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AMENDMENT
TO
RED ROCK CANYON
DRAINAGE BASIN DESIGN PLAN

PREPARED FOR:
CITY OF RAPID CITY
RAPID CITY, SOUTH DAKOTA
By

Boschee Engineering

December, 2005

INTRODUCTION

GENERAL

This Amendment to the Red Rock Drainage Basin Design Plan has been prepared for the City of Rapid City by Boschee Engineering. The purpose of this amendment is to reevaluate the location of Detention Pond 101 based on current development within the Red Rock Drainage Basin.

All recommendations for the facilities evaluated made in this report supersede those given in the 1993 DBDP.

DESIGN PLAN LIMITATIONS

It was beyond the scope of work to provide final engineering drawings suitable for construction. Exceptions to this are Pond 101 and Pond 201 which were designed as part of this Amendment.

The design plan presented herein is conceptual and is intended to provide the general information necessary for the final working design of an efficient, planned system. The design plan is based on a practical hydraulic system which is suitable for further evaluation and implementation as the basin develops.

This AMENDMENT provides for only major drainage. Unless specifically addressed in the report, localized or minor drainage was beyond the scope of the study.

Note that the design plan runoff/routing analysis is considered an approximation since storms rarely follow ideal patterns and other factors such as ground cover, infiltration, and channel conditions may vary with time or from assumed conditions. The intent of a hydrologic runoff/routing analysis is to provide a reasonably dependable and consistent approximation of rainfall-runoff characteristics. It is also worth noting that the design analysis assumes unobstructed flow in pipes and channels.

HYDROLOGY AND HYDRAULICS

METHODOLOGY

The computer models used in the 1993 DBDP were used in the analysis and preparation of this AMENDMENT. Modeling input data was revised to account for the proposed changes discussed in this report.

COMPUTER MODEL REVISIONS

It was necessary to revise the 1993 DBDP sub-basin and flow network in order to model the proposed changes.

Figure 1 shows the updated sub-basin boundaries for the upper drainage basins in the Red Rock Drainage Basin. All land use conditions in this AMENDMENT are future land use conditions and assumed sub-basin imperviousness is included in the CUHP data. The 1993 DBDP also contains a map showing future assumed land use. These changes are described in the next section of this report

Figure 2 shows the updated flow routing network for the elements modified for this AMENDMENT. New elements 105 and 201 were added to the routing network. These changes are described in the next section of this report.

AMENDED DESIGN PLAN

GENERAL

The Amended Design Plan follows the conceptual plan recommended in the 1993 DBDP. The City of Rapid City directed that all metering dams be below the size regulated by the State of South Dakota as a Small Dam. It was also a requirement that flows downstream not be increased with this AMENDMENT. Major AMENDMENT changes thus made were the addition of Ponds 105, Pond 201 and relocating Pond 101. Note that all changes were made upstream of Element 2.

SUB-BASIN MODIFICATIONS

Sub-basin Z:

This sub-basin was added during the design of Detention Cell 102 to better reflect the flow patterns into the detention cell. Sub-basin Z was created by a reduction in the size of sub-basin J.

Sub-basin J:

Sub-basin J was also changed during the design of Detention Cell 102. This sub-basin was reduced in size to better reflect the flow patterns to Detention Cell 102. The reduction in sub-basin J was accounted for in sub-basin Z.

Sub-basin I:

Sub-basin I was reduced in size from 224 acres to 132.5 acres. This reduction was made to reflect the current development plans for this sub-basin.

Sub-Basin M:

Sub-basin M was increased in size to account for the acres lost in reduction of sub-basin I.

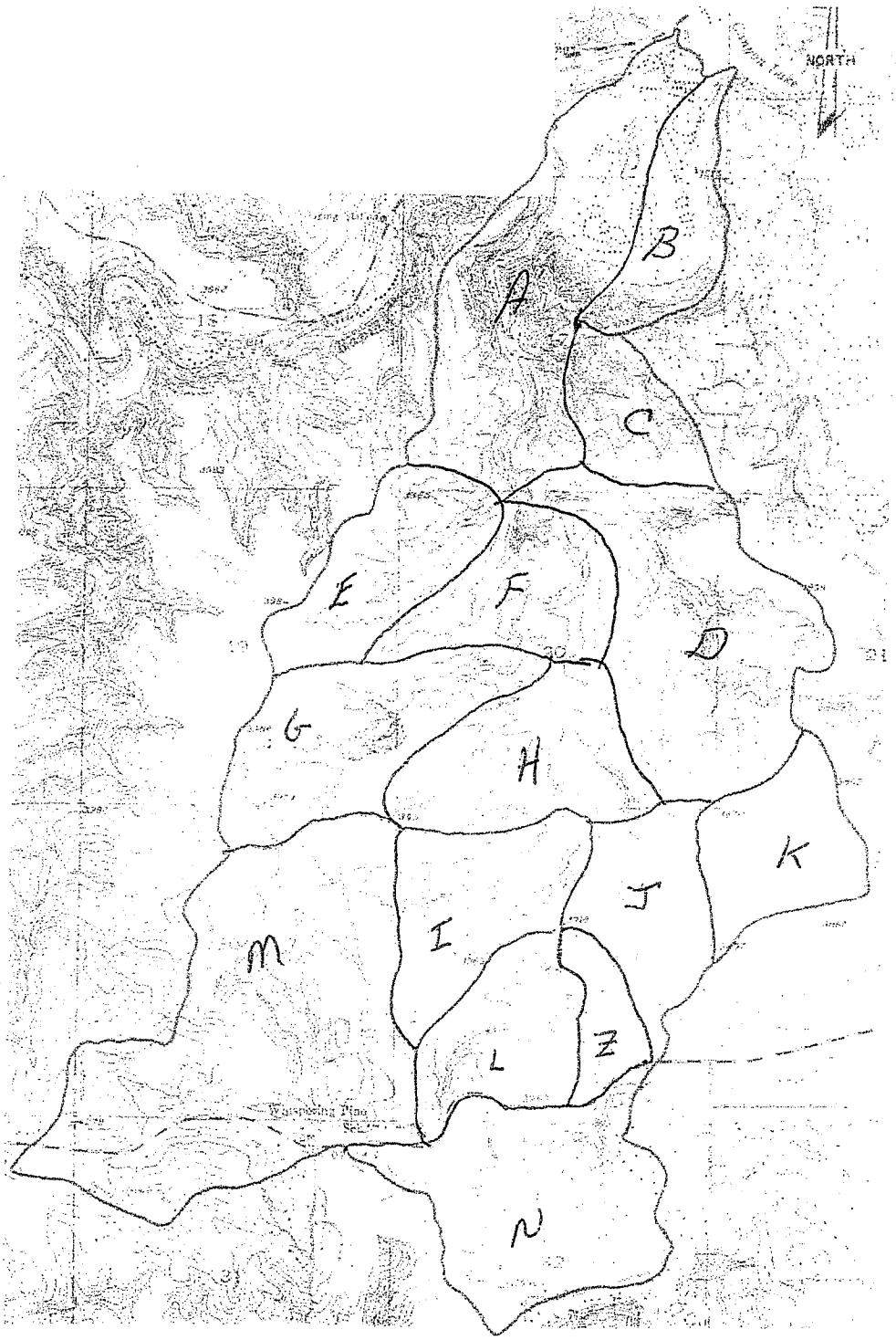

FIGURE 1: DRAINAGE BASIN AND SUB-BASIN MAP

CUHP Sub-basin output files:

Table 1 summarizes the hydrograph peak for the 10-year, and 100-year storm events for the fully developed condition and compares the original DBDP to this Amendment..

TABLE 1:
RED ROCK DRAINAGE BASIN
FULLY DEVELOPED CONDITIONS SUB-BASIN CUHP OUTPUT

SUB-BASIN	Original DBDP 10-Year Developed Runoff	Original DBDP 100-Year Developed Runoff	Amended DBDP 10-Year Developed Runoff	Amended DBDP 100-Year Developed Runoff
A	63	268	61	266
B	123	315	123	315
C	21	125	20	125
D	78	290	78	288
E	40	146	40	145
F	41	175	40	174
G	112	328	111	327
H	82	261	82	261
I	117	293	79	224
J	208	482	101	297
Z	N/A	N/A	83	184
K	176	464	176	463
L	152	389	152	388
M	126	381	113	342
N	167	427	167	426

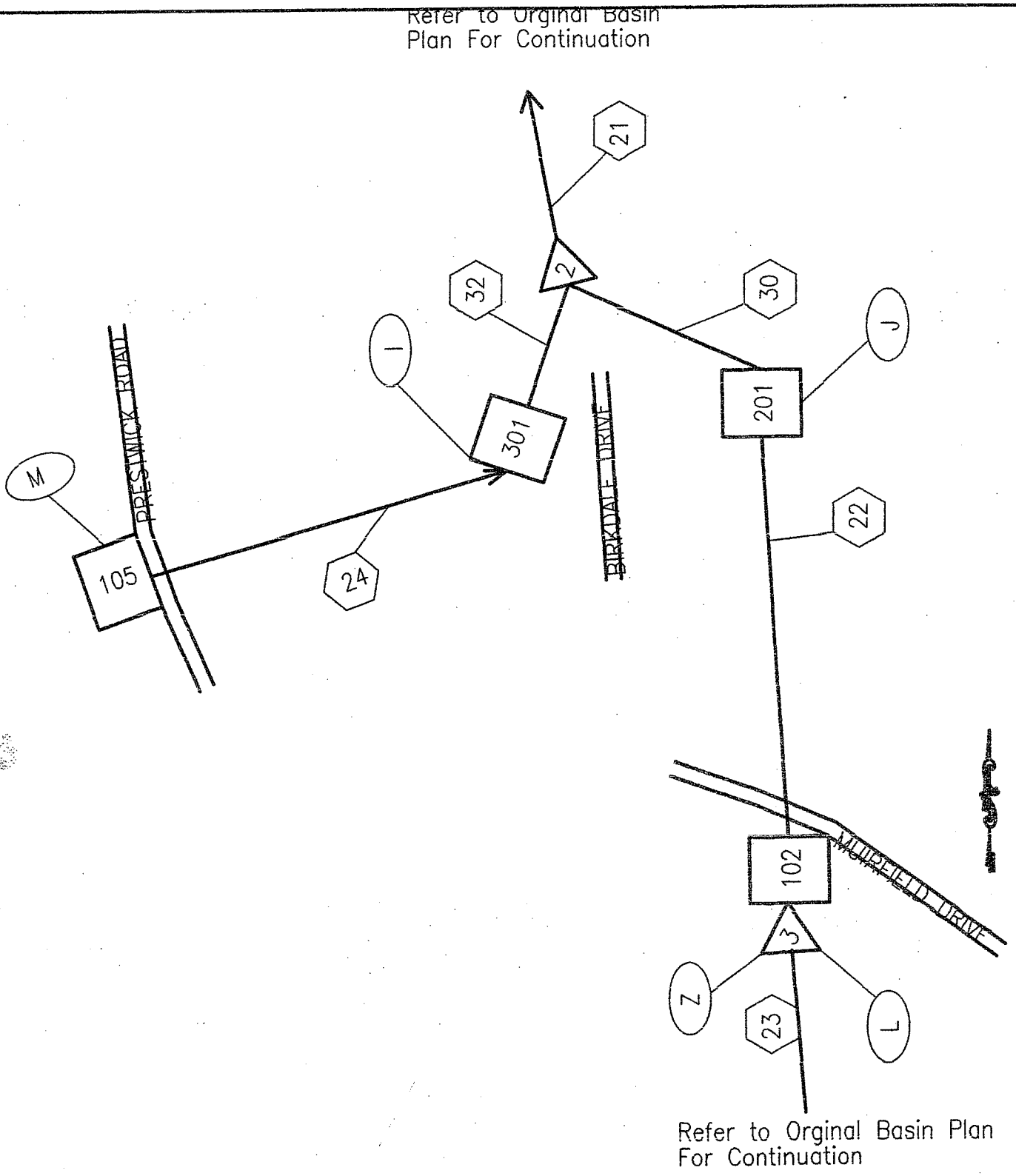

Figure 2: RED ROCK CANYON 2005 AMENDMENT HYDRAULIC SCHEMATIC

N.T.S.

INDIVIDUAL ELEMENT DESIGN

A discussion of each of the revised routing elements in the Red Rock Basin follows.

Element 22:

Element 24 was shortened in length. Element 22 in this run is an existing open channel beginning at the outlet of Detention Cell 105 and ending at Detention Cell 301. For this AMENDMENT Element 22 has a length of 3400 feet and a slope of 1.4 percent

Element 24:

Element 24 was shortened in length. Element 24 in this run is an existing open channel beginning at the outlet of Detention Cell 105 and ending at Detention Cell 101. For this AMENDMENT Element 24 has a length of 2850 feet and a slope of 2.2 percent

Element 30:

Element 30 is a natural channel with a slope of 1.4 percent beginning at the outlet of Detention Cell 301 and extends downstream a length of 300 feet. The 10 year design flow is 118 cfs, and the 100 year design flow is 279 cfs.

Element 32:

Element 32 is a natural channel with a slope 2.2 percent beginning at the outlet of Detention Cell 201 and extends downstream a length of 200 feet. The 10 year design flow is 229 cfs, and the 100 year design flow is 517 cfs.

The channel is modeled with an overflow trapezoidal channel with a 105 foot bottom width, 2:1 sideslopes and a depth of 10.

Detention Cell 105:

Detention Cell 105 is modeled as a dry detention cell that will be created by replacing the existing box stand pipe structure with a 48- inch stand pipe, with an 18 – inch orifice. Additional grading will need to be completed to provide 20 acre-feet of storage in the pool area at an elevation of 3882.

The peak 10 year outflow from Detention Cell 105 will be 88 cfs and the peak 100-year outflow will be 202 cfs.

Detention Cell 201:

Detention Cell 201 is modeled as a dry detention cell with an 8' x 6' box stand pipe structure with a 60- inch outlet pipe, with a 24 – inch orifice. During the 100-year event

an earthen spillway will be used to discharge part of the 100-year peak. Additional grading will need to be completed to provide 11 acre-feet of storage in the pool area.

The peak 10 year outflow from Detention Cell 201 will be 229 cfs and the peak 100-year outflow will be 515 cfs.

Detention Cell 301:

Detention Cell 301 is modeled as a dry detention cell with 60- inch outlet pipe. Additional grading will need to be completed to provide 10 acre-feet of storage in the pool area.

The peak 10 year outflow from Detention Cell 201 will be 118 cfs and the peak 100-year outflow will be 279 cfs.

INDIVIDUAL ELEMENT DESIGN

The projected cost for the revised Drainage Basin Design Plan elements is listed below.

Flow Summaries:

Tables 2 through 4 summaries the flows at each element listed in the original DBDP and provides a comparison with the 2005 AMENDMENT for the 2-year, 10-year, and 100-year storm runoff events.

Table 2.
2-YEAR FLOW SUMMARY

CONVEYANCE ELEMENT #	2-YR EXISTING (cfs)	2-YR 1993 DESIGN PLAN (cfs)	2-YEAR, 2005 DESIGN PLAN AMENDMENT (cfs)
4	40	40	40.
104	38	38	38.
28	37	37	37.
103	35	35	35.
23	32	32	32.
3	67	67	67.
105	N A	N A	14.
102	36	36	36.
24	8	17	14.
22	35	35	35.
201	N A	N A	40.
301	N A	N A	20.
30	N A	N A	20
32	N A	N A	40
2	62	66	60.
27	3	43	43.
21	56	64	59.
26	2	32	32.
20	56	64	59.
25	2	31	31.
19	55	68	61.
18	59	89	77.
17	59	89	77.
16	59	89	77.
15	60	90	78.
152	60	90	78.
151	60	90	78.
144	60	90	78.
143	59	90	78.
142	59	90	78.
141	59	90	77.
13	59	90	77.
12	59	90	77.
11	59	90	77.
10	59	90	77.
1	63	97	81

Table 3.
10-YEAR FLOW SUMMARY

CONVEYANCE ELEMENT #	10-YR EXISTING (cfs)	10-YR 1993 DESIGN PLAN (cfs)	10-YEAR, 2005 DESIGN PLAN AMENDMENT (cfs)
4	167	167	167.
104	157	157	157.
28	155	156	155.
103	147	147	147.
23	143	144	143.
3	269	262	289.
105	N A	N A	88
102	281	139	210.
24	112	110	86.
22	259	148	206.
201	N A	N A	229.
301	N A	N A	118.
30	N A	N A	118
32	N A	N A	229
2	460	385	344.
27	104	173	173.
21	448	360	339.
26	84	142	141.
20	448	360	339.
25	83	140	139.
19	512	422	372.
18	648	584	486.
17	647	584	486.
16	646	584	486.
15	671	611	514.
152	671	611	514.
151	670	611	513.
144	675	621	521.
143	676	621	521.
142	676	621	521.
141	673	620	520.
13	672	619	519.
12	671	619	519.
11	672	619	518.
10	671	619	518.
1	735	696	592.

Table 4.
100-YEAR FLOW SUMMARY

CONVEYANCE ELEMENT #	100-YR EXISTING (cfs)	100-YR 1993 DESIGN PLAN (cfs)	100-YEAR, 2005 DESIGN PLAN AMENDMENT (cfs)
4	426	427	426.
104	416	416	416.
28	411	411	411.
103	362	362	362.
23	353	354	353.
3	691	639	717.
105	N A.	N A	202.
102	691	416	399.
24	375	342	202.
22	652	406	395.
201	N A	N A	515.
301	N A	N A	279.
30	N A	N A	279
32	N A	N A	517
2	1339	1097	777.
27	346	464	463.
21	1327	853	773.
26	310	410	409.
20	1326	853	773.
25	309	407	407.
19	1692	1057	1034.
18	2340	1798	1697.
17	2340	1799	1697.
16	2338	1797	1695.
15	2456	1922	1824.
152	2457	1924	1825.
151	2460	1925	1825.
144	2520	1996	1894.
143	2521	1996	1892.
142	2521	1995	1890.
141	2513	1989	1889
13	2514	1989	1886.
12	2512	1987	1883.
11	2511	1985	1884.
10	2507	1984	1885.
1	2828	2337	2229

2 YEAR CHUP DATA

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 2      RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS 2005 AMENDMENT
01002-YEAR     2 1.10

 7001015.0RRCSBA001  RED ROCK CANYON SUBBASIN A
0.494 1.61 1.15 11.4 .030      0.35 0.05 4.80.0011 .837
 7001015.0RRCSBB002  RED ROCK CANYON SUBBASIN B
0.225 1.14 0.46 25.7 .040      0.35 0.05 4.57.0015 .696
 7001015.0RRCSBC003  RED ROCK CANYON SUBBASIN C
0.170 0.88 0.44 6.70 .057      0.30 0.05 4.89.0008 .956
 7001015.0RRCSBD004  RED ROCK CANYON SUBBASIN D
0.378 1.30 0.66 8.50 .047      0.30 0.05 4.79.0012 .835
 7001015.0RRCSBE005  RED ROCK CANYON SUBBASIN E
0.241 1.52 0.89 6.01 .048      0.25 0.05 4.79.0012 .831
 7001015.0RRCSBF006  RED ROCK CANYON SUBBASIN F
0.278 1.31 0.62 4.50 .032      0.25 0.05 4.84.0010 .876
 7001015.0RRCSBG007  RED ROCK CANYON SUBBASIN G
0.330 1.03 0.57 9.10 .052      0.30 0.05 4.43.0015 .686
 7001015.0RRCSBH008  RED ROCK CANYON SUBBASIN H
0.316 1.25 0.59 8.80 .040      0.30 0.05 4.68.0014 .742
 7001015.0RRCSBI009  RED ROCK CANYON SUBBASIN I
0.300 1.34 0.79 10.9 .029      0.40 0.05 3.98.0018 .566
 7001015.0RRCSBJ010  RED ROCK CANYON SUBBASIN J
0.289 0.89 0.46 14.0 .022      0.40 0.05 4.54.0017 .636
 7101015.0RRCSBJ015  RED ROCK CANYON SUBBASIN Z
0.089 0.56 0.24 28.0 .028 26.0 0.30 0.05 4.54.0017 .636
 7001015.0RRCSBK011  RED ROCK CANYON SUBBASIN K
0.408 1.13 0.57 19.6 .027      0.35 0.05 4.55.0017 .638
 7001015.0RRCSBL012  RED ROCK CANYON SUBBASIN L
0.384 1.28 0.61 13.6 .041      0.35 0.05 3.79.0018 .553
 7001015.0RRCSBM013  RED ROCK CANYON SUBBASIN M
0.677 2.14 1.46 11.1 .016      0.40 0.05 4.22.0018 .581
 7001015.0RRCSBN014  RED ROCK CANYON SUBBASIN N
0.417 1.14 0.49 11.2 .026      0.35 0.05 3.57.0018 .538
E
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1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBA -- BASIN COMMENT: RED ROCK CANYON SUBBASIN A

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.49	1.61	1.15	11.40	.0300	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.123	.260

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .09

FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .23

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
25.60	432.36	213.59	26.35

WIDTH AT 50 = 69. MIN. WIDTH AT 75 = 36. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.80 IN./HR. DECAY = .00110/SECOND FNINFL = .84 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	100.	82.	200.	22.
5.	36.	105.	76.	205.	20.
10.	103.	110.	72.	210.	19.
15.	163.	115.	67.	215.	18.
20.	201.	120.	63.	220.	17.
25.	213.	125.	59.	225.	16.
30.	208.	130.	55.	230.	15.
35.	192.	135.	51.	235.	14.
40.	173.	140.	48.	240.	13.
45.	160.	145.	45.	245.	12.
50.	159.	150.	42.	250.	11.
55.	152.	155.	40.	255.	11.
60.	143.	160.	37.	260.	10.
65.	134.	165.	35.	265.	9.
70.	125.	170.	32.	270.	9.
75.	115.	175.	30.	275.	8.
80.	106.	180.	28.	280.	8.
85.	99.	185.	27.	285.	0.
90.	93.	190.	25.	0.	0.
95.	87.	195.	23.	0.	0.

1 BASIN ID: RRCSBA -- BASIN COMMENT: RED ROCK CANYON SUBBASIN A

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)

0.	.00	.000	0.	120.	.01	.000	6.
5.	.02	.000	0.	125.	.00	.000	6.
10.	.04	.000	0.	130.	.00	.000	6.
15.	.09	.002	0.	135.	.00	.000	5.
20.	.18	.004	0.	140.	.00	.000	5.
25.	.28	.027	2.	145.	.00	.000	5.
30.	.15	.019	5.	150.	.00	.000	4.
35.	.07	.004	8.	155.	.00	.000	4.
40.	.05	.003	11.	160.	.00	.000	4.
45.	.03	.001	12.	165.	.00	.000	4.
50.	.03	.001	12.	170.	.00	.000	3.
55.	.03	.001	12.	175.	.00	.000	3.
60.	.03	.001	11.	180.	.00	.000	3.
65.	.03	.001	11.	185.	.00	.000	3.
70.	.02	.001	10.	190.	.00	.000	3.
75.	.02	.001	10.	195.	.00	.000	2.
80.	.02	.001	10.	200.	.00	.000	2.
85.	.02	.001	9.	205.	.00	.000	2.
90.	.02	.001	9.	210.	.00	.000	2.
95.	.02	.001	8.	215.	.00	.000	2.
100.	.02	.001	8.	220.	.00	.000	2.
105.	.02	.001	8.	225.	.00	.000	2.
110.	.02	.001	7.	230.	.00	.000	2.
115.	.01	.000	7.	235.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .070 INCHES
VOLUME OF EXCESS PRECIP = 1.84 ACRE-FEET
PEAK Q = 12. CFS TIME OF PEAK = 50. MIN.
INFILT.= 4.80 IN/HR DECAY = .00110 FNINF = .84 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBB -- BASIN COMMENT: RED ROCK CANYON SUBBASIN B

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.22	1.14	.46	25.70	.0400	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.104	.287

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .14	D= .51

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
12.38	1117.81	251.51	12.00

WIDTH AT 50 = 27. MIN. WIDTH AT 75 = 14. MIN. K50 = .28 K75 = .38

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.57 IN./HR. DECAY = .00150/SECOND FNINFL = .70 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	40.	94.	80.	22.
5.	127.	45.	78.	85.	19.
10.	240.	50.	65.	90.	15.
15.	241.	55.	55.	95.	13.
20.	197.	60.	46.	100.	11.
25.	166.	65.	38.	105.	9.
30.	136.	70.	32.	110.	8.
35.	112.	75.	27.	115.	0.

1 BASIN ID: RRCSBB -- BASIN COMMENT: RED ROCK CANYON SUBBASIN B

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	75.	.02	.003	17.
5.	.02	.000	0.	80.	.02	.003	15.
10.	.04	.002	0.	85.	.02	.003	13.
15.	.09	.012	2.	90.	.02	.003	12.
20.	.18	.022	6.	95.	.02	.003	11.
25.	.28	.079	19.	100.	.02	.003	10.
30.	.15	.045	33.	105.	.02	.003	9.
35.	.07	.016	38.	110.	.02	.003	8.
40.	.05	.012	37.	115.	.01	.001	7.
45.	.03	.005	34.	120.	.01	.001	7.
50.	.03	.005	30.	125.	.00	.000	6.
55.	.03	.005	26.	130.	.00	.000	5.
60.	.03	.005	23.	135.	.00	.000	3.
65.	.03	.005	21.	140.	.00	.000	3.
70.	.02	.003	19.	145.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .241 INCHES
VOLUME OF EXCESS PRECIP = 2.89 ACRE-FEET
PEAK Q = 38. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.57 IN/HR DECAY = .00150 FNINF = .70 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBC -- BASIN COMMENT: RED ROCK CANYON SUBBASIN C

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.17	.88	.44	6.70	.0570	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.138	.232

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM

(DEFAULT)
R= .07

RR205Cuout
(DEFAULT)
D= .13

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
12.95	851.74	144.80	9.07

WIDTH AT 50 = 35. MIN. WIDTH AT 75 = 18. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.89 IN./HR. DECAY = .00080/SECOND FNINFL = .96 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	50.	57.	100.	16.
5.	69.	55.	50.	105.	14.
10.	136.	60.	44.	110.	13.
15.	141.	65.	39.	115.	11.
20.	119.	70.	35.	120.	10.
25.	107.	75.	31.	125.	9.
30.	98.	80.	27.	130.	8.
35.	86.	85.	24.	135.	0.
40.	73.	90.	21.	0.	0.
45.	65.	95.	19.	0.	0.

1 BASIN ID: RRCSBC -- BASIN COMMENT: RED ROCK CANYON SUBBASIN C

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	35.	.07	.001	3.
5.	.02	.000	0.	40.	.05	.000	3.
10.	.04	.000	0.	45.	.03	.000	2.
15.	.09	.001	0.	50.	.03	.000	2.
20.	.18	.002	0.	55.	.03	.000	2.
25.	.28	.009	1.	60.	.03	.000	2.
30.	.15	.009	2.	65.	.03	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .025 INCHES
VOLUME OF EXCESS PRECIP = .23 ACRE-FEET
PEAK Q = 3. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.89 IN/HR DECAY = .00080 FNINF = .96 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBD -- BASIN COMMENT: RED ROCK CANYON SUBBASIN D

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.38	1.30	.66	8.50	.0470	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.131	.254

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .08	D= .17

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
17.77	638.72	241.44	20.16

WIDTH AT 50 = 47. MIN. WIDTH AT 75 = 24. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.79 IN./HR. DECAY = .00120/SECOND FNINFL = .83 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	70.	88.	140.	22.
5.	73.	75.	80.	145.	20.
10.	178.	80.	72.	150.	18.
15.	235.	85.	66.	155.	16.
20.	238.	90.	59.	160.	15.
25.	213.	95.	54.	165.	14.
30.	185.	100.	49.	170.	12.
35.	180.	105.	44.	175.	11.
40.	164.	110.	40.	180.	10.
45.	149.	115.	36.	185.	9.
50.	133.	120.	33.	190.	8.
55.	119.	125.	30.	195.	7.
60.	107.	130.	27.	200.	0.
65.	97.	135.	24.	0.	0.

1 BASIN ID: RRCSBD -- BASIN COMMENT: RED ROCK CANYON SUBBASIN D

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	80.	.02	.000	6.
5.	.02	.000	0.	85.	.02	.000	5.
10.	.04	.000	0.	90.	.02	.000	5.
15.	.09	.001	0.	95.	.02	.000	5.
20.	.18	.002	0.	100.	.02	.000	4.
25.	.28	.023	2.	105.	.02	.000	4.
30.	.15	.015	6.	110.	.02	.000	4.
35.	.07	.003	9.	115.	.01	.000	3.
40.	.05	.002	11.	120.	.01	.000	3.
45.	.03	.000	10.	125.	.00	.000	3.
50.	.03	.000	10.	130.	.00	.000	3.
55.	.03	.000	9.	135.	.00	.000	2.
60.	.03	.000	8.	140.	.00	.000	2.
65.	.03	.000	8.	145.	.00	.000	2.
70.	.02	.000	7.	150.	.00	.000	2.
75.	.02	.000	7.	155.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .053 INCHES
VOLUME OF EXCESS PRECIP = 1.06 ACRE-FEET
PEAK Q = 11. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.79 IN/HR DECAY = .00120 FNINF = .83 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBE -- BASIN COMMENT: RED ROCK CANYON SUBBASIN E

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.24	1.52	.89	6.01	.0480	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.141	.247

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .12

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
22.73	469.59	113.17	12.85

WIDTH AT 50 = 64. MIN. WIDTH AT 75 = 33. MIN. K50 = .21 K75 = .29

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .25 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.79 IN./HR. DECAY = .00120/SECOND FNINFL = .83 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	80.	52.	160.	18.
5.	23.	85.	48.	165.	17.
10.	64.	90.	45.	170.	16.
15.	96.	95.	42.	175.	15.
20.	111.	100.	40.	180.	14.
25.	112.	105.	37.	185.	13.
30.	104.	110.	35.	190.	12.
35.	92.	115.	32.	195.	11.
40.	84.	120.	30.	200.	11.
45.	83.	125.	28.	205.	10.
50.	81.	130.	27.	210.	9.
55.	76.	135.	25.	215.	9.
60.	70.	140.	23.	220.	8.
65.	65.	145.	22.	225.	8.
70.	60.	150.	20.	230.	0.
75.	55.	155.	19.	0.	0.

