.447	0.0	2.1	0.0
100.0	0.480	0.477	0.0	2.9	0.0
105.0	0.510	0.506	0.0	3.8	0.0
110.0	0.540	0.536	0.0	4.8	0.0
115.0	0.580	0.568	0.0	5.8	0.0
120.0	0.620	0.599	0.0	7.0	0.0
125.0	0.660	0.629	0.0	8.5	0.0
130.0	0.700	0.658	0.0	10.3	0.0
135.0	0.750	0.693	0.0	12.3	0.0
140.0	0.800	0.728	0.0	14.7	0.0
145.0	0.850	0.761	0.0	17.4	0.0
150.0	0.900	0.793	0.0	20.5	0.0
155.0	0.960	0.831	0.0	24.0	0.0
160.0	1.050	0.884	0.0	27.9	0.0
165.0	1.160	0.945	0.0	33.1	0.0
170.0	1.300	1.017	0.0	40.6	0.0
175.0	1.460	1.092	0.0	51.7	0.0
180.0	1.640	1.170	0.0	67.6	0.0
185.0	1.900	1.268	0.0	89.4	0.0
190.0	2.270	1.387	0.0	117.4	0.0
195.0	2.930	1.550	0.0	151.4	0.0
200.0	3.880	1.719	0.1	205.5	0.0
205.0	4.340	1.790	0.1	295.0	0.0
210.0	4.630	1.832	0.0	394.1	0.0
215.0	4.720	1.844	0.1	475.6	0.0
220.0	4.800	1.855	0.0	533.3	0.0
225.0	4.870	1.866	0.0	550.0	16.6
230.0	4.930	1.876	0.0	550.0	15.9
235.0	4.980	1.887	0.0	544.9	0.0
240.0	5.020	1.897	0.0	517.7	0.0
245.0	5.060	1.908	0.0	495.7	0.0
250.0	5.100	1.918	0.0	474.1	0.0
255.0	5.140	1.928	0.0	449.3	0.0
260.0	5.180	1.937	0.0	423.2	0.0
265.0	5.220	1.947	0.0	399.1	0.0
270.0	5.250	1.957	0.0	374.9	0.0
275.0	5.280	1.966	0.0	347.3	0.0
280.0	5.310	1.975	0.0	321.3	0.0
285.0	5.340	1.984	0.0	298.6	0.0
290.0	5.370	1.993	0.0	278.8	0.0
295.0	5.400	2.002	0.0	261.8	0.0
300.0	5.430	2.011	0.0	247.1	0.0
305.0	5.460	2.020	0.0	234.5	0.0
310.0	5.490	2.028	0.0	221.5	0.0
315.0	5.520	2.037	0.0	205.4	0.0
320.0	5.550	2.045	0.0	193.0	0.0
325.0	5.570	2.053	0.0	184.6	0.0
330.0	5.590	2.061	0.0	178.3	0.0
335.0	5.610	2.069	0.0	172.9	0.0
340.0	5.630	2.077	0.0	168.1	0.0

345.0	5.650	2.085	0.0		163.5	0.0
350.0	5.670	2.092	0.0		159.4	0.0
355.0	5.690	2.100	0.0		155.6	0.0
360.0	5.710	2.107	0.0		152.1	0.0

Runoff = 3.58 inches, Runoff Peak = 0.1 cfs Peak Timing = 200.0 min.
Runoff Volume = 0.0 cfs-hrs

Hydrograph for Subarea 8 Dr.A = 50.6 ac. Cum. Dr.A = 50.6 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.1			0.1	0.0	
10.0	0.040	0.040	0.1			0.1	0.0	
15.0	0.060	0.060	0.1			0.1	0.0	
20.0	0.080	0.080	0.1			0.1	0.0	
25.0	0.100	0.100	0.1			0.1	0.0	
30.0	0.120	0.120	0.1			0.1	0.0	
35.0	0.140	0.139	0.1			0.1	0.0	
40.0	0.160	0.159	0.1			0.1	0.0	
45.0	0.180	0.179	0.1			0.1	0.0	
50.0	0.200	0.199	0.1			0.1	0.0	
55.0	0.220	0.219	0.1			0.1	0.0	
60.0	0.240	0.239	0.1			0.1	0.0	
65.0	0.270	0.269	0.1			0.1	0.0	
70.0	0.300	0.298	0.1			0.1	0.0	
75.0	0.330	0.328	0.1			0.1	0.0	
80.0	0.360	0.358	0.1			0.1	0.0	
85.0	0.390	0.388	0.1			0.1	0.0	
90.0	0.420	0.417	0.1			0.1	0.0	
95.0	0.450	0.447	0.1			0.1	0.0	
100.0	0.480	0.477	0.1			0.1	0.0	
105.0	0.510	0.506	0.1			0.1	0.0	
110.0	0.540	0.536	0.1			0.1	0.0	
115.0	0.580	0.568	0.1			0.1	0.0	
120.0	0.620	0.599	0.1			0.1	0.0	
125.0	0.660	0.629	0.2			0.2	0.0	
130.0	0.700	0.658	0.2			0.2	0.0	
135.0	0.750	0.693	0.4			0.4	0.0	
140.0	0.800	0.728	0.5			0.5	0.0	
145.0	0.850	0.761	0.7			0.7	0.0	
150.0	0.900	0.793	0.9			0.9	0.0	
155.0	0.960	0.831	1.2			1.2	0.0	
160.0	1.050	0.884	1.6			1.6	0.0	
165.0	1.160	0.945	2.4			2.4	0.0	
170.0	1.300	1.017	3.7			3.7	0.0	
175.0	1.460	1.092	5.6			5.6	0.0	
180.0	1.640	1.170	8.3			8.3	0.0	
185.0	1.900	1.268	12.8			12.8	0.0	
190.0	2.270	1.387	21.2			21.2	0.0	
195.0	2.930	1.550	40.6			40.6	0.0	
200.0	3.880	1.719	83.0			80.0	3.0	
205.0	4.340	1.790	123.7			80.0	43.7	
210.0	4.630	1.832	135.2			80.0	55.2	
215.0	4.720	1.844	129.5			80.0	49.5	
220.0	4.800	1.855	116.1			80.0	36.1	
225.0	4.870	1.866	104.4			80.0	24.4	
230.0	4.930	1.876	94.0			80.0	14.0	
235.0	4.980	1.887	84.6			80.0	4.6	

240.0	5.020	1.897	76.1		76.1	0.0
245.0	5.060	1.908	68.6		68.6	0.0
250.0	5.100	1.918	62.3		62.3	0.0
255.0	5.140	1.928	57.0		57.0	0.0
260.0	5.180	1.937	52.5		52.5	0.0
265.0	5.220	1.947	48.6		48.6	0.0
270.0	5.250	1.957	45.0		45.0	0.0
275.0	5.280	1.966	41.5		41.5	0.0
280.0	5.310	1.975	38.5		38.5	0.0
285.0	5.340	1.984	35.9		35.9	0.0
290.0	5.370	1.993	33.7		33.7	0.0
295.0	5.400	2.002	31.7		31.7	0.0
300.0	5.430	2.011	29.9		29.9	0.0
305.0	5.460	2.020	28.4		28.4	0.0
310.0	5.490	2.028	27.0		27.0	0.0
315.0	5.520	2.037	25.8		25.8	0.0
320.0	5.550	2.045	24.7		24.7	0.0
325.0	5.570	2.053	23.5		23.5	0.0
330.0	5.590	2.061	22.1		22.1	0.0
335.0	5.610	2.069	20.9		20.9	0.0
340.0	5.630	2.077	19.8		19.8	0.0
345.0	5.650	2.085	18.9		18.9	0.0
350.0	5.670	2.092	18.0		18.0	0.0
355.0	5.690	2.100	17.2		17.2	0.0
360.0	5.710	2.107	16.5		16.5	0.0

Runoff = 3.03 inches, Runoff Peak = 135.2 cfs Peak Timing = 210.0 min.
Runoff Volume = 154.4 cfs-hrs

Hydrograph for Subarea 9 Dr.A = 0.0 ac. Cum. Dr.A = 372.1 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.1	0.0	
10.0	0.040	0.040	0.0			0.3	0.0	
15.0	0.060	0.060	0.0			0.3	0.0	
20.0	0.080	0.080	0.0			0.2	0.0	
25.0	0.100	0.100	0.0			0.1	0.0	
30.0	0.120	0.120	0.0			0.2	0.0	
35.0	0.140	0.139	0.0			0.2	0.0	
40.0	0.160	0.159	0.0			0.3	0.0	
45.0	0.180	0.179	0.0			0.3	0.0	
50.0	0.200	0.199	0.0			0.3	0.0	
55.0	0.220	0.219	0.0			0.3	0.0	
60.0	0.240	0.239	0.0			0.3	0.0	
65.0	0.270	0.269	0.0			0.3	0.0	
70.0	0.300	0.298	0.0			0.3	0.0	
75.0	0.330	0.328	0.0			0.4	0.0	
80.0	0.360	0.358	0.0			0.4	0.0	
85.0	0.390	0.388	0.0			0.6	0.0	
90.0	0.420	0.417	0.0			0.8	0.0	
95.0	0.450	0.447	0.0			1.2	0.0	
100.0	0.480	0.477	0.0			1.8	0.0	
105.0	0.510	0.506	0.0			2.5	0.0	
110.0	0.540	0.536	0.0			3.3	0.0	
115.0	0.580	0.568	0.0			4.2	0.0	
120.0	0.620	0.599	0.0			5.2	0.0	
125.0	0.660	0.629	0.0			6.4	0.0	
130.0	0.700	0.658	0.0			7.8	0.0	

135.0	0.750	0.693	0.0	9.5	0.0
140.0	0.800	0.728	0.0	11.5	0.0
145.0	0.850	0.761	0.0	13.8	0.0
150.0	0.900	0.793	0.0	16.5	0.0
155.0	0.960	0.831	0.0	19.6	0.0
160.0	1.050	0.884	0.0	23.3	0.0
165.0	1.160	0.945	0.0	27.7	0.0
170.0	1.300	1.017	0.0	33.4	0.0
175.0	1.460	1.092	0.0	41.2	0.0
180.0	1.640	1.170	0.0	52.7	0.0
185.0	1.900	1.268	0.0	69.8	0.0
190.0	2.270	1.387	0.0	96.1	0.0
195.0	2.930	1.550	0.0	139.1	0.0
200.0	3.880	1.719	0.1	211.2	0.0
205.0	4.340	1.790	0.1	292.3	0.0
210.0	4.630	1.832	0.0	370.8	0.0
215.0	4.720	1.844	0.1	458.4	0.0
220.0	4.800	1.855	0.0	538.3	0.0
225.0	4.870	1.866	0.0	600.0	0.0
230.0	4.930	1.876	0.0	633.3	0.0
235.0	4.980	1.887	0.0	643.4	0.0
240.0	5.020	1.897	0.0	640.8	0.0
245.0	5.060	1.908	0.0	612.2	0.0
250.0	5.100	1.918	0.0	572.7	0.0
255.0	5.140	1.928	0.0	545.5	0.0
260.0	5.180	1.937	0.0	518.2	0.0
265.0	5.220	1.947	0.0	489.1	0.0
270.0	5.250	1.957	0.0	460.0	0.0
275.0	5.280	1.966	0.0	432.5	0.0
280.0	5.310	1.975	0.0	404.1	0.0
285.0	5.340	1.984	0.0	374.5	0.0
290.0	5.370	1.993	0.0	347.3	0.0
295.0	5.400	2.002	0.0	323.6	0.0
300.0	5.430	2.011	0.0	303.0	0.0
305.0	5.460	2.020	0.0	285.2	0.0
310.0	5.490	2.028	0.0	269.9	0.0
315.0	5.520	2.037	0.0	255.9	0.0
320.0	5.550	2.045	0.0	240.8	0.0
325.0	5.570	2.053	0.0	224.7	0.0
330.0	5.590	2.061	0.0	212.3	0.0
335.0	5.610	2.069	0.0	203.4	0.0
340.0	5.630	2.077	0.0	196.3	0.0
345.0	5.650	2.085	0.0	190.2	0.0
350.0	5.670	2.092	0.0	184.5	0.0
355.0	5.690	2.100	0.0	179.3	0.0
360.0	5.710	2.107	0.0	174.6	0.0

Runoff = 3.58 inches, Runoff Peak = 0.1 cfs Peak Timing = 200.0 min.
Runoff Volume = 0.0 cfs-hrs

Hydrograph for Subarea 10 Dr.A = 110.0 ac. Cum. Dr.A = 110.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.1	0.1	0.0	0.1	0.0	
10.0	0.040	0.040	0.1	0.1	1365.0	0.0	0.0	
15.0	0.060	0.060	0.1	0.1	1365.0	0.0	0.0	
20.0	0.080	0.080	0.1	0.1	1365.0	0.0	0.0	
25.0	0.100	0.100	0.1	0.1	1365.0	0.0	0.0	

30.0	0.120	0.120	0.1	0.1	1365.0	0.0	0.0
35.0	0.140	0.139	0.1	0.1	1365.0	0.0	0.0
40.0	0.160	0.159	0.1	0.1	1365.0	0.1	0.0
45.0	0.180	0.179	0.1	0.1	1365.0	0.1	0.0
50.0	0.200	0.199	0.1	0.1	1365.0	0.1	0.0
55.0	0.220	0.219	0.1	0.1	1365.0	0.1	0.0
60.0	0.240	0.239	0.1	0.1	1365.0	0.1	0.0
65.0	0.270	0.269	0.1	0.1	1365.0	0.1	0.0
70.0	0.300	0.298	0.1	0.1	1365.0	0.1	0.0
75.0	0.330	0.328	0.1	0.1	1365.0	0.1	0.0
80.0	0.360	0.358	0.1	0.1	1365.0	0.1	0.0
85.0	0.390	0.388	0.1	0.1	1365.0	0.1	0.0
90.0	0.420	0.417	0.1	0.1	1365.0	0.1	0.0
95.0	0.450	0.447	0.2	0.2	1365.0	0.1	0.0
100.0	0.480	0.477	0.2	0.2	1365.0	0.1	0.0
105.0	0.510	0.506	0.2	0.2	1365.0	0.1	0.0
110.0	0.540	0.536	0.2	0.2	1365.0	0.1	0.0
115.0	0.580	0.568	0.2	0.2	1365.0	0.1	0.0
120.0	0.620	0.599	0.2	0.2	1365.0	0.1	0.0
125.0	0.660	0.629	0.3	0.3	1365.0	0.2	0.0
130.0	0.700	0.658	0.4	0.4	1365.0	0.2	0.0
135.0	0.750	0.693	0.6	0.6	1365.0	0.2	0.0
140.0	0.800	0.728	0.8	0.8	1365.0	0.3	0.0
145.0	0.850	0.761	1.1	1.1	1365.1	0.3	0.0
150.0	0.900	0.793	1.4	1.4	1365.1	0.4	0.0
155.0	0.960	0.831	1.9	1.9	1365.1	0.6	0.0
160.0	1.050	0.884	2.6	2.6	1365.1	0.7	0.0
165.0	1.160	0.945	3.9	3.9	1365.2	1.0	0.0
170.0	1.300	1.017	5.9	5.9	1365.2	1.4	0.0
175.0	1.460	1.092	9.1	9.1	1365.3	2.1	0.0
180.0	1.640	1.170	13.5	13.5	1365.5	3.0	0.0
185.0	1.900	1.268	20.8	20.8	1365.6	4.4	0.0
190.0	2.270	1.387	34.7	34.7	1365.8	6.6	0.0
195.0	2.930	1.550	66.6	66.6	1366.1	10.3	0.0
200.0	3.880	1.719	137.1	137.1	1366.5	16.8	0.0
205.0	4.340	1.790	208.1	208.1	1367.0	25.3	0.0
210.0	4.630	1.832	234.6	234.6	1367.3	32.4	0.0
215.0	4.720	1.844	232.4	232.4	1367.7	39.7	0.0
220.0	4.800	1.855	215.8	215.8	1368.0	46.3	0.0
225.0	4.870	1.866	200.2	200.2	1368.2	51.0	0.0
230.0	4.930	1.876	185.4	185.4	1368.3	55.1	0.0
235.0	4.980	1.887	171.2	171.2	1368.5	58.6	0.0
240.0	5.020	1.897	157.5	157.5	1368.6	61.4	0.0
245.0	5.060	1.908	145.0	145.0	1368.7	63.9	0.0
250.0	5.100	1.918	134.2	134.2	1368.8	65.9	0.0
255.0	5.140	1.928	124.8	124.8	1368.8	67.6	0.0
260.0	5.180	1.937	116.6	116.6	1368.9	69.0	0.0
265.0	5.220	1.947	109.4	109.4	1368.9	70.2	0.0
270.0	5.250	1.957	102.4	102.4	1369.0	71.2	0.0
275.0	5.280	1.966	95.7	95.7	1369.0	71.9	0.0
280.0	5.310	1.975	89.7	89.7	1369.0	72.5	0.0
285.0	5.340	1.984	84.4	84.4	1369.0	72.9	0.0
290.0	5.370	1.993	79.7	79.7	1369.0	73.1	0.0
295.0	5.400	2.002	75.4	75.4	1369.0	73.3	0.0
300.0	5.430	2.011	71.6	71.6	1369.0	73.3	0.0
305.0	5.460	2.020	68.2	68.2	1369.0	73.2	0.0
310.0	5.490	2.028	65.2	65.2	1369.0	73.0	0.0
315.0	5.520	2.037	62.4	62.4	1369.0	72.7	0.0
320.0	5.550	2.045	59.9	59.9	1369.0	72.4	0.0
325.0	5.570	2.053	57.1	57.1	1369.0	72.0	0.0

330.0	5.590	2.061	54.2	54.2	1369.0	71.6	0.0
335.0	5.610	2.069	51.5	51.5	1369.0	71.1	0.0
340.0	5.630	2.077	49.0	49.0	1368.9	70.5	0.0
345.0	5.650	2.085	46.8	46.8	1368.9	69.9	0.0
350.0	5.670	2.092	44.8	44.8	1368.9	69.3	0.0
355.0	5.690	2.100	42.9	42.9	1368.9	68.6	0.0
360.0	5.710	2.107	41.2	41.2	1368.8	67.9	0.0

Runoff = 2.84 inches, Runoff Peak = 73.3 cfs Peak Timing = 300.0 min.
Runoff Volume = 314.5 cfs-hrs