1 BASIN ID: RRCSBE -- BASIN COMMENT: RED ROCK CANYON SUBBASIN E

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.03	.000	3.
5.	.02	.000	0.	70.	.02	.000	3.
10.	.04	.000	0.	75.	.02	.000	3.
15.	.09	.001	0.	80.	.02	.000	3.
20.	.18	.001	0.	85.	.02	.000	2.
25.	.28	.018	1.	90.	.02	.000	2.
30.	.15	.011	2.	95.	.02	.000	2.
35.	.07	.002	3.	100.	.02	.000	2.
40.	.05	.001	3.	105.	.02	.000	2.
45.	.03	.000	4.	110.	.02	.000	2.
50.	.03	.000	4.	115.	.01	.000	2.
55.	.03	.000	3.	120.	.01	.000	2.
60.	.03	.000	3.	125.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .037 INCHES
VOLUME OF EXCESS PRECIP = .47 ACRE-FEET
PEAK Q = 4. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.79 IN/HR DECAY = .00120 FNINF = .83 IN/HR
MAX.PERV.RET.= .25 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBF -- BASIN COMMENT: RED ROCK CANYON SUBBASIN F

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.28	1.31	.62	4.50	.0320	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.146	.260

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .09

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
20.65	550.75	153.11	14.83

WIDTH AT 50 = 54. MIN. WIDTH AT 75 = 28. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .25 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.84 IN./HR. DECAY = .00100/SECOND FNINFL = .88 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	75.	63.	150.	18.
5.	37.	80.	58.	155.	17.

10.	97.	85.	53.	160.	16.
15.	139.	90.	49.	165.	14.
20.	153.	95.	45.	170.	13.
25.	147.	100.	42.	175.	12.
30.	132.	105.	38.	180.	11.
35.	117.	110.	35.	185.	10.
40.	115.	115.	32.	190.	9.
45.	107.	120.	30.	195.	9.
50.	98.	125.	28.	200.	8.
55.	90.	130.	25.	205.	7.
60.	81.	135.	23.	210.	0.
65.	74.	140.	22.	0.	0.
70.	68.	145.	20.	0.	0.

1 BASIN ID: RRCSBF -- BASIN COMMENT: RED ROCK CANYON SUBBASIN F

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	45.	.03	.000	3.
5.	.02	.000	0.	50.	.03	.000	3.
10.	.04	.000	0.	55.	.03	.000	2.
15.	.09	.000	0.	60.	.03	.000	2.
20.	.18	.001	0.	65.	.03	.000	2.
25.	.28	.009	0.	70.	.02	.000	2.
30.	.15	.008	1.	75.	.02	.000	2.
35.	.07	.000	2.	80.	.02	.000	2.
40.	.05	.000	3.	85.	.02	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .020 INCHES
VOLUME OF EXCESS PRECIP = .30 ACRE-FEET
PEAK Q = 3. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.84 IN/HR DECAY = .00100 FNINF = .88 IN/HR
MAX.PERV.RET.= .25 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBG -- BASIN COMMENT: RED ROCK CANYON SUBBASIN G

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.33	1.03	.57	9.10	.0520	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.129	.247

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .08	D= .18

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)

14.71 775.73 255.99 17.60

WIDTH AT 50 = 39. MIN. WIDTH AT 75 = 20. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.43 IN./HR. DECAY = .00150/SECOND FNINFL = .69 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	60.	88.	120.	21.
5.	102.	65.	78.	125.	18.
10.	222.	70.	69.	130.	16.
15.	256.	75.	61.	135.	14.
20.	231.	80.	54.	140.	13.
25.	196.	85.	48.	145.	11.
30.	186.	90.	43.	150.	10.
35.	166.	95.	38.	155.	9.
40.	146.	100.	33.	160.	8.
45.	127.	105.	30.	165.	0.
50.	112.	110.	26.	0.	0.
55.	99.	115.	23.	0.	0.

1 BASIN ID: RRCSBG -- BASIN COMMENT: RED ROCK CANYON SUBBASIN G

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	80.	.02	.000	7.
5.	.02	.000	0.	85.	.02	.000	7.
10.	.04	.000	0.	90.	.02	.000	6.
15.	.09	.001	0.	95.	.02	.000	5.
20.	.18	.003	1.	100.	.02	.000	5.
25.	.28	.033	4.	105.	.02	.000	4.
30.	.15	.020	10.	110.	.02	.000	4.
35.	.07	.006	14.	115.	.01	.000	4.
40.	.05	.004	15.	120.	.01	.000	3.
45.	.03	.001	14.	125.	.00	.000	3.
50.	.03	.001	13.	130.	.00	.000	3.
55.	.03	.001	12.	135.	.00	.000	2.
60.	.03	.001	11.	140.	.00	.000	2.
65.	.03	.001	10.	145.	.00	.000	2.
70.	.02	.000	9.	150.	.00	.000	2.
75.	.02	.000	8.	155.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .074 INCHES
VOLUME OF EXCESS PRECIP = 1.30 ACRE-FEET
PEAK Q = 15. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.43 IN/HR DECAY = .00150 FNINF = .69 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBH -- BASIN COMMENT: RED ROCK CANYON SUBBASIN H

AREA LENGTH OF BASIN DIST TO CENTROID IMPERV. AREA SLOPE UNIT DURATION

RR205Cuout

(SQMI)	(MI)	(MI)	(PCT)	(FT/FT)	(MIN)
.32	1.25	.59	8.80	.0400	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.130	.246

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .08	D= .18

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
17.13	645.88	204.10	16.85

WIDTH AT 50 = 46. MIN. WIDTH AT 75 = 24. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.68 IN./HR. DECAY = .00140/SECOND FNINFL = .74 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	81.	130.	23.
5.	65.	70.	74.	135.	21.
10.	155.	75.	67.	140.	19.
15.	200.	80.	61.	145.	17.
20.	199.	85.	55.	150.	15.
25.	175.	90.	50.	155.	14.
30.	153.	95.	45.	160.	13.
35.	150.	100.	41.	165.	11.
40.	137.	105.	37.	170.	10.
45.	124.	110.	34.	175.	9.
50.	111.	115.	30.	180.	9.
55.	99.	120.	28.	185.	8.
60.	90.	125.	25.	190.	0.

1 BASIN ID: RRCSBH -- BASIN COMMENT: RED ROCK CANYON SUBBASIN H

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	80.	.02	.000	6.
5.	.02	.000	0.	85.	.02	.000	5.
10.	.04	.000	0.	90.	.02	.000	5.
15.	.09	.001	0.	95.	.02	.000	5.
20.	.18	.003	0.	100.	.02	.000	4.
25.	.28	.028	3.	105.	.02	.000	4.
30.	.15	.017	6.	110.	.02	.000	4.
35.	.07	.005	9.	115.	.01	.000	3.
40.	.05	.003	11.	120.	.01	.000	3.
45.	.03	.000	10.	125.	.00	.000	3.
50.	.03	.000	10.	130.	.00	.000	3.
55.	.03	.000	9.	135.	.00	.000	2.
60.	.03	.000	9.	140.	.00	.000	2.
65.	.03	.001	8.	145.	.00	.000	2.
70.	.02	.000	7.	150.	.00	.000	2.
75.	.02	.000	7.	155.	.00	.000	2.

RR205Cuout
* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .063 INCHES
VOLUME OF EXCESS PRECIP = 1.06 ACRE-FEET
PEAK Q = 11. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.68 IN/HR DECAY = .00140 FNINF = .74 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBI -- BASIN COMMENT: RED ROCK CANYON SUBBASIN I

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.30	1.34	.79	10.90	.0290	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.241

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
20.43	515.70	154.71	16.00

WIDTH AT 50 = 58. MIN. WIDTH AT 75 = 30. MIN. K50 = .21 K75 = .29

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.98 IN./HR. DECAY = .00180/SECOND FNINFL = .57 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	80.	63.	160.	19.
5.	37.	85.	58.	165.	17.
10.	99.	90.	54.	170.	16.
15.	141.	95.	50.	175.	15.
20.	155.	100.	47.	180.	14.
25.	148.	105.	43.	185.	13.
30.	131.	110.	40.	190.	12.
35.	116.	115.	37.	195.	11.
40.	112.	120.	34.	200.	10.
45.	111.	125.	32.	205.	10.
50.	103.	130.	30.	210.	9.
55.	95.	135.	27.	215.	8.
60.	87.	140.	25.	220.	8.
65.	79.	145.	24.	225.	0.
70.	73.	150.	22.	0.	0.
75.	68.	155.	20.	0.	0.

1 BASIN ID: RRCSBI -- BASIN COMMENT: RED ROCK CANYON SUBBASIN I

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	105.	.02	.000	7.
5.	.02	.000	0.	110.	.02	.000	6.
10.	.04	.000	0.	115.	.01	.000	6.
15.	.09	.002	0.	120.	.01	.000	5.
20.	.18	.004	0.	125.	.00	.000	5.
25.	.28	.039	2.	130.	.00	.000	5.
30.	.15	.023	6.	135.	.00	.000	4.
35.	.07	.008	9.	140.	.00	.000	4.
40.	.05	.006	11.	145.	.00	.000	4.
45.	.03	.002	12.	150.	.00	.000	4.
50.	.03	.002	12.	155.	.00	.000	3.
55.	.03	.002	11.	160.	.00	.000	3.
60.	.03	.002	11.	165.	.00	.000	3.
65.	.03	.002	11.	170.	.00	.000	3.
70.	.02	.000	10.	175.	.00	.000	2.
75.	.02	.000	10.	180.	.00	.000	2.
80.	.02	.000	9.	185.	.00	.000	2.
85.	.02	.000	9.	190.	.00	.000	2.
90.	.02	.000	8.	195.	.00	.000	2.
95.	.02	.000	7.	200.	.00	.000	2.
100.	.02	.000	7.	205.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .099 INCHES
VOLUME OF EXCESS PRECIP = 1.58 ACRE-FEET
PEAK Q = 12. CFS TIME OF PEAK = 45. MIN.
INFILT.= 3.98 IN/HR DECAY = .00180 FNINF = .57 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN J

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.29	.89	.46	14.00	.0220	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.119	.245

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .10	D= .28

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
14.14	806.77	233.16	15.41

WIDTH AT 50 = 37. MIN. WIDTH AT 75 = 19. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.54 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	55.	86.	110.	22.
5.	98.	60.	76.	115.	19.
10.	208.	65.	67.	120.	17.
15.	232.	70.	59.	125.	15.
20.	205.	75.	52.	130.	13.
25.	175.	80.	46.	135.	12.
30.	165.	85.	41.	140.	10.
35.	146.	90.	36.	145.	9.
40.	127.	95.	32.	150.	8.
45.	110.	100.	28.	155.	0.
50.	98.	105.	25.	0.	0.

1 BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN J

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	85.	.02	.001	10.
5.	.02	.000	0.	90.	.02	.001	9.
10.	.04	.001	0.	95.	.02	.001	8.
15.	.09	.003	0.	100.	.02	.001	7.
20.	.18	.007	1.	105.	.02	.001	7.
25.	.28	.046	7.	110.	.02	.001	6.
30.	.15	.027	15.	115.	.01	.000	6.
35.	.07	.010	19.	120.	.01	.000	5.
40.	.05	.007	20.	125.	.00	.000	5.
45.	.03	.002	19.	130.	.00	.000	4.
50.	.03	.002	18.	135.	.00	.000	4.
55.	.03	.003	17.	140.	.00	.000	3.
60.	.03	.003	16.	145.	.00	.000	3.
65.	.03	.003	14.	150.	.00	.000	2.
70.	.02	.001	13.	155.	.00	.000	2.
75.	.02	.001	12.	160.	.00	.000	2.
80.	.02	.001	11.	165.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .121 INCHES
VOLUME OF EXCESS PRECIP = 1.87 ACRE-FEET
PEAK Q = 20. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.54 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN Z

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.09	.56	.24	28.00	.0280	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)

.101 .264

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .15	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .56

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
8.06	26.00	1822.85	162.23	4.75

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 7.97)

WIDTH AT 50 = 16. MIN. WIDTH AT 75 = 9. MIN. K50 = .29 K75 = .40

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.54 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	60.	50.	14.
5.	130.	30.	45.	55.	11.
10.	154.	35.	33.	60.	8.
15.	110.	40.	25.	65.	0.
20.	80.	45.	19.	0.	0.

1 BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN Z

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	60.	.03	.007	10.
5.	.02	.000	0.	65.	.03	.007	9.
10.	.04	.002	0.	70.	.02	.003	7.
15.	.09	.014	2.	75.	.02	.003	6.
20.	.18	.027	6.	80.	.02	.003	5.
25.	.28	.093	18.	85.	.02	.003	4.
30.	.15	.074	28.	90.	.02	.003	3.
35.	.07	.022	28.	95.	.02	.003	3.
40.	.05	.014	23.	100.	.02	.003	3.
45.	.03	.006	19.	105.	.02	.003	2.
50.	.03	.006	15.	110.	.02	.003	2.
55.	.03	.006	12.	115.	.01	.002	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .311 INCHES
VOLUME OF EXCESS PRECIP = 1.48 ACRE-FEET
PEAK Q = 28. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.54 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

RATIONAL FORMULA C = .24

I = 1.9 INCHES/HOUR
A = 57.0 ACRES
Q = 26. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBK -- BASIN COMMENT: RED ROCK CANYON SUBBASIN K

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.41	1.13	.57	19.60	.0270	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.111	.278

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .12	D= .39

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
15.32	832.31	339.58	21.76

WIDTH AT 50 = 36. MIN. WIDTH AT 75 = 19. MIN. K50 = .26 K75 = .35

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.55 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	55.	120.	110.	27.
5.	128.	60.	105.	115.	24.
10.	285.	65.	92.	120.	21.
15.	339.	70.	80.	125.	18.
20.	314.	75.	70.	130.	16.
25.	268.	80.	61.	135.	14.
30.	241.	85.	54.	140.	12.
35.	211.	90.	47.	145.	11.
40.	182.	95.	41.	150.	9.
45.	157.	100.	36.	155.	8.
50.	138.	105.	31.	160.	0.

1 BASIN ID: RRCSBK -- BASIN COMMENT: RED ROCK CANYON SUBBASIN K

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	90.	.02	.002	19.
5.	.02	.000	0.	95.	.02	.002	17.
10.	.04	.001	0.	100.	.02	.002	15.
15.	.09	.007	1.	105.	.02	.002	14.

20.	.18	.013	4.	110.	.02	.002	13.
25.	.28	.068	15.	115.	.01	.001	12.
30.	.15	.036	31.	120.	.01	.001	11.
35.	.07	.013	41.	125.	.00	.000	10.
40.	.05	.010	44.	130.	.00	.000	9.
45.	.03	.004	42.	135.	.00	.000	8.
50.	.03	.004	39.	140.	.00	.000	7.
55.	.03	.004	36.	145.	.00	.000	6.
60.	.03	.004	33.	150.	.00	.000	5.
65.	.03	.004	31.	155.	.00	.000	4.
70.	.02	.002	28.	160.	.00	.000	4.
75.	.02	.002	25.	165.	.00	.000	3.
80.	.02	.002	23.	170.	.00	.000	3.
85.	.02	.002	21.	175.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .184 INCHES
VOLUME OF EXCESS PRECIP = 4.01 ACRE-FEET
PEAK Q = 44. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.55 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBL -- BASIN COMMENT: RED ROCK CANYON SUBBASIN L

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.38	1.28	.61	13.60	.0410	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.120	.254

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .10	D= .27

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
16.24	710.62	272.88	20.48

WIDTH AT 50 = 42. MIN. WIDTH AT 75 = 22. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.79 IN./HR. DECAY = .00180/SECOND FNINFL = .55 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	95.	130.	22.
5.	94.	70.	85.	135.	20.
10.	218.	75.	76.	140.	18.
15.	271.	80.	68.	145.	16.
20.	260.	85.	61.	150.	14.
25.	225.	90.	54.	155.	13.

30.	203.	95.	49.	160.	11.
35.	190.	100.	43.	165.	10.
40.	171.	105.	39.	170.	9.
45.	151.	110.	35.	175.	8.
50.	133.	115.	31.	180.	0.
55.	119.	120.	28.	0.	0.
60.	106.	125.	25.	0.	0.

1 BASIN ID: RRCSBL -- BASIN COMMENT: RED ROCK CANYON SUBBASIN L

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	100.	.02	.001	15.
5.	.02	.000	0.	105.	.02	.001	13.
10.	.04	.001	0.	110.	.02	.001	12.
15.	.09	.003	0.	115.	.01	.000	11.
20.	.18	.007	2.	120.	.01	.000	10.
25.	.28	.053	8.	125.	.00	.000	9.
30.	.15	.058	20.	130.	.00	.000	8.
35.	.07	.022	32.	135.	.00	.000	7.
40.	.05	.011	38.	140.	.00	.000	7.
45.	.03	.003	38.	145.	.00	.000	6.
50.	.03	.003	35.	150.	.00	.000	5.
55.	.03	.003	33.	155.	.00	.000	5.
60.	.03	.003	31.	160.	.00	.000	4.
65.	.03	.003	29.	165.	.00	.000	4.
70.	.02	.001	26.	170.	.00	.000	3.
75.	.02	.001	24.	175.	.00	.000	3.
80.	.02	.001	22.	180.	.00	.000	3.
85.	.02	.001	20.	185.	.00	.000	2.
90.	.02	.001	18.	190.	.00	.000	2.
95.	.02	.001	16.	195.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .178 INCHES
VOLUME OF EXCESS PRECIP = 3.65 ACRE-FEET
PEAK Q = 38. CFS TIME OF PEAK = 45. MIN.
INFILT.= 3.79 IN/HR DECAY = .00180 FNINF = .55 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBM -- BASIN COMMENT: RED ROCK CANYON SUBBASIN M

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.68	2.14	1.46	11.10	.0160	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.272

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
37.17	301.56	204.16	36.11

WIDTH AT 50 = 99. MIN. WIDTH AT 75 = 52. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.22 IN./HR. DECAY = .00180/SECOND FNINFL = .58 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	135.	84.	270.	24.
5.	19.	140.	81.	275.	23.
10.	57.	145.	77.	280.	22.
15.	103.	150.	73.	285.	21.
20.	144.	155.	70.	290.	20.
25.	175.	160.	67.	295.	19.
30.	195.	165.	64.	300.	18.
35.	203.	170.	61.	305.	18.
40.	203.	175.	58.	310.	17.
45.	196.	180.	56.	315.	16.
50.	185.	185.	53.	320.	15.
55.	173.	190.	51.	325.	15.
60.	162.	195.	49.	330.	14.
65.	153.	200.	46.	335.	13.
70.	151.	205.	44.	340.	13.
75.	151.	210.	42.	345.	12.
80.	145.	215.	40.	350.	12.
85.	138.	220.	39.	355.	11.
90.	132.	225.	37.	360.	11.
95.	126.	230.	35.	365.	10.
100.	120.	235.	34.	370.	10.
105.	114.	240.	32.	375.	9.
110.	107.	245.	31.	380.	9.
115.	101.	250.	29.	385.	8.
120.	97.	255.	28.	390.	8.
125.	93.	260.	27.	395.	8.
130.	88.	265.	25.	400.	0.

1 BASIN ID: RRCSBM -- BASIN COMMENT: RED ROCK CANYON SUBBASIN M

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	180.	.00	.000	7.
5.	.02	.000	0.	185.	.00	.000	7.
10.	.04	.000	0.	190.	.00	.000	7.
15.	.09	.002	0.	195.	.00	.000	6.
20.	.18	.004	0.	200.	.00	.000	6.
25.	.28	.039	1.	205.	.00	.000	6.
30.	.15	.023	3.	210.	.00	.000	6.
35.	.07	.008	7.	215.	.00	.000	5.
40.	.05	.006	10.	220.	.00	.000	5.
45.	.03	.002	13.	225.	.00	.000	5.
50.	.03	.002	15.	230.	.00	.000	5.
55.	.03	.002	16.	235.	.00	.000	4.
60.	.03	.002	17.	240.	.00	.000	4.
65.	.03	.002	17.	245.	.00	.000	4.
70.	.02	.001	17.	250.	.00	.000	4.
75.	.02	.001	17.	255.	.00	.000	4.
80.	.02	.001	16.	260.	.00	.000	4.
85.	.02	.001	16.	265.	.00	.000	3.
90.	.02	.001	15.	270.	.00	.000	3.

RR205Cuout

95.	.02	.001	15.	275.	.00	.000	3.
100.	.02	.001	15.	280.	.00	.000	3.
105.	.02	.001	14.	285.	.00	.000	3.
110.	.02	.001	14.	290.	.00	.000	3.
115.	.01	.000	13.	295.	.00	.000	3.
120.	.01	.000	13.	300.	.00	.000	2.
125.	.00	.000	12.	305.	.00	.000	2.
130.	.00	.000	12.	310.	.00	.000	2.
135.	.00	.000	11.	315.	.00	.000	2.
140.	.00	.000	11.	320.	.00	.000	2.
145.	.00	.000	10.	325.	.00	.000	2.
150.	.00	.000	10.	330.	.00	.000	2.
155.	.00	.000	9.	335.	.00	.000	2.
160.	.00	.000	9.	340.	.00	.000	2.
165.	.00	.000	8.	345.	.00	.000	2.
170.	.00	.000	8.	350.	.00	.000	2.
175.	.00	.000	8.	355.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .099 INCHES
VOLUME OF EXCESS PRECIP = 3.57 ACRE-FEET
PEAK Q = 17. CFS TIME OF PEAK = 65. MIN.
INFILT.= 4.22 IN/HR DECAY = .00180 FNINF = .58 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 9:28

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 2 YEAR FULL DEVELOPED DRAINAGE ANALYSIS

BASIN ID: RRCSBN -- BASIN COMMENT: RED ROCK CANYON SUBBASIN N

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.42	1.14	.49	11.20	.0260	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.253

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
15.99	721.25	300.76	22.24

WIDTH AT 50 = 42. MIN. WIDTH AT 75 = 22. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.57 IN./HR. DECAY = .00180/SECOND FNINFL = .54 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	102.	130.	23.
5.	106.	70.	91.	135.	21.
10.	244.	75.	81.	140.	19.

15.	300.	80.	73.	145.	17.
20.	285.	85.	65.	150.	15.
25.	245.	90.	58.	155.	13.
30.	224.	95.	52.	160.	12.
35.	207.	100.	46.	165.	10.
40.	185.	105.	41.	170.	9.
45.	163.	110.	37.	175.	8.
50.	144.	115.	33.	180.	7.
55.	128.	120.	29.	185.	0.
60.	114.	125.	26.	0.	0.

1 BASIN ID: RRCSBN -- BASIN COMMENT: RED ROCK CANYON SUBBASIN N

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 002-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	100.	.02	.001	15.
5.	.02	.000	0.	105.	.02	.001	13.
10.	.04	.000	0.	110.	.02	.001	12.
15.	.09	.002	0.	115.	.01	.000	11.
20.	.18	.005	1.	120.	.01	.000	10.
25.	.28	.046	7.	125.	.00	.000	9.
30.	.15	.062	20.	130.	.00	.000	8.
35.	.07	.022	33.	135.	.00	.000	7.
40.	.05	.011	40.	140.	.00	.000	6.
45.	.03	.002	40.	145.	.00	.000	6.
50.	.03	.002	37.	150.	.00	.000	5.
55.	.03	.003	35.	155.	.00	.000	4.
60.	.03	.003	32.	160.	.00	.000	4.
65.	.03	.003	30.	165.	.00	.000	4.
70.	.02	.001	27.	170.	.00	.000	3.
75.	.02	.001	25.	175.	.00	.000	3.
80.	.02	.001	22.	180.	.00	.000	3.
85.	.02	.001	20.	185.	.00	.000	2.
90.	.02	.001	18.	190.	.00	.000	2.
95.	.02	.001	16.	195.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 1.27 (1-HOUR RAIN = 1.10) EXCESS PRECIP. = .166 INCHES
VOLUME OF EXCESS PRECIP = 3.69 ACRE-FEET
PEAK Q = 40. CFS TIME OF PEAK = 45. MIN.
INFILT.= 3.57 IN/HR DECAY = .00180 FNINF = .54 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

2-YEAR UDSWM DATA

```
   2   1   1   2
   3   4
WATERSHED   1
RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 2 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005
        70   0 0   5.0                                                                    1
         1     1
         2     1
         3   144
         4    18
         5    15
         6    18
         7    19
         8    19
         9   301
        10   201
        11    27
        12     3
        13   105
        14     4
        15     3

 0     1     0   0 3
 0     2    21   0 3
 0     3   102   0 3
 0     4   104   0 3
 0    10     1   0 1    40.0  1220.0   0.010     4.0     4.0    .035     8.0
 0    11    10   0 1    40.0   520.0   0.010     4.0     4.0    .035     8.0
 0    12    11   0 1    40.0   800.0   0.010     4.0     4.0    .035     8.0
 0    13    12   0 1    40.0  1580.0   0.010     4.0     4.0    .035     6.0
 0   141    13   0 1    32.0  1510.0   0.015     2.0     2.0    .056     7.5
 0   142   141   0 1    20.0   500.0   0.018     2.0     0.0    .056     9.5
 0   143   142   0 1    32.0   980.0   0.010     3.5     3.5    .044     7.0
 0   144   143   0 1    20.0   670.0   0.017     1.0     1.0    .044     9.5
 0   151   144   0 4     0.1   600.0   0.017     4.0     4.0    .056     3.0
                        50.0   600.0   0.017     4.0     1.5    .056    10.0
 0   152   151   0 4     5.0   410.0   0.017     1.0     8.0    .050     2.5
                        34.5   410.0   0.017     1.0     2.5    .050     6.0
 0    15   152   0 4     0.1  1410.0   0.017     5.0     5.0    .062     1.0
                        11.0  1410.0   0.017     2.0     2.0    .062    12.0
 0    16    15   0 4     0.1   880.0   0.021     5.0     5.0    .062     1.0
                        11.0   880.0   0.021     2.0     2.0    .062    12.0
 0    17    16   0 4     0.1   560.0   0.018     5.0     5.0    .062     1.0
                        11.0   560.0   0.018     2.0     2.0    .062    12.0
 0    18    17   0 4     0.1   620.0   0.019     5.0     5.0    .062     1.0
                        11.0   620.0   0.019     2.0     2.0    .062    12.0
 0    19    18   0 4     0.1  5420.0   0.024     5.0     5.0    .062     1.0
                        11.0  5420.0   0.024     2.0     2.0    .062    12.0
 0    20    19   0 4     0.1   970.0   0.019     5.0     5.0    .062     1.0
                        11.0   970.0   0.019     2.0     2.0    .062    12.0
 0    21    20   0 4     8.0  3890.0   0.015     1.0     1.0    .050     2.5
                        25.0  3890.0   0.015     1.0     2.0    .050    12.0
 0    22   201   0 4     0.1  3400.0   0.014     2.0     3.0    .050     5.0
                       105.0  3400.0   0.014     1.5    15.0    .050    10.0
 0    32     2   0 4     0.1   200.0   0.014     2.0     3.0    .030     5.0
                       105.0   200.0   0.014     1.5    15.0    .030    10.0
 0    23     3   0 4     0.1  2080.0   0.018     8.0     4.0    .050     8.0
                        96.0  2080.0   0.018    15.0    35.0    .050     8.0
 0    24   301   0 1     0.1  2850.0   0.022     5.0    10.0    .050    20.0
 0    30     2   0 1     0.1   300.0   0.022     5.0    10.0    .050    20.0
 0    25    18   0 1     0.1  1340.0   0.029     2.5     1.5    .062    20.0
 0    26    25   0 4     0.1  3680.0   0.024     6.0     6.0    .062     2.5
                        30.0  3680.0   0.024     2.0    10.0    .062    10.0
 0    27    26   0 4     0.1   780.0   0.028     5.0     5.0    .062     3.0
                        30.0   780.0   0.028     2.5     1.5    .062    10.0
 0    28   103   0 4     0.1  1000.0   0.018     8.0     4.0    .050     8.0
                        96.0  1000.0   0.018    15.0    35.0    .050     8.0
 0   301    30   7 2      .1     1.0   0.010      .0      .0    .016     0.1
       0.0     0.0       0.3    29.7     0.8    93.3     1.8    153.7
       3.6   214.1       6.5   255.3    10.8   290.8
 0   102    22  23 2      .1     1.0   0.010      .0      .0    .016     0.1
       0.0     0.0       0.7     2.0     2.1    14.0     3.7     33.0
       5.5    47.0       6.9    75.0     8.7   108.0    10.7    160.0
      12.8   210.0      15.1   244.0    17.5   274.0    20.1    298.0
      22.8   321.0      25.7   341.0    28.8   356.0    31.9    374.0
      35.5   390.0      39.3   408.0    43.3   428.0    47.7    600.0
      49.0  1100.0      50.0  2500.0    51.0  2800.0
 0   103    23   8 2      .1     1.0   0.010      .0      .0    .016     0.1
       0.0     0.0       0.1    20.0     0.5    60.0     1.2    140.0
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                                                    SW205Amen
      2.2      210.0       3.2      260.0       5.3      300.0       7.0      560.0
  0  104   28  4 2         .1     1.0   0.010      .0        .0     .016       0.1
      0.0        0.0       1.7      220.0       4.1      350.0       5.0      600.0
  0  105   24 13 2         .1     1.0   0.010      .0        .0     .016       0.1
      0.0        0.0       0.1        9.5       0.4       15.3       0.8       19.5
      1.4       22.9       2.3       25.9       3.4       28.5       5.0       31.0
      7.0      118.8       9.5      156.3      15.6      185.5      20.3      210.3
     30.8      232.3
  0  201   32 10 2         .1     1.0   0.010      .0        .0     .016       0.1
      0.0        0.0       0.5       18.5       1.3      109.0       2.4      153.7
      3.9      223.9       5.7      263.6       8.3      298.1      12.3      593.0
     18.2      757.2

  0
 37
  1    2    3    4   10   11   12   13  141  142  143  144  151  152   15   16
 17   18   19   20   21   22   23   24   25   26   27   28  301  102  103  104
 99  105  201   30   32
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 2 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

0NUMBER OF TIME STEPS 70
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 2 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 15 SUBCATCHMENTS

TIME(HR/MIN)	1	2	3	4	5	6	7	8	9
10	15	11	12	13	14				
0 0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.				
0 5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.				
0 10.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.				
0 15.	0.	2.	0.	0.	0.	0.	0.	0.	0.
0.	2.	1.	0.	0.	0.				
0 20.	0.	6.	0.	0.	0.	0.	1.	0.	0.
2.	6.	4.	2.	0.	1.				
0 25.	2.	19.	1.	2.	1.	0.	4.	3.	2.
7.	18.	15.	8.	1.	7.				
0 30.	5.	33.	2.	6.	2.	1.	10.	6.	6.
15.	28.	31.	20.	3.	20.				
0 35.	8.	38.	3.	9.	3.	2.	14.	9.	9.
19.	28.	41.	32.	7.	33.				
0 40.	11.	37.	3.	11.	3.	3.	15.	11.	11.
20.	23.	44.	38.	10.	40.				
0 45.	12.	34.	2.	10.	4.	3.	14.	10.	12.
19.	19.	42.	38.	13.	40.				
0 50.	12.	30.	2.	10.	4.	3.	13.	10.	12.
18.	15.	39.	35.	15.	37.				
0 55.	12.	26.	2.	9.	3.	2.	12.	9.	11.
17.	12.	36.	33.	16.	35.				
1 0.	11.	23.	2.	8.	3.	2.	11.	9.	11.

16.		10.	33.	31.	17.	32.				
14.	1 5.	11.	21.	2.	8.	3.	2.	10.	8.	11.
		9.	31.	29.	17.	30.				
13.	1 10.	10.	19.	1.	7.	3.	2.	9.	7.	10.
		7.	28.	26.	17.	27.				
12.	1 15.	10.	17.	0.	7.	3.	2.	8.	7.	10.
		6.	25.	24.	17.	25.				
11.	1 20.	10.	15.	0.	6.	3.	2.	7.	6.	9.
		5.	23.	22.	16.	22.				
10.	1 25.	9.	13.	0.	5.	2.	2.	7.	5.	9.
		4.	21.	20.	16.	20.				
9.	1 30.	9.	12.	0.	5.	2.	1.	6.	5.	8.
		3.	19.	18.	15.	18.				
8.	1 35.	8.	11.	0.	5.	2.	0.	5.	5.	7.
		3.	17.	16.	15.	16.				
7.	1 40.	8.	10.	0.	4.	2.	0.	5.	4.	7.
		3.	15.	15.	15.	15.				
7.	1 45.	8.	9.	0.	4.	2.	0.	4.	4.	7.
		2.	14.	13.	14.	13.				
6.	1 50.	7.	8.	0.	4.	2.	0.	4.	4.	6.
		2.	13.	12.	14.	12.				
6.	1 55.	7.	8.	0.	3.	2.	0.	4.	3.	6.
		2.	12.	11.	13.	11.				
5.	2 0.	7.	7.	0.	3.	2.	0.	3.	3.	5.
		2.	11.	10.	13.	10.				
5.	2 5.	6.	6.	0.	3.	2.	0.	3.	3.	5.
		0.	10.	9.	12.	9.				
4.	2 10.	6.	5.	0.	3.	1.	0.	3.	3.	5.
		0.	9.	8.	12.	8.				
4.	2 15.	5.	3.	0.	2.	0.	0.	2.	2.	4.
		0.	8.	7.	11.	7.				
3.	2 20.	5.	3.	0.	2.	0.	0.	2.	2.	4.
		0.	7.	7.	11.	6.				
3.	2 25.	5.	2.	0.	2.	0.	0.	2.	2.	4.
		0.	6.	6.	10.	6.				
2.	2 30.	5.	2.	0.	2.	0.	0.	2.	2.	4.
		0.	5.	5.	10.	5.				
2.	2 35.	4.	0.	0.	2.	0.	0.	1.	2.	3.
		0.	4.	5.	9.	4.				

2.	2	40.	4.	0.	0.	1.	0.	0.	0.	1.	3.
			0.	4.	4.	9.	4.				
2.	2	45.	4.	0.	0.	0.	0.	0.	0.	0.	3.
			0.	3.	4.	8.	4.				
1.	2	50.	3.	0.	0.	0.	0.	0.	0.	0.	3.
			0.	3.	3.	8.	3.				
0.	2	55.	3.	0.	0.	0.	0.	0.	0.	0.	2.
			0.	2.	3.	8.	3.				
0.	3	0.	3.	0.	0.	0.	0.	0.	0.	0.	2.
			0.	2.	3.	7.	3.				
0.	3	5.	3.	0.	0.	0.	0.	0.	0.	0.	2.
			0.	0.	2.	7.	2.				
0.	3	10.	3.	0.	0.	0.	0.	0.	0.	0.	2.
			0.	0.	2.	7.	2.				
0.	3	15.	2.	0.	0.	0.	0.	0.	0.	0.	2.
			0.	0.	2.	6.	2.				
0.	3	20.	2.	0.	0.	0.	0.	0.	0.	0.	2.
			0.	0.	0.	6.	2.				
0.	3	25.	2.	0.	0.	0.	0.	0.	0.	0.	2.
			0.	0.	0.	6.	0.				
0.	3	30.	2.	0.	0.	0.	0.	0.	0.	0.	1.
			0.	0.	0.	6.	0.				
0.	3	35.	2.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	5.	0.				
0.	3	40.	2.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	5.	0.				
0.	3	45.	2.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	5.	0.				
0.	3	50.	2.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	5.	0.				
0.	3	55.	1.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	4.	0.				
0.	4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	4.	0.				
0.	4	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	4.	0.				
0.	4	10.	0.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	4.	0.				
0.	4	15.	0.	0.	0.	0.	0.	0.	0.	0.	0.
			0.	0.	0.	4.	0.				

0.4	20.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	4.	0.				
0.4	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	3.	0.				
0.4	30.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	3.	0.				
0.4	35.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	3.	0.				
0.4	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	3.	0.				
0.4	45.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	3.	0.				
0.4	50.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	3.	0.				
0.4	55.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	3.	0.				
0.5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	10.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	15.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	20.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	30.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	35.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	45.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				
0.5	50.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	2.	0.				

1

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 2 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

OVERBANK/SURCHARGE GUTTER MANNING NUMBER N	GUTTER DEPTH CONNECTION (FT)	NDP JK	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R
1	0	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
2	21	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
3	102	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
4	104	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
10	1	0	1	CHANNEL	40.0	1220.	.0100	4.0	4.0
.035	8.00	0							
11	10	0	1	CHANNEL	40.0	520.	.0100	4.0	4.0
.035	8.00	0							
12	11	0	1	CHANNEL	40.0	800.	.0100	4.0	4.0
.035	8.00	0							
13	12	0	1	CHANNEL	40.0	1580.	.0100	4.0	4.0
.035	6.00	0							
141	13	0	1	CHANNEL	32.0	1510.	.0150	2.0	2.0
.056	7.50	0							
142	141	0	1	CHANNEL	20.0	500.	.0180	2.0	.0
.056	9.50	0							
143	142	0	1	CHANNEL	32.0	980.	.0100	3.5	3.5
.044	7.00	0							
144	143	0	1	CHANNEL	20.0	670.	.0170	1.0	1.0
.044	9.50	0							
151	144	0	4	CHANNEL	.1	600.	.0170	4.0	4.0
.056	3.00	0							
				OVERFLOW	50.0	600.	.0170	4.0	1.5
.056	10.00								
152	151	0	4	CHANNEL	5.0	410.	.0170	1.0	8.0
.050	2.50	0							
				OVERFLOW	34.5	410.	.0170	1.0	2.5
.050	6.00								
15	152	0	4	CHANNEL	.1	1410.	.0170	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	1410.	.0170	2.0	2.0
.062	12.00								
16	15	0	4	CHANNEL	.1	880.	.0210	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	880.	.0210	2.0	2.0
.062	12.00								
17	16	0	4	CHANNEL	.1	560.	.0180	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	560.	.0180	2.0	2.0
.062	12.00								
18	17	0	4	CHANNEL	.1	620.	.0190	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	620.	.0190	2.0	2.0
.062	12.00								
19	18	0	4	CHANNEL	.1	5420.	.0240	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	5420.	.0240	2.0	2.0
.062	12.00								
20	19	0	4	CHANNEL	.1	970.	.0190	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	970.	.0190	2.0	2.0
.062	12.00								
21	20	0	4	CHANNEL	8.0	3890.	.0150	1.0	1.0
.050	2.50	0							
				OVERFLOW	25.0	3890.	.0150	1.0	2.0
.050	12.00								
22	201	0	4	CHANNEL	.1	3400.	.0140	2.0	3.0
.050	5.00	0							
				OVERFLOW	105.0	3400.	.0140	1.5	15.0
.050	10.00								
32	2	0	4	CHANNEL	.1	200.	.0140	2.0	3.0
.030	5.00	0							

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                                                    RR205Swout
                                                    OVERFLOW      105.0      200.     .0140      1.5  15.0
.030       10.00
   23            3          0          4      CHANNEL             .1     2080.     .0180      8.0   4.0
.050        8.00          0
                                                    OVERFLOW       96.0     2080.     .0180     15.0  35.0
.050        8.00
   24          301          0          1      CHANNEL             .1     2850.     .0220      5.0  10.0
.050       20.00          0
   30            2          0          1      CHANNEL             .1      300.     .0220      5.0  10.0
.050       20.00          0
   25           18          0          1      CHANNEL             .1     1340.     .0290      2.5   1.5
.062       20.00          0
   26           25          0          4      CHANNEL             .1     3680.     .0240      6.0   6.0
.062        2.50          0
                                                    OVERFLOW       30.0     3680.     .0240      2.0  10.0
.062       10.00
   27           26          0          4      CHANNEL             .1      780.     .0280      5.0   5.0
.062        3.00          0
                                                    OVERFLOW       30.0      780.     .0280      2.5   1.5
.062       10.00
   28          103          0          4      CHANNEL             .1     1000.     .0180      8.0   4.0
.050        8.00          0
                                                    OVERFLOW       96.0     1000.     .0180     15.0  35.0
.050        8.00
  301           30          7          2      PIPE                .1        1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0        .0         .3       29.7        .8       93.3      1.8     153.7       3.6
214.1        6.5     255.3
                         10.8     290.8
  102           22          23          2      PIPE                .1        1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0        .0         .7        2.0        2.1       14.0      3.7      33.0       5.5
47.0         6.9      75.0
                          8.7     108.0        10.7     160.0       12.8      210.0     15.1     244.0      17.5
274.0       20.1     298.0
                         22.8     321.0        25.7     341.0       28.8      356.0     31.9     374.0      35.5
390.0       39.3     408.0
                         43.3     428.0        47.7     600.0       49.0     1100.0     50.0    2500.0      51.0
2800.0
  103           23           8          2      PIPE                .1        1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0        .0         .1       20.0        .5       60.0      1.2     140.0       2.2
210.0        3.2     260.0
                          5.3     300.0        7.0      560.0
  104           28           4          2      PIPE                .1        1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0        .0        1.7       220.0       4.1      350.0      5.0     600.0
  105           24          13          2      PIPE                .1        1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0        .0         .1        9.5        .4       15.3       .8      19.5       1.4
22.9         2.3      25.9
                          3.4      28.5        5.0       31.0       7.0      118.8      9.5     156.3      15.6
185.5       20.3     210.3
                         30.8     232.3
  201           32          10          2      PIPE                .1        1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0        .0         .5       18.5        1.3      109.0      2.4     153.7       3.9
223.9        5.7      263.6
                          8.3     298.1        12.3     593.0       18.2      757.2      .0       .0
0TOTAL NUMBER OF GUTTERS/PIPES,  36
1
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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 2 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE D.A.(AC)	TRIBUTARY SUBAREA

0	10 0	0	11 0	0 2737.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	11 0	0	12 0	0 2737.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	12 0	0	13 0	0 2737.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	13 0	0	141 0	0 2737.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	15 0	0	16 0	0 2628.5	0	0	0	0	0	0	0	0		5	0	0	0	0	0
0	16 0	0	17 0	0 2474.2	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	17 0	0	18 0	0 2474.2	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	18 0	0	19 25	0 2474.2	0	0	0	0	0	0	0	0		4	6	0	0	0	0
0	19 0	0	20 0	0 1793.3	0	0	0	0	0	0	0	0		7	8	0	0	0	0
0	20 0	0	21 0	0 1379.8	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	21 0	0	2 0	0 1379.8	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	22 0	0	102 0	0 569.6	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	23 0	0	103 0	0 266.9	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	24 0	0	105 0	0 433.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	25 0	0	26 0	0 261.1	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	26 0	0	27 0	0 261.1	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	27 0	0	0 0	0 261.1	0	0	0	0	0	0	0	0		11	0	0	0	0	0
0	28 0	0	104 0	0 266.9	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	30 0	0	301 0	0 625.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	32 0	0	201 0	0 754.6	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	102 0	0	3 0	0 569.6	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	103 0	0	28 0	0 266.9	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	104 0	0	4 0	0 266.9	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	105 0	0	0 0	0 433.3	0	0	0	0	0	0	0	0		13	0	0	0	0	0
0	141 0	0	142 0	0 2737.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
0	142 0	0	143 0	0 2737.3	0	0	0	0	0	0	0	0		0	0	0	0	0	0
	143		144 0		0	0	0	0	0	0	0	0		0	0	0	0	0	0

```
   0    0    0    0  2737.3
        144       151    0    0    0    0    0    0    0    0              3    0    0    0    0    0
   0    0    0    0  2737.3
        151       152    0    0    0    0    0    0    0    0    0         0    0    0    0    0    0
   0    0    0    0  2628.5
        152        15    0    0    0    0    0    0    0    0    0         0    0    0    0    0    0
   0    0    0    0  2628.5
        201        22    0    0    0    0    0    0    0    0    0        10    0    0    0    0    0
   0    0    0    0   754.6
        301        24    0    0    0    0    0    0    0    0    0         9    0    0    0    0    0
   0    0    0    0   625.3
1
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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 2 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 37 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
(D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
(O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)	1	2	3	4	10	11	12	13	141
	142	143	144	151	152	15	16	17	18	19
	20	21	22	23	24	25	26	27	28	301
	102	103	104	99	105	201	30	32		
0 5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		0.	0.	0.	0.	0.	0.	0.	0.	0.
		.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		0.	0.	0.	0.	0.	0.	0.	0.	0.
		.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0(S)
		0.	0.	0.	0.	0.	0.	0.		
		.0(S)	.0(S)	.0( )	.0(S)	.0(S)	.0( )	.0( )		
0 10.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		0.	0.	0.	0.	0.	0.	0.	0.	0.
		.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		0.	0.	0.	0.	0.	0.	0.	0.	0.
		.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.0( )	.0(S)
		0.	0.	0.	0.	0.	0.	0.		
		.0(S)	.0(S)	.0( )	.0(S)	.0(S)	.0( )	.0( )		

0 15.	2.	0.	3.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.0( )
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
.0(S)	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.2( )	.1( )	.0(S)
	0.	0.	0.	0.	0.	0.	0.		
	.0(S)	.0(S)	.0( )	.0(S)	.0(S)	.0( )	.1( )		
0 20.	7.	0.	8.	1.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.2( )	.1( )
.0(S)	0.	0.	0.	0.	0.	0.	1.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.4( )	.1( )	.0(S)
	0.	0.	0.	0.	0.	0.	0.		
	.0(S)	.0(S)	.0( )	.0(S)	.0(S)	.1( )	.2( )		
0 25.	20.	1.	26.	7.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	0.	0.	0.	0.	0.	0.	1.	0.
0.	.0( )	.0( )	.0( )	.0( )	.1( )	.1( )	.2( )	.4( )	.2( )
.2(S)	0.	0.	0.	0.	0.	0.	7.	1.	1.
	.0( )	.1( )	.1( )	.1( )	.1( )	.2( )	.8( )	.3( )	.0(S)
	0.	3.	0.	0.	1.	0.	1.		
	.0(S)	.0(S)	.0( )	.0(S)	.0(S)	.2( )	.4( )		
0 30.	37.	4.	48.	20.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	1.	0.	0.	0.	0.	1.	4.	1.
0.	.0( )	.0( )	.0( )	.0( )	.2( )	.2( )	.5( )	.7( )	.4( )
.1( )	0.	0.	0.	0.	0.	2.	19.	3.	2.
1.	.0( )	.2( )	.1( )	.1( )	.3( )	.5( )	1.2( )	.5( )	.0(S)
.4(S)	1.	9.	0.	1.	3.	1.	3.		
	.0(S)	.1(S)	.0( )	.0(S)	.1(S)	.4( )	.6( )		
0 35.	46.	10.	60.	33.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	1.	0.	0.	1.	2.	6.	11.	3.
0.									

.1( )	.0( )	.1( )	.1( )	.1( )	.4( )	.5( )	.8( )	1.0( )	.6( )
3.	1.	0.	1.	0.	2.	6.	34.	9.	5.
.8(S)	.1( )	.3( )	.3( )	.2( )	.7( )	.7( )	1.4( )	.8( )	.1(S)
	5.	20.	0.	3.	6.	4.	6.		
	.0(S)	.2(S)	.0( )	.0(S)	.2(S)	.5( )	.8( )		
0 40.	48.	16.	63.	40.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )									
0.	0.	2.	0.	1.	3.	5.	12.	18.	6.
.3( )	.0( )	.1( )	.3( )	.2( )	.6( )	.8( )	1.0( )	1.1( )	.8( )
6.	2.	1.	3.	1.	5.	12.	42.	20.	8.
1.2(S)	.2( )	.5( )	.5( )	.3( )	1.0( )	1.0( )	1.6( )	1.1( )	.1(S)
	13.	30.	0.	6.	10.	7.	9.		
	.1(S)	.2(S)	.0( )	.1(S)	.3(S)	.7( )	1.0( )		
0 45.	46.	22.	63.	40.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )									
2.	1.	3.	2.	4.	6.	12.	20.	27.	9.
.5( )	.0( )	.1( )	.5( )	.4( )	.8( )	1.0( )	1.2( )	1.3( )	.9( )
9.	5.	2.	7.	2.	11.	19.	43.	29.	11.
1.5(S)	.3( )	.7( )	.7( )	.4( )	1.4( )	1.1( )	1.6( )	1.3( )	.1(S)
	22.	36.	0.	8.	12.	10.	12.		
	.1(S)	.3(S)	.0( )	.1(S)	.3(S)	.7( )	1.1( )		
0 50.	42.	26.	63.	37.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )									
4.	1.	5.	5.	9.	11.	20.	31.	37.	11.
.7( )	.1( )	.2( )	.8( )	.6( )	1.0( )	1.2( )	1.4( )	1.4( )	1.0( )
12.	9.	4.	13.	4.	18.	25.	41.	35.	13.
1.9(S)	.5( )	.8( )	.9( )	.5( )	1.6( )	1.2( )	1.6( )	1.4( )	.1(S)
	27.	38.	0.	10.	14.	12.	14.		
	.2(S)	.3(S)	.0( )	.1(S)	.4(S)	.8( )	1.2( )		
0 55.	38.	30.	65.	35.	0.	0.	0.	0.	0.
1.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.1( )									
8.	3.	9.	11.	15.	19.	32.	41.	45.	13.
.9( )	.1( )	.2( )	1.1( )	.7( )	1.2( )	1.3( )	1.5( )	1.5( )	1.0( )
16.	13.	6.	19.	5.	24.	29.	38.	37.	14.
2.3(S)	.6( )	1.0( )	1.1( )	.6( )	1.8( )	1.3( )	1.5( )	1.4( )	.1(S)

	32. .2(S)	37. .3(S)	0. .0( )	11. .2(S)	16. .4(S)	14. .9( )	16. 1.2( )	
1 0. 3. .2( )	35. .0( )	33. .0( )	67. .0( )	32. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
12. 1.0( )	6. .2( )	16. .4( )	19. 1.3( )	25. .9( )	29. 1.3( )	42. 1.4( )	49. 1.6( )	52. 1.6( )	15. 1.1( )
20. 2.6(S)	18. .8( )	9. 1.2( )	25. 1.2( )	7. .6( )	28. 1.9( )	31. 1.3( )	35. 1.5( )	36. 1.4( )	15. .2(S)
	34. .2(S)	35. .3(S)	0. .0( )	11. .2(S)	18. .5(S)	15. .9( )	18. 1.3( )		
1 5. 8. .3( )	32. .0( )	37. .0( )	67. .0( )	30. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .1( )
17. 1.1( )	13. .3( )	26. .5( )	30. 1.6( )	36. 1.1( )	40. 1.5( )	50. 1.5( )	54. 1.6( )	56. 1.6( )	18. 1.1( )
23. 2.9(S)	23. .9( )	12. 1.3( )	29. 1.3( )	8. .7( )	30. 2.0( )	32. 1.4( )	32. 1.4( )	34. 1.4( )	17. .2(S)
	35. .2(S)	33. .3(S)	0. .0( )	12. .2(S)	21. .5(S)	16. .9( )	20. 1.3( )		
1 10. 18. .4( )	29. .0( )	42. .0( )	65. .0( )	27. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	3. .1( )
22. 1.2( )	24. .4( )	38. .6( )	42. 1.8( )	47. 1.3( )	49. 1.6( )	55. 1.6( )	58. 1.6( )	60. 1.6( )	21. 1.2( )
27. 3.2(S)	28. 1.0( )	16. 1.5( )	31. 1.3( )	9. .7( )	31. 2.0( )	31. 1.3( )	30. 1.4( )	32. 1.3( )	18. .2(S)
	34. .2(S)	30. .2(S)	0. .0( )	13. .3(S)	25. .6(S)	18. .9( )	24. 1.4( )		
1 15. 30. .6( )	27. .0( )	46. .0( )	62. .0( )	25. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	9. .2( )
28. 1.3( )	36. .5( )	48. .7( )	51. 1.9( )	54. 1.4( )	56. 1.6( )	59. 1.6( )	61. 1.7( )	62. 1.7( )	24. 1.2( )
30. 3.4(S)	33. 1.1( )	19. 1.6( )	32. 1.3( )	10. .8( )	31. 2.0( )	31. 1.3( )	27. 1.3( )	30. 1.3( )	19. .2(S)
	32. .2(S)	28. .2(S)	0. .0( )	13. .3(S)	28. .6(S)	19. 1.0( )	27. 1.5( )		
1 20. 42.	24. .0( )	49. .0( )	58. .0( )	22. .0( )	0. .0( )	0. .0( )	0. .0( )	3. .1( )	19. .4( )

.7( )

33.
1.4( )

32.
3.6(S)

52.[1] 25.
.8( )

38.
1.4( )

34.
3.8(S)

58.[1] 30.
.9( )

43.
1.5( )

35.
3.9(S)

62.[1] 35.
.9( )

47.
1.5( )

35.
4.0(S)

66.[1] 40.
1.0( )

50.
1.6( )

46. .6( )	55. .8( )	57. 2.0( )	59. 1.4( )	61. 1.7( )	62. 1.6( )	64. 1.7( )	64. 1.7( )	27. 1.3( )
38. 1.2( )	23. 1.7( )	32. 1.3( )	11. .8( )	30. 2.0( )	29. 1.3( )	24. 1.3( )	27. 1.2( )	20. .2(S)
30. .2(S)	25. .2(S)	0. .0( )	14. .3(S)	30. .6(S)	19. 1.0( )	30. 1.6( )		
22. .0( )	52. .0( )	54. .0( )	20. .0( )	0. .0( )	0. .0( )	2. .1( )	10. .2( )	32. .5( )
54. .7( )	60. .8( )	62. 2.1( )	63. 1.5( )	64. 1.7( )	64. 1.7( )	66. 1.7( )	66. 1.7( )	31. 1.3( )
42. 1.3( )	26. 1.8( )	31. 1.3( )	12. .8( )	29. 1.9( )	28. 1.3( )	22. 1.2( )	25. 1.2( )	20. .2(S)
28. .2(S)	23. .2(S)	0. .0( )	14. .3(S)	33. .6(S)	20. 1.0( )	32. 1.6( )		
21. .0( )	55. .0( )	50. .0( )	18. .0( )	0. .0( )	2. .1( )	8. .2( )	21. .3( )	43. .6( )
60. .7( )	63. .8( )	65. 2.1( )	66. 1.5( )	66. 1.7( )	66. 1.7( )	68. 1.7( )	68. 1.7( )	35. 1.3( )
46. 1.3( )	28. 1.9( )	29. 1.3( )	13. .8( )	27. 1.9( )	26. 1.3( )	20. 1.2( )	22. 1.2( )	20. .2(S)
26. .2(S)	20. .2(S)	0. .0( )	14. .3(S)	35. .6(S)	20. 1.0( )	34. 1.7( )		
20. .0( )	57. .0( )	46. .0( )	16. .0( )	1. .0( )	11. .2( )	20. .3( )	34. .4( )	53. .7( )
64. .7( )	66. .8( )	67. 2.2( )	68. 1.5( )	68. 1.8( )	68. 1.7( )	69. 1.7( )	70. 1.7( )	39. 1.4( )
50. 1.4( )	31. 1.9( )	27. 1.2( )	13. .8( )	26. 1.9( )	24. 1.2( )	18. 1.1( )	20. 1.1( )	20. .2(S)
23. .1(S)	18. .1(S)	0. .0( )	14. .3(S)	36. .7(S)	20. 1.0( )	36. 1.7( )		
23. .0( )	58. .0( )	42. .0( )	15. .0( )	6. .1( )	26. .3( )	35. .4( )	45. .4( )	59. .7( )
66. .7( )	68. .9( )	69. 2.2( )	70. 1.6( )	70. 1.8( )	70. 1.7( )	70. 1.8( )	71. 1.7( )	43. 1.4( )

36.	52.	32.	25.	13.	24.	23.	17.	18.	20.
4.1(S)	1.4( )	2.0( )	1.2( )	.8( )	1.8( )	1.2( )	1.1( )	1.1( )	.2(S)
	21.	17.	0.	14.	38.	20.	38.		
	.1(S)	.1(S)	.0( )	.3(S)	.7(S)	1.0( )	1.7( )		
1 45. 68.	34.	59.	39.	13.	18.	41.	47.	54.	63.
1.0( )	.0( )	.0( )	.0( )	.0( )	.3( )	.4( )	.5( )	.5( )	.7( )
53.	68.	70.	71.	71.	71.	71.	72.	73.	47.
1.6( )	.7( )	.9( )	2.2( )	1.6( )	1.8( )	1.7( )	1.8( )	1.8( )	1.5( )
36.	55.	33.	23.	14.	22.	21.	15.	17.	20.
4.1(S)	1.5( )	2.0( )	1.2( )	.8( )	1.8( )	1.2( )	1.1( )	1.0( )	.2(S)
	19.	15.	0.	14.	39.	20.	39.		
	.1(S)	.1(S)	.0( )	.4(S)	.7(S)	1.0( )	1.7( )		
1 50. 70.	49.	60.	35.	12.	34.	52.	56.	60.	67.
1.0( )	.0( )	.0( )	.0( )	.0( )	.4( )	.5( )	.5( )	.5( )	.8( )
55.	70.	71.	72.	73.	73.	73.	74.	74.	50.
1.6( )	.8( )	.9( )	2.2( )	1.6( )	1.8( )	1.7( )	1.8( )	1.8( )	1.5( )
36.	56.	34.	21.	14.	21.	19.	14.	15.	20.
4.1(S)	1.5( )	2.0( )	1.1( )	.9( )	1.7( )	1.1( )	1.0( )	1.0( )	.2(S)
	16.	14.	0.	14.	40.	20.	40.		
	.1(S)	.1(S)	.0( )	.3(S)	.7(S)	1.0( )	1.7( )		
1 55. 71.	62.	60.	32.	11.	48.	59.	62.	65.	69.
1.0( )	.0( )	.0( )	.0( )	.0( )	.5( )	.5( )	.5( )	.6( )	.8( )
57.	72.	73.	73.	74.	74.	74.	75.	75.	53.
1.6( )	.8( )	.9( )	2.2( )	1.6( )	1.8( )	1.7( )	1.8( )	1.8( )	1.5( )
36.	58.	35.	19.	14.	19.	18.	13.	14.	20.
4.1(S)	1.5( )	2.0( )	1.1( )	.9( )	1.7( )	1.1( )	1.0( )	1.0( )	.2(S)
	15.	12.	0.	14.	40.	20.	40.		
	.1(S)	.1(S)	.0( )	.3(S)	.7(S)	1.0( )	1.7( )		
2 0. 73.	70.	60.	29.	10.	57.	64.	66.	68.	71.
1.0( )	.0( )	.0( )	.0( )	.0( )	.5( )	.6( )	.6( )	.6( )	.8( )
58.	73.	74.	75.	75.	76.	75.	76.	76.	56.
1.6( )	.8( )	.9( )	2.2( )	1.6( )	1.8( )	1.8( )	1.8( )	1.8( )	1.5( )
36.	59.	35.	17.	14.	18.	17.	12.	12.	20.
4.0(S)	1.5( )	2.0( )	1.0( )	.9( )	1.6( )	1.1( )	1.0( )	.9( )	.2(S)
	13.	11.	0.	14.	40.	20.	40.		
	.1(S)	.1(S)	.0( )	.3(S)	.7(S)	1.0( )	1.7( )		

58.
1.6( )

32.
3.6(S)

2 30.
77.
1.1( )

57.
1.6( )

31.
3.5(S)

2 35.
77.
1.1( )

56.
1.6( )

29.
3.4(S)

2 40.
76.
1.1( )

55.
1.6( )

28.
3.3(S)

2 45.
76.
1.0( )

54.
1.6( )

27.