Hydrograph for Subarea 11 Dr.A = 212.0 ac. Cum. Dr.A = 212.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.2	0.2	0.0	0.2	0.0	
10.0	0.040	0.040	0.2	0.2	1366.0	0.0	0.0	
15.0	0.060	0.060	0.2	0.2	1366.0	0.1	0.0	
20.0	0.080	0.080	0.2	0.2	1366.0	0.1	0.0	
25.0	0.100	0.100	0.2	0.2	1366.0	0.1	0.0	
30.0	0.120	0.120	0.2	0.2	1366.0	0.1	0.0	
35.0	0.140	0.139	0.2	0.2	1366.0	0.2	0.0	
40.0	0.160	0.159	0.2	0.2	1366.0	0.2	0.0	
45.0	0.180	0.179	0.2	0.2	1366.0	0.2	0.0	
50.0	0.200	0.199	0.2	0.2	1366.0	0.2	0.0	
55.0	0.220	0.219	0.2	0.2	1366.0	0.2	0.0	
60.0	0.240	0.239	0.2	0.2	1366.0	0.2	0.0	
65.0	0.270	0.269	0.2	0.2	1366.0	0.2	0.0	
70.0	0.300	0.298	0.2	0.2	1366.0	0.2	0.0	
75.0	0.330	0.328	0.2	0.2	1366.0	0.2	0.0	
80.0	0.360	0.358	0.2	0.2	1366.0	0.2	0.0	
85.0	0.390	0.388	0.3	0.3	1366.0	0.2	0.0	
90.0	0.420	0.417	0.3	0.3	1366.0	0.2	0.0	
95.0	0.450	0.447	0.3	0.3	1366.0	0.2	0.0	
100.0	0.480	0.477	0.3	0.3	1366.0	0.2	0.0	
105.0	0.510	0.506	0.3	0.3	1366.0	0.3	0.0	
110.0	0.540	0.536	0.3	0.3	1366.0	0.3	0.0	
115.0	0.580	0.568	0.3	0.3	1366.0	0.3	0.0	
120.0	0.620	0.599	0.4	0.4	1366.0	0.3	0.0	
125.0	0.660	0.629	0.4	0.4	1366.0	0.3	0.0	
130.0	0.700	0.658	0.6	0.6	1366.0	0.4	0.0	
135.0	0.750	0.693	0.8	0.8	1366.0	0.4	0.0	
140.0	0.800	0.728	1.1	1.1	1366.0	0.6	0.0	
145.0	0.850	0.761	1.5	1.5	1366.0	0.7	0.0	
150.0	0.900	0.793	1.9	1.9	1366.1	0.9	0.0	
155.0	0.960	0.831	2.5	2.5	1366.1	1.2	0.0	
160.0	1.050	0.884	3.4	3.4	1366.1	1.6	0.0	
165.0	1.160	0.945	5.0	5.0	1366.1	2.2	0.0	
170.0	1.300	1.017	7.6	7.6	1366.2	3.1	0.0	
175.0	1.460	1.092	11.6	11.6	1366.3	4.6	0.0	
180.0	1.640	1.170	17.3	17.3	1366.5	6.8	0.0	
185.0	1.900	1.268	26.8	26.8	1366.6	10.0	0.0	
190.0	2.270	1.387	44.7	44.7	1366.8	15.4	0.0	
195.0	2.930	1.550	86.1	86.1	1367.1	24.8	0.0	
200.0	3.880	1.719	178.5	178.5	1367.6	41.4	0.0	
205.0	4.340	1.790	276.2	276.2	1368.1	62.0	0.0	
210.0	4.630	1.832	320.8	320.8	1368.5	81.8	0.0	
215.0	4.720	1.844	329.1	329.1	1368.9	101.7	0.0	
220.0	4.800	1.855	317.1	317.1	1369.2	117.8	0.0	

225.0	4.870	1.866	304.3	304.3	1369.4	130.8	0.0
230.0	4.930	1.876	290.7	290.7	1369.6	141.6	0.0
235.0	4.980	1.887	276.4	276.4	1369.7	150.1	0.0
240.0	5.020	1.897	261.6	261.6	1369.8	157.3	0.0
245.0	5.060	1.908	247.2	247.2	1369.9	163.2	0.0
250.0	5.100	1.918	234.2	234.2	1370.0	167.8	0.0
255.0	5.140	1.928	222.6	222.6	1370.1	171.7	0.0
260.0	5.180	1.937	212.0	212.0	1370.1	174.7	0.0
265.0	5.220	1.947	202.3	202.3	1370.1	176.8	0.0
270.0	5.250	1.957	192.7	192.7	1370.2	178.1	0.0
275.0	5.280	1.966	183.1	183.1	1370.2	178.8	0.0
280.0	5.310	1.975	174.3	174.3	1370.2	178.8	0.0
285.0	5.340	1.984	166.3	166.3	1370.2	178.2	0.0
290.0	5.370	1.993	158.9	158.9	1370.1	177.2	0.0
295.0	5.400	2.002	152.2	152.2	1370.1	175.8	0.0
300.0	5.430	2.011	146.0	146.0	1370.1	174.1	0.0
305.0	5.460	2.020	140.4	140.4	1370.1	172.1	0.0
310.0	5.490	2.028	135.2	135.2	1370.0	169.9	0.0
315.0	5.520	2.037	130.4	130.4	1370.0	167.5	0.0
320.0	5.550	2.045	125.9	125.9	1370.0	165.1	0.0
325.0	5.570	2.053	121.1	121.1	1369.9	162.6	0.0
330.0	5.590	2.061	115.9	115.9	1369.9	159.9	0.0
335.0	5.610	2.069	111.0	111.0	1369.8	157.1	0.0
340.0	5.630	2.077	106.6	106.6	1369.8	154.2	0.0
345.0	5.650	2.085	102.5	102.5	1369.7	151.2	0.0
350.0	5.670	2.092	98.6	98.6	1369.7	148.2	0.0
355.0	5.690	2.100	95.1	95.1	1369.6	145.1	0.0
360.0	5.710	2.107	91.8	91.8	1369.6	141.9	0.0

Runoff = 2.50 inches, Runoff Peak = 178.8 cfs Peak Timing = 275.0 min.
Runoff Volume = 535.2 cfs-hrs

Hydrograph for Subarea 12 Dr.A = 21.0 ac. Cum. Dr.A = 21.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.0	0.0	
10.0	0.040	0.040	0.0			0.0	0.0	
15.0	0.060	0.060	0.0			0.0	0.0	
20.0	0.080	0.080	0.0			0.0	0.0	
25.0	0.100	0.100	0.0			0.0	0.0	
30.0	0.120	0.120	0.0			0.0	0.0	
35.0	0.140	0.139	0.0			0.0	0.0	
40.0	0.160	0.159	0.0			0.0	0.0	
45.0	0.180	0.179	0.0			0.0	0.0	
50.0	0.200	0.199	0.0			0.0	0.0	
55.0	0.220	0.219	0.0			0.0	0.0	
60.0	0.240	0.239	0.0			0.0	0.0	
65.0	0.270	0.269	0.0			0.0	0.0	
70.0	0.300	0.298	0.0			0.0	0.0	
75.0	0.330	0.328	0.0			0.0	0.0	
80.0	0.360	0.358	0.0			0.0	0.0	
85.0	0.390	0.388	0.0			0.0	0.0	
90.0	0.420	0.417	0.0			0.0	0.0	
95.0	0.450	0.447	0.0			0.0	0.0	
100.0	0.480	0.477	0.0			0.0	0.0	
105.0	0.510	0.506	0.1			0.1	0.0	
110.0	0.540	0.536	0.1			0.1	0.0	
115.0	0.580	0.568	0.1			0.1	0.0	

120.0	0.620	0.599	0.1		0.1	0.0
125.0	0.660	0.629	0.1		0.1	0.0
130.0	0.700	0.658	0.2		0.2	0.0
135.0	0.750	0.693	0.3		0.3	0.0
140.0	0.800	0.728	0.4		0.4	0.0
145.0	0.850	0.761	0.6		0.6	0.0
150.0	0.900	0.793	0.7		0.7	0.0
155.0	0.960	0.831	1.0		1.0	0.0
160.0	1.050	0.884	1.3		1.3	0.0
165.0	1.160	0.945	2.0		2.0	0.0
170.0	1.300	1.017	3.0		3.0	0.0
175.0	1.460	1.092	4.5		4.5	0.0
180.0	1.640	1.170	6.6		6.6	0.0
185.0	1.900	1.268	10.0		10.0	0.0
190.0	2.270	1.387	16.3		16.3	0.0
195.0	2.930	1.550	30.8		30.8	0.0
200.0	3.880	1.719	61.7		61.7	0.0
205.0	4.340	1.790	85.9		80.0	5.9
210.0	4.630	1.832	84.4		80.0	4.4
215.0	4.720	1.844	72.2		72.2	0.0
220.0	4.800	1.855	57.9		57.9	0.0
225.0	4.870	1.866	47.6		47.6	0.0
230.0	4.930	1.876	39.8		39.8	0.0
235.0	4.980	1.887	33.6		33.6	0.0
240.0	5.020	1.897	28.5		28.5	0.0
245.0	5.060	1.908	24.4		24.4	0.0
250.0	5.100	1.918	21.3		21.3	0.0
255.0	5.140	1.928	18.9		18.9	0.0
260.0	5.180	1.937	17.0		17.0	0.0
265.0	5.220	1.947	15.5		15.5	0.0
270.0	5.250	1.957	14.1		14.1	0.0
275.0	5.280	1.966	12.8		12.8	0.0
280.0	5.310	1.975	11.7		11.7	0.0
285.0	5.340	1.984	10.8		10.8	0.0
290.0	5.370	1.993	10.0		10.0	0.0
295.0	5.400	2.002	9.4		9.4	0.0
300.0	5.430	2.011	8.9		8.9	0.0
305.0	5.460	2.020	8.4		8.4	0.0
310.0	5.490	2.028	8.1		8.1	0.0
315.0	5.520	2.037	7.7		7.7	0.0
320.0	5.550	2.045	7.5		7.5	0.0
325.0	5.570	2.053	7.1		7.1	0.0
330.0	5.590	2.061	6.6		6.6	0.0
335.0	5.610	2.069	6.2		6.2	0.0
340.0	5.630	2.077	5.9		5.9	0.0
345.0	5.650	2.085	5.6		5.6	0.0
350.0	5.670	2.092	5.3		5.3	0.0
355.0	5.690	2.100	5.1		5.1	0.0
360.0	5.710	2.107	4.9		4.9	0.0