.8( )	.9( )	2.3( )	1.6( )	1.8( )	1.8( )	1.8( )	1.8( )	1.6( )
58.	34.	10.	13.	12.	11.	7.	7.	18.
1.5( )	2.0( )	.9( )	.8( )	1.4( )	.9( )	.8( )	.8( )	.2(S)
8.	6.	0.	13.	38.	18.	38.		
.0(S)	.0(S)	.0( )	.3(S)	.7(S)	.9( )	1.7( )		
81.	54.	15.	5.	75.	76.	76.	77.	77.
.0( )	.0( )	.0( )	.0( )	.6( )	.6( )	.6( )	.6( )	.8( )
77.	77.	77.	77.	76.	76.	75.	75.	61.
.8( )	.9( )	2.3( )	1.6( )	1.8( )	1.8( )	1.8( )	1.8( )	1.6( )
57.	33.	9.	13.	11.	10.	6.	7.	17.
1.5( )	2.0( )	.8( )	.8( )	1.3( )	.9( )	.7( )	.7( )	.2(S)
7.	6.	0.	12.	37.	18.	37.		
.0(S)	.0(S)	.0( )	.2(S)	.7(S)	.9( )	1.7( )		
80.	53.	13.	4.	76.	77.	77.	77.	77.
.0( )	.0( )	.0( )	.0( )	.6( )	.6( )	.6( )	.6( )	.8( )
77.	76.	76.	76.	76.	75.	74.	73.	61.
.8( )	.9( )	2.3( )	1.6( )	1.8( )	1.7( )	1.8( )	1.8( )	1.6( )
56.	32.	8.	13.	10.	9.	5.	6.	17.
1.5( )	1.9( )	.8( )	.8( )	1.3( )	.8( )	.7( )	.7( )	.2(S)
6.	5.	0.	12.	36.	17.	36.		
.0(S)	.0(S)	.0( )	.2(S)	.7(S)	.9( )	1.7( )		
81.	51.	12.	4.	77.	77.	77.	77.	77.
.0( )	.0( )	.0( )	.0( )	.6( )	.6( )	.6( )	.6( )	.8( )
76.	76.	75.	75.	74.	73.	72.	72.	60.
.8( )	.9( )	2.2( )	1.6( )	1.8( )	1.7( )	1.8( )	1.8( )	1.6( )
54.	31.	8.	13.	9.	8.	4.	5.	16.
1.4( )	1.9( )	.8( )	.8( )	1.3( )	.8( )	.7( )	.7( )	.2(S)
6.	5.	0.	12.	34.	17.	34.		
.0(S)	.0(S)	.0( )	.2(S)	.6(S)	.9( )	1.7( )		
81.	49.	11.	4.	77.	77.	77.	77.	76.
.0( )	.0( )	.0( )	.0( )	.6( )	.6( )	.6( )	.6( )	.8( )
75.	74.	74.	73.	73.	71.	70.	69.	59.
.8( )	.9( )	2.2( )	1.6( )	1.8( )	1.7( )	1.8( )	1.7( )	1.6( )
53.	30.	7.	12.	8.	7.	4.	5.	16.
1.4( )	1.9( )	.7( )	.8( )	1.2( )	.8( )	.6( )	.6( )	.2(S)

3.2(S)

	5. .0(S)	4. .0(S)	0. .0( )	11. .2(S)	33. .6(S)	16. .9( )	33. 1.6( )		
2 50. 74.	80. .0( )	47. .0( )	10. .0( )	3. .0( )	77. .6( )	77. .6( )	77. .6( )	76. .6( )	76. .8( )
1.0( )									
52.	74. .8( )	73. .9( )	72. 2.2( )	72. 1.6( )	71. 1.8( )	69. 1.7( )	67. 1.7( )	66. 1.7( )	58. 1.6( )
1.6( )									
25.	51. 1.4( )	29. 1.9( )	6. .7( )	12. .8( )	8. 1.2( )	7. .7( )	3. .6( )	4. .6( )	15. .2(S)
3.1(S)									
	5. .0(S)	4. .0(S)	0. .0( )	11. .2(S)	32. .6(S)	15. .9( )	32. 1.6( )		
2 55. 73.	80. .0( )	45. .0( )	9. .0( )	3. .0( )	77. .6( )	76. .6( )	76. .6( )	75. .6( )	74. .8( )
1.0( )									
51.	72. .8( )	71. .9( )	70. 2.2( )	69. 1.6( )	69. 1.8( )	66. 1.7( )	65. 1.7( )	64. 1.7( )	56. 1.6( )
1.6( )									
24.	49. 1.4( )	27. 1.8( )	6. .7( )	12. .8( )	7. 1.1( )	6. .7( )	3. .6( )	4. .6( )	15. .1(S)
2.9(S)									
	4. .0(S)	3. .0(S)	0. .0( )	11. .2(S)	30. .6(S)	15. .9( )	30. 1.6( )		
3 0. 71.	79. .0( )	43. .0( )	8. .0( )	3. .0( )	76. .6( )	75. .6( )	75. .6( )	74. .6( )	73. .8( )
1.0( )									
49.	71. .8( )	69. .9( )	68. 2.2( )	67. 1.5( )	66. 1.7( )	64. 1.7( )	63. 1.7( )	62. 1.7( )	55. 1.5( )
1.5( )									
23.	47. 1.3( )	26. 1.8( )	5. .7( )	11. .8( )	6. 1.1( )	5. .7( )	2. .5( )	3. .6( )	14. .1(S)
2.8(S)									
	4. .0(S)	3. .0(S)	0. .0( )	10. .1(S)	28. .6(S)	14. .9( )	28. 1.5( )		
3 5. 69.	78. .0( )	41. .0( )	7. .0( )	2. .0( )	75. .6( )	74. .6( )	74. .6( )	73. .6( )	71. .8( )
1.0( )									
47.	68. .7( )	67. .8( )	66. 2.1( )	65. 1.5( )	64. 1.7( )	62. 1.6( )	61. 1.7( )	60. 1.6( )	53. 1.5( )
1.5( )									
22.	45. 1.3( )	25. 1.8( )	5. .6( )	11. .8( )	6. 1.0( )	5. .7( )	1. .4( )	3. .5( )	14. .1(S)
2.7(S)									
	3. .0(S)	3. .0(S)	0. .0( )	10. .1(S)	27. .6(S)	14. .9( )	27. 1.5( )		
3 10. 67.	77.	39.	6.	2.	74.	73.	72.	71.	69.

.0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .8( ) 1.0( )

66. 64. 63. 63. 62. 60. 58. 57. 51. 45.
.7( ) .8( ) 2.1( ) 1.5( ) 1.7( ) 1.6( ) 1.6( ) 1.6( ) 1.5( ) 1.5( )

43. 24. 4. 10. 5. 4. 1. 3. 13. 20.
1.3( ) 1.7( ) .6( ) .8( ) 1.0( ) .6( ) .3( ) .5( ) .1(s) 2.6(s)

3. 2. 0. 9. 25. 13. 25.
.0(s) .0(s) .0( ) .1(s) .6(s) .8( ) 1.5( )

75. 37. 6. 2. 73. 71. 71. 69. 67. 3 15. 65.
.0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .8( ) 1.0( )

64. 62. 61. 60. 60. 58. 56. 55. 50. 43.
.7( ) .8( ) 2.1( ) 1.5( ) 1.7( ) 1.6( ) 1.6( ) 1.6( ) 1.5( ) 1.5( )

41. 23. 4. 10. 4. 4. 0. 2. 13. 19.
1.2( ) 1.7( ) .6( ) .8( ) .9( ) .6( ) .3( ) .5( ) .1(s) 2.5(s)

3. 2. 0. 8. 24. 13. 24.
.0(s) .0(s) .0( ) .1(s) .5(s) .8( ) 1.4( )

73. 35. 3. 2. 71. 69. 69. 67. 65. 3 20. 62.
.0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .7( ) .9( )

62. 60. 59. 58. 58. 55. 54. 53. 48. 41.
.7( ) .8( ) 2.1( ) 1.4( ) 1.7( ) 1.6( ) 1.6( ) 1.6( ) 1.5( ) 1.5( )

40. 21. 3. 9. 4. 3. 0. 2. 12. 18.
1.2( ) 1.7( ) .6( ) .7( ) .9( ) .6( ) .2( ) .5( ) .1(s) 2.5(s)

2. 2. 0. 7. 23. 12. 23.
.0(s) .0(s) .0( ) .1(s) .5(s) .8( ) 1.4( )

71. 33. 3. 0. 69. 67. 67. 65. 63. 3 25. 60.
.0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .7( ) .9( )

60. 58. 57. 56. 55. 53. 52. 51. 46. 39.
.7( ) .8( ) 2.0( ) 1.4( ) 1.6( ) 1.6( ) 1.6( ) 1.6( ) 1.5( ) 1.4( )

38. 20. 3. 9. 3. 3. 0. 2. 11. 17.
1.2( ) 1.6( ) .5( ) .7( ) .8( ) .5( ) .2( ) .5( ) .1(s) 2.4(s)

2. 1. 0. 7. 22. 11. 22.
.0(s) .0(s) .0( ) .1(s) .5(s) .8( ) 1.4( )

69. 31. 3. 0. 67. 65. 65. 63. 61. 3 30. 58.
.0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .5( ) .7( ) .9( )

58. 56. 55. 54. 53. 51. 49. 48. 45. 38.
.7( ) .8( ) 2.0( ) 1.4( ) 1.6( ) 1.5( ) 1.6( ) 1.5( ) 1.4( ) 1.4( )

16.	36.	19.	3.	8.	3.	2.	0.	1.	10.
2.3(S)	1.1( )	1.6( )	.5( )	.7( )	.8( )	.5( )	.2( )	.4( )	.1(S)
	2.	0.	0.	6.	21.	11.	21.		
	.0(S)	.0(S)	.0( )	.1(S)	.5(S)	.8( )	1.4( )		
3 35.	67.	29.	2.	0.	65.	63.	62.	61.	59.
56. .9( )	.0( )	.0( )	.0( )	.0( )	.6( )	.5( )	.5( )	.5( )	.7( )
36.	55.	54.	53.	52.	51.	49.	47.	46.	43.
1.4( )	.7( )	.7( )	2.0( )	1.4( )	1.6( )	1.5( )	1.5( )	1.5( )	1.4( )
15.	34.	18.	2.	7.	2.	2.	0.	1.	9.
2.2(S)	1.1( )	1.6( )	.5( )	.7( )	.8( )	.5( )	.1( )	.3( )	.1(S)
	1.	0.	0.	6.	19.	10.	20.		
	.0(S)	.0(S)	.0( )	.1(S)	.5(S)	.7( )	1.3( )		
3 40.	65.	27.	2.	0.	63.	61.	60.	59.	57.
54. .9( )	.0( )	.0( )	.0( )	.0( )	.5( )	.5( )	.5( )	.5( )	.7( )
34.	53.	51.	51.	50.	49.	47.	45.	44.	41.
1.4( )	.6( )	.7( )	1.9( )	1.3( )	1.6( )	1.5( )	1.5( )	1.5( )	1.4( )
14.	32.	17.	2.	7.	2.	2.	0.	1.	8.
2.1(S)	1.1( )	1.5( )	.5( )	.7( )	.7( )	.4( )	.1( )	.3( )	.1(S)
	1.	0.	0.	5.	18.	9.	19.		
	.0(S)	.0(S)	.0( )	.1(S)	.5(S)	.7( )	1.3( )		
3 45.	63.	26.	2.	0.	61.	59.	58.	57.	55.
52. .8( )	.0( )	.0( )	.0( )	.0( )	.5( )	.5( )	.5( )	.5( )	.7( )
32.	51.	49.	49.	48.	47.	45.	43.	42.	39.
1.4( )	.6( )	.7( )	1.9( )	1.3( )	1.5( )	1.5( )	1.5( )	1.5( )	1.4( )
13.	30.	16.	2.	7.	2.	1.	0.	0.	8.
2.0(S)	1.0( )	1.5( )	.4( )	.6( )	.7( )	.4( )	.1( )	.3( )	.1(S)
	1.	0.	0.	5.	18.	8.	18.		
	.0(S)	.0(S)	.0( )	.1(S)	.5(S)	.7( )	1.3( )		
3 50.	61.	25.	1.	0.	59.	57.	56.	55.	53.
50. .8( )	.0( )	.0( )	.0( )	.0( )	.5( )	.5( )	.5( )	.5( )	.7( )
30.	49.	47.	47.	46.	45.	43.	41.	40.	38.
1.3( )	.6( )	.7( )	1.9( )	1.3( )	1.5( )	1.5( )	1.5( )	1.5( )	1.4( )
13.	29.	15.	1.	6.	2.	1.	0.	0.	7.
1.9(S)	1.0( )	1.5( )	.4( )	.6( )	.6( )	.4( )	.1( )	.2( )	.1(S)
	0.	0.	0.	5.	17.	7.	18.		

.0(S) .0(S) .0( ) .1(S) .5(S) .7( ) 1.3( )

48.[3] 55. 59. 24. 1. 0. 57. 55. 54. 53. 51.
.8( ) .0( ) .0( ) .0( ) .0( ) .5( ) .5( ) .5( ) .5( ) .6( )

29. 47. 45. 45. 44. 43. 41. 39. 38. 36.
1.3( ) .6( ) .7( ) 1.8( ) 1.2( ) 1.5( ) 1.4( ) 1.5( ) 1.4( ) 1.4( )

12. 27. 14. 1. 6. 1. 1. 0. 0. 6.
1.9(S) 1.0( ) 1.4( ) .4( ) .6( ) .6( ) .4( ) .1( ) .2( ) .1(S)

0. 0. 0. 5. 17. 7. 17.
.0(S) .0(S) .0( ) .0(S) .5(S) .6( ) 1.3( )

46.[4] 0. 55. 23. 1. 0. 55. 53. 52. 51. 49.
.8( ) .0( ) .0( ) .0( ) .0( ) .5( ) .5( ) .5( ) .5( ) .6( )

27. 45. 43. 43. 42. 41. 39. 38. 37. 34.
1.3( ) .6( ) .7( ) 1.8( ) 1.2( ) 1.5( ) 1.4( ) 1.4( ) 1.4( ) 1.3( )

11. 26. 14. 1. 6. 1. 1. 0. 0. 6.
1.8(S) .9( ) 1.4( ) .4( ) .6( ) .6( ) .4( ) .1( ) .2( ) .1(S)

0. 0. 0. 5. 16. 6. 16.
.0(S) .0(S) .0( ) .0(S) .4(S) .6( ) 1.2( )

44.[4] 5. 53. 21. 1. 0. 53. 51. 50. 49. 47.
.8( ) .0( ) .0( ) .0( ) .0( ) .5( ) .5( ) .5( ) .5( ) .6( )

26. 43. 42. 41. 40. 39. 37. 36. 35. 33.
1.3( ) .6( ) .6( ) 1.8( ) 1.2( ) 1.5( ) 1.4( ) 1.4( ) 1.4( ) 1.3( )

11. 25. 13. 1. 5. 1. 1. 0. 0. 6.
1.7(S) .9( ) 1.4( ) .3( ) .6( ) .6( ) .3( ) .1( ) .1( ) .1(S)

0. 0. 0. 4. 16. 6. 16.
.0(S) .0(S) .0( ) .0(S) .4(S) .6( ) 1.2( )

42.[4] 10. 51. 21. 1. 0. 51. 49. 48. 47. 45.
.7( ) .0( ) .0( ) .0( ) .0( ) .5( ) .5( ) .5( ) .5( ) .6( )

25. 41. 40. 39. 38. 38. 35. 34. 33. 31.
1.3( ) .6( ) .6( ) 1.8( ) 1.2( ) 1.4( ) 1.4( ) 1.4( ) 1.4( ) 1.3( )

10. 24. 12. 1. 5. 1. 1. 0. 0. 5.
1.6(S) .9( ) 1.4( ) .3( ) .6( ) .5( ) .3( ) .1( ) .1( ) .1(S)

0. 0. 0. 4. 15. 6. 15.
.0(S) .0(S) .0( ) .0(S) .4(S) .6( ) 1.2( )

40.[4] 15. 49. 20. 1. 0. 49. 47. 47. 45. 43.
.7( ) .0( ) .0( ) .0( ) .0( ) .5( ) .5( ) .5( ) .4( ) .6( )

	40.	38.	37.	36.	36.	34.			
24.	.5( )	.6( )	1.7( )	1.1( )	1.4( )	1.			
1.2( )									
	23.	12.	1.	5.	1.	1.			
10.	.9( )	1.3( )	.3( )	.6( )	.5( )	.3			
1.6(S)									
	0.	0.	0.	4.	14.	5.			
	.0(S)	.0(S)	.0( )	.0(S)	.4(S)	.6			
4 20.	47.	19.	0.	0.	47.	46.			
39.	.0( )	.0( )	.0( )	.0( )	.5( )	.5(			
.7( )									
	38.	36.	36.	35.	34.	32.	31.	30.	29.
23.	.5( )	.6( )	1.7( )	1.1( )	1.4( )	1.3( )	1.4( )	1.3( )	1.3( )
1.2( )									
	22.	11.	0.	5.	1.	1.	0.	0.	5.
9.	.8( )	1.3( )	.3( )	.6( )	.5( )	.3( )	.1( )	.1( )	.0(S)
1.5(S)									
	0.	0.	0.	4.	14.	5.	14.		
	.0(S)	.0(S)	.0( )	.0(S)	.4(S)	.6( )	1.2( )		
4 25.	46.	18.	0.	0.	46.	44.	43.	42.	39.
37.	.0( )	.0( )	.0( )	.0( )	.5( )	.4( )	.4( )	.4( )	.6( )
.7( )									
	36.	35.	34.	33.	33.	31.	30.	29.	28.
22.	.5( )	.6( )	1.7( )	1.1( )	1.4( )	1.3( )	1.3( )	1.3( )	1.3( )
1.2( )									
	21.	10.	0.	4.	1.	1.	0.	0.	5.
9.	.8( )	1.3( )	.2( )	.6( )	.5( )	.3( )	.0( )	.1( )	.0(S)
1.5(S)									
	0.	0.	0.	4.	13.	5.	13.		
	.0(S)	.0(S)	.0( )	.0(S)	.3(S)	.6( )	1.1( )		
4 30.	44.	17.	0.	0.	44.	42.	41.	40.	38.
35.	.0( )	.0( )	.0( )	.0( )	.4( )	.4( )	.4( )	.4( )	.5( )
.7( )									
	35.	33.	33.	32.	31.	30.	29.	28.	26.
21.	.5( )	.6( )	1.6( )	1.1( )	1.4( )	1.3( )	1.3( )	1.3( )	1.2( )
1.2( )									
	20.	10.	0.	4.	1.	0.	0.	0.	4.
8.	.8( )	1.2( )	.2( )	.5( )	.4( )	.3( )	.0( )	.1( )	.0(S)
1.4(S)									
	0.	0.	0.	3.	12.	5.	12.		
	.0(S)	.0(S)	.0( )	.0(S)	.3(S)	.6( )	1.1( )		
4 35.	42.	16.	0.	0.	42.	40.	40.	39.	36.
34.	.0( )	.0( )	.0( )	.0( )	.4( )	.4( )	.4( )	.4( )	.5( )
.6( )									
	33.	32.	31.	31.	30.	28.	27.	27.	25.
20.	.5( )	.5( )	1.6( )	1.0( )	1.4( )	1.3( )	1.3( )	1.3( )	1.2( )
1.2( )									
	19.	9.	0.	4.	1.	0.	0.	0.	4.
8.									

1.4(S)	.8( )	1.2( )	.2( )	.5( )	.4( )	.3( )	.0( )	.1( )	.0(S)
	0. .0(S)	0. .0(S)	0. .0( )	3. .0(S)	12. .3(S)	4. .6( )	12. 1.1( )		
4 40. 33. .6( )	41. .0( )	15. .0( )	0. .0( )	0. .0( )	41. .4( )	39. .4( )	38. .4( )	37. .4( )	35. .5( )
19. 1.2( )	32. .5( )	31. .5( )	30. 1.6( )	29. 1.0( )	29. 1.3( )	27. 1.3( )	26. 1.3( )	26. 1.3( )	24. 1.2( )
7. 1.3(S)	18. .8( )	9. 1.2( )	0. .2( )	4. .5( )	1. .4( )	0. .3( )	0. .0( )	0. .1( )	4. .0(S)
	0. .0(S)	0. .0(S)	0. .0( )	3. .0(S)	11. .3(S)	4. .5( )	11. 1.1( )		
4 45. 31. .6( )	39. .0( )	15. .0( )	0. .0( )	0. .0( )	39. .4( )	37. .4( )	37. .4( )	35. .4( )	33. .5( )
18. 1.2( )	31. .5( )	29. .5( )	29. 1.6( )	28. 1.0( )	28. 1.3( )	26. 1.3( )	25. 1.3( )	24. 1.3( )	23. 1.2( )
7. 1.3(S)	17. .7( )	8. 1.2( )	0. .2( )	4. .5( )	0. .4( )	0. .2( )	0. .0( )	0. .1( )	4. .0(S)
	0. .0(S)	0. .0(S)	0. .0( )	3. .0(S)	11. .3(S)	4. .5( )	11. 1.1( )		
4 50. 30. .6( )	37. .0( )	14. .0( )	0. .0( )	0. .0( )	37. .4( )	36. .4( )	35. .4( )	34. .4( )	32. .5( )
17. 1.1( )	29. .5( )	28. .5( )	28. 1.5( )	27. 1.0( )	27. 1.3( )	25. 1.2( )	24. 1.3( )	23. 1.2( )	22. 1.2( )
6. 1.2(S)	16. .7( )	8. 1.1( )	0. .2( )	3. .5( )	0. .4( )	0. .2( )	0. .0( )	0. .1( )	4. .0(S)
	0. .0(S)	0. .0(S)	0. .0( )	3. .0(S)	10. .3(S)	4. .5( )	10. 1.0( )		
4 55. 29. .6( )	36. .0( )	13. .0( )	0. .0( )	0. .0( )	36. .4( )	34. .4( )	34. .4( )	33. .4( )	31. .5( )
17. 1.1( )	28. .4( )	27. .5( )	26. 1.5( )	26. 1.0( )	26. 1.3( )	24. 1.2( )	23. 1.2( )	23. 1.2( )	22. 1.2( )
6. 1.2(S)	16. .7( )	8. 1.1( )	0. .2( )	3. .5( )	0. .4( )	0. .2( )	0. .0( )	0. .1( )	4. .0(S)
	0. .0(S)	0. .0(S)	0. .0( )	3. .0(S)	10. .3(S)	4. .5( )	10. 1.0( )		
5 0.	35.	13.	0.	0.	35.	33.	32.	31.	30.

28. .0( ) .0( ) .0( ) .0( ) .4( ) .4( ) .4( ) .4( ) .5( ) .6( )

27. 26. 25. 25. 25. 23. 22. 22. 21. 16.
.4( ) .5( ) 1.5( ) .9( ) 1.3( ) 1.2( ) 1.2( ) 1.2( ) 1.2( ) 1.1( )

15. 7. 0. 3. 0. 0. 0. 0. 3. 6.
.7( ) 1.1( ) .2( ) .5( ) .4( ) .2( ) .0( ) .1( ) .0(S) 1.1(S)

0. 0. 0. 3. 9. 3. 9.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) 1.0( )

5 5. 33. 12. 0. 0. 33. 32. 31. 30. 28. 27.
.0( ) .0( ) .0( ) .0( ) .4( ) .4( ) .4( ) .4( ) .5( ) .6( )

26. 25. 24. 24. 24. 22. 21. 21. 20. 15.
.4( ) .5( ) 1.5( ) .9( ) 1.3( ) 1.2( ) 1.2( ) 1.2( ) 1.1( ) 1.1( )

14. 7. 0. 3. 0. 0. 0. 0. 3. 5.
.7( ) 1.1( ) .2( ) .5( ) .3( ) .2( ) .0( ) .1( ) .0(S) 1.1(S)

0. 0. 0. 2. 9. 3. 9.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) 1.0( )

5 10. 32. 11. 0. 0. 32. 31. 30. 29. 27. 26.
.0( ) .0( ) .0( ) .0( ) .4( ) .4( ) .4( ) .3( ) .4( ) .5( )

25. 24. 23. 23. 23. 21. 20. 20. 19. 14.
.4( ) .5( ) 1.4( ) .9( ) 1.2( ) 1.2( ) 1.2( ) 1.2( ) 1.1( ) 1.1( )

14. 6. 0. 3. 0. 0. 0. 0. 3. 5.
.6( ) 1.1( ) .1( ) .5( ) .3( ) .2( ) .0( ) .1( ) .0(S) 1.1(S)

0. 0. 0. 2. 8. 3. 8.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) 1.0( )

5 15. 31. 11. 0. 0. 31. 29. 29. 28. 26. 25.
.0( ) .0( ) .0( ) .0( ) .4( ) .3( ) .3( ) .3( ) .4( ) .5( )

24. 23. 23. 22. 22. 20. 20. 19. 18. 14.
.4( ) .4( ) 1.4( ) .9( ) 1.2( ) 1.2( ) 1.2( ) 1.2( ) 1.1( ) 1.1( )

13. 6. 0. 3. 0. 0. 0. 0. 3. 5.
.6( ) 1.0( ) .1( ) .5( ) .3( ) .2( ) .0( ) .0( ) .0(S) 1.0(S)

0. 0. 0. 2. 8. 3. 8.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) .9( )

5 20. 30. 10. 0. 0. 30. 28. 28. 27. 25. 24.
.0( ) .0( ) .0( ) .0( ) .3( ) .3( ) .3( ) .3( ) .4( ) .5( )

23. 22. 22. 21. 21. 20. 19. 18. 18. 13.
.4( ) .4( ) 1.4( ) .9( ) 1.2( ) 1.2( ) 1.2( ) 1.2( ) 1.1( )

1.1( )

5.

1.0(S)

12. 6. 0. 3. 0. 0. 0. 0. 3.
.6( ) 1.0( ) .1( ) .5( ) .3( ) .2( ) .0( ) .0( ) .0(S)

0. 0. 0. 2. 7. 3. 7.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) .9( )

5 25.

23.

.5( )

29. 10. 0. 0. 29. 27. 27. 26. 24.
.0( ) .0( ) .0( ) .0( ) .3( ) .3( ) .3( ) .3( ) .4( )

13.

1.1( )

22. 21. 21. 20. 20. 19. 18. 18. 17.
.4( ) .4( ) 1.4( ) .9( ) 1.2( ) 1.2( ) 1.2( ) 1.1( ) 1.1( )

4.

1.0(S)

12. 5. 0. 3. 0. 0. 0. 0. 3.
.6( ) 1.0( ) .1( ) .5( ) .3( ) .2( ) .0( ) .0( ) .0(S)

0. 0. 0. 2. 7. 3. 7.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) .9( )

5 30.

22.

.5( )

28. 9. 0. 0. 28. 26. 26. 25. 23.
.0( ) .0( ) .0( ) .0( ) .3( ) .3( ) .3( ) .3( ) .4( )

12.

1.0( )

22. 21. 20. 20. 19. 18. 17. 17. 16.
.4( ) .4( ) 1.4( ) .8( ) 1.2( ) 1.1( ) 1.2( ) 1.1( ) 1.1( )

4.

.9(S)

11. 5. 0. 2. 0. 0. 0. 0. 3.
.6( ) 1.0( ) .1( ) .4( ) .3( ) .2( ) .0( ) .0( ) .0(S)

0. 0. 0. 2. 7. 3. 7.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) .9( )

5 35.

21.

.5( )

27. 9. 0. 0. 27. 25. 25. 24. 23.
.0( ) .0( ) .0( ) .0( ) .3( ) .3( ) .3( ) .3( ) .4( )

12.

1.0( )

21. 20. 19. 19. 19. 18. 17. 16. 16.
.4( ) .4( ) 1.3( ) .8( ) 1.2( ) 1.1( ) 1.1( ) 1.1( ) 1.1( )

4.

.9(S)

11. 5. 0. 2. 0. 0. 0. 0. 3.
.6( ) 1.0( ) .1( ) .4( ) .3( ) .2( ) .0( ) .0( ) .0(S)

0. 0. 0. 2. 6. 3. 6.
.0(S) .0(S) .0( ) .0(S) .2(S) .5( ) .9( )

5 40.

20.

.5( )

26. 8. 0. 0. 26. 24. 24. 23. 22.
.0( ) .0( ) .0( ) .0( ) .3( ) .3( ) .3( ) .3( ) .4( )

11.

1.0( )

20. 19. 19. 18. 18. 17. 16. 16. 15.
.4( ) .4( ) 1.3( ) .8( ) 1.2( ) 1.1( ) 1.1( ) 1.1( ) 1.1( )

4.

.9(S)

10. 5. 0. 2. 0. 0. 0. 0. 2.
.5( ) .9( ) .1( ) .4( ) .3( ) .2( ) .0( ) .0( ) .0(S)

RR205Swout

	0. .0(S)	0. .0(S)	0. .0( )	2. .0(S)	6. .2(S)	2. .4( )	6. .8( )	
5 45. 20. .5( )	25. .0( )	8. .0( )	0. .0( )	0. .0( )	25. .3( )	24. .3( )	23. .3( )	22. .3( )	21. .4( )
11. 1.0( )	19. .4( )	18. .4( )	18. 1.3( )	18. .8( )	17. 1.2( )	16. 1.1( )	16. 1.1( )	15. 1.1( )	15. 1.1( )
3. .9(S)	10. .5( )	4. .9( )	0. .1( )	2. .4( )	0. .3( )	0. .2( )	0. .0( )	0. .0( )	2. .0(S)
	0. .0(S)	0. .0(S)	0. .0( )	2. .0(S)	6. .2(S)	2. .4( )	6. .8( )		
5 50. 19. .5( )	24. .0( )	8. .0( )	0. .0( )	0. .0( )	24. .3( )	23. .3( )	22. .3( )	22. .3( )	20. .4( )
10. 1.0( )	19. .3( )	18. .4( )	17. 1.3( )	17. .8( )	17. 1.1( )	16. 1.1( )	15. 1.1( )	15. 1.1( )	14. 1.0( )
3. .8(S)	9. .5( )	4. .9( )	0. .1( )	2. .4( )	0. .2( )	0. .2( )	0. .0( )	0. .0( )	2. .0(S)
	0. .0(S)	0. .0(S)	0. .0( )	2. .0(S)	5. .1(S)	2. .4( )	5. .8( )		

1

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 2 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
4	40.	(DIRECT FLOW)		0 45.
104	38.	.1	.3	0 50.
28	37.	1.4		0 55.
103	35.	.1	.2	1 5.
23	32.	1.3		1 15.
3	67.	(DIRECT FLOW)		1 5.
105	14.	.1	.4	1 45.
102	36.	.1	4.1	1 50.
24	14.	.9		2 0.
22	35.	2.0		2 5.
301	20.	.1	.2	1 40.
201	40.	.1	.7	2 0.
30	20.	1.0		1 40.
32	40.	1.7		2 0.
2	60.	(DIRECT FLOW)		1 55.
27	43.	1.6		0 45.
21	59.	1.5		2 10.
26	32.	1.4		1 5.
20	59.	1.6		2 15.
25	31.	2.0		1 10.
19	61.	1.6		2 25.
18	77.	1.8		2 10.
17	77.	1.8		2 15.
16	77.	1.8		2 15.
15	78.	1.8		2 15.
152	78.	1.6		2 15.
151	78.	2.3		2 15.

			RR205Swout
144	78.	.9	2 20.
143	78.	.8	2 25.
142	78.	1.1	2 25.
141	77.	.8	2 30.
13	77.	.6	2 40.
12	77.	.6	2 40.
11	77.	.6	2 40.
10	77.	.6	2 45.
1	81.	(DIRECT FLOW)	2 30.

10- YEAR CHUP DATA

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 2      RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSIS 2005 AMENDMENT
01010-YEAR    10 1.86

 7001015.0RRCSBA001  RED ROCK CANYON SUBBASIN A
0.494 1.61 1.15 11.4 .030       0.35 0.05 4.80.0011 .837
 7001015.0RRCSBB002  RED ROCK CANYON SUBBASIN B
0.225 1.14 0.46 25.7 .040       0.35 0.05 4.57.0015 .696
 7001015.0RRCSBC003  RED ROCK CANYON SUBBASIN C
0.170 0.88 0.44 6.70 .057       0.30 0.05 4.89.0008 .956
 7001015.0RRCSBD004  RED ROCK CANYON SUBBASIN D
0.378 1.30 0.66 8.50 .047       0.30 0.05 4.79.0012 .835
 7001015.0RRCSBE005  RED ROCK CANYON SUBBASIN E
0.241 1.52 0.89 6.01 .048       0.25 0.05 4.79.0012 .831
 7001015.0RRCSBF006  RED ROCK CANYON SUBBASIN F
0.278 1.31 0.62 4.50 .032       0.25 0.05 4.84.0010 .876
 7001015.0RRCSBG007  RED ROCK CANYON SUBBASIN G
0.330 1.03 0.57 9.10 .052       0.30 0.05 4.43.0015 .686
 7001015.0RRCSBH008  RED ROCK CANYON SUBBASIN H
0.316 1.25 0.59 8.80 .040       0.30 0.05 4.68.0014 .742
 7001015.0RRCSBI009  RED ROCK CANYON SUBBASIN I
0.300 1.34 0.79 10.9 .029       0.40 0.05 3.98.0018 .566
 7001015.0RRCSBJ010  RED ROCK CANYON SUBBASIN J
0.289 0.89 0.46 14.0 .022       0.40 0.05 4.54.0017 .636
 7101015.0RRCSBJ015  RED ROCK CANYON SUBBASIN Z
0.089 0.56 0.24 28.0 .028 26.0 0.30 0.05 4.54.0017 .636
 7001015.0RRCSBK011  RED ROCK CANYON SUBBASIN K
0.408 1.13 0.57 19.6 .027       0.35 0.05 4.55.0017 .638
 7001015.0RRCSBL012  RED ROCK CANYON SUBBASIN L
0.384 1.28 0.61 13.6 .041       0.35 0.05 3.79.0018 .553
 7001015.0RRCSBM013  RED ROCK CANYON SUBBASIN M
0.677 2.14 1.46 11.1 .016       0.40 0.05 4.22.0018 .581
 7001015.0RRCSBN014  RED ROCK CANYON SUBBASIN N
0.417 1.14 0.49 11.2 .026       0.35 0.05 3.57.0018 .538
E
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**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	95.	.04	.001	40.
5.	.04	.000	0.	100.	.04	.001	36.
10.	.07	.001	0.	105.	.04	.001	32.
15.	.15	.002	0.	110.	.04	.001	29.
20.	.28	.024	3.	115.	.03	.001	26.
25.	.47	.254	32.	120.	.02	.000	23.
30.	.22	.146	78.	125.	.00	.000	21.
35.	.10	.037	107.	130.	.00	.000	18.
40.	.08	.018	111.	135.	.00	.000	16.
45.	.07	.012	103.	140.	.00	.000	14.
50.	.06	.005	97.	145.	.00	.000	13.
55.	.06	.005	90.	150.	.00	.000	11.
60.	.06	.006	81.	155.	.00	.000	10.
65.	.06	.006	73.	160.	.00	.000	9.
70.	.06	.007	66.	165.	.00	.000	8.
75.	.06	.007	60.	170.	.00	.000	7.
80.	.05	.003	55.	175.	.00	.000	6.
85.	.04	.001	50.	180.	.00	.000	5.
90.	.04	.001	45.	185.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .543 INCHES
VOLUME OF EXCESS PRECIP = 9.56 ACRE-FEET
PEAK Q = 111. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.43 IN/HR DECAY = .00150 FNINF = .69 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBH -- BASIN COMMENT: RED ROCK CANYON SUBBASIN H

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.32	1.25	.59	8.80	.0400	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.130	.246

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .08	D= .18

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
17.13	645.88	204.10	16.85

WIDTH AT 50 = 46. MIN. WIDTH AT 75 = 24. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.68 IN./HR. DECAY = .00140/SECOND FNINFL = .74 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	81.	130.	23.
5.	65.	70.	74.	135.	21.
10.	155.	75.	67.	140.	19.
15.	200.	80.	61.	145.	17.
20.	199.	85.	55.	150.	15.
25.	175.	90.	50.	155.	14.
30.	153.	95.	45.	160.	13.
35.	150.	100.	41.	165.	11.
40.	137.	105.	37.	170.	10.
45.	124.	110.	34.	175.	9.
50.	111.	115.	30.	180.	9.
55.	99.	120.	28.	185.	8.
60.	90.	125.	25.	190.	0.

1 BASIN ID: RRCSBH -- BASIN COMMENT: RED ROCK CANYON SUBBASIN H

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	105.	.04	.001	30.
5.	.04	.000	0.	110.	.04	.001	27.
10.	.07	.001	0.	115.	.03	.000	25.
15.	.15	.002	0.	120.	.02	.000	23.
20.	.28	.020	2.	125.	.00	.000	20.
25.	.47	.229	19.	130.	.00	.000	19.
30.	.22	.136	49.	135.	.00	.000	17.
35.	.10	.028	73.	140.	.00	.000	15.
40.	.08	.010	82.	145.	.00	.000	14.
45.	.07	.006	78.	150.	.00	.000	13.
50.	.06	.004	71.	155.	.00	.000	11.
55.	.06	.005	67.	160.	.00	.000	10.
60.	.06	.005	64.	165.	.00	.000	9.
65.	.06	.005	59.	170.	.00	.000	8.
70.	.06	.005	54.	175.	.00	.000	8.
75.	.06	.005	50.	180.	.00	.000	7.
80.	.05	.003	46.	185.	.00	.000	6.
85.	.04	.001	42.	190.	.00	.000	6.
90.	.04	.001	39.	195.	.00	.000	5.
95.	.04	.001	35.	200.	.00	.000	5.
100.	.04	.001	32.	205.	.00	.000	4.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .469 INCHES
VOLUME OF EXCESS PRECIP = 7.91 ACRE-FEET
PEAK Q = 82. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.68 IN/HR DECAY = .00140 FNINF = .74 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBI -- BASIN COMMENT: RED ROCK CANYON SUBBASIN I

RR1005Cuut

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.30	1.34	.79	10.90	.0290	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.241

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
20.43	515.70	154.71	16.00

WIDTH AT 50 = 58. MIN. WIDTH AT 75 = 30. MIN. K50 = .21 K75 = .29

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.98 IN./HR. DECAY = .00180/SECOND FNINFL = .57 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	80.	63.	160.	19.
5.	37.	85.	58.	165.	17.
10.	99.	90.	54.	170.	16.
15.	141.	95.	50.	175.	15.
20.	155.	100.	47.	180.	14.
25.	148.	105.	43.	185.	13.
30.	131.	110.	40.	190.	12.
35.	116.	115.	37.	195.	11.
40.	112.	120.	34.	200.	10.
45.	111.	125.	32.	205.	10.
50.	103.	130.	30.	210.	9.
55.	95.	135.	27.	215.	8.
60.	87.	140.	25.	220.	8.
65.	79.	145.	24.	225.	0.
70.	73.	150.	22.	0.	0.
75.	68.	155.	20.	0.	0.

1 BASIN ID: RRCSBI -- BASIN COMMENT: RED ROCK CANYON SUBBASIN I

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	130.	.00	.000	34.
5.	.04	.000	0.	135.	.00	.000	32.
10.	.07	.001	0.	140.	.00	.000	29.
15.	.15	.003	0.	145.	.00	.000	27.
20.	.28	.027	2.	150.	.00	.000	25.
25.	.47	.252	13.	155.	.00	.000	23.
30.	.22	.167	36.	160.	.00	.000	22.
35.	.10	.054	59.	165.	.00	.000	20.
40.	.08	.033	74.	170.	.00	.000	19.
45.	.07	.026	79.	175.	.00	.000	17.
50.	.06	.016	78.	180.	.00	.000	16.
55.	.06	.016	74.	185.	.00	.000	15.
60.	.06	.017	71.	190.	.00	.000	14.

65.	.06	.017	71.	195.	.00	.000	13.
70.	.06	.017	70.	200.	.00	.000	12.
75.	.06	.017	68.	205.	.00	.000	11.
80.	.05	.005	66.	210.	.00	.000	10.
85.	.04	.003	62.	215.	.00	.000	9.
90.	.04	.003	58.	220.	.00	.000	9.
95.	.04	.003	54.	225.	.00	.000	8.
100.	.04	.003	51.	230.	.00	.000	7.
105.	.04	.003	48.	235.	.00	.000	7.
110.	.04	.003	45.	240.	.00	.000	6.
115.	.03	.002	42.	245.	.00	.000	4.
120.	.02	.001	39.	250.	.00	.000	3.
125.	.00	.000	37.	255.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .687 INCHES
VOLUME OF EXCESS PRECIP = 11.00 ACRE-FEET
PEAK Q = 79. CFS TIME OF PEAK = 45. MIN.
INFILT.= 3.98 IN/HR DECAY = .00180 FNINF = .57 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN J

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.29	.89	.46	14.00	.0220	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.119	.245

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .10

FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .28

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
14.14	806.77	233.16	15.41

WIDTH AT 50 = 37. MIN. WIDTH AT 75 = 19. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.54 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	55.	86.	110.	22.
5.	98.	60.	76.	115.	19.
10.	208.	65.	67.	120.	17.
15.	232.	70.	59.	125.	15.
20.	205.	75.	52.	130.	13.
25.	175.	80.	46.	135.	12.
30.	165.	85.	41.	140.	10.

35.	146.	90.	36.	145.	9.
40.	127.	95.	32.	150.	8.
45.	110.	100.	28.	155.	0.
50.	98.	105.	25.	0.	0.

1 BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN J

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	100.	.04	.003	39.
5.	.04	.000	0.	105.	.04	.003	35.
10.	.07	.002	0.	110.	.04	.003	32.
15.	.15	.006	1.	115.	.03	.002	29.
20.	.28	.033	5.	120.	.02	.001	26.
25.	.47	.218	30.	125.	.00	.000	23.
30.	.22	.159	70.	130.	.00	.000	21.
35.	.10	.048	96.	135.	.00	.000	18.
40.	.08	.028	101.	140.	.00	.000	16.
45.	.07	.021	96.	145.	.00	.000	14.
50.	.06	.011	91.	150.	.00	.000	13.
55.	.06	.012	86.	155.	.00	.000	11.
60.	.06	.013	79.	160.	.00	.000	10.
65.	.06	.013	72.	165.	.00	.000	9.
70.	.06	.013	67.	170.	.00	.000	7.
75.	.06	.013	63.	175.	.00	.000	5.
80.	.05	.006	58.	180.	.00	.000	3.
85.	.04	.003	53.	185.	.00	.000	2.
90.	.04	.003	48.	190.	.00	.000	2.
95.	.04	.003	43.	195.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .618 INCHES
VOLUME OF EXCESS PRECIP = 9.52 ACRE-FEET
PEAK Q = 101. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.54 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN Z

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.09	.56	.24	28.00	.0280	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.101	.264

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .15	D= .56

CALCULATED UNIT HYDROGRAPH

RR1005Cuut

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
8.06	26.00	1822.85	162.23	4.75

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 7.97)

WIDTH AT 50 = 16. MIN. WIDTH AT 75 = 9. MIN. K50 = .29 K75 = .40

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.54 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	60.	50.	14.
5.	130.	30.	45.	55.	11.
10.	154.	35.	33.	60.	8.
15.	110.	40.	25.	65.	0.
20.	80.	45.	19.	0.	0.

1 BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN Z

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	70.	.06	.020	23.
5.	.04	.000	0.	75.	.06	.020	21.
10.	.07	.008	1.	80.	.05	.012	18.
15.	.15	.023	4.	85.	.04	.008	13.
20.	.28	.079	15.	90.	.04	.008	10.
25.	.47	.323	58.	95.	.04	.008	8.
30.	.22	.168	83.	100.	.04	.008	7.
35.	.10	.056	77.	105.	.04	.008	7.
40.	.08	.036	64.	110.	.04	.008	6.
45.	.07	.028	53.	115.	.03	.006	6.
50.	.06	.019	43.	120.	.02	.004	5.
55.	.06	.019	36.	125.	.00	.000	4.
60.	.06	.020	30.	130.	.00	.000	3.
65.	.06	.020	26.	135.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .907 INCHES
VOLUME OF EXCESS PRECIP = 4.30 ACRE-FEET
PEAK Q = 83. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.54 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

RATIONAL FORMULA C = .42
I = 3.2 INCHES/HOUR
A = 57.0 ACRES
Q = 76. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBK -- BASIN COMMENT: RED ROCK CANYON SUBBASIN K

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.41	1.13	.57	19.60	.0270	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.111	.278

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .12	D= .39

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
15.32	832.31	339.58	21.76

WIDTH AT 50 = 36. MIN. WIDTH AT 75 = 19. MIN. K50 = .26 K75 = .35

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.55 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	55.	120.	110.	27.
5.	128.	60.	105.	115.	24.
10.	285.	65.	92.	120.	21.
15.	339.	70.	80.	125.	18.
20.	314.	75.	70.	130.	16.
25.	268.	80.	61.	135.	14.
30.	241.	85.	54.	140.	12.
35.	211.	90.	47.	145.	11.
40.	182.	95.	41.	150.	9.
45.	157.	100.	36.	155.	8.
50.	138.	105.	31.	160.	0.

1 BASIN ID: RRCSBK -- BASIN COMMENT: RED ROCK CANYON SUBBASIN K

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	105.	.04	.005	58.
5.	.04	.000	0.	110.	.04	.005	53.
10.	.07	.004	1.	115.	.03	.004	48.
15.	.15	.011	3.	120.	.02	.002	44.
20.	.28	.053	11.	125.	.00	.000	39.
25.	.47	.270	55.	130.	.00	.000	34.
30.	.22	.162	120.	135.	.00	.000	30.
35.	.10	.051	165.	140.	.00	.000	26.
40.	.08	.031	176.	145.	.00	.000	23.
45.	.07	.024	168.	150.	.00	.000	20.
50.	.06	.014	157.	155.	.00	.000	17.
55.	.06	.015	146.	160.	.00	.000	15.
60.	.06	.015	133.	165.	.00	.000	13.
65.	.06	.016	122.	170.	.00	.000	12.
70.	.06	.016	112.	175.	.00	.000	10.

75.	.06	.016	105.	180.	.00	.000	7.
80.	.05	.008	97.	185.	.00	.000	5.
85.	.04	.005	88.	190.	.00	.000	4.
90.	.04	.005	80.	195.	.00	.000	3.
95.	.04	.005	72.	200.	.00	.000	2.
100.	.04	.005	65.	205.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .741 INCHES
VOLUME OF EXCESS PRECIP = 16.13 ACRE-FEET
PEAK Q = 176. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.55 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBL -- BASIN COMMENT: RED ROCK CANYON SUBBASIN L

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.38	1.28	.61	13.60	.0410	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.120	.254

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .10

FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .27

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
16.24	710.62	272.88	20.48

WIDTH AT 50 = 42. MIN. WIDTH AT 75 = 22. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.79 IN./HR. DECAY = .00180/SECOND FNINFL = .55 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	95.	130.	22.
5.	94.	70.	85.	135.	20.
10.	218.	75.	76.	140.	18.
15.	271.	80.	68.	145.	16.
20.	260.	85.	61.	150.	14.
25.	225.	90.	54.	155.	13.
30.	203.	95.	49.	160.	11.
35.	190.	100.	43.	165.	10.
40.	171.	105.	39.	170.	9.
45.	151.	110.	35.	175.	8.
50.	133.	115.	31.	180.	0.
55.	119.	120.	28.	0.	0.
60.	106.	125.	25.	0.	0.

1 BASIN ID: RRCSBL -- BASIN COMMENT: RED ROCK CANYON SUBBASIN L

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	115.	.03	.003	53.
5.	.04	.000	0.	120.	.02	.001	49.
10.	.07	.002	0.	125.	.00	.000	44.
15.	.15	.005	1.	130.	.00	.000	39.
20.	.28	.040	5.	135.	.00	.000	35.
25.	.47	.307	40.	140.	.00	.000	32.
30.	.22	.170	96.	145.	.00	.000	28.
35.	.10	.057	138.	150.	.00	.000	25.
40.	.08	.036	152.	155.	.00	.000	23.
45.	.07	.028	148.	160.	.00	.000	20.
50.	.06	.018	142.	165.	.00	.000	18.
55.	.06	.018	136.	170.	.00	.000	16.
60.	.06	.019	129.	175.	.00	.000	14.
65.	.06	.019	121.	180.	.00	.000	13.
70.	.06	.019	114.	185.	.00	.000	12.
75.	.06	.019	108.	190.	.00	.000	10.
80.	.05	.006	101.	195.	.00	.000	9.
85.	.04	.004	93.	200.	.00	.000	6.
90.	.04	.004	85.	205.	.00	.000	4.
95.	.04	.004	77.	210.	.00	.000	3.
100.	.04	.004	70.	215.	.00	.000	2.
105.	.04	.004	64.	220.	.00	.000	2.
110.	.04	.004	59.	225.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .790 INCHES
VOLUME OF EXCESS PRECIP = 16.17 ACRE-FEET
PEAK Q = 152. CFS TIME OF PEAK = 40. MIN.
INFILT.= 3.79 IN/HR DECAY = .00180 FNINF = .55 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBM -- BASIN COMMENT: RED ROCK CANYON SUBBASIN M

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.68	2.14	1.46	11.10	.0160	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.272

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .09

FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)

37.17 301.56 204.16 36.11

WIDTH AT 50 = 99. MIN. WIDTH AT 75 = 52. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.22 IN./HR. DECAY = .00180/SECOND FNINFL = .58 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	135.	84.	270.	24.
5.	19.	140.	81.	275.	23.
10.	57.	145.	77.	280.	22.
15.	103.	150.	73.	285.	21.
20.	144.	155.	70.	290.	20.
25.	175.	160.	67.	295.	19.
30.	195.	165.	64.	300.	18.
35.	203.	170.	61.	305.	18.
40.	203.	175.	58.	310.	17.
45.	196.	180.	56.	315.	16.
50.	185.	185.	53.	320.	15.
55.	173.	190.	51.	325.	15.
60.	162.	195.	49.	330.	14.
65.	153.	200.	46.	335.	13.
70.	151.	205.	44.	340.	13.
75.	151.	210.	42.	345.	12.
80.	145.	215.	40.	350.	12.
85.	138.	220.	39.	355.	11.
90.	132.	225.	37.	360.	11.
95.	126.	230.	35.	365.	10.
100.	120.	235.	34.	370.	10.
105.	114.	240.	32.	375.	9.
110.	107.	245.	31.	380.	9.
115.	101.	250.	29.	385.	8.
120.	97.	255.	28.	390.	8.
125.	93.	260.	27.	395.	8.
130.	88.	265.	25.	400.	0.

1 BASIN ID: RRCSBM -- BASIN COMMENT: RED ROCK CANYON SUBBASIN M

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	215.	.00	.000	36.
5.	.04	.000	0.	220.	.00	.000	35.
10.	.07	.001	0.	225.	.00	.000	33.
15.	.15	.004	0.	230.	.00	.000	32.
20.	.28	.027	1.	235.	.00	.000	30.
25.	.47	.242	7.	240.	.00	.000	29.
30.	.22	.165	21.	245.	.00	.000	27.
35.	.10	.052	40.	250.	.00	.000	26.
40.	.08	.032	61.	255.	.00	.000	25.
45.	.07	.025	80.	260.	.00	.000	24.
50.	.06	.015	95.	265.	.00	.000	23.
55.	.06	.015	105.	270.	.00	.000	22.
60.	.06	.016	111.	275.	.00	.000	21.
65.	.06	.016	113.	280.	.00	.000	20.
70.	.06	.016	112.	285.	.00	.000	19.
75.	.06	.016	110.	290.	.00	.000	18.
80.	.05	.005	107.	295.	.00	.000	17.
85.	.04	.003	105.	300.	.00	.000	17.
90.	.04	.003	103.	305.	.00	.000	16.
95.	.04	.003	103.	310.	.00	.000	15.
100.	.04	.003	101.	315.	.00	.000	14.
105.	.04	.003	98.	320.	.00	.000	14.
110.	.04	.003	94.	325.	.00	.000	13.
115.	.03	.002	91.	330.	.00	.000	13.

120.	.02	.001	87.	335.	.00	.000	12.
125.	.00	.000	84.	340.	.00	.000	11.
130.	.00	.000	80.	345.	.00	.000	11.
135.	.00	.000	76.	350.	.00	.000	10.
140.	.00	.000	73.	355.	.00	.000	10.
145.	.00	.000	69.	360.	.00	.000	10.
150.	.00	.000	66.	365.	.00	.000	9.
155.	.00	.000	63.	370.	.00	.000	9.
160.	.00	.000	60.	375.	.00	.000	8.
165.	.00	.000	58.	380.	.00	.000	8.
170.	.00	.000	55.	385.	.00	.000	8.
175.	.00	.000	52.	390.	.00	.000	7.
180.	.00	.000	50.	395.	.00	.000	7.
185.	.00	.000	48.	400.	.00	.000	7.
190.	.00	.000	46.	405.	.00	.000	6.
195.	.00	.000	44.	410.	.00	.000	6.
200.	.00	.000	42.	415.	.00	.000	6.
205.	.00	.000	40.	420.	.00	.000	3.
210.	.00	.000	38.	425.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .664 INCHES
VOLUME OF EXCESS PRECIP = 23.99 ACRE-FEET
PEAK Q = 113. CFS TIME OF PEAK = 65. MIN.
INFILT.= 4.22 IN/HR DECAY = .00180 FNINF = .58 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBN -- BASIN COMMENT: RED ROCK CANYON SUBBASIN N

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.42	1.14	.49	11.20	.0260	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.253

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
15.99	721.25	300.76	22.24

WIDTH AT 50 = 42. MIN. WIDTH AT 75 = 22. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.57 IN./HR. DECAY = .00180/SECOND FNINFL = .54 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	102.	130.	23.

5.	106.	70.	91.	135.	21.
10.	244.	75.	81.	140.	19.
15.	300.	80.	73.	145.	17.
20.	285.	85.	65.	150.	15.
25.	245.	90.	58.	155.	13.
30.	224.	95.	52.	160.	12.
35.	207.	100.	46.	165.	10.
40.	185.	105.	41.	170.	9.
45.	163.	110.	37.	175.	8.
50.	144.	115.	33.	180.	7.
55.	128.	120.	29.	185.	0.
60.	114.	125.	26.	0.	0.

1 BASIN ID: RRCSBN -- BASIN COMMENT: RED ROCK CANYON SUBBASIN N

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	115.	.03	.002	56.
5.	.04	.000	0.	120.	.02	.001	51.
10.	.07	.001	0.	125.	.00	.000	46.
15.	.15	.004	1.	130.	.00	.000	41.
20.	.28	.033	5.	135.	.00	.000	37.
25.	.47	.312	43.	140.	.00	.000	33.
30.	.22	.171	106.	145.	.00	.000	29.
35.	.10	.057	152.	150.	.00	.000	26.
40.	.08	.036	167.	155.	.00	.000	23.
45.	.07	.028	162.	160.	.00	.000	21.
50.	.06	.018	155.	165.	.00	.000	19.
55.	.06	.019	149.	170.	.00	.000	17.
60.	.06	.019	141.	175.	.00	.000	15.
65.	.06	.019	132.	180.	.00	.000	13.
70.	.06	.019	124.	185.	.00	.000	12.
75.	.06	.019	117.	190.	.00	.000	10.
80.	.05	.006	110.	195.	.00	.000	9.
85.	.04	.003	101.	200.	.00	.000	8.
90.	.04	.003	92.	205.	.00	.000	5.
95.	.04	.003	83.	210.	.00	.000	3.
100.	.04	.003	75.	215.	.00	.000	3.
105.	.04	.003	68.	220.	.00	.000	2.
110.	.04	.003	62.	225.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .783 INCHES
VOLUME OF EXCESS PRECIP = 17.42 ACRE-FEET
PEAK Q = 167. CFS TIME OF PEAK = 40. MIN.
INFILT.= 3.57 IN/HR DECAY = .00180 FNINF = .54 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

RR1005Cuut

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBA -- BASIN COMMENT: RED ROCK CANYON SUBBASIN A

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.49	1.61	1.15	11.40	.0300	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.123	.260

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .23

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
25.60	432.36	213.59	26.35

WIDTH AT 50 = 69. MIN. WIDTH AT 75 = 36. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.80 IN./HR. DECAY = .00110/SECOND FNINFL = .84 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	100.	82.	200.	22.
5.	36.	105.	76.	205.	20.
10.	103.	110.	72.	210.	19.
15.	163.	115.	67.	215.	18.
20.	201.	120.	63.	220.	17.
25.	213.	125.	59.	225.	16.
30.	208.	130.	55.	230.	15.
35.	192.	135.	51.	235.	14.
40.	173.	140.	48.	240.	13.
45.	160.	145.	45.	245.	12.
50.	159.	150.	42.	250.	11.
55.	152.	155.	40.	255.	11.
60.	143.	160.	37.	260.	10.
65.	134.	165.	35.	265.	9.
70.	125.	170.	32.	270.	9.
75.	115.	175.	30.	275.	8.
80.	106.	180.	28.	280.	8.
85.	99.	185.	27.	285.	0.
90.	93.	190.	25.	0.	0.
95.	87.	195.	23.	0.	0.

1 BASIN ID: RRCSBA -- BASIN COMMENT: RED ROCK CANYON SUBBASIN A

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)

0.	.00	.000	0.	155.	.00	.000	20.
5.	.04	.000	0.	160.	.00	.000	19.
10.	.07	.001	0.	165.	.00	.000	17.
15.	.15	.004	0.	170.	.00	.000	16.
20.	.28	.019	1.	175.	.00	.000	15.
25.	.47	.137	8.	180.	.00	.000	14.
30.	.22	.112	22.	185.	.00	.000	13.
35.	.10	.011	39.	190.	.00	.000	13.
40.	.08	.007	52.	195.	.00	.000	12.
45.	.07	.006	59.	200.	.00	.000	11.
50.	.06	.004	61.	205.	.00	.000	10.
55.	.06	.005	59.	210.	.00	.000	10.
60.	.06	.005	56.	215.	.00	.000	9.
65.	.06	.005	52.	220.	.00	.000	8.
70.	.06	.005	51.	225.	.00	.000	8.
75.	.06	.005	51.	230.	.00	.000	7.
80.	.05	.003	49.	235.	.00	.000	7.
85.	.04	.001	47.	240.	.00	.000	6.
90.	.04	.001	45.	245.	.00	.000	6.
95.	.04	.001	42.	250.	.00	.000	6.
100.	.04	.001	40.	255.	.00	.000	5.
105.	.04	.001	37.	260.	.00	.000	5.
110.	.04	.001	35.	265.	.00	.000	5.
115.	.03	.001	33.	270.	.00	.000	4.
120.	.02	.001	31.	275.	.00	.000	4.
125.	.00	.000	29.	280.	.00	.000	4.
130.	.00	.000	28.	285.	.00	.000	4.
135.	.00	.000	26.	290.	.00	.000	3.
140.	.00	.000	24.	295.	.00	.000	3.
145.	.00	.000	23.	300.	.00	.000	3.
150.	.00	.000	21.	305.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .338 INCHES
VOLUME OF EXCESS PRECIP = 8.91 ACRE-FEET
PEAK Q = 61. CFS TIME OF PEAK = 50. MIN.
INFILT.= 4.80 IN/HR DECAY = .00110 FNINF = .84 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBB -- BASIN COMMENT: RED ROCK CANYON SUBBASIN B

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.22	1.14	.46	25.70	.0400	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.104	.287

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .14	D= .51

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
12.38	1117.81	251.51	12.00

WIDTH AT 50 = 27. MIN. WIDTH AT 75 = 14. MIN. K50 = .28 K75 = .38

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.57 IN./HR. DECAY = .00150/SECOND FNINFL = .70 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	40.	94.	80.	22.
5.	127.	45.	78.	85.	19.
10.	240.	50.	65.	90.	15.
15.	241.	55.	55.	95.	13.
20.	197.	60.	46.	100.	11.
25.	166.	65.	38.	105.	9.
30.	136.	70.	32.	110.	8.
35.	112.	75.	27.	115.	0.

1 BASIN ID: RRCSBB -- BASIN COMMENT: RED ROCK CANYON SUBBASIN B

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	90.	.04	.006	38.
5.	.04	.000	0.	95.	.04	.006	33.
10.	.07	.007	1.	100.	.04	.006	30.
15.	.15	.019	4.	105.	.04	.006	27.
20.	.28	.065	15.	110.	.04	.006	24.
25.	.47	.259	55.	115.	.03	.005	22.
30.	.22	.157	103.	120.	.02	.003	19.
35.	.10	.047	123.	125.	.00	.000	17.
40.	.08	.028	118.	130.	.00	.000	14.
45.	.07	.021	106.	135.	.00	.000	10.
50.	.06	.014	94.	140.	.00	.000	7.
55.	.06	.014	82.	145.	.00	.000	6.
60.	.06	.014	72.	150.	.00	.000	5.
65.	.06	.015	65.	155.	.00	.000	4.
70.	.06	.015	58.	160.	.00	.000	3.
75.	.06	.015	53.	165.	.00	.000	2.
80.	.05	.010	48.	170.	.00	.000	2.
85.	.04	.006	43.	175.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .747 INCHES
VOLUME OF EXCESS PRECIP = 8.97 ACRE-FEET
PEAK Q = 123. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.57 IN/HR DECAY = .00150 FNINF = .70 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBC -- BASIN COMMENT: RED ROCK CANYON SUBBASIN C

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.17	.88	.44	6.70	.0570	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.138	.232

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .13

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
12.95	851.74	144.80	9.07

WIDTH AT 50 = 35. MIN. WIDTH AT 75 = 18. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.89 IN./HR. DECAY = .00080/SECOND FNINFL = .96 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	50.	57.	100.	16.
5.	69.	55.	50.	105.	14.
10.	136.	60.	44.	110.	13.
15.	141.	65.	39.	115.	11.
20.	119.	70.	35.	120.	10.
25.	107.	75.	31.	125.	9.
30.	98.	80.	27.	130.	8.
35.	86.	85.	24.	135.	0.
40.	73.	90.	21.	0.	0.
45.	65.	95.	19.	0.	0.