Runoff = 3.31 inches, Runoff Peak = 85.8 cfs Peak Timing = 205.0 min.
Runoff Volume = 70.2 cfs-hrs

Hydrograph for Subarea 13 Dr.A = 7.0 ac. Cum. Dr.A = 28.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.0	0.0	
10.0	0.040	0.040	0.0			0.0	0.0	

15.0	0.060	0.060	0.0	0.0	0.0
20.0	0.080	0.080	0.0	0.0	0.0
25.0	0.100	0.100	0.0	0.0	0.0
30.0	0.120	0.120	0.0	0.0	0.0
35.0	0.140	0.139	0.0	0.0	0.0
40.0	0.160	0.159	0.0	0.0	0.0
45.0	0.180	0.179	0.0	0.0	0.0
50.0	0.200	0.199	0.0	0.0	0.0
55.0	0.220	0.219	0.0	0.0	0.0
60.0	0.240	0.239	0.0	0.0	0.0
65.0	0.270	0.269	0.0	0.0	0.0
70.0	0.300	0.298	0.0	0.0	0.0
75.0	0.330	0.328	0.0	0.0	0.0
80.0	0.360	0.358	0.0	0.0	0.0
85.0	0.390	0.388	0.0	0.0	0.0
90.0	0.420	0.417	0.0	0.1	0.0
95.0	0.450	0.447	0.0	0.1	0.0
100.0	0.480	0.477	0.0	0.1	0.0
105.0	0.510	0.506	0.0	0.1	0.0
110.0	0.540	0.536	0.0	0.1	0.0
115.0	0.580	0.568	0.0	0.1	0.0
120.0	0.620	0.599	0.0	0.1	0.0
125.0	0.660	0.629	0.0	0.1	0.0
130.0	0.700	0.658	0.0	0.2	0.0
135.0	0.750	0.693	0.1	0.4	0.0
140.0	0.800	0.728	0.1	0.5	0.0
145.0	0.850	0.761	0.2	0.7	0.0
150.0	0.900	0.793	0.2	0.9	0.0
155.0	0.960	0.831	0.3	1.2	0.0
160.0	1.050	0.884	0.4	1.7	0.0
165.0	1.160	0.945	0.6	2.5	0.0
170.0	1.300	1.017	0.8	3.8	0.0
175.0	1.460	1.092	1.3	5.8	0.0
180.0	1.640	1.170	1.9	8.4	0.0
185.0	1.900	1.268	2.8	12.8	0.0
190.0	2.270	1.387	4.6	20.9	0.0
195.0	2.930	1.550	8.8	39.4	0.0
200.0	3.880	1.719	17.7	78.8	0.0
205.0	4.340	1.790	25.3	100.0	10.6
210.0	4.630	1.832	25.7	100.0	10.2
215.0	4.720	1.844	22.8	95.3	0.0
220.0	4.800	1.855	18.9	77.1	0.0
225.0	4.870	1.866	15.9	63.8	0.0
230.0	4.930	1.876	13.6	53.5	0.0
235.0	4.980	1.887	11.7	45.4	0.0
240.0	5.020	1.897	10.1	38.6	0.0
245.0	5.060	1.908	8.7	33.2	0.0
250.0	5.100	1.918	7.7	29.1	0.0
255.0	5.140	1.928	6.9	25.9	0.0
260.0	5.180	1.937	6.2	23.3	0.0
265.0	5.220	1.947	5.7	21.2	0.0
270.0	5.250	1.957	5.2	19.3	0.0
275.0	5.280	1.966	4.7	17.5	0.0
280.0	5.310	1.975	4.3	16.0	0.0
285.0	5.340	1.984	4.0	14.8	0.0
290.0	5.370	1.993	3.7	13.7	0.0
295.0	5.400	2.002	3.5	12.9	0.0
300.0	5.430	2.011	3.3	12.1	0.0
305.0	5.460	2.020	3.1	11.5	0.0
310.0	5.490	2.028	2.9	11.0	0.0

315.0	5.520	2.037	2.8		10.6	0.0
320.0	5.550	2.045	2.7		10.2	0.0
325.0	5.570	2.053	2.6		9.7	0.0
330.0	5.590	2.061	2.4		9.0	0.0
335.0	5.610	2.069	2.3		8.5	0.0
340.0	5.630	2.077	2.1		8.0	0.0
345.0	5.650	2.085	2.0		7.6	0.0
350.0	5.670	2.092	1.9		7.2	0.0
355.0	5.690	2.100	1.8		6.9	0.0
360.0	5.710	2.107	1.8		6.7	0.0

Runoff = 3.25 inches, Runoff Peak = 25.7 cfs Peak Timing = 210.0 min.
Runoff Volume = 23.0 cfs-hrs

Hydrograph for Subarea 14 Dr.A = 0.0 ac. Cum. Dr.A = 350.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.4	0.0	
10.0	0.040	0.040	0.0			0.1	0.0	
15.0	0.060	0.060	0.0			0.1	0.0	
20.0	0.080	0.080	0.0			0.2	0.0	
25.0	0.100	0.100	0.0			0.2	0.0	
30.0	0.120	0.120	0.0			0.2	0.0	
35.0	0.140	0.139	0.0			0.2	0.0	
40.0	0.160	0.159	0.0			0.3	0.0	
45.0	0.180	0.179	0.0			0.3	0.0	
50.0	0.200	0.199	0.0			0.3	0.0	
55.0	0.220	0.219	0.0			0.3	0.0	
60.0	0.240	0.239	0.0			0.3	0.0	
65.0	0.270	0.269	0.0			0.3	0.0	
70.0	0.300	0.298	0.0			0.3	0.0	
75.0	0.330	0.328	0.0			0.3	0.0	
80.0	0.360	0.358	0.0			0.4	0.0	
85.0	0.390	0.388	0.0			0.4	0.0	
90.0	0.420	0.417	0.0			0.4	0.0	
95.0	0.450	0.447	0.0			0.4	0.0	
100.0	0.480	0.477	0.0			0.4	0.0	
105.0	0.510	0.506	0.0			0.4	0.0	
110.0	0.540	0.536	0.0			0.5	0.0	
115.0	0.580	0.568	0.0			0.5	0.0	
120.0	0.620	0.599	0.0			0.5	0.0	
125.0	0.660	0.629	0.0			0.6	0.0	
130.0	0.700	0.658	0.0			0.7	0.0	
135.0	0.750	0.693	0.0			1.0	0.0	
140.0	0.800	0.728	0.0			1.3	0.0	
145.0	0.850	0.761	0.0			1.8	0.0	
150.0	0.900	0.793	0.0			2.3	0.0	
155.0	0.960	0.831	0.0			3.0	0.0	
160.0	1.050	0.884	0.0			4.0	0.0	
165.0	1.160	0.945	0.0			5.7	0.0	
170.0	1.300	1.017	0.0			8.3	0.0	
175.0	1.460	1.092	0.0			12.3	0.0	
180.0	1.640	1.170	0.0			18.2	0.0	
185.0	1.900	1.268	0.0			27.0	0.0	
190.0	2.270	1.387	0.0			42.6	0.0	
195.0	2.930	1.550	0.0			73.9	0.0	
200.0	3.880	1.719	0.1			135.8	0.0	
205.0	4.340	1.790	0.1			196.7	0.0	

210.0	4.630	1.832	0.0		223.8	0.0
215.0	4.720	1.844	0.1		236.5	0.0
220.0	4.800	1.855	0.0		241.2	0.0
225.0	4.870	1.866	0.0		245.5	0.0
230.0	4.930	1.876	0.0		250.1	0.0
235.0	4.980	1.887	0.0		254.0	0.0
240.0	5.020	1.897	0.0		257.3	0.0
245.0	5.060	1.908	0.0		260.2	0.0
250.0	5.100	1.918	0.0		262.8	0.0
255.0	5.140	1.928	0.0		265.1	0.0
260.0	5.180	1.937	0.0		267.0	0.0
265.0	5.220	1.947	0.0		268.2	0.0
270.0	5.250	1.957	0.0		268.6	0.0
275.0	5.280	1.966	0.0		268.2	0.0
280.0	5.310	1.975	0.0		267.2	0.0
285.0	5.340	1.984	0.0		265.9	0.0
290.0	5.370	1.993	0.0		264.1	0.0
295.0	5.400	2.002	0.0		262.0	0.0
300.0	5.430	2.011	0.0		259.5	0.0
305.0	5.460	2.020	0.0		256.8	0.0
310.0	5.490	2.028	0.0		253.9	0.0
315.0	5.520	2.037	0.0		250.9	0.0
320.0	5.550	2.045	0.0		247.8	0.0
325.0	5.570	2.053	0.0		244.4	0.0
330.0	5.590	2.061	0.0		240.6	0.0
335.0	5.610	2.069	0.0		236.8	0.0
340.0	5.630	2.077	0.0		232.8	0.0
345.0	5.650	2.085	0.0		228.8	0.0
350.0	5.670	2.092	0.0		224.7	0.0
355.0	5.690	2.100	0.0		220.7	0.0
360.0	5.710	2.107	0.0		216.6	0.0