1 BASIN ID: RRCSBC -- BASIN COMMENT: RED ROCK CANYON SUBBASIN C

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	75.	.06	.002	9.
5.	.04	.000	0.	80.	.05	.000	8.
10.	.07	.000	0.	85.	.04	.000	7.
15.	.15	.001	0.	90.	.04	.000	6.
20.	.28	.002	0.	95.	.04	.000	6.
25.	.47	.076	6.	100.	.04	.000	5.
30.	.22	.066	15.	105.	.04	.000	5.
35.	.10	.004	20.	110.	.04	.000	4.
40.	.08	.001	19.	115.	.03	.000	4.
45.	.07	.001	17.	120.	.02	.000	3.
50.	.06	.001	16.	125.	.00	.000	3.
55.	.06	.001	14.	130.	.00	.000	3.
60.	.06	.001	12.	135.	.00	.000	2.
65.	.06	.001	11.	140.	.00	.000	2.
70.	.06	.002	10.	145.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .162 INCHES
VOLUME OF EXCESS PRECIP = 1.46 ACRE-FEET
PEAK Q = 20. CFS TIME OF PEAK = 35. MIN.

INFILT.= 4.89 IN/HR DECAY = .00080 FNINF = .96 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBD -- BASIN COMMENT: RED ROCK CANYON SUBBASIN D

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.38	1.30	.66	8.50	.0470	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.131	.254

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .08	D= .17

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
17.77	638.72	241.44	20.16

WIDTH AT 50 = 47. MIN. WIDTH AT 75 = 24. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.79 IN./HR. DECAY = .00120/SECOND FNINFL = .83 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	70.	88.	140.	22.
5.	73.	75.	80.	145.	20.
10.	178.	80.	72.	150.	18.
15.	235.	85.	66.	155.	16.
20.	238.	90.	59.	160.	15.
25.	213.	95.	54.	165.	14.
30.	185.	100.	49.	170.	12.
35.	180.	105.	44.	175.	11.
40.	164.	110.	40.	180.	10.
45.	149.	115.	36.	185.	9.
50.	133.	120.	33.	190.	8.
55.	119.	125.	30.	195.	7.
60.	107.	130.	27.	200.	0.
65.	97.	135.	24.	0.	0.

1 BASIN ID: RRCSBD -- BASIN COMMENT: RED ROCK CANYON SUBBASIN D

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	110.	.04	.000	25.
5.	.04	.000	0.	115.	.03	.000	23.

10.	.07	.001	0.	120.	.02	.000	21.
15.	.15	.002	0.	125.	.00	.000	19.
20.	.28	.016	2.	130.	.00	.000	17.
25.	.47	.185	17.	135.	.00	.000	16.
30.	.22	.117	46.	140.	.00	.000	14.
35.	.10	.011	69.	145.	.00	.000	13.
40.	.08	.006	78.	150.	.00	.000	12.
45.	.07	.005	74.	155.	.00	.000	10.
50.	.06	.003	67.	160.	.00	.000	9.
55.	.06	.004	64.	165.	.00	.000	9.
60.	.06	.004	60.	170.	.00	.000	8.
65.	.06	.004	56.	175.	.00	.000	7.
70.	.06	.004	51.	180.	.00	.000	6.
75.	.06	.004	47.	185.	.00	.000	6.
80.	.05	.002	43.	190.	.00	.000	5.
85.	.04	.000	40.	195.	.00	.000	5.
90.	.04	.000	36.	200.	.00	.000	4.
95.	.04	.000	33.	205.	.00	.000	4.
100.	.04	.000	30.	210.	.00	.000	4.
105.	.04	.000	27.	215.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .369 INCHES
VOLUME OF EXCESS PRECIP = 7.44 ACRE-FEET
PEAK Q = 78. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.79 IN/HR DECAY = .00120 FNINF = .83 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBE -- BASIN COMMENT: RED ROCK CANYON SUBBASIN E

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.24	1.52	.89	6.01	.0480	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.141	.247

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .07

FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .12

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
22.73	469.59	113.17	12.85

WIDTH AT 50 = 64. MIN. WIDTH AT 75 = 33. MIN. K50 = .21 K75 = .29

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .25 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.79 IN./HR. DECAY = .00120/SECOND FNINFL = .83 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH

RR1005Cuut

.28	1.31	.62	4.50	.0320	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.146	.260

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .09

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
20.65	550.75	153.11	14.83

WIDTH AT 50 = 54. MIN. WIDTH AT 75 = 28. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .25 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.84 IN./HR. DECAY = .00100/SECOND FNINFL = .88 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	75.	63.	150.	18.
5.	37.	80.	58.	155.	17.
10.	97.	85.	53.	160.	16.
15.	139.	90.	49.	165.	14.
20.	153.	95.	45.	170.	13.
25.	147.	100.	42.	175.	12.
30.	132.	105.	38.	180.	11.
35.	117.	110.	35.	185.	10.
40.	115.	115.	32.	190.	9.
45.	107.	120.	30.	195.	9.
50.	98.	125.	28.	200.	8.
55.	90.	130.	25.	205.	7.
60.	81.	135.	23.	210.	0.
65.	74.	140.	22.	0.	0.
70.	68.	145.	20.	0.	0.

1 BASIN ID: RRCSBF -- BASIN COMMENT: RED ROCK CANYON SUBBASIN F

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 010-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	115.	.03	.000	13.
5.	.04	.000	0.	120.	.02	.000	12.
10.	.07	.000	0.	125.	.00	.000	11.
15.	.15	.001	0.	130.	.00	.000	11.
20.	.28	.003	0.	135.	.00	.000	10.
25.	.47	.170	7.	140.	.00	.000	9.
30.	.22	.092	20.	145.	.00	.000	8.
35.	.10	.003	33.	150.	.00	.000	8.
40.	.08	.002	40.	155.	.00	.000	7.
45.	.07	.001	40.	160.	.00	.000	6.
50.	.06	.000	37.	165.	.00	.000	6.
55.	.06	.001	34.	170.	.00	.000	5.
60.	.06	.001	32.	175.	.00	.000	5.
65.	.06	.001	30.	180.	.00	.000	5.
70.	.06	.001	28.	185.	.00	.000	4.
75.	.06	.001	26.	190.	.00	.000	4.
80.	.05	.000	24.	195.	.00	.000	4.

85.	.04	.000	22.	200.	.00	.000	3.
90.	.04	.000	20.	205.	.00	.000	3.
95.	.04	.000	18.	210.	.00	.000	3.
100.	.04	.000	17.	215.	.00	.000	3.
105.	.04	.000	16.	220.	.00	.000	2.
110.	.04	.000	15.	225.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .280 INCHES
VOLUME OF EXCESS PRECIP = 4.15 ACRE-FEET
PEAK Q = 40. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.84 IN/HR DECAY = .00100 FNINF = .88 IN/HR
MAX.PERV.RET.= .25 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 10:33

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 10 YEAR FULL DEVELOPED DRAINAGE ANALYSI

BASIN ID: RRCSBG -- BASIN COMMENT: RED ROCK CANYON SUBBASIN G

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.33	1.03	.57	9.10	.0520	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.129	.247

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .08

FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .18

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
14.71	775.73	255.99	17.60

WIDTH AT 50 = 39. MIN. WIDTH AT 75 = 20. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.43 IN./HR. DECAY = .00150/SECOND FNINFL = .69 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	60.	88.	120.	21.
5.	102.	65.	78.	125.	18.
10.	222.	70.	69.	130.	16.
15.	256.	75.	61.	135.	14.
20.	231.	80.	54.	140.	13.
25.	196.	85.	48.	145.	11.
30.	186.	90.	43.	150.	10.
35.	166.	95.	38.	155.	9.
40.	146.	100.	33.	160.	8.
45.	127.	105.	30.	165.	0.
50.	112.	110.	26.	0.	0.
55.	99.	115.	23.	0.	0.

1 BASIN ID: RRCSBG -- BASIN COMMENT: RED ROCK CANYON SUBBASIN G

10-YEAR UDSWM DATA

```
   2   1   1   2
   3   4
WATERSHED   1
RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 10 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005
        70   0 0  5.0                                                                    1
         1    1
         2    1
         3  144
         4   18
         5   15
         6   18
         7   19
         8   19
         9  301
        10  201
        11   27
        12    3
        13  105
        14    4
        15    3

   0    1    0  0 3
   0    2   21  0 3
   0    3  102  0 3
   0    4  104  0 3
   0   10    1  0 1   40.0  1220.0  0.010    4.0    4.0   .035    8.0
   0   11   10  0 1   40.0   520.0  0.010    4.0    4.0   .035    8.0
   0   12   11  0 1   40.0   800.0  0.010    4.0    4.0   .035    8.0
   0   13   12  0 1   40.0  1580.0  0.010    4.0    4.0   .035    6.0
   0  141   13  0 1   32.0  1510.0  0.015    2.0    2.0   .056    7.5
   0  142  141  0 1   20.0   500.0  0.018    2.0    0.0   .056    9.5
   0  143  142  0 1   32.0   980.0  0.010    3.5    3.5   .044    7.0
   0  144  143  0 1   20.0   670.0  0.017    1.0    1.0   .044    9.5
   0  151  144  0 4    0.1   600.0  0.017    4.0    4.0   .056    3.0
                       50.0   600.0  0.017    4.0    1.5   .056   10.0
   0  152  151  0 4    5.0   410.0  0.017    1.0    8.0   .050    2.5
                       34.5   410.0  0.017    1.0    2.5   .050    6.0
   0   15  152  0 4    0.1  1410.0  0.017    5.0    5.0   .062    1.0
                       11.0  1410.0  0.017    2.0    2.0   .062   12.0
   0   16   15  0 4    0.1   880.0  0.021    5.0    5.0   .062    1.0
                       11.0   880.0  0.021    2.0    2.0   .062   12.0
   0   17   16  0 4    0.1   560.0  0.018    5.0    5.0   .062    1.0
                       11.0   560.0  0.018    2.0    2.0   .062   12.0
   0   18   17  0 4    0.1   620.0  0.019    5.0    5.0   .062    1.0
                       11.0   620.0  0.019    2.0    2.0   .062   12.0
   0   19   18  0 4    0.1  5420.0  0.024    5.0    5.0   .062    1.0
                       11.0  5420.0  0.024    2.0    2.0   .062   12.0
   0   20   19  0 4    0.1   970.0  0.019    5.0    5.0   .062    1.0
                       11.0   970.0  0.019    2.0    2.0   .062   12.0
   0   21   20  0 4    8.0  3890.0  0.015    1.0    1.0   .050    2.5
                       25.0  3890.0  0.015    1.0    2.0   .050   12.0
   0   22  201  0 4    0.1  3400.0  0.014    2.0    3.0   .050    5.0
                      105.0  3400.0  0.014    1.5   15.0   .050   10.0
   0   32    2  0 4    0.1   200.0  0.014    2.0    3.0   .030    5.0
                      105.0   200.0  0.014    1.5   15.0   .030   10.0
   0   23    3  0 4    0.1  2080.0  0.018    8.0    4.0   .050    8.0
                       96.0  2080.0  0.018   15.0   35.0   .050    8.0
   0   24  301  0 1    0.1  2850.0  0.022    5.0   10.0   .050   20.0
   0   30    2  0 1    0.1   300.0  0.022    5.0   10.0   .050   20.0
   0   25   18  0 1    0.1  1340.0  0.029    2.5    1.5   .062   20.0
   0   26   25  0 4    0.1  3680.0  0.024    6.0    6.0   .062    2.5
                       30.0  3680.0  0.024    2.0   10.0   .062   10.0
   0   27   26  0 4    0.1   780.0  0.028    5.0    5.0   .062    3.0
                       30.0   780.0  0.028    2.5    1.5   .062   10.0
   0   28  103  0 4    0.1  1000.0  0.018    8.0    4.0   .050    8.0
                       96.0  1000.0  0.018   15.0   35.0   .050    8.0
   0  301   30  7 2     .1     1.0  0.010     .0     .0   .016    0.1
     0.0    0.0   0.3    29.7   0.8    93.3   1.8   153.7
     3.6  214.1   6.5   255.3  10.8   290.8
   0  102   22 23 2     .1     1.0  0.010     .0     .0   .016    0.1
     0.0    0.0   0.7     2.0   2.1    14.0   3.7    33.0
     5.5   47.0   6.9    75.0   8.7   108.0  10.7   160.0
    12.8  210.0  15.1   244.0  17.5   274.0  20.1   298.0
    22.8  321.0  25.7   341.0  28.8   356.0  31.9   374.0
    35.5  390.0  39.3   408.0  43.3   428.0  47.7   600.0
    49.0 1100.0  50.0  2500.0  51.0  2800.0
   0  103   23  8 2     .1     1.0  0.010     .0     .0   .016    0.1
     0.0    0.0   0.1    20.0   0.5    60.0   1.2   140.0
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     2.2      210.0       3.2      260.0       5.3      300.0       7.0      560.0
  0  104   28  4 2        .1     1.0   0.010        .0        .0      .016       0.1
     0.0       0.0       1.7      220.0       4.1      350.0       5.0      600.0
  0  105   24 13 2        .1     1.0   0.010        .0        .0      .016       0.1
     0.0       0.0       0.1        9.5       0.4       15.3       0.8       19.5
     1.4      22.9       2.3       25.9       3.4       28.5       5.0       31.0
     7.0     118.8       9.5      156.3      15.6      185.5      20.3      210.3
    30.8     232.3
  0  201   32 10 2        .1     1.0   0.010        .0        .0      .016       0.1
     0.0       0.0       0.5       18.5       1.3      109.0       2.4      153.7
     3.9     223.9       5.7      263.6       8.3      298.1      12.3      593.0
    18.2     757.2

   0
  37
   1    2    3    4   10   11   12   13  141  142  143  144  151  152   15   16
  17   18   19   20   21   22   23   24   25   26   27   28  301  102  103  104
  99  105  201   30   32
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 10 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

0NUMBER OF TIME STEPS 70
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 10 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 15 SUBCATCHMENTS

TIME(HR/MIN)	1	2	3	4	5	6	7	8	9
10	15	11	12	13	14				
0 0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.				
0 5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.				
0 10.	0.	1.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	0.	0.	0.				
0 15.	0.	4.	0.	0.	0.	0.	0.	0.	0.
1.	4.	3.	1.	0.	1.				
0 20.	1.	15.	0.	2.	0.	0.	3.	2.	2.
5.	15.	11.	5.	1.	5.				
0 25.	8.	55.	6.	17.	6.	7.	32.	19.	13.
30.	58.	55.	40.	7.	43.				
0 30.	22.	103.	15.	46.	18.	20.	78.	49.	36.
70.	83.	120.	96.	21.	106.				
0 35.	39.	123.	20.	69.	30.	33.	107.	73.	59.
96.	77.	165.	138.	40.	152.				
0 40.	52.	118.	19.	78.	38.	40.	111.	82.	74.
101.	64.	176.	152.	61.	167.				
0 45.	59.	106.	17.	74.	40.	40.	103.	78.	79.
96.	53.	168.	148.	80.	162.				
0 50.	61.	94.	16.	67.	38.	37.	97.	71.	78.
91.	43.	157.	142.	95.	155.				
0 55.	59.	82.	14.	64.	35.	34.	90.	67.	74.
86.	36.	146.	136.	105.	149.				
1 0.	56.	72.	12.	60.	32.	32.	81.	64.	71.

79.		30.	133.	129.	111.	141.				
72.	1 5.	52.	65.	11.	56.	31.	30.	73.	59.	71.
		26.	122.	121.	113.	132.				
67.	1 10.	51.	58.	10.	51.	31.	28.	66.	54.	70.
		23.	112.	114.	112.	124.				
63.	1 15.	51.	53.	9.	47.	29.	26.	60.	50.	68.
		21.	105.	108.	110.	117.				
58.	1 20.	49.	48.	8.	43.	28.	24.	55.	46.	66.
		18.	97.	101.	107.	110.				
53.	1 25.	47.	43.	7.	40.	26.	22.	50.	42.	62.
		13.	88.	93.	105.	101.				
48.	1 30.	45.	38.	6.	36.	24.	20.	45.	39.	58.
		10.	80.	85.	103.	92.				
43.	1 35.	42.	33.	6.	33.	22.	18.	40.	35.	54.
		8.	72.	77.	103.	83.				
39.	1 40.	40.	30.	5.	30.	21.	17.	36.	32.	51.
		7.	65.	70.	101.	75.				
35.	1 45.	37.	27.	5.	27.	19.	16.	32.	30.	48.
		7.	58.	64.	98.	68.				
32.	1 50.	35.	24.	4.	25.	18.	15.	29.	27.	45.
		6.	53.	59.	94.	62.				
29.	1 55.	33.	22.	4.	23.	17.	13.	26.	25.	42.
		6.	48.	53.	91.	56.				
26.	2 0.	31.	19.	3.	21.	16.	12.	23.	23.	39.
		5.	44.	49.	87.	51.				
23.	2 5.	29.	17.	3.	19.	15.	11.	21.	20.	37.
		4.	39.	44.	84.	46.				
21.	2 10.	28.	14.	3.	17.	14.	11.	18.	19.	34.
		3.	34.	39.	80.	41.				
18.	2 15.	26.	10.	2.	16.	13.	10.	16.	17.	32.
		2.	30.	35.	76.	37.				
16.	2 20.	24.	7.	2.	14.	12.	9.	14.	15.	29.
		0.	26.	32.	73.	33.				
14.	2 25.	23.	6.	2.	13.	12.	8.	13.	14.	27.
		0.	23.	28.	69.	29.				
13.	2 30.	21.	5.	2.	12.	11.	8.	11.	13.	25.
		0.	20.	25.	66.	26.				
11.	2 35.	20.	4.	0.	10.	10.	7.	10.	11.	23.
		0.	17.	23.	63.	23.				

10.2	40.	19.	3.	0.	9.	9.	6.	9.	10.	22.
		0.	15.	20.	60.	21.				
9.2	45.	17.	2.	0.	9.	9.	6.	8.	9.	20.
		0.	13.	18.	58.	19.				
7.2	50.	16.	2.	0.	8.	8.	5.	7.	8.	19.
		0.	12.	16.	55.	17.				
5.2	55.	15.	1.	0.	7.	8.	5.	6.	8.	17.
		0.	10.	14.	52.	15.				
3.3	0.	14.	0.	0.	6.	7.	5.	5.	7.	16.
		0.	7.	13.	50.	13.				
2.3	5.	13.	0.	0.	6.	7.	4.	3.	6.	15.
		0.	5.	12.	48.	12.				
2.3	10.	13.	0.	0.	5.	6.	4.	2.	6.	14.
		0.	4.	10.	46.	10.				
2.3	15.	12.	0.	0.	5.	6.	4.	0.	5.	13.
		0.	3.	9.	44.	9.				
0.3	20.	11.	0.	0.	4.	6.	3.	0.	5.	12.
		0.	2.	6.	42.	8.				
0.3	25.	10.	0.	0.	4.	5.	3.	0.	4.	11.
		0.	2.	4.	40.	5.				
0.3	30.	10.	0.	0.	4.	5.	3.	0.	2.	10.
		0.	2.	3.	38.	3.				
0.3	35.	9.	0.	0.	3.	5.	3.	0.	0.	9.
		0.	0.	2.	36.	3.				
0.3	40.	8.	0.	0.	2.	4.	2.	0.	0.	9.
		0.	0.	2.	35.	2.				
0.3	45.	8.	0.	0.	0.	4.	2.	0.	0.	8.
		0.	0.	2.	33.	2.				
0.3	50.	7.	0.	0.	0.	4.	0.	0.	0.	7.
		0.	0.	0.	32.	1.				
0.3	55.	7.	0.	0.	0.	3.	0.	0.	0.	7.
		0.	0.	0.	30.	0.				
0.4	0.	6.	0.	0.	0.	3.	0.	0.	0.	6.
		0.	0.	0.	29.	0.				
0.4	5.	6.	0.	0.	0.	3.	0.	0.	0.	4.
		0.	0.	0.	27.	0.				
0.4	10.	6.	0.	0.	0.	0.	0.	0.	0.	3.
		0.	0.	0.	26.	0.				
0.4	15.	5.	0.	0.	0.	0.	0.	0.	0.	2.
		0.	0.	0.	25.	0.				

0.4	20.	5.	0.	0.	0.	0.	0.	0.	0.	2.
		0.	0.	0.	24.	0.				
0.4	25.	5.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	23.	0.				
0.4	30.	4.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	22.	0.				
0.4	35.	4.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	21.	0.				
0.4	40.	4.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	20.	0.				
0.4	45.	4.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	19.	0.				
0.4	50.	3.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	18.	0.				
0.4	55.	3.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	17.	0.				
0.5	0.	3.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	17.	0.				
0.5	5.	2.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	16.	0.				
0.5	10.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	15.	0.				
0.5	15.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	14.	0.				
0.5	20.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	14.	0.				
0.5	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	13.	0.				
0.5	30.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	13.	0.				
0.5	35.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	12.	0.				
0.5	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	11.	0.				
0.5	45.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	11.	0.				
0.5	50.	0.	0.	0.	0.	0.	0.	0.	0.	0.
		0.	0.	0.	10.	0.				

1

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 10 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

OVERBANK/SURCHARGE GUTTER MANNING NUMBER N	GUTTER DEPTH CONNECTION (FT)	NDP JK	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R
1	0	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
2	21	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
3	102	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
4	104	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
10	1	0	1	CHANNEL	40.0	1220.	.0100	4.0	4.0
.035	8.00	0							
11	10	0	1	CHANNEL	40.0	520.	.0100	4.0	4.0
.035	8.00	0							
12	11	0	1	CHANNEL	40.0	800.	.0100	4.0	4.0
.035	8.00	0							
13	12	0	1	CHANNEL	40.0	1580.	.0100	4.0	4.0
.035	6.00	0							
141	13	0	1	CHANNEL	32.0	1510.	.0150	2.0	2.0
.056	7.50	0							
142	141	0	1	CHANNEL	20.0	500.	.0180	2.0	.0
.056	9.50	0							
143	142	0	1	CHANNEL	32.0	980.	.0100	3.5	3.5
.044	7.00	0							
144	143	0	1	CHANNEL	20.0	670.	.0170	1.0	1.0
.044	9.50	0							
151	144	0	4	CHANNEL	.1	600.	.0170	4.0	4.0
.056	3.00	0							
				OVERFLOW	50.0	600.	.0170	4.0	1.5
.056	10.00								
152	151	0	4	CHANNEL	5.0	410.	.0170	1.0	8.0
.050	2.50	0							
				OVERFLOW	34.5	410.	.0170	1.0	2.5
.050	6.00								
15	152	0	4	CHANNEL	.1	1410.	.0170	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	1410.	.0170	2.0	2.0
.062	12.00								
16	15	0	4	CHANNEL	.1	880.	.0210	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	880.	.0210	2.0	2.0
.062	12.00								
17	16	0	4	CHANNEL	.1	560.	.0180	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	560.	.0180	2.0	2.0
.062	12.00								
18	17	0	4	CHANNEL	.1	620.	.0190	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	620.	.0190	2.0	2.0
.062	12.00								
19	18	0	4	CHANNEL	.1	5420.	.0240	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	5420.	.0240	2.0	2.0
.062	12.00								
20	19	0	4	CHANNEL	.1	970.	.0190	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	970.	.0190	2.0	2.0
.062	12.00								
21	20	0	4	CHANNEL	8.0	3890.	.0150	1.0	1.0
.050	2.50	0							
				OVERFLOW	25.0	3890.	.0150	1.0	2.0
.050	12.00								
22	201	0	4	CHANNEL	.1	3400.	.0140	2.0	3.0
.050	5.00	0							
				OVERFLOW	105.0	3400.	.0140	1.5	15.0
.050	10.00								
32	2	0	4	CHANNEL	.1	200.	.0140	2.0	3.0
.030	5.00	0							

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                                                    RR1005Swout
                                                    OVERFLOW      105.0      200.     .0140      1.5   15.0
.030      10.00
   23          3          0          4             CHANNEL         .1     2080.     .0180      8.0    4.0
.050       8.00          0
                                                      OVERFLOW     96.0     2080.     .0180     15.0   35.0
.050       8.00
   24        301          0          1             CHANNEL         .1     2850.     .0220      5.0   10.0
.050      20.00          0
   30          2          0          1             CHANNEL         .1      300.     .0220      5.0   10.0
.050      20.00          0
   25         18          0          1             CHANNEL         .1     1340.     .0290      2.5    1.5
.062      20.00          0
   26         25          0          4             CHANNEL         .1     3680.     .0240      6.0    6.0
.062       2.50          0
                                                      OVERFLOW     30.0     3680.     .0240      2.0   10.0
.062      10.00
   27         26          0          4             CHANNEL         .1      780.     .0280      5.0    5.0
.062       3.00          0
                                                      OVERFLOW     30.0      780.     .0280      2.5    1.5
.062      10.00
   28        103          0          4             CHANNEL         .1     1000.     .0180      8.0    4.0
.050       8.00          0
                                                      OVERFLOW     96.0     1000.     .0180     15.0   35.0
.050       8.00
  301         30          7          2             PIPE            .1        1.     .0100       .0    .0
.016        .10          0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                              .0       .0        .3     29.7       .8     93.3      1.8    153.7       3.6
214.1       6.5   255.3
                             10.8    290.8
  102         22             23          2       PIPE                .1        1.     .0100       .0    .0
.016        .10          0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                              .0       .0        .7      2.0       2.1     14.0      3.7     33.0       5.5
47.0        6.9    75.0
                             8.7    108.0      10.7    160.0      12.8    210.0     15.1    244.0      17.5
274.0      20.1   298.0
                            22.8    321.0      25.7    341.0      28.8    356.0     31.9    374.0      35.5
390.0      39.3   408.0
                            43.3    428.0      47.7    600.0      49.0   1100.0     50.0   2500.0      51.0
2800.0
  103         23             8          2       PIPE                .1        1.     .0100       .0    .0
.016        .10          0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                              .0       .0        .1     20.0       .5     60.0      1.2    140.0       2.2
210.0       3.2    260.0
                             5.3    300.0       7.0    560.0
  104         28             4          2       PIPE                .1        1.     .0100       .0    .0
.016        .10          0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                              .0       .0       1.7    220.0      4.1     350.0     5.0     600.0
  105         24            13          2       PIPE                .1        1.     .0100       .0    .0
.016        .10          0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                              .0       .0        .1      9.5       .4      15.3      .8      19.5       1.4
22.9        2.3    25.9
                             3.4     28.5       5.0     31.0       7.0     118.8     9.5     156.3      15.6
185.5      20.3   210.3
                            30.8    232.3
  201         32            10          2       PIPE                .1        1.     .0100       .0    .0
.016        .10          0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                              .0       .0        .5     18.5       1.3     109.0     2.4     153.7       3.9
223.9       5.7    263.6
                             8.3    298.1      12.3    593.0      18.2     757.2      .0       .0
0TOTAL NUMBER OF GUTTERS/PIPES,  36
1
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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 10 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE D.A.(AC)	TRIBUTARY SUBAREA

0	10 0	0	11 0	0 2737.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	11 0	0	12 0	0 2737.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	12 0	0	13 0	0 2737.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	13 0	0	141 0	0 2737.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	15 0	0	16 0	0 2628.5	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0
0	16 0	0	17 0	0 2474.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	17 0	0	18 0	0 2474.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	18 0	0	19 0	25 2474.2	0	0	0	0	0	0	0	0	4	6	0	0	0	0	0	0	0
0	19 0	0	20 0	0 1793.3	0	0	0	0	0	0	0	0	7	8	0	0	0	0	0	0	0
0	20 0	0	21 0	0 1379.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	21 0	0	2 0	0 1379.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	22 0	0	102 0	0 569.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	23 0	0	103 0	0 266.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	24 0	0	105 0	0 433.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	25 0	0	26 0	0 261.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	26 0	0	27 0	0 261.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	27 0	0	0 0	0 261.1	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0
0	28 0	0	104 0	0 266.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	30 0	0	301 0	0 625.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	32 0	0	201 0	0 754.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	102 0	0	3 0	0 569.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	103 0	0	28 0	0 266.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	104 0	0	4 0	0 266.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	105 0	0	0 0	0 433.3	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0
0	141 0	0	142 0	0 2737.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	142 0	0	143 0	0 2737.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	143		144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

```
    0    0    0    0  2737.3
         144       151     0    0    0    0    0    0    0    0          3    0    0    0    0    0
    0    0    0    0  2737.3
         151       152     0    0    0    0    0    0    0    0          0    0    0    0    0    0
    0    0    0    0  2628.5
         152        15     0    0    0    0    0    0    0    0          0    0    0    0    0    0
    0    0    0    0  2628.5
         201        22     0    0    0    0    0    0    0    0         10    0    0    0    0    0
    0    0    0    0   754.6
         301        24     0    0    0    0    0    0    0    0          9    0    0    0    0    0
    0    0    0    0   625.3
1
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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 10 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 37 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
(D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
(O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)	1	2	3	4	10	11	12	13	141	142
	143	144	151	152	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	301	102
	103	104	99	105	201	30	32			
0 5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0(s)	.0(s)
	0.	0.	0.	0.	0.	0.	0.			
	.0(s)	.0(s)	.0( )	.0(s)	.0(s)	.0( )	.0( )			
0 10.	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.0( )	.0(s)	.0(s)
	0.	0.	0.	0.	0.	0.	0.			
	.0(s)	.0(s)	.0( )	.0(s)	.0(s)	.0( )	.1( )			

0 15.	4.	0.	5.	1.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.1( )
.0( )	0.	0.	0.	0.	0.	0.	1.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.3( )	.1( )	.0(s)
.0(s)	0.	0.	0.	0.	0.	0.	0.		
	.0(s)	.0(s)	.0( )	.0(s)	.0(s)	.1( )	.2( )		
0 20.	16.	1.	20.	5.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	0.	0.	0.	0.	0.	0.	1.	0.
0.	.0( )	.0( )	.0( )	.0( )	.1( )	.0( )	.2( )	.3( )	.2( )
.0( )	0.	0.	0.	0.	0.	0.	4.	0.	0.
0.	.0( )	.1( )	.0( )	.0( )	.1( )	.2( )	.7( )	.2( )	.0(s)
.1(s)	0.	2.	0.	0.	1.	0.	1.		
	.0(s)	.0(s)	.0( )	.0(s)	.0(s)	.2( )	.3( )		
0 25.	62.	6.	97.	43.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	1.	0.	0.	1.	0.	3.	10.	3.
0.	.0( )	.1( )	.1( )	.0( )	.4( )	.3( )	.6( )	1.0( )	.6( )
.0( )	0.	0.	0.	0.	0.	2.	27.	4.	4.
1.	.0( )	.2( )	.1( )	.1( )	.3( )	.5( )	1.3( )	.6( )	.0(s)
.5(s)	2.	15.	0.	2.	5.	2.	4.		
	.0(s)	.1(s)	.0( )	.0(s)	.1(s)	.4( )	.7( )		
0 30.	125.	23.	180.	106.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	1.	7.	1.	2.	6.	7.	24.	49.	14.
0.	.0( )	.2( )	.3( )	.3( )	.8( )	.9( )	1.3( )	1.5( )	1.0( )
.2( )	1.	1.	1.	1.	3.	12.	85.	23.	14.
8.	.2( )	.4( )	.4( )	.3( )	.8( )	.9( )	2.0( )	1.2( )	.1(s)
1.4(s)	11.	52.	0.	8.	15.	10.	13.		
	.1(s)	.4(s)	.0( )	.1(s)	.4(s)	.8( )	1.1( )		
0 35.	162.	71.	222.	152.	0.	0.	0.	0.	0.
1.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.1( )	4.	19.	6.	15.	24.	43.	92.	127.	38.
2.									

	.1( )	.4( )	.9( )	.7( )	1.3( )	1.5( )	1.9( )	2.2( )	1.4( )
.6( )									
	10.	3.	7.	2.	16.	38.	146.	64.	32.
21.	.5( )	.8( )	.7( )	.4( )	1.5( )	1.5( )	2.5( )	1.7( )	.3(S)
2.7(S)									
	31.	99.	0.	12.	49.	27.	44.		
	.2(S)	.8(S)	.0( )	.2(S)	.8(S)	1.1( )	1.8( )		
0 40.	170.	129.	237.	167.	0.	0.	0.	0.	0.
7.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.3( )									
	16.	41.	36.	62.	83.	134.	187.	211.	74.
13.	.3( )	.6( )	1.7( )	1.5( )	1.9( )	2.2( )	2.5( )	2.7( )	1.7( )
1.1( )									
	36.	9.	22.	5.	45.	75.	173.	111.	55.
36.	1.1( )	1.2( )	1.1( )	.6( )	2.3( )	1.9( )	2.7( )	2.1( )	.5(S)
4.1(S)									
	60.	136.	0.	16.	80.	50.	79.		
	.5(S)	1.1(S)	.0( )	.5(S)	1.0(S)	1.4( )	2.3( )		
0 45.	166.	166.	248.	162.	0.	0.	0.	0.	4.
35.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )
.7( )									
	54.	104.	119.	162.	190.	235.	270.	290.	113.
42.	.6( )	1.1( )	2.7( )	2.3( )	2.6( )	2.7( )	3.0( )	3.0( )	2.0( )
1.5( )									
	77.	18.	47.	8.	82.	108.	172.	142.	72.
47.	1.8( )	1.5( )	1.5( )	.7( )	2.9( )	2.1( )	2.7( )	2.3( )	.6(S)
5.5(S)									
	98.	154.	0.	20.	98.	69.	96.		
	.8(S)	1.2(S)	.0( )	.8(S)	1.2(S)	1.6( )	2.4( )		
0 50.	155.	189.	265.	155.	0.	0.	0.	3.	30.
109.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.5( )
1.3( )									
	137.	206.	215.	266.	295.	314.	340.	355.	151.
89.	1.1( )	1.7( )	3.2( )	2.7( )	3.1( )	3.1( )	3.3( )	3.3( )	2.2( )
1.9( )									
	119.	31.	80.	12.	113.	129.	162.	155.	82.
74.	2.3( )	1.9( )	1.9( )	.8( )	3.3( )	2.3( )	2.6( )	2.4( )	.7(S)
6.8(S)									
	126.	157.	0.	22.	109.	80.	109.		
	1.1(S)	1.2(S)	.0( )	1.3(S)	1.3(S)	1.7( )	2.5( )		
0 55.	141.	199.	281.	149.	0.	1.	5.	27.	109.
224.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.3( )	1.0( )
2.0( )									
	251.	310.	320.	359.	373.	377.	395.	407.	190.
129.	1.6( )	2.1( )	3.5( )	3.0( )	3.5( )	3.3( )	3.5( )	3.5( )	2.4( )
2.2( )									
	145.	49.	110.	15.	131.	139.	151.	155.	86.
97.	2.6( )	2.3( )	2.1( )	.9( )	3.4( )	2.4( )	2.5( )	2.4( )	.7(S)
8.1(S)									

	142. 1.2(S)	154. 1.2(S)	0. .0( )	24. 1.8(S)	114. 1.4(S)	86. 1.7( )	113. 2.6( )		
1 0. 336. 2.6( )	130. .0( )	208. .0( )	289. .0( )	141. .0( )	2. .1( )	21. .3( )	52. .5( )	112. .8( )	233. 1.6( )
152. 2.3( )	355. 2.0( )	399. 2.5( )	401. 3.7( )	419. 3.1( )	430. 3.7( )	425. 3.5( )	439. 3.7( )	448. 3.7( )	225. 2.6( )
124. 9.3(S)	161. 2.7( )	72. 2.6( )	129. 2.2( )	18. .9( )	139. 3.5( )	141. 2.4( )	138. 2.5( )	151. 2.4( )	88. .8(S)
	146. 1.3(S)	148. 1.1(S)	0. .0( )	26. 2.4(S)	121. 1.6(S)	88. 1.7( )	120. 2.6( )		
1 5. 418. 2.9( )	152. .0( )	220. .0( )	287. .0( )	132. .0( )	35. .4( )	126. .8( )	178. 1.0( )	245. 1.2( )	350. 2.0( )
169. 2.4( )	430. 2.2( )	453. 2.7( )	450. 3.8( )	464. 3.2( )	471. 3.9( )	460. 3.6( )	468. 3.8( )	472. 3.8( )	251. 2.7( )
151. 10.4(S)	177. 2.7( )	98. 3.0( )	140. 2.3( )	21. 1.0( )	139. 3.5( )	138. 2.4( )	127. 2.4( )	145. 2.3( )	90. .8(S)
	147. 1.3(S)	141. 1.1(S)	0. .0( )	28. 3.0(S)	131. 1.8(S)	90. 1.7( )	130. 2.7( )		
1 10. 468. 3.2( )	275. .0( )	234. .0( )	280. .0( )	124. .0( )	165. 1.0( )	287. 1.3( )	322. 1.4( )	365. 1.5( )	430. 2.3( )
185. 2.5( )	474. 2.3( )	489. 2.8( )	486. 3.9( )	494. 3.3( )	498. 3.9( )	478. 3.7( )	482. 3.8( )	483. 3.8( )	270. 2.8( )
172. 11.2(S)	192. 2.8( )	125. 3.3( )	143. 2.3( )	23. 1.0( )	135. 3.5( )	132. 2.3( )	116. 2.3( )	138. 2.3( )	92. .8(S)
	145. 1.3(S)	133. 1.0(S)	0. .0( )	29. 3.6(S)	143. 2.1(S)	92. 1.7( )	142. 2.8( )		
1 15. 498. 3.3( )	434. .0( )	250. .0( )	271. .0( )	117. .0( )	330. 1.4( )	402. 1.6( )	419. 1.7( )	442. 1.7( )	477. 2.4( )
201. 2.6( )	503. 2.4( )	512. 2.9( )	506. 3.9( )	509. 3.3( )	511. 4.0( )	485. 3.7( )	486. 3.9( )	486. 3.8( )	284. 2.9( )
188. 11.9(S)	209. 2.9( )	149. 3.5( )	143. 2.3( )	25. 1.1( )	129. 3.4( )	125. 2.3( )	108. 2.2( )	130. 2.2( )	93. .8(S)
	141. 1.2(S)	125. 1.0(S)	0. .0( )	30. 4.1(S)	158. 2.5(S)	93. 1.7( )	157. 2.9( )		
1 20. 516.	530. .0( )	267. .0( )	258. .0( )	110. .0( )	432. 1.7( )	464. 1.8( )	473. 1.8( )	485. 1.8( )	504. 2.5( )

3.3( )									
218.	517.	520.	513.	514.	514.	486.	485.	485.	296.
2.7( )	2.4( )	2.9( )	3.9( )	3.3( )	4.0( )	3.7( )	3.9( )	3.8( )	2.9( )
199.	227.	169.	139.	27.	122.	118.	100.	122.	93.
12.4(S)	3.0( )	3.7( )	2.3( )	1.1( )	3.4( )	2.2( )	2.2( )	2.2( )	.8(S)
	133.	118.	0.	30.	175.	93.	174.		
	1.1(S)	.9(S)	.0( )	4.7(S)	2.9(S)	1.8( )	3.0( )		
1 25.	572.	283.	239.	101.	482.	497.	502.	508.	517.
521.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.9( )	2.5( )
3.4( )									
236.	521.	521.	513.	512.	512.	484.	484.	483.	306.
2.8( )	2.4( )	2.9( )	3.9( )	3.3( )	4.0( )	3.7( )	3.8( )	3.8( )	3.0( )
207.	245.	185.	133.	29.	115.	110.	92.	115.	93.
12.7(S)	3.1( )	3.8( )	2.3( )	1.1( )	3.3( )	2.2( )	2.1( )	2.1( )	.8(S)
	125.	110.	0.	38.	191.	93.	190.		
	1.1(S)	.9(S)	.0( )	5.2(S)	3.2(S)	1.7( )	3.1( )		
1 30.	589.	297.	221.	92.	506.	513.	515.	517.	520.
519.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.9( )	1.9( )	1.9( )	2.6( )
3.4( )									
254.	519.	517.	510.	509.	508.	482.	481.	481.	316.
2.9( )	2.4( )	2.9( )	3.9( )	3.3( )	4.0( )	3.7( )	3.8( )	3.8( )	3.0( )
210.	262.	196.	126.	36.	107.	102.	84.	107.	93.
12.8(S)	3.1( )	3.9( )	2.2( )	1.2( )	3.2( )	2.1( )	2.0( )	2.1( )	.8(S)
	117.	102.	0.	55.	205.	93.	204.		
	1.0(S)	.8(S)	.0( )	5.6(S)	3.5(S)	1.7( )	3.2( )		
1 35.	592.	309.	204.	83.	516.	518.	519.	519.	518.
515.	.0( )	.0( )	.0( )	.0( )	1.9( )	1.9( )	1.9( )	1.9( )	2.6( )
3.3( )									
271.	515.	513.	506.	505.	504.	479.	479.	478.	326.
2.9( )	2.4( )	2.9( )	3.9( )	3.3( )	4.0( )	3.7( )	3.8( )	3.8( )	3.0( )
210.	278.	203.	118.	45.	100.	95.	76.	98.	94.
12.8(S)	3.2( )	3.9( )	2.2( )	1.3( )	3.1( )	2.0( )	2.0( )	2.0( )	.8(S)
	109.	93.	0.	68.	216.	94.	215.		
	.9(S)	.7(S)	.0( )	5.8(S)	3.7(S)	1.8( )	3.3( )		
1 40.	587.	320.	188.	75.	518.	517.	517.	516.	514.
511.	.0( )	.0( )	.0( )	.0( )	1.9( )	1.9( )	1.9( )	1.9( )	2.5( )
3.3( )									
287.	510.	508.	502.	501.	500.	477.	476.	475.	335.
3.0( )	2.4( )	2.9( )	3.9( )	3.3( )	4.0( )	3.7( )	3.8( )	3.8( )	3.1( )

209.	293.	206.	111.	56.	92.	87.	68.	90.	97.
12.7(S)	3.3( )	3.9( )	2.1( )	1.4( )	3.0( )	2.0( )	1.9( )	2.0( )	.9(S)
	101.	85.	0.	77.	224.	97.	224.		
	.9(S)	.7(S)	.0( )	6.0(S)	3.9(S)	1.8( )	3.3( )		
1 45.	579.	328.	174.	68.	516.	514.	513.	512.	509.
506.	.0( )	.0( )	.0( )	.0( )	1.9( )	1.9( )	1.9( )	1.9( )	2.5( )
3.3( )									
300.	505.	503.	498.	496.	496.	474.	473.	473.	344.
3.1( )	2.4( )	2.9( )	3.9( )	3.3( )	3.9( )	3.7( )	3.8( )	3.8( )	3.1( )
204.	306.	206.	103.	65.	85.	80.	62.	82.	102.
12.6(S)	3.3( )	3.9( )	2.1( )	1.5( )	2.9( )	1.9( )	1.8( )	1.9( )	.9(S)
	92.	77.	0.	83.	227.	101.	227.		
	.8(S)	.6(S)	.0( )	6.2(S)	4.0(S)	1.8( )	3.4( )		
1 50.	570.	334.	160.	62.	511.	509.	508.	507.	504.
501.	.0( )	.0( )	.0( )	.0( )	1.9( )	1.9( )	1.9( )	1.9( )	2.5( )
3.3( )									
312.	501.	499.	494.	493.	492.	472.	471.	470.	352.
3.1( )	2.4( )	2.8( )	3.9( )	3.3( )	3.9( )	3.7( )	3.8( )	3.8( )	3.1( )
199.	316.	204.	95.	73.	78.	73.	56.	74.	107.
12.3(S)	3.3( )	3.9( )	2.0( )	1.6( )	2.8( )	1.9( )	1.7( )	1.8( )	1.0(S)
	84.	70.	0.	86.	228.	106.	228.		
	.7(S)	.5(S)	.0( )	6.3(S)	4.1(S)	1.8( )	3.4( )		
1 55.	562.	339.	146.	56.	507.	505.	504.	502.	500.
497.	.0( )	.0( )	.0( )	.0( )	1.9( )	1.8( )	1.8( )	1.8( )	2.5( )
3.3( )									
321.	496.	494.	490.	489.	488.	469.	468.	467.	359.
3.2( )	2.4( )	2.8( )	3.9( )	3.3( )	3.9( )	3.7( )	3.8( )	3.7( )	3.2( )
192.	325.	200.	87.	79.	71.	67.	51.	68.	111.
12.0(S)	3.4( )	3.9( )	1.9( )	1.6( )	2.7( )	1.8( )	1.7( )	1.8( )	1.1(S)
	77.	63.	0.	88.	229.	110.	229.		
	.6(S)	.5(S)	.0( )	6.3(S)	4.1(S)	1.9( )	3.4( )		
2 0.	553.	342.	133.	51.	502.	500.	499.	498.	495.
493.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.8( )	2.5( )
3.3( )									
329.	492.	490.	486.	485.	484.	466.	465.	464.	365.
3.2( )	2.3( )	2.8( )	3.9( )	3.3( )	3.9( )	3.7( )	3.8( )	3.7( )	3.2( )
184.	332.	194.	80.	83.	65.	61.	46.	61.	115.
11.7(S)	3.4( )	3.8( )	1.9( )	1.7( )	2.6( )	1.7( )	1.6( )	1.7( )	1.2(S)
	70.	57.	0.	88.	228.	114.	228.		
	.6(S)	.4(S)	.0( )	6.3(S)	4.1(S)	1.9( )	3.4( )		

2 5.	544.	344.	120.	46.	498.	496.	495.	494.	491.
488.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.8( )	2.5( )
3.2( )									
	488.	486.	482.	481.	480.	462.	461.	460.	369.
335.	2.3( )	2.8( )	3.9( )	3.3( )	3.9( )	3.6( )	3.8( )	3.7( )	3.2( )
3.2( )									
	337.	187.	73.	85.	60.	56.	41.	56.	117.
175.	3.4( )	3.8( )	1.8( )	1.7( )	2.6( )	1.7( )	1.6( )	1.6( )	1.2(S)
11.3(S)									
	64.	52.	0.	87.	226.	117.	227.		
	.5(S)	.4(S)	.0( )	6.3(S)	4.0(S)	1.9( )	3.4( )		
2 10.	535.	342.	109.	41.	494.	492.	491.	489.	487.
484.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.8( )	2.5( )
3.2( )									
	483.	481.	477.	476.	475.	458.	456.	455.	371.
338.	2.3( )	2.8( )	3.9( )	3.2( )	3.9( )	3.6( )	3.7( )	3.7( )	3.2( )
3.2( )									
	339.	180.	67.	86.	55.	51.	37.	50.	118.
166.	3.4( )	3.7( )	1.7( )	1.7( )	2.5( )	1.6( )	1.5( )	1.6( )	1.2(S)
11.0(S)									
	58.	47.	0.	86.	223.	118.	223.		
	.5(S)	.4(S)	.0( )	6.3(S)	3.9(S)	1.9( )	3.3( )		
2 15.	525.	334.	98.	37.	489.	487.	486.	485.	482.
479.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.8( )	2.4( )
3.2( )									
	478.	475.	472.	470.	469.	452.	450.	449.	372.
339.	2.3( )	2.8( )	3.8( )	3.2( )	3.8( )	3.6( )	3.7( )	3.7( )	3.2( )
3.2( )									
	339.	171.	61.	85.	50.	46.	32.	45.	118.
156.	3.4( )	3.7( )	1.7( )	1.7( )	2.4( )	1.6( )	1.4( )	1.5( )	1.2(S)
10.6(S)									
	53.	42.	0.	84.	215.	118.	216.		
	.4(S)	.3(S)	.0( )	6.2(S)	3.7(S)	1.9( )	3.3( )		
2 20.	516.	324.	87.	33.	485.	482.	481.	480.	476.
473.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.8( )	2.4( )
3.2( )									
	472.	469.	466.	463.	462.	446.	443.	441.	371.
336.	2.3( )	2.7( )	3.8( )	3.2( )	3.8( )	3.6( )	3.7( )	3.6( )	3.2( )
3.2( )									
	335.	162.	56.	84.	45.	42.	28.	41.	117.
146.	3.4( )	3.6( )	1.6( )	1.7( )	2.3( )	1.5( )	1.4( )	1.5( )	1.2(S)
10.1(S)									
	48.	37.	0.	81.	206.	118.	207.		
	.4(S)	.3(S)	.0( )	6.1(S)	3.5(S)	1.9( )	3.3( )		
2 25.	508.	313.	79.	29.	479.	477.	476.	474.	470.
466.	.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.8( )	2.4( )
3.1( )									
	465.	461.	458.	455.	454.	437.	434.	432.	367.

331. 2.3( ) 2.7( ) 3.8( ) 3.2( ) 3.8( ) 3.6( ) 3.7( ) 3.6( ) 3.2( )
3.2( )

135. 328. 152. 51. 82. 41. 37. 25. 37. 115.
9.8(S) 3.4( ) 3.5( ) 1.6( ) 1.7( ) 2.2( ) 1.4( ) 1.3( ) 1.4( ) 1.2(S)

43. 33. 0. 79. 197. 116. 198.
.3(S) .3(S) .0( ) 6.1(S) 3.3(S) 1.9( ) 3.2( )

458.2 30. 499. 301. 71. 26. 474. 471. 469. 467. 463.
3.1( ) .0( ) .0( ) .0( ) .0( ) 1.8( ) 1.8( ) 1.8( ) 1.8( ) 2.4( )

323. 456. 452. 449. 446. 444. 427. 423. 420. 361.
3.2( ) 2.2( ) 2.7( ) 3.8( ) 3.2( ) 3.7( ) 3.5( ) 3.6( ) 3.6( ) 3.2( )

125. 319. 143. 46. 80. 37. 34. 22. 33. 113.
9.4(S) 3.4( ) 3.4( ) 1.5( ) 1.7( ) 2.1( ) 1.4( ) 1.2( ) 1.3( ) 1.1(S)

39. 30. 0. 76. 187. 113. 188.
.3(S) .2(S) .0( ) 6.0(S) 3.1(S) 1.9( ) 3.1( )

448.2 35. 491. 287. 64. 23. 467. 464. 462. 459. 454.
3.1( ) .0( ) .0( ) .0( ) .0( ) 1.8( ) 1.8( ) 1.8( ) 1.7( ) 2.4( )

313. 446. 441. 438. 434. 432. 415. 410. 407. 353.
3.1( ) 2.2( ) 2.6( ) 3.8( ) 3.2( ) 3.7( ) 3.5( ) 3.6( ) 3.5( ) 3.1( )

116. 309. 133. 42. 78. 33. 30. 19. 29. 109.
9.0(S) 3.3( ) 3.3( ) 1.5( ) 1.6( ) 2.0( ) 1.3( ) 1.2( ) 1.3( ) 1.1(S)

35. 27. 0. 73. 177. 110. 177.
.2(S) .2(S) .0( ) 6.0(S) 2.9(S) 1.9( ) 3.1( )

436.2 40. 481. 273. 58. 21. 459. 455. 453. 450. 443.
3.0( ) .0( ) .0( ) .0( ) .0( ) 1.7( ) 1.7( ) 1.7( ) 1.7( ) 2.3( )

302. 434. 428. 426. 421. 419. 401. 396. 393. 343.
3.1( ) 2.2( ) 2.6( ) 3.8( ) 3.1( ) 3.7( ) 3.4( ) 3.5( ) 3.5( ) 3.1( )

107. 297. 124. 38. 75. 30. 27. 17. 26. 106.
8.7(S) 3.3( ) 3.2( ) 1.4( ) 1.6( ) 2.0( ) 1.3( ) 1.1( ) 1.2( ) 1.0(S)

31. 24. 0. 70. 166. 106. 167.
.2(S) .2(S) .0( ) 5.9(S) 2.7(S) 1.8( ) 3.0( )

423.2 45. 469. 259. 52. 19. 450. 445. 442. 439. 431.
3.0( ) .0( ) .0( ) .0( ) .0( ) 1.7( ) 1.7( ) 1.7( ) 1.7( ) 2.3( )

290. 421. 415. 412. 407. 404. 386. 381. 377. 332.
3.0( ) 2.1( ) 2.5( ) 3.7( ) 3.1( ) 3.6( ) 3.4( ) 3.5( ) 3.4( ) 3.1( )

101. 284. 115. 34. 72. 27. 24. 15. 24. 102.
3.2( ) 3.2( ) 1.4( ) 1.6( ) 1.9( ) 1.2( ) 1.1( ) 1.2( ) .9(S)

8.3(S)										
	28.	21.	0.	67.	156.	103.	156.			
	.2(S)	.2(S)	.0( )	5.8(S)	2.4(S)	1.8( )	2.9( )			
2 50.	457.	246.	47.	17.	439.	433.	430.	426.	418.	409.
	.0( )	.0( )	.0( )	.0( )	1.7( )	1.7( )	1.7( )	1.7( )	2.3( )	2.9( )
	407.	400.	397.	391.	388.	370.	365.	361.	320.	277.
	2.1( )	2.5( )	3.7( )	3.1( )	3.5( )	3.3( )	3.4( )	3.3( )	3.0( )	3.0( )
	272.	108.	31.	70.	24.	21.	13.	21.	98.	95.
	3.2( )	3.1( )	1.3( )	1.6( )	1.8( )	1.2( )	1.0( )	1.1( )	.9(S)	8.0(S)
	25.	19.	0.	64.	147.	99.	147.			
	.2(S)	.1(S)	.0( )	5.8(S)	2.2(S)	1.8( )	2.9( )			
2 55.	443.	233.	42.	15.	426.	420.	417.	413.	404.	394.
	.0( )	.0( )	.0( )	.0( )	1.7( )	1.7( )	1.7( )	1.6( )	2.2( )	2.8( )
	391.	384.	381.	375.	372.	354.	348.	345.	307.	264.
	2.1( )	2.4( )	3.7( )	3.0( )	3.5( )	3.2( )	3.3( )	3.3( )	3.0( )	2.9( )
	259.	101.	28.	67.	21.	19.	11.	19.	94.	89.
	3.1( )	3.0( )	1.3( )	1.5( )	1.7( )	1.1( )	.9( )	1.1( )	.8(S)	7.7(S)
	22.	17.	0.	62.	138.	95.	139.			
	.1(S)	.1(S)	.0( )	5.7(S)	2.0(S)	1.8( )	2.8( )			
3 0.	427.	218.	38.	13.	413.	406.	403.	398.	389.	378.
	.0( )	.0( )	.0( )	.0( )	1.6( )	1.6( )	1.6( )	1.6( )	2.2( )	2.8( )
	375.	368.	365.	359.	355.	338.	332.	328.	293.	252.
	2.0( )	2.4( )	3.6( )	3.0( )	3.4( )	3.2( )	3.3( )	3.2( )	2.9( )	2.9( )
	246.	95.	25.	64.	19.	17.	9.	17.	87.	83.
	3.1( )	2.9( )	1.2( )	1.5( )	1.7( )	1.1( )	.9( )	1.0( )	.8(S)	7.3(S)
	20.	15.	0.	59.	129.	89.	130.			
	.1(S)	.1(S)	.0( )	5.6(S)	1.8(S)	1.7( )	2.7( )			
3 5.	412.	204.	34.	12.	399.	392.	388.	383.	373.	362.
	.0( )	.0( )	.0( )	.0( )	1.6( )	1.6( )	1.6( )	1.6( )	2.1( )	2.7( )
	359.	352.	348.	342.	338.	321.	315.	311.	280.	239.
	2.0( )	2.3( )	3.6( )	2.9( )	3.3( )	3.1( )	3.2( )	3.1( )	2.8( )	2.8( )
	233.	89.	22.	61.	17.	15.	6.	15.	82.	77.
	3.0( )	2.9( )	1.2( )	1.5( )	1.6( )	1.0( )	.8( )	1.0( )	.7(S)	7.0(S)
	17.	13.	0.	56.	121.	82.	121.			
	.1(S)	.1(S)	.0( )	5.6(S)	1.6(S)	1.7( )	2.7( )			
3 10.	396.	191.	30.	10.	384.	376.	373.	368.	357.	346.