Runoff = 3.58 inches, Runoff Peak = 0.1 cfs Peak Timing = 200.0 min.
Runoff Volume = 0.0 cfs-hrs

Hydrograph for Subarea 15 Dr.A = 26.9 ac. Cum. Dr.A = 26.9 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.0	0.0	
10.0	0.040	0.040	0.0			0.0	0.0	
15.0	0.060	0.060	0.0			0.0	0.0	
20.0	0.080	0.080	0.0			0.0	0.0	
25.0	0.100	0.100	0.0			0.0	0.0	
30.0	0.120	0.120	0.0			0.0	0.0	
35.0	0.140	0.139	0.0			0.0	0.0	
40.0	0.160	0.159	0.0			0.0	0.0	
45.0	0.180	0.179	0.0			0.0	0.0	
50.0	0.200	0.199	0.0			0.0	0.0	
55.0	0.220	0.219	0.0			0.0	0.0	
60.0	0.240	0.239	0.0			0.0	0.0	
65.0	0.270	0.269	0.0			0.0	0.0	
70.0	0.300	0.298	0.0			0.0	0.0	
75.0	0.330	0.328	0.0			0.0	0.0	
80.0	0.360	0.358	0.0			0.0	0.0	
85.0	0.390	0.388	0.0			0.0	0.0	
90.0	0.420	0.417	0.0			0.0	0.0	
95.0	0.450	0.447	0.0			0.0	0.0	
100.0	0.480	0.477	0.0			0.0	0.0	

105.0	0.510	0.506	0.0		0.0	0.0
110.0	0.540	0.536	0.1		0.1	0.0
115.0	0.580	0.568	0.1		0.1	0.0
120.0	0.620	0.599	0.1		0.1	0.0
125.0	0.660	0.629	0.1		0.1	0.0
130.0	0.700	0.658	0.1		0.1	0.0
135.0	0.750	0.693	0.2		0.2	0.0
140.0	0.800	0.728	0.3		0.3	0.0
145.0	0.850	0.761	0.4		0.4	0.0
150.0	0.900	0.793	0.5		0.5	0.0
155.0	0.960	0.831	0.6		0.6	0.0
160.0	1.050	0.884	0.8		0.8	0.0
165.0	1.160	0.945	1.2		1.2	0.0
170.0	1.300	1.017	1.9		1.9	0.0
175.0	1.460	1.092	2.9		2.9	0.0
180.0	1.640	1.170	4.3		4.3	0.0
185.0	1.900	1.268	6.6		6.6	0.0
190.0	2.270	1.387	10.9		10.9	0.0
195.0	2.930	1.550	20.9		20.9	0.0
200.0	3.880	1.719	42.8		42.8	0.0
205.0	4.340	1.790	63.9		63.9	0.0
210.0	4.630	1.832	70.2		70.2	0.0
215.0	4.720	1.844	67.5		67.5	0.0
220.0	4.800	1.855	60.8		60.8	0.0
225.0	4.870	1.866	54.9		54.9	0.0
230.0	4.930	1.876	49.6		49.6	0.0
235.0	4.980	1.887	44.8		44.8	0.0
240.0	5.020	1.897	40.3		40.3	0.0
245.0	5.060	1.908	36.4		36.4	0.0
250.0	5.100	1.918	33.2		33.2	0.0
255.0	5.140	1.928	30.4		30.4	0.0
260.0	5.180	1.937	28.0		28.0	0.0
265.0	5.220	1.947	26.0		26.0	0.0
270.0	5.250	1.957	24.1		24.1	0.0
275.0	5.280	1.966	22.3		22.3	0.0
280.0	5.310	1.975	20.7		20.7	0.0
285.0	5.340	1.984	19.3		19.3	0.0
290.0	5.370	1.993	18.1		18.1	0.0
295.0	5.400	2.002	17.0		17.0	0.0
300.0	5.430	2.011	16.1		16.1	0.0
305.0	5.460	2.020	15.3		15.3	0.0
310.0	5.490	2.028	14.5		14.5	0.0
315.0	5.520	2.037	13.9		13.9	0.0
320.0	5.550	2.045	13.3		13.3	0.0
325.0	5.570	2.053	12.7		12.7	0.0
330.0	5.590	2.061	11.9		11.9	0.0
335.0	5.610	2.069	11.3		11.3	0.0
340.0	5.630	2.077	10.7		10.7	0.0
345.0	5.650	2.085	10.2		10.2	0.0
350.0	5.670	2.092	9.7		9.7	0.0
355.0	5.690	2.100	9.3		9.3	0.0
360.0	5.710	2.107	8.9		8.9	0.0

Runoff = 3.01 inches, Runoff Peak = 70.1 cfs Peak Timing = 210.0 min.
Runoff Volume = 81.6 cfs-hrs

Hydrograph for Subarea 16 Dr.A = 0.0 ac. Cum. Dr.A = 749.1 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir	Pipe Q	Surch	Obs Q

min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.1	0.0	
10.0	0.040	0.040	0.0			0.7	0.0	
15.0	0.060	0.060	0.0			0.5	0.0	
20.0	0.080	0.080	0.0			0.3	0.0	
25.0	0.100	0.100	0.0			0.3	0.0	
30.0	0.120	0.120	0.0			0.4	0.0	
35.0	0.140	0.139	0.0			0.5	0.0	
40.0	0.160	0.159	0.0			0.5	0.0	
45.0	0.180	0.179	0.0			0.6	0.0	
50.0	0.200	0.199	0.0			0.6	0.0	
55.0	0.220	0.219	0.0			0.6	0.0	
60.0	0.240	0.239	0.0			0.6	0.0	
65.0	0.270	0.269	0.0			0.7	0.0	
70.0	0.300	0.298	0.0			0.7	0.0	
75.0	0.330	0.328	0.0			0.7	0.0	
80.0	0.360	0.358	0.0			0.8	0.0	
85.0	0.390	0.388	0.0			1.0	0.0	
90.0	0.420	0.417	0.0			1.2	0.0	
95.0	0.450	0.447	0.0			1.6	0.0	
100.0	0.480	0.477	0.0			2.2	0.0	
105.0	0.510	0.506	0.0			2.9	0.0	
110.0	0.540	0.536	0.0			3.8	0.0	
115.0	0.580	0.568	0.0			4.7	0.0	
120.0	0.620	0.599	0.0			5.8	0.0	
125.0	0.660	0.629	0.0			7.0	0.0	
130.0	0.700	0.658	0.0			8.4	0.0	
135.0	0.750	0.693	0.0			10.3	0.0	
140.0	0.800	0.728	0.0			12.6	0.0	
145.0	0.850	0.761	0.0			15.3	0.0	
150.0	0.900	0.793	0.0			18.5	0.0	
155.0	0.960	0.831	0.0			22.3	0.0	
160.0	1.050	0.884	0.0			26.8	0.0	
165.0	1.160	0.945	0.0			32.6	0.0	
170.0	1.300	1.017	0.0			40.3	0.0	
175.0	1.460	1.092	0.0			51.4	0.0	
180.0	1.640	1.170	0.0			67.7	0.0	
185.0	1.900	1.268	0.0			92.2	0.0	
190.0	2.270	1.387	0.0			130.4	0.0	
195.0	2.930	1.550	0.0			196.4	0.0	
200.0	3.880	1.719	0.1			315.5	0.0	
205.0	4.340	1.790	0.1			469.0	0.0	
210.0	4.630	1.832	0.0			615.2	0.0	
215.0	4.720	1.844	0.1			738.8	0.0	
220.0	4.800	1.855	0.0			829.8	0.0	
225.0	4.870	1.866	0.0			893.4	0.0	
230.0	4.930	1.876	0.0			926.3	0.0	
235.0	4.980	1.887	0.0			936.6	0.0	
240.0	5.020	1.897	0.0			934.0	0.0	
245.0	5.060	1.908	0.0			905.5	0.0	
250.0	5.100	1.918	0.0			865.9	0.0	
255.0	5.140	1.928	0.0			838.4	0.0	
260.0	5.180	1.937	0.0			811.2	0.0	
265.0	5.220	1.947	0.0			782.1	0.0	
270.0	5.250	1.957	0.0			752.5	0.0	
275.0	5.280	1.966	0.0			723.8	0.0	
280.0	5.310	1.975	0.0			693.7	0.0	
285.0	5.340	1.984	0.0			662.0	0.0	
290.0	5.370	1.993	0.0			632.3	0.0	
295.0	5.400	2.002	0.0			605.8	0.0	

300.0	5.430	2.011	0.0		582.2	0.0
305.0	5.460	2.020	0.0		561.2	0.0
310.0	5.490	2.028	0.0		542.5	0.0
315.0	5.520	2.037	0.0		525.0	0.0
320.0	5.550	2.045	0.0		506.3	0.0
325.0	5.570	2.053	0.0		486.5	0.0
330.0	5.590	2.061	0.0		470.0	0.0
335.0	5.610	2.069	0.0		456.7	0.0
340.0	5.630	2.077	0.0		445.3	0.0
345.0	5.650	2.085	0.0		434.6	0.0
350.0	5.670	2.092	0.0		424.5	0.0
355.0	5.690	2.100	0.0		414.9	0.0
360.0	5.710	2.107	0.0		405.7	0.0

Runoff = 3.58 inches, Runoff Peak = 0.1 cfs Peak Timing = 200.0 min.
Runoff Volume = 0.0 cfs-hrs

Hydrograph for Subarea 17 Dr.A = 14.0 ac. Cum. Dr.A = 14.0 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.0	0.0	
10.0	0.040	0.040	0.0			0.0	0.0	
15.0	0.060	0.060	0.0			0.0	0.0	
20.0	0.080	0.080	0.0			0.0	0.0	
25.0	0.100	0.100	0.0			0.0	0.0	
30.0	0.120	0.120	0.0			0.0	0.0	
35.0	0.140	0.139	0.0			0.0	0.0	
40.0	0.160	0.158	0.0			0.0	0.0	
45.0	0.180	0.176	0.0			0.0	0.0	
50.0	0.200	0.194	0.0			0.0	0.0	
55.0	0.220	0.211	0.0			0.0	0.0	
60.0	0.240	0.227	0.0			0.0	0.0	
65.0	0.270	0.251	0.0			0.0	0.0	
70.0	0.300	0.274	0.0			0.0	0.0	
75.0	0.330	0.296	0.0			0.0	0.0	
80.0	0.360	0.317	0.1			0.1	0.0	
85.0	0.390	0.337	0.1			0.1	0.0	
90.0	0.420	0.356	0.1			0.1	0.0	
95.0	0.450	0.375	0.2			0.2	0.0	
100.0	0.480	0.393	0.3			0.3	0.0	
105.0	0.510	0.410	0.4			0.4	0.0	
110.0	0.540	0.427	0.4			0.4	0.0	
115.0	0.580	0.448	0.5			0.5	0.0	
120.0	0.620	0.468	0.6			0.6	0.0	
125.0	0.660	0.487	0.8			0.8	0.0	
130.0	0.700	0.506	0.9			0.9	0.0	
135.0	0.750	0.527	1.1			1.1	0.0	
140.0	0.800	0.548	1.4			1.4	0.0	
145.0	0.850	0.568	1.6			1.6	0.0	
150.0	0.900	0.586	1.9			1.9	0.0	
155.0	0.960	0.608	2.2			2.2	0.0	
160.0	1.050	0.637	2.7			2.7	0.0	
165.0	1.160	0.669	3.4			3.4	0.0	
170.0	1.300	0.705	4.6			4.6	0.0	
175.0	1.460	0.742	6.2			6.2	0.0	
180.0	1.640	0.778	8.2			8.2	0.0	
185.0	1.900	0.821	11.2			11.2	0.0	
190.0	2.270	0.870	16.5			16.5	0.0	

195.0	2.930	0.931	27.7		27.7	0.0
200.0	3.880	0.989	49.6		49.6	0.0
205.0	4.340	1.012	65.8		65.8	0.0
210.0	4.630	1.026	64.4		64.4	0.0
215.0	4.720	1.030	55.6		55.6	0.0
220.0	4.800	1.033	45.3		45.3	0.0
225.0	4.870	1.036	37.7		37.7	0.0
230.0	4.930	1.039	31.8		31.8	0.0
235.0	4.980	1.041	27.2		27.2	0.0
240.0	5.020	1.044	23.3		23.3	0.0
245.0	5.060	1.046	20.2		20.2	0.0
250.0	5.100	1.049	17.8		17.8	0.0
255.0	5.140	1.051	15.9		15.9	0.0
260.0	5.180	1.054	14.4		14.4	0.0
265.0	5.220	1.056	13.2		13.2	0.0
270.0	5.250	1.059	12.0		12.0	0.0
275.0	5.280	1.061	11.0		11.0	0.0
280.0	5.310	1.063	10.1		10.1	0.0
285.0	5.340	1.065	9.4		9.4	0.0
290.0	5.370	1.068	8.8		8.8	0.0
295.0	5.400	1.070	8.2		8.2	0.0
300.0	5.430	1.072	7.8		7.8	0.0
305.0	5.460	1.074	7.4		7.4	0.0
310.0	5.490	1.076	7.1		7.1	0.0
315.0	5.520	1.078	6.8		6.8	0.0
320.0	5.550	1.080	6.6		6.6	0.0
325.0	5.570	1.082	6.3		6.3	0.0
330.0	5.590	1.084	5.9		5.9	0.0
335.0	5.610	1.086	5.6		5.6	0.0
340.0	5.630	1.088	5.3		5.3	0.0
345.0	5.650	1.090	5.1		5.1	0.0
350.0	5.670	1.092	4.9		4.9	0.0
355.0	5.690	1.094	4.7		4.7	0.0
360.0	5.710	1.096	4.5		4.5	0.0

Runoff = 4.20 inches, Runoff Peak = 65.8 cfs Peak Timing = 205.0 min.
Runoff Volume = 59.3 cfs-hrs

Hydrograph for Subarea 18 Dr.A = 59.3 ac. Cum. Dr.A = 73.3 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.1			0.1	0.0	
10.0	0.040	0.040	0.1			0.1	0.0	
15.0	0.060	0.060	0.1			0.1	0.0	
20.0	0.080	0.080	0.1			0.1	0.0	
25.0	0.100	0.100	0.1			0.1	0.0	
30.0	0.120	0.120	0.1			0.1	0.0	
35.0	0.140	0.139	0.1			0.1	0.0	
40.0	0.160	0.159	0.1			0.1	0.0	
45.0	0.180	0.179	0.1			0.1	0.0	
50.0	0.200	0.199	0.1			0.1	0.0	
55.0	0.220	0.219	0.1			0.1	0.0	
60.0	0.240	0.239	0.1			0.1	0.0	
65.0	0.270	0.269	0.1			0.1	0.0	
70.0	0.300	0.298	0.1			0.1	0.0	
75.0	0.330	0.328	0.1			0.1	0.0	
80.0	0.360	0.358	0.1			0.1	0.0	
85.0	0.390	0.388	0.1			0.1	0.0	

90.0	0.420	0.417	0.1	0.2	0.0
95.0	0.450	0.447	0.1	0.2	0.0
100.0	0.480	0.477	0.1	0.3	0.0
105.0	0.510	0.506	0.1	0.4	0.0
110.0	0.540	0.536	0.1	0.4	0.0
115.0	0.580	0.568	0.1	0.5	0.0
120.0	0.620	0.599	0.2	0.6	0.0
125.0	0.660	0.629	0.2	0.8	0.0
130.0	0.700	0.658	0.4	1.1	0.0
135.0	0.750	0.693	0.5	1.4	0.0
140.0	0.800	0.728	0.7	1.7	0.0
145.0	0.850	0.761	1.0	2.2	0.0
150.0	0.900	0.793	1.3	2.7	0.0
155.0	0.960	0.831	1.7	3.4	0.0
160.0	1.050	0.884	2.4	4.4	0.0
165.0	1.160	0.945	3.5	5.9	0.0
170.0	1.300	1.017	5.4	8.4	0.0
175.0	1.460	1.092	8.2	12.1	0.0
180.0	1.640	1.170	12.1	17.3	0.0
185.0	1.900	1.268	18.5	25.5	0.0
190.0	2.270	1.387	30.6	40.0	0.0
195.0	2.930	1.550	58.3	71.6	0.0
200.0	3.880	1.719	118.5	139.4	0.0
205.0	4.340	1.790	173.4	209.8	0.0
210.0	4.630	1.832	184.3	240.4	0.0
215.0	4.720	1.844	171.1	236.3	0.0
220.0	4.800	1.855	148.7	209.6	0.0
225.0	4.870	1.866	130.2	181.7	0.0
230.0	4.930	1.876	114.6	156.9	0.0
235.0	4.980	1.887	101.1	136.4	0.0
240.0	5.020	1.897	89.2	119.1	0.0
245.0	5.060	1.908	79.0	104.7	0.0
250.0	5.100	1.918	70.8	92.9	0.0
255.0	5.140	1.928	64.0	83.3	0.0
260.0	5.180	1.937	58.4	75.5	0.0
265.0	5.220	1.947	53.7	69.0	0.0
270.0	5.250	1.957	49.3	63.2	0.0
275.0	5.280	1.966	45.2	57.9	0.0
280.0	5.310	1.975	41.6	53.2	0.0
285.0	5.340	1.984	38.6	49.2	0.0
290.0	5.370	1.993	36.0	45.8	0.0
295.0	5.400	2.002	33.8	42.9	0.0
300.0	5.430	2.011	31.8	40.4	0.0
305.0	5.460	2.020	30.1	38.2	0.0
310.0	5.490	2.028	28.7	36.3	0.0
315.0	5.520	2.037	27.4	34.7	0.0
320.0	5.550	2.045	26.2	33.2	0.0
325.0	5.570	2.053	24.9	31.6	0.0
330.0	5.590	2.061	23.4	29.8	0.0
335.0	5.610	2.069	22.0	28.1	0.0
340.0	5.630	2.077	20.8	26.6	0.0
345.0	5.650	2.085	19.8	25.3	0.0
350.0	5.670	2.092	18.9	24.1	0.0
355.0	5.690	2.100	18.0	23.0	0.0
360.0	5.710	2.107	17.3	22.1	0.0

Runoff = 3.14 inches, Runoff Peak = 184.2 cfs Peak Timing = 210.0 min.
Runoff Volume = 187.8 cfs-hrs

Hydrograph for Subarea 19 Dr.A = 17.9 ac. Cum. Dr.A = 17.9 ac.

Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.0	0.0	
10.0	0.040	0.040	0.0			0.0	0.0	
15.0	0.060	0.060	0.0			0.0	0.0	
20.0	0.080	0.080	0.0			0.0	0.0	
25.0	0.100	0.100	0.0			0.0	0.0	
30.0	0.120	0.120	0.0			0.0	0.0	
35.0	0.140	0.139	0.0			0.0	0.0	
40.0	0.160	0.159	0.0			0.0	0.0	
45.0	0.180	0.179	0.0			0.0	0.0	
50.0	0.200	0.199	0.0			0.0	0.0	
55.0	0.220	0.219	0.0			0.0	0.0	
60.0	0.240	0.239	0.0			0.0	0.0	
65.0	0.270	0.269	0.0			0.0	0.0	
70.0	0.300	0.298	0.0			0.0	0.0	
75.0	0.330	0.328	0.0			0.0	0.0	
80.0	0.360	0.358	0.0			0.0	0.0	
85.0	0.390	0.388	0.0			0.0	0.0	
90.0	0.420	0.417	0.0			0.0	0.0	
95.0	0.450	0.447	0.0			0.0	0.0	
100.0	0.480	0.477	0.0			0.0	0.0	
105.0	0.510	0.506	0.0			0.0	0.0	
110.0	0.540	0.536	0.0			0.0	0.0	
115.0	0.580	0.568	0.1			0.1	0.0	
120.0	0.620	0.599	0.1			0.1	0.0	
125.0	0.660	0.629	0.1			0.1	0.0	
130.0	0.700	0.658	0.2			0.2	0.0	
135.0	0.750	0.693	0.2			0.2	0.0	
140.0	0.800	0.728	0.3			0.3	0.0	
145.0	0.850	0.761	0.5			0.5	0.0	
150.0	0.900	0.793	0.6			0.6	0.0	
155.0	0.960	0.831	0.8			0.8	0.0	
160.0	1.050	0.884	1.1			1.1	0.0	
165.0	1.160	0.945	1.7			1.7	0.0	
170.0	1.300	1.017	2.5			2.5	0.0	
175.0	1.460	1.092	3.8			3.8	0.0	
180.0	1.640	1.170	5.5			5.5	0.0	
185.0	1.900	1.268	8.4			8.4	0.0	
190.0	2.270	1.387	13.6			13.6	0.0	
195.0	2.930	1.550	25.8			25.8	0.0	
200.0	3.880	1.719	51.6			51.6	0.0	
205.0	4.340	1.790	72.1			70.0	2.1	
210.0	4.630	1.832	71.2			70.0	1.2	
215.0	4.720	1.844	61.2			61.2	0.0	
220.0	4.800	1.855	49.3			49.3	0.0	
225.0	4.870	1.866	40.7			40.7	0.0	
230.0	4.930	1.876	34.1			34.1	0.0	
235.0	4.980	1.887	28.8			28.8	0.0	
240.0	5.020	1.897	24.5			24.5	0.0	
245.0	5.060	1.908	21.0			21.0	0.0	
250.0	5.100	1.918	18.4			18.4	0.0	
255.0	5.140	1.928	16.3			16.3	0.0	
260.0	5.180	1.937	14.7			14.7	0.0	
265.0	5.220	1.947	13.4			13.4	0.0	
270.0	5.250	1.957	12.2			12.2	0.0	
275.0	5.280	1.966	11.0			11.0	0.0	
280.0	5.310	1.975	10.1			10.1	0.0	

285.0	5.340	1.984	9.3		9.3	0.0
290.0	5.370	1.993	8.7		8.7	0.0
295.0	5.400	2.002	8.1		8.1	0.0
300.0	5.430	2.011	7.7		7.7	0.0
305.0	5.460	2.020	7.3		7.3	0.0
310.0	5.490	2.028	6.9		6.9	0.0
315.0	5.520	2.037	6.7		6.7	0.0
320.0	5.550	2.045	6.4		6.4	0.0
325.0	5.570	2.053	6.1		6.1	0.0
330.0	5.590	2.061	5.7		5.7	0.0
335.0	5.610	2.069	5.3		5.3	0.0
340.0	5.630	2.077	5.0		5.0	0.0
345.0	5.650	2.085	4.8		4.8	0.0
350.0	5.670	2.092	4.6		4.6	0.0
355.0	5.690	2.100	4.4		4.4	0.0
360.0	5.710	2.107	4.2		4.2	0.0

Runoff = 3.31 inches, Runoff Peak = 72.1 cfs Peak Timing = 205.0 min.
Runoff Volume = 59.7 cfs-hrs

Hydrograph for Subarea 20 Dr.A = 0.0 ac. Cum. Dr.A = 840.3 ac.
Storm Total and Centroid = 5.71 inches and 188.7 min.

Time	Precip	Infilt	Runoff	Reservoir		Pipe Q	Surch	Obs Q
min.	inches	inches	cfs	Inflow	W.S.El.	cfs	cfs	cfs
5.0	0.020	0.020	0.0			0.1	0.0	
10.0	0.040	0.040	0.0			0.2	0.0	
15.0	0.060	0.060	0.0			0.8	0.0	
20.0	0.080	0.080	0.0			0.6	0.0	
25.0	0.100	0.100	0.0			0.4	0.0	
30.0	0.120	0.120	0.0			0.4	0.0	
35.0	0.140	0.139	0.0			0.5	0.0	
40.0	0.160	0.159	0.0			0.6	0.0	
45.0	0.180	0.179	0.0			0.6	0.0	
50.0	0.200	0.199	0.0			0.6	0.0	
55.0	0.220	0.219	0.0			0.7	0.0	
60.0	0.240	0.239	0.0			0.7	0.0	
65.0	0.270	0.269	0.0			0.7	0.0	
70.0	0.300	0.298	0.0			0.8	0.0	
75.0	0.330	0.328	0.0			0.8	0.0	
80.0	0.360	0.358	0.0			0.9	0.0	
85.0	0.390	0.388	0.0			1.0	0.0	
90.0	0.420	0.417	0.0			1.2	0.0	
95.0	0.450	0.447	0.0			1.5	0.0	
100.0	0.480	0.477	0.0			1.9	0.0	
105.0	0.510	0.506	0.0			2.6	0.0	
110.0	0.540	0.536	0.0			3.4	0.0	
115.0	0.580	0.568	0.0			4.3	0.0	
120.0	0.620	0.599	0.0			5.4	0.0	
125.0	0.660	0.629	0.0			6.6	0.0	
130.0	0.700	0.658	0.0			8.1	0.0	
135.0	0.750	0.693	0.0			9.9	0.0	
140.0	0.800	0.728	0.0			12.3	0.0	
145.0	0.850	0.761	0.0			15.1	0.0	
150.0	0.900	0.793	0.0			18.5	0.0	
155.0	0.960	0.831	0.0			22.5	0.0	
160.0	1.050	0.884	0.0			27.4	0.0	
165.0	1.160	0.945	0.0			33.9	0.0	
170.0	1.300	1.017	0.0			42.6	0.0	
175.0	1.460	1.092	0.0			54.9	0.0	

180.0	1.640	1.170	0.0	72.6	0.0
185.0	1.900	1.268	0.0	98.9	0.0
190.0	2.270	1.387	0.0	140.8	0.0
195.0	2.930	1.550	0.0	216.3	0.0
200.0	3.880	1.719	0.1	362.9	0.0
205.0	4.340	1.790	0.1	577.4	0.0
210.0	4.630	1.832	0.0	780.1	0.0
215.0	4.720	1.844	0.1	922.3	0.0
220.0	4.800	1.855	0.0	1009.3	0.0
225.0	4.870	1.866	0.0	1060.5	0.0
230.0	4.930	1.876	0.0	1090.7	0.0
235.0	4.980	1.887	0.0	1096.7	0.0
240.0	5.020	1.897	0.0	1084.4	0.0
245.0	5.060	1.908	0.0	1063.1	0.0
250.0	5.100	1.918	0.0	1019.4	0.0
255.0	5.140	1.928	0.0	967.6	0.0
260.0	5.180	1.937	0.0	930.2	0.0
265.0	5.220	1.947	0.0	895.0	0.0
270.0	5.250	1.957	0.0	858.8	0.0
275.0	5.280	1.966	0.0	822.6	0.0
280.0	5.310	1.975	0.0	788.0	0.0
285.0	5.340	1.984	0.0	753.1	0.0
290.0	5.370	1.993	0.0	717.1	0.0
295.0	5.400	2.002	0.0	683.9	0.0
300.0	5.430	2.011	0.0	654.3	0.0
305.0	5.460	2.020	0.0	628.1	0.0
310.0	5.490	2.028	0.0	604.8	0.0
315.0	5.520	2.037	0.0	584.1	0.0
320.0	5.550	2.045	0.0	564.9	0.0
325.0	5.570	2.053	0.0	544.3	0.0
330.0	5.590	2.061	0.0	522.4	0.0
335.0	5.610	2.069	0.0	503.8	0.0
340.0	5.630	2.077	0.0	488.7	0.0
345.0	5.650	2.085	0.0	475.6	0.0
350.0	5.670	2.092	0.0	463.5	0.0
355.0	5.690	2.100	0.0	452.1	0.0
360.0	5.710	2.107	0.0	441.3	0.0

Runoff = 3.58 inches, Runoff Peak = 0.1 cfs Peak Timing = 200.0 min.
Runoff Volume = 0.0 cfs-hrs

Peak Flow Presentation for Subarea 1

Sub-Area	Travel Time	Time, minutes 180	185	190	195	200	205	210	215	220	225	230
1	0.0	57	77	114	192	342	436	397	319	243	193	157

Peak Flow Presentation for Subarea 2

Sub-Area	Travel Time	Time, minutes 180	185	190	195	200	205	210	215	220	225	230
2	0.0	44	60	88	149	266	336	303	240	181	142	115

Peak Flow Presentation for Subarea 3

Sub-Area	Travel Time	Time, minutes 200	205	210	215	220	225	230	235	240	245	250
3	0.0	205	277	330	355	366	367	362	353	341	327	309
2	0.1	264	335	303	241	182	143	115	95	79	67	59
1	0.1	338	433	398	321	245	194	158	131	109	93	81

Peak Flow Presentation for Subarea 4

Sub-Area	Travel Time	Time, minutes 180	185	190	195	200	205	210	215	220	225	230
4	0.0	20	26	37	60	103	135	131	114	93	78	66

Peak Flow Presentation for Subarea 5

Sub-Area	Travel Time	Time, minutes 195	200	205	210	215	220	225	230	235	240	245
5	0.0	163	235	324	409	472	499	490	466	439	413	389
4	12.6	23	32	48	81	118	133	123	104	86	72	62
3	0.1	140	203	276	329	354	366	367	362	353	341	328
2	0.2	147	261	333	304	243	183	143	116	96	80	68
1	0.2	188	335	431	399	323	247	195	158	131	110	93

Peak Flow Presentation for Subarea 6

Sub-Area	Travel Time	Time, minutes 190	195	200	205	210	215	220	225	230	235	240
6	0.0	8	13	21	33	44	54	62	69	75	81	86

Peak Flow Presentation for Subarea 7

Sub-Area	Travel Time	Time, minutes 200	205	210	215	220	225	230	235	240	245	250
7	0.0	205	295	394	476	533	567	566	545	518	496	474
6	0.1	20	33	44	54	62	69	75	81	85	89	93
5	3.7	182	259	347	426	479	497	484	459	432	407	382
4	16.3	25	34	54	92	127	132	118	98	82	69	59
3	3.8	157	223	290	336	357	366	366	360	350	338	323
2	3.9	176	282	328	288	227	172	136	110	91	76	65
1	3.9	225	363	427	380	303	232	185	151	125	105	90

Peak Flow Presentation for Subarea 8

Sub-Area	Travel Time	Time, minutes 185	190	195	200	205	210	215	220	225	230	235
8	0.0	13	21	41	83	124	135	129	116	104	94	85

Peak Flow Presentation for Subarea 9

Sub-Area	Travel Time	Time, minutes 210	215	220	225	230	235	240	245	250	255	260
9	0.0	371	458	538	600	633	643	641	612	573	545	518
8	0.1	135	130	116	105	94	85	76	69	62	57	53
7	8.4	234	326	420	494	544	566	559	536	511	489	466
6	8.6	24	37	47	56	64	71	77	82	87	91	94
5	12.1	205	287	374	446	488	494	476	450	424	399	374
4	24.7	27	39	63	105	134	130	112	92	77	65	56
3	12.2	177	246	307	344	361	367	364	357	346	333	317
2	12.3	212	304	318	269	208	160	127	104	86	73	62
1	12.3	272	392	415	355	278	216	173	142	119	100	86

Peak Flow Presentation for Subarea 10

Sub-Area	Travel Time	Time, minutes 185	190	195	200	205	210	215	220	225	230	235
10	0.0	4	7	10	17	25	32	40	46	51	55	59

Peak Flow Presentation for Subarea 11

Sub-Area	Travel Time	Time, minutes 190	195	200	205	210	215	220	225	230	235	240
11	0.0	15	25	41	62	82	102	118	131	142	150	157

Peak Flow Presentation for Subarea 12

Sub-Area	Travel Time	Time, minutes 180	185	190	195	200	205	210	215	220	225	230
12	0.0	7	10	16	31	62	86	84	72	58	48	40

Peak Flow Presentation for Subarea 13

Sub-Area	Travel Time	Time, minutes 180	185	190	195	200	205	210	215	220	225	230
13	0.0	8	13	21	39	79	111	110	95	77	64	54
12	0.1	7	10	16	31	61	85	84	72	58	48	40

Peak Flow Presentation for Subarea 14

Sub-Area	Travel Time	Time, minutes 245	250	255	260	265	270	275	280	285	290	295
14	0.0	260	263	265	267	268	269	268	267	266	264	262
13	0.1	33	29	26	23	21	19	18	16	15	14	13
12	0.2	25	21	19	17	16	14	13	12	11	10	9
11	0.1	163	168	172	175	177	178	179	179	178	177	176
10	0.1	64	66	68	69	70	71	72	72	73	73	73

Peak Flow Presentation for Subarea 15

Sub-Area	Travel Time	Time, minutes 185	190	195	200	205	210	215	220	225	230	235
15	0.0	7	11	21	43	64	70	67	61	55	50	45

Peak Flow Presentation for Subarea 16

Sub-Area	Travel Time	Time, minutes 210	215	220	225	230	235	240	245	250	255	260
16	0.0	615	739	830	893	926	937	934	905	866	838	811
15	0.1	70	68	61	55	50	45	40	37	33	30	28
14	6.7	176	215	232	240	244	249	253	256	259	262	264
13	6.8	99	110	101	84	69	57	48	41	35	31	27
12	6.9	77	85	77	63	52	43	36	30	26	23	20
11	6.8	55	75	94	112	126	138	147	155	161	166	170
10	6.8	22	30	37	44	49	54	57	60	63	65	67
9	0.1	369	457	537	599	633	643	641	613	573	546	519
8	0.2	135	130	117	105	94	85	76	69	63	57	53
7	8.5	232	324	418	493	543	566	560	537	511	489	467
6	8.7	24	36	47	56	64	71	77	82	87	91	94
5	12.2	204	285	372	445	487	494	477	451	425	400	374
4	24.8	27	38	62	105	134	131	113	93	77	66	56
3	12.3	176	244	306	343	361	367	365	357	346	334	317
2	12.4	210	303	319	270	209	160	128	104	87	73	63
1	12.4	269	390	416	357	280	217	174	143	119	100	86

Peak Flow Presentation for Subarea 17

Sub-Area	Travel Time	Time, minutes 180	185	190	195	200	205	210	215	220	225	230

17	0.0	8	11	16	28	50	66	64	56	45	38	32

Peak Flow Presentation for Subarea 18

Sub-Area	Travel Time	Time, minutes 185	190	195	200	205	210	215	220	225	230	235
18	0.0	26	40	72	139	210	240	236	210	182	157	136
17	8.0	7	9	13	21	36	56	65	61	51	42	35

Peak Flow Presentation for Subarea 19

Sub-Area	Travel Time	Time, minutes 180	185	190	195	200	205	210	215	220	225	230
19	0.0	6	8	14	26	52	72	71	61	49	41	34

Peak Flow Presentation for Subarea 20

Sub-Area	Travel Time	Time, minutes 210	215	220	225	230	235	240	245	250	255	260
20	0.0	780	922	1009	1061	1091	1097	1084	1063	1019	968	930
19	4.6	72	70	60	49	40	34	28	24	21	18	16
18	0.1	240	236	210	182	157	137	119	105	93	84	76
17	8.1	56	65	61	52	42	35	30	26	22	19	17
16	5.0	469	615	739	830	893	926	937	934	905	866	838
15	5.1	64	70	68	61	55	50	45	40	37	33	30
14	11.7	115	176	215	232	240	244	249	253	256	259	262
13	11.8	65	99	110	101	84	69	57	48	41	35	31
12	11.9	50	77	85	77	63	52	43	36	30	26	23
11	11.8	35	55	75	94	112	126	138	147	155	161	166
10	11.8	14	22	30	37	44	49	54	57	60	63	65
9	5.1	291	369	457	537	599	633	643	641	613	573	546
8	5.2	122	135	130	117	105	94	85	76	69	63	57
7	13.5	167	232	324	418	493	543	566	560	537	511	489
6	13.7	15	24	36	47	56	64	71	77	82	87	91
5	17.2	148	204	285	372	445	487	494	477	451	425	400
4	29.8	20	27	38	62	105	134	131	113	93	77	66
3	17.3	127	176	244	306	343	361	367	365	357	346	334
2	17.4	120	210	303	319	270	209	160	128	104	87	73
1	17.4	154	269	390	416	357	280	217	174	143	119	100

OUTFLOW SUMMARY TABLE

Subarea No.	Peak Runoff cfs	Time of peak,min	Runoff Volume cfs-hrs	Peak Outflow cfs	Time of peak,min
1	435.5	205.0	331.2	435.5	205.0
2	336.0	205.0	249.3	336.0	205.0
3	0.1	200.0	0.0	367.3	225.0
4	134.5	205.0	126.2	134.5	205.0
5	0.1	200.0	0.0	498.8	220.0
6	106.4	305.0	430.1	285.1	215.0
7	0.1	200.0	0.0	566.6	225.0
8	135.2	210.0	154.4	135.2	210.0
9	0.1	200.0	0.0	643.4	235.0
10	73.3	300.0	314.5	234.4	210.0
11	178.8	275.0	535.2	328.9	215.0
12	85.8	205.0	70.2	85.8	205.0
13	25.7	210.0	23.0	110.6	205.0
14	0.1	200.0	0.0	268.6	270.0
15	70.1	210.0	81.6	70.1	210.0
16	0.1	200.0	0.0	936.6	235.0

17	65.8	205.0	59.3	65.8	205.0
18	184.2	210.0	187.8	240.4	210.0
19	72.1	205.0	59.7	72.1	205.0
20	0.1	200.0	0.0	1096.7	235.0

Surcharge Flow Occurred in Areas
1 5 6 7 8 10 11 12 13 19
Surcharge Flow above 20 Percent of Channel Capacity Occurred in Areas
1 6 8 10 11