	.0( )	.0( )	.0( )	.0( )	1.6( )	1.6( )	1.6( )	1.5( )	2.1( )
2.6( )									
	343.	335.	332.	325.	322.	305.	298.	294.	265.
226.	1.9( )	2.2( )	3.5( )	2.9( )	3.3( )	3.0( )	3.1( )	3.1( )	2.8( )
2.7( )									
	220.	83.	20.	59.	15.	13.	5.	14.	77.
72.	3.0( )	2.8( )	1.1( )	1.5( )	1.5( )	1.0( )	.7( )	1.0( )	.7(S)
6.7(S)									
	15.	12.	0.	54.	113.	78.	113.		
	.1(S)	.1(S)	.0( )	5.5(S)	1.4(S)	1.6( )	2.6( )		
3 15.	380.	176.	26.	9.	369.	361.	357.	352.	341.
330.	.0( )	.0( )	.0( )	.0( )	1.5( )	1.5( )	1.5( )	1.5( )	2.0( )
2.6( )									
	326.	319.	315.	308.	305.	288.	281.	277.	251.
213.	1.9( )	2.2( )	3.5( )	2.9( )	3.2( )	3.0( )	3.0( )	3.0( )	2.7( )
2.7( )									
	207.	78.	17.	56.	13.	11.	4.	12.	73.
66.	2.9( )	2.7( )	1.0( )	1.4( )	1.4( )	.9( )	.6( )	.9( )	.6(S)
6.5(S)									
	13.	11.	0.	51.	101.	74.	102.		
	.1(S)	.1(S)	.0( )	5.5(S)	1.2(S)	1.6( )	2.5( )		
3 20.	364.	158.	21.	8.	353.	345.	341.	336.	325.
313.	.0( )	.0( )	.0( )	.0( )	1.5( )	1.5( )	1.5( )	1.5( )	1.9( )
2.5( )									
	310.	302.	298.	292.	288.	271.	265.	261.	237.
200.	1.8( )	2.1( )	3.5( )	2.8( )	3.1( )	2.9( )	3.0( )	2.9( )	2.7( )
2.6( )									
	194.	72.	15.	54.	11.	9.	3.	11.	70.
61.	2.8( )	2.6( )	1.0( )	1.4( )	1.4( )	.9( )	.6( )	.9( )	.6(S)
6.2(S)									
	12.	9.	0.	49.	87.	70.	88.		
	.1(S)	.1(S)	.0( )	5.4(S)	1.1(S)	1.6( )	2.4( )		
3 25.	347.	145.	18.	5.	337.	329.	325.	320.	308.
297.	.0( )	.0( )	.0( )	.0( )	1.5( )	1.4( )	1.4( )	1.4( )	1.9( )
2.4( )									
	294.	285.	282.	275.	271.	255.	249.	245.	223.
187.	1.7( )	2.0( )	3.4( )	2.8( )	3.0( )	2.8( )	2.9( )	2.8( )	2.6( )
2.5( )									
	180.	67.	14.	52.	10.	8.	3.	9.	66.
55.	2.8( )	2.6( )	1.0( )	1.4( )	1.3( )	.8( )	.5( )	.8( )	.6(S)
5.9(S)									
	10.	8.	0.	47.	77.	67.	78.		
	.1(S)	.1(S)	.0( )	5.4(S)	1.0(S)	1.5( )	2.2( )		
3 30.	331.	134.	15.	3.	321.	313.	309.	304.	292.
281.	.0( )	.0( )	.0( )	.0( )	1.4( )	1.4( )	1.4( )	1.4( )	1.8( )
2.3( )									
	277.	269.	266.	259.	255.	239.	233.	229.	210.
174.	1.7( )	2.0( )	3.4( )	2.7( )	2.9( )	2.7( )	2.8( )	2.7( )	2.5( )
2.4( )									

	.0(S)	.0(S)	.0( )	5.1(S)	.8(S)	1.4( )	1.9( )			
3 55.	252.	98.	5.	0.	246.	237.	234.	228.	217.	206.
	.0( )	.0( )	.0( )	.0( )	1.2( )	1.2( )	1.2( )	1.2( )	1.5( )	1.9( )
	203.	195.	191.	182.	180.	166.	161.	157.	150.	121.
	1.4( )	1.6( )	3.1( )	2.4( )	2.5( )	2.4( )	2.4( )	2.4( )	2.2( )	2.1( )
	115.	44.	5.	39.	4.	3.	0.	2.	49.	39.
	2.2( )	2.2( )	.7( )	1.3( )	.9( )	.6( )	.2( )	.5( )	.5(S)	4.5(S)
	3.	1.	0.	36.	48.	50.	48.			
	.0(S)	.0(S)	.0( )	5.1(S)	.8(S)	1.4( )	1.9( )			
4 0.	238.	93.	4.	0.	232.	223.	220.	214.	203.	192.
	.0( )	.0( )	.0( )	.0( )	1.2( )	1.2( )	1.1( )	1.1( )	1.5( )	1.8( )
	189.	181.	177.	170.	167.	155.	150.	147.	139.	111.
	1.4( )	1.5( )	3.1( )	2.3( )	2.5( )	2.3( )	2.3( )	2.3( )	2.1( )	2.1( )
	107.	42.	4.	38.	3.	3.	0.	2.	47.	37.
	2.2( )	2.2( )	.6( )	1.2( )	.9( )	.5( )	.2( )	.4( )	.4(S)	4.3(S)
	2.	0.	0.	34.	45.	47.	46.			
	.0(S)	.0(S)	.0( )	5.1(S)	.7(S)	1.4( )	1.8( )			
4 5.	224.	88.	4.	0.	218.	210.	206.	201.	190.	179.
	.0( )	.0( )	.0( )	.0( )	1.1( )	1.1( )	1.1( )	1.1( )	1.4( )	1.8( )
	176.	169.	166.	158.	156.	144.	139.	136.	130.	104.
	1.3( )	1.5( )	3.0( )	2.3( )	2.4( )	2.2( )	2.3( )	2.2( )	2.1( )	2.0( )
	100.	40.	4.	36.	3.	2.	0.	1.	44.	36.
	2.1( )	2.1( )	.6( )	1.2( )	.8( )	.5( )	.1( )	.4( )	.4(S)	4.0(S)
	1.	0.	0.	32.	43.	45.	43.			
	.0(S)	.0(S)	.0( )	5.0(S)	.7(S)	1.3( )	1.8( )			
4 10.	210.	83.	3.	0.	204.	196.	193.	187.	177.	166.
	.0( )	.0( )	.0( )	.0( )	1.1( )	1.1( )	1.1( )	1.0( )	1.4( )	1.7( )
	164.	156.	152.	147.	144.	134.	130.	127.	121.	97.
	1.2( )	1.4( )	2.9( )	2.2( )	2.3( )	2.2( )	2.2( )	2.2( )	2.0( )	2.0( )
	94.	39.	3.	34.	3.	2.	0.	1.	41.	34.
	2.0( )	2.1( )	.5( )	1.2( )	.8( )	.5( )	.1( )	.3( )	.4(S)	3.8(S)
	1.	0.	0.	31.	41.	41.	41.			
	.0(S)	.0(S)	.0( )	5.0(S)	.7(S)	1.3( )	1.8( )			
4 15.	197.	78.	2.	0.	192.	184.	180.	175.	165.	154.
	.0( )	.0( )	.0( )	.0( )	1.1( )	1.0( )	1.0( )	1.0( )	1.3( )	1.6( )

	151.	143.	139.	135.	133.	125.	121.	118.	113.
92.	1.2( )	1.3( )	2.8( )	2.1( )	2.3( )	2.1( )	2.1( )	2.1( )	2.0( )
1.9( )									
	88.	37.	2.	33.	2.	2.	0.	0.	38.
32.	1.9( )	2.1( )	.5( )	1.2( )	.7( )	.4( )	.1( )	.3( )	.4(S)
3.6(S)									
	1.	0.	0.	31.	39.	38.	39.		
	.0(S)	.0(S)	.0( )	5.0(S)	.7(S)	1.3( )	1.7( )		
4 20.	184.	74.	2.	0.	179.	171.	168.	163.	152.
141.	.0( )	.0( )	.0( )	.0( )	1.0( )	1.0( )	1.0( )	1.0( )	1.2( )
1.5( )									
	139.	132.	129.	126.	124.	117.	113.	111.	106.
86.	1.1( )	1.3( )	2.8( )	2.0( )	2.2( )	2.1( )	2.1( )	2.1( )	1.9( )
1.9( )									
	83.	35.	2.	32.	2.	1.	0.	0.	36.
30.	1.9( )	2.0( )	.5( )	1.2( )	.7( )	.4( )	.1( )	.2( )	.3(S)
3.4(S)									
	0.	0.	0.	31.	37.	36.	37.		
	.0(S)	.0(S)	.0( )	4.9(S)	.7(S)	1.2( )	1.7( )		
4 25.	172.	70.	2.	0.	167.	160.	156.	151.	141.
131.	.0( )	.0( )	.0( )	.0( )	1.0( )	.9( )	.9( )	.9( )	1.2( )
1.5( )									
	129.	123.	121.	118.	116.	110.	106.	104.	100.
81.	1.1( )	1.2( )	2.7( )	2.0( )	2.1( )	2.0( )	2.0( )	2.0( )	1.9( )
1.8( )									
	79.	33.	2.	32.	2.	1.	0.	0.	34.
28.	1.8( )	2.0( )	.4( )	1.2( )	.6( )	.4( )	.1( )	.2( )	.3(S)
3.2(S)									
	0.	0.	0.	31.	35.	34.	35.		
	.0(S)	.0(S)	.0( )	4.9(S)	.6(S)	1.2( )	1.7( )		
4 30.	160.	66.	1.	0.	156.	148.	145.	140.	131.
123.	.0( )	.0( )	.0( )	.0( )	.9( )	.9( )	.9( )	.9( )	1.1( )
1.4( )									
	121.	115.	113.	111.	109.	103.	100.	98.	94.
77.	1.0( )	1.2( )	2.6( )	1.9( )	2.1( )	2.0( )	2.0( )	2.0( )	1.9( )
1.8( )									
	74.	31.	1.	31.	1.	1.	0.	0.	33.
25.	1.7( )	1.9( )	.4( )	1.2( )	.6( )	.4( )	.1( )	.2( )	.3(S)
3.1(S)									
	0.	0.	0.	31.	33.	33.	33.		
	.0(S)	.0(S)	.0( )	4.8(S)	.6(S)	1.2( )	1.6( )		
4 35.	149.	63.	1.	0.	145.	138.	135.	131.	123.
115.	.0( )	.0( )	.0( )	.0( )	.9( )	.9( )	.9( )	.8( )	1.1( )
1.4( )									
	113.	109.	107.	104.	103.	97.	94.	92.	89.
73.	1.0( )	1.1( )	2.6( )	1.9( )	2.0( )	1.9( )	2.0( )	1.9( )	1.8( )
1.8( )									
	71.	29.	1.	31.	1.	1.	0.	0.	32.
24.									

2.9(S)	1.7( )	1.9( )	.4( )	1.2( )	.6( )	.4( )	.1( )	.2( )	.3(S)
	0. .0(S)	0. .0(S)	0. .0( )	31. 4.7(S)	31. .6(S)	32. 1.2( )	31. 1.6( )		
4 40. 108.	139. .0( )	61. .0( )	1. .0( )	0. .0( )	136. .9( )	129. .8( )	127. .8( )	123. .8( )	115. 1.1( )
1.3( )									
70.	107. 1.0( )	102. 1.1( )	100. 2.5( )	98. 1.8( )	97. 2.0( )	92. 1.9( )	89. 1.9( )	87. 1.9( )	84. 1.8( )
1.7( )									
22.	67. 1.6( )	27. 1.8( )	1. .3( )	31. 1.2( )	1. .6( )	1. .3( )	0. .1( )	0. .1( )	31. .3(S)
2.8(S)									
	0. .0(S)	0. .0(S)	0. .0( )	30. 4.7(S)	29. .6(S)	31. 1.2( )	30. 1.6( )		
4 45. 102.	131. .0( )	59. .0( )	1. .0( )	0. .0( )	127. .8( )	121. .8( )	119. .8( )	115. .8( )	109. 1.0( )
1.3( )									
67.	101. .9( )	97. 1.1( )	95. 2.5( )	93. 1.8( )	92. 2.0( )	87. 1.8( )	84. 1.9( )	83. 1.8( )	80. 1.7( )
1.7( )									
20.	65. 1.6( )	25. 1.8( )	1. .3( )	31. 1.2( )	1. .5( )	1. .3( )	0. .1( )	0. .1( )	31. .3(S)
2.6(S)									
	0. .0(S)	0. .0(S)	0. .0( )	30. 4.6(S)	27. .6(S)	31. 1.2( )	28. 1.5( )		
4 50. 97.	123. .0( )	57. .0( )	1. .0( )	0. .0( )	119. .8( )	114. .8( )	112. .8( )	109. .8( )	103. 1.0( )
1.2( )									
64.	95. .9( )	91. 1.0( )	90. 2.4( )	88. 1.7( )	87. 1.9( )	83. 1.8( )	80. 1.8( )	79. 1.8( )	76. 1.7( )
1.7( )									
19.	62. 1.6( )	23. 1.7( )	1. .3( )	31. 1.2( )	1. .5( )	1. .3( )	0. .1( )	0. .1( )	31. .3(S)
2.5(S)									
	0. .0(S)	0. .0(S)	0. .0( )	30. 4.5(S)	26. .6(S)	31. 1.2( )	26. 1.5( )		
4 55. 92.	116. .0( )	55. .0( )	0. .0( )	0. .0( )	113. .8( )	108. .7( )	106. .7( )	103. .7( )	97. 1.0( )
1.2( )									
61.	90. .9( )	87. 1.0( )	85. 2.4( )	84. 1.7( )	82. 1.9( )	78. 1.8( )	76. 1.8( )	75. 1.8( )	73. 1.7( )
1.7( )									
17.	60. 1.5( )	22. 1.7( )	0. .3( )	30. 1.1( )	1. .5( )	1. .3( )	0. .0( )	0. .1( )	31. .3(S)
2.4(S)									
	0. .0(S)	0. .0(S)	0. .0( )	30. 4.4(S)	24. .5(S)	31. 1.2( )	24. 1.4( )		
5 0.	109.	53.	0.	0.	107.	102.	100.	97.	92.

87. .0( ) .0( ) .0( ) .0( ) .7( ) .7( ) .7( ) .7( ) .9( ) 1.1( )

59. 86. 82. 81. 79. 78. 75. 73. 72. 69. .9( ) 1.0( ) 2.3( ) 1.7( ) 1.8( ) 1.7( ) 1.8( ) 1.8( ) 1.7( ) 1.6( )

16. 57. 20. 0. 30. 1. 1. 0. 0. 30. 1.5( ) 1.6( ) .2( ) 1.1( ) .5( ) .3( ) .0( ) .1( ) .3(S) 2.3(S)

0. 0. 0. 30. 22. 31. 22. .0(S) .0(S) .0( ) 4.3(S) .5(S) 1.2( ) 1.4( )

5 5. 83. 103. 51. 0. 0. 101. 97. 95. 92. 87. .0( ) .0( ) .0( ) .0( ) .7( ) .7( ) .7( ) .7( ) .9( ) 1.1( )

57. 82. 79. 77. 76. 75. 72. 70. 68. 67. .8( ) .9( ) 2.3( ) 1.6( ) 1.8( ) 1.7( ) 1.8( ) 1.7( ) 1.6( ) 1.6( )

15. 55. 19. 0. 30. 1. 0. 0. 0. 30. 1.5( ) 1.6( ) .2( ) 1.1( ) .4( ) .3( ) .0( ) .1( ) .3(S) 2.2(S)

0. 0. 0. 30. 21. 30. 21. .0(S) .0(S) .0( ) 4.2(S) .5(S) 1.1( ) 1.4( )

5 10. 79. 96. 50. 0. 0. 96. 92. 90. 88. 83. .0( ) .0( ) .0( ) .0( ) .7( ) .7( ) .7( ) .7( ) .9( ) 1.1( )

55. 78. 75. 74. 72. 72. 69. 67. 66. 64. .8( ) .9( ) 2.2( ) 1.6( ) 1.8( ) 1.7( ) 1.7( ) 1.7( ) 1.6( ) 1.6( )

14. 54. 17. 0. 30. 1. 0. 0. 0. 30. 1.4( ) 1.5( ) .2( ) 1.1( ) .4( ) .3( ) .0( ) .1( ) .3(S) 2.1(S)

0. 0. 0. 30. 19. 30. 19. .0(S) .0(S) .0( ) 4.1(S) .5(S) 1.1( ) 1.3( )

5 15. 75. 91. 48. 0. 0. 91. 88. 86. 84. 79. .0( ) .0( ) .0( ) .0( ) .7( ) .7( ) .7( ) .6( ) .8( ) 1.0( )

53. 74. 72. 71. 69. 69. 66. 64. 63. 62. .8( ) .9( ) 2.2( ) 1.6( ) 1.8( ) 1.7( ) 1.7( ) 1.7( ) 1.6( ) 1.6( )

13. 52. 16. 0. 30. 1. 0. 0. 0. 30. 1.4( ) 1.5( ) .2( ) 1.1( ) .4( ) .3( ) .0( ) .1( ) .3(S) 2.0(S)

0. 0. 0. 30. 18. 30. 18. .0(S) .0(S) .0( ) 4.0(S) .5(S) 1.1( ) 1.3( )

5 20. 72. 87. 48. 0. 0. 87. 83. 82. 80. 76. .0( ) .0( ) .0( ) .0( ) .7( ) .6( ) .6( ) .6( ) .8( ) 1.0( )

52. 71. 69. 68. 67. 66. 63. 62. 61. 59. .8( ) .9( ) 2.2( ) 1.5( ) 1.7( ) 1.7( ) 1.7( ) 1.7( ) 1.6( )

1.6( )

12. 50. 15. 0. 30. 0. 0. 0. 0. 30.
1.9(S) 1.4( ) 1.5( ) .2( ) 1.1( ) .4( ) .2( ) .0( ) .1( ) .3(S)
0. 0. 0. 29. 18. 30. 18.
.0(S) .0(S) .0( ) 3.9(S) .5(S) 1.1( ) 1.3( )

5 25. 83. 47. 0. 0. 83. 80. 78. 76. 73.
69. .0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .8( )
1.0( )

50. 68. 66. 65. 64. 63. 61. 60. 59. 57.
.7( ) .8( ) 2.1( ) 1.5( ) 1.7( ) 1.6( ) 1.7( ) 1.6( ) 1.6( )
1.6( )

11. 49. 14. 0. 30. 0. 0. 0. 0. 30.
1.8(S) 1.4( ) 1.4( ) .2( ) 1.1( ) .4( ) .2( ) .0( ) .1( ) .3(S)
0. 0. 0. 29. 17. 30. 17.
.0(S) .0(S) .0( ) 3.8(S) .5(S) 1.1( ) 1.3( )

5 30. 79. 46. 0. 0. 79. 76. 75. 73. 70.
66. .0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .8( )
1.0( )

49. 66. 64. 63. 62. 61. 59. 58. 57. 56.
.7( ) .8( ) 2.1( ) 1.5( ) 1.7( ) 1.6( ) 1.6( ) 1.6( ) 1.5( )
1.5( )

11. 48. 13. 0. 29. 0. 0. 0. 0. 30.
1.7(S) 1.4( ) 1.4( ) .2( ) 1.1( ) .4( ) .2( ) .0( ) .1( ) .3(S)
0. 0. 0. 29. 16. 30. 16.
.0(S) .0(S) .0( ) 3.7(S) .4(S) 1.1( ) 1.2( )

5 35. 76. 45. 0. 0. 76. 73. 72. 70. 67.
64. .0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .8( )
.9( )

48. 63. 61. 61. 60. 59. 57. 56. 55. 54.
.7( ) .8( ) 2.1( ) 1.4( ) 1.7( ) 1.6( ) 1.6( ) 1.6( ) 1.5( )
1.5( )

10. 47. 13. 0. 29. 0. 0. 0. 0. 29.
1.7(S) 1.3( ) 1.4( ) .2( ) 1.1( ) .3( ) .2( ) .0( ) .1( ) .3(S)
0. 0. 0. 29. 16. 29. 16.
.0(S) .0(S) .0( ) 3.6(S) .4(S) 1.1( ) 1.2( )

5 40. 73. 44. 0. 0. 73. 70. 69. 68. 65.
62. .0( ) .0( ) .0( ) .0( ) .6( ) .6( ) .6( ) .6( ) .7( )
.9( )

47. 61. 59. 59. 58. 57. 55. 54. 53. 52.
.7( ) .8( ) 2.0( ) 1.4( ) 1.7( ) 1.6( ) 1.6( ) 1.6( ) 1.5( )
1.5( )

10. 46. 12. 0. 29. 0. 0. 0. 0. 29.
1.6(S) 1.3( ) 1.3( ) .2( ) 1.1( ) .3( ) .2( ) .0( ) .1( ) .3(S)

	0. .0(S)	0. .0(S)	0. .0( )	29. 3.5(S)	15. .4(S)	29. 1.1( )	15. 1.2( )		
5 45. 60. .9( )	70. .0( )	43. .0( )	0. .0( )	0. .0( )	70. .6( )	68. .6( )	67. .6( )	65. .6( )	62. .7( )
46. 1.5( )	59. .7( )	57. .8( )	57. 2.0( )	56. 1.4( )	55. 1.6( )	54. 1.6( )	53. 1.6( )	52. 1.6( )	51. 1.5( )
9. 1.5(S)	45. 1.3( )	11. 1.3( )	0. .1( )	29. 1.1( )	0. .3( )	0. .2( )	0. .0( )	0. .0( )	29. .3(S)
	0. .0(S)	0. .0(S)	0. .0( )	28. 3.4(S)	14. .4(S)	29. 1.1( )	14. 1.2( )		
5 50. 58. .9( )	67. .0( )	42. .0( )	0. .0( )	0. .0( )	67. .6( )	65. .6( )	64. .6( )	63. .5( )	60. .7( )
45. 1.5( )	57. .7( )	56. .8( )	55. 2.0( )	54. 1.4( )	54. 1.6( )	52. 1.5( )	51. 1.6( )	51. 1.6( )	50. 1.5( )
9. 1.5(S)	45. 1.3( )	11. 1.3( )	0. .1( )	29. 1.1( )	0. .3( )	0. .2( )	0. .0( )	0. .0( )	29. .3(S)
	0. .0(S)	0. .0(S)	0. .0( )	28. 3.2(S)	13. .4(S)	29. 1.1( )	13. 1.2( )		

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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 10 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
4	167.	(DIRECT FLOW)		0 40.
104	157.	.1	1.2	0 50.
28	155.	2.4		0 55.
103	147.	.1	1.3	1 5.
23	143.	2.3		1 10.
3	289.	(DIRECT FLOW)		1 0.
105	88.	.1	6.3	2 0.
102	210.	.1	12.8	1 35.
24	86.	1.7		2 10.
22	206.	3.9		1 45.
301	118.	.1	1.2	2 10.
201	229.	.1	4.1	1 55.
30	118.	1.9		2 15.
32	229.	3.4		1 55.
2	344.	(DIRECT FLOW)		2 5.
27	173.	2.7		0 40.
21	339.	3.4		2 10.
26	141.	2.4		1 0.
20	339.	3.2		2 15.
25	139.	3.5		1 5.
19	372.	3.2		2 15.
18	486.	3.8		1 15.
17	486.	3.9		1 15.
16	486.	3.7		1 20.
15	514.	4.0		1 20.
152	514.	3.3		1 20.
151	513.	3.9		1 20.

			RR1005Swout	
144	521.	2.9	1	25.
143	521.	2.4	1	25.
142	521.	3.4	1	25.
141	520.	2.6	1	30.
13	519.	1.9	1	35.
12	519.	1.9	1	35.
11	518.	1.9	1	35.
10	518.	1.9	1	40.
1	592.	(DIRECT FLOW)	1	35.

100-YEAR CHUP DATA

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 2      RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYSIS 2005 AMENDMENT
01100-YEAR  100 2.95

 7001015.0RRCSBA001  RED ROCK CANYON SUBBASIN A
0.494 1.61 1.15 11.4 .030      0.35 0.05 4.80.0011 .837
 7001015.0RRCSBB002  RED ROCK CANYON SUBBASIN B
0.225 1.14 0.46 25.7 .040      0.35 0.05 4.57.0015 .696
 7001015.0RRCSBC003  RED ROCK CANYON SUBBASIN C
0.170 0.88 0.44 6.70 .057      0.30 0.05 4.89.0008 .956
 7001015.0RRCSBD004  RED ROCK CANYON SUBBASIN D
0.378 1.30 0.66 8.50 .047      0.30 0.05 4.79.0012 .835
 7001015.0RRCSBE005  RED ROCK CANYON SUBBASIN E
0.241 1.52 0.89 6.01 .048      0.25 0.05 4.79.0012 .831
 7001015.0RRCSBF006  RED ROCK CANYON SUBBASIN F
0.278 1.31 0.62 4.50 .032      0.25 0.05 4.84.0010 .876
 7001015.0RRCSBG007  RED ROCK CANYON SUBBASIN G
0.330 1.03 0.57 9.10 .052      0.30 0.05 4.43.0015 .686
 7001015.0RRCSBH008  RED ROCK CANYON SUBBASIN H
0.316 1.25 0.59 8.80 .040      0.30 0.05 4.68.0014 .742
 7001015.0RRCSBI009  RED ROCK CANYON SUBBASIN I
0.300 1.34 0.79 10.9 .029      0.40 0.05 3.98.0018 .566
 7001015.0RRCSBJ010  RED ROCK CANYON SUBBASIN J
0.289 0.89 0.46 14.0 .022      0.40 0.05 4.54.0017 .636
 7101015.0RRCSBJ015  RED ROCK CANYON SUBBASIN Z
0.089 0.56 0.24 28.0 .028 26.0 0.30 0.05 4.54.0017 .636
 7001015.0RRCSBK011  RED ROCK CANYON SUBBASIN K
0.408 1.13 0.57 19.6 .027      0.35 0.05 4.55.0017 .638
 7001015.0RRCSBL012  RED ROCK CANYON SUBBASIN L
0.384 1.28 0.61 13.6 .041      0.35 0.05 3.79.0018 .553
 7001015.0RRCSBM013  RED ROCK CANYON SUBBASIN M
0.677 2.14 1.46 11.1 .016      0.40 0.05 4.22.0018 .581
 7001015.0RRCSBN014  RED ROCK CANYON SUBBASIN N
0.417 1.14 0.49 11.2 .026      0.35 0.05 3.57.0018 .538
E
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1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBA -- BASIN COMMENT: RED ROCK CANYON SUBBASIN A

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.49	1.61	1.15	11.40	.0300	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.123	.260

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .23

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
25.60	432.36	213.59	26.35

WIDTH AT 50 = 69. MIN. WIDTH AT 75 = 36. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.80 IN./HR. DECAY = .00110/SECOND FNINFL = .84 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	100.	82.	200.	22.
5.	36.	105.	76.	205.	20.
10.	103.	110.	72.	210.	19.
15.	163.	115.	67.	215.	18.
20.	201.	120.	63.	220.	17.
25.	213.	125.	59.	225.	16.
30.	208.	130.	55.	230.	15.
35.	192.	135.	51.	235.	14.
40.	173.	140.	48.	240.	13.
45.	160.	145.	45.	245.	12.
50.	159.	150.	42.	250.	11.
55.	152.	155.	40.	255.	11.
60.	143.	160.	37.	260.	10.
65.	134.	165.	35.	265.	9.
70.	125.	170.	32.	270.	9.
75.	115.	175.	30.	275.	8.
80.	106.	180.	28.	280.	8.
85.	99.	185.	27.	285.	0.
90.	93.	190.	25.	0.	0.
95.	87.	195.	23.	0.	0.

1 BASIN ID: RRCSBA -- BASIN COMMENT: RED ROCK CANYON SUBBASIN A

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)

0.	.00	.000	0.	165.	.00	.000	80.
5.	.03	.000	0.	170.	.00	.000	75.
10.	.09	.002	0.	175.	.00	.000	70.
15.	.14	.003	0.	180.	.00	.000	66.
20.	.24	.008	1.	185.	.00	.000	62.
25.	.41	.066	4.	190.	.00	.000	58.
30.	.74	.608	31.	195.	.00	.000	54.
35.	.41	.315	88.	200.	.00	.000	51.
40.	.24	.148	153.	205.	.00	.000	47.
45.	.18	.102	209.	210.	.00	.000	44.
50.	.15	.072	247.	215.	.00	.000	41.
55.	.12	.046	264.	220.	.00	.000	39.
60.	.12	.049	266.	225.	.00	.000	36.
65.	.12	.051	260.	230.	.00	.000	34.
70.	.06	.005	252.	235.	.00	.000	32.
75.	.06	.005	248.	240.	.00	.000	30.
80.	.04	.001	241.	245.	.00	.000	28.
85.	.04	.001	230.	250.	.00	.000	26.
90.	.04	.001	217.	255.	.00	.000	24.
95.	.04	.001	203.	260.	.00	.000	23.
100.	.04	.001	190.	265.	.00	.000	21.
105.	.04	.001	177.	270.	.00	.000	20.
110.	.04	.001	166.	275.	.00	.000	19.
115.	.04	.001	155.	280.	.00	.000	18.
120.	.04	.001	145.	285.	.00	.000	16.
125.	.00	.000	136.	290.	.00	.000	15.
130.	.00	.000	127.	295.	.00	.000	14.
135.	.00	.000	119.	300.	.00	.000	13.
140.	.00	.000	112.	305.	.00	.000	12.
145.	.00	.000	104.	310.	.00	.000	7.
150.	.00	.000	98.	315.	.00	.000	4.
155.	.00	.000	92.	320.	.00	.000	3.
160.	.00	.000	86.	325.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.490 INCHES
VOLUME OF EXCESS PRECIP = 39.27 ACRE-FEET
PEAK Q = 266. CFS TIME OF PEAK = 60. MIN.
INFILT.= 4.80 IN/HR DECAY = .00110 FNINF = .84 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBB -- BASIN COMMENT: RED ROCK CANYON SUBBASIN B

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.22	1.14	.46	25.70	.0400	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.104	.287

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .14	D= .51

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)

12.38 1117.81 251.51 12.00

WIDTH AT 50 = 27. MIN. WIDTH AT 75 = 14. MIN. K50 = .28 K75 = .38

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.57 IN./HR. DECAY = .00150/SECOND FNINFL = .70 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	40.	94.	80.	22.
5.	127.	45.	78.	85.	19.
10.	240.	50.	65.	90.	15.
15.	241.	55.	55.	95.	13.
20.	197.	60.	46.	100.	11.
25.	166.	65.	38.	105.	9.
30.	136.	70.	32.	110.	8.
35.	112.	75.	27.	115.	0.

1 BASIN ID: RRCSBB -- BASIN COMMENT: RED ROCK CANYON SUBBASIN B

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	90.	.04	.006	109.
5.	.03	.000	0.	95.	.04	.006	93.
10.	.09	.009	1.	100.	.04	.006	79.
15.	.14	.017	4.	105.	.04	.006	68.
20.	.24	.046	12.	110.	.04	.006	59.
25.	.41	.180	40.	115.	.04	.006	51.
30.	.74	.665	144.	120.	.04	.006	44.
35.	.41	.352	261.	125.	.00	.000	38.
40.	.24	.182	315.	130.	.00	.000	32.
45.	.18	.132	315.	135.	.00	.000	25.
50.	.15	.099	300.	140.	.00	.000	17.
55.	.12	.071	276.	145.	.00	.000	12.
60.	.12	.072	251.	150.	.00	.000	9.
65.	.12	.073	230.	155.	.00	.000	6.
70.	.06	.015	206.	160.	.00	.000	5.
75.	.06	.015	178.	165.	.00	.000	4.
80.	.04	.006	151.	170.	.00	.000	3.
85.	.04	.006	129.	175.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.983 INCHES
VOLUME OF EXCESS PRECIP = 23.80 ACRE-FEET
PEAK Q = 315. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.57 IN/HR DECAY = .00150 FNINF = .70 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBC -- BASIN COMMENT: RED ROCK CANYON SUBBASIN C

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)

RR10005Cuout

.17	.88	.44	6.70	.0570	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.138	.232

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .13

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
12.95	851.74	144.80	9.07

WIDTH AT 50 = 35. MIN. WIDTH AT 75 = 18. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.89 IN./HR. DECAY = .00080/SECOND FNINFL = .96 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	50.	57.	100.	16.
5.	69.	55.	50.	105.	14.
10.	136.	60.	44.	110.	13.
15.	141.	65.	39.	115.	11.
20.	119.	70.	35.	120.	10.
25.	107.	75.	31.	125.	9.
30.	98.	80.	27.	130.	8.
35.	86.	85.	24.	135.	0.
40.	73.	90.	21.	0.	0.
45.	65.	95.	19.	0.	0.

1 BASIN ID: RRCSBC -- BASIN COMMENT: RED ROCK CANYON SUBBASIN C

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	85.	.04	.000	60.
5.	.03	.000	0.	90.	.04	.000	53.
10.	.09	.001	0.	95.	.04	.000	46.
15.	.14	.001	0.	100.	.04	.000	41.
20.	.24	.002	0.	105.	.04	.000	36.
25.	.41	.035	3.	110.	.04	.000	32.
30.	.74	.524	41.	115.	.04	.000	28.
35.	.41	.273	95.	120.	.04	.000	25.
40.	.24	.110	123.	125.	.00	.000	22.
45.	.18	.068	125.	130.	.00	.000	20.
50.	.15	.041	120.	135.	.00	.000	17.
55.	.12	.019	114.	140.	.00	.000	15.
60.	.12	.024	104.	145.	.00	.000	13.
65.	.12	.028	95.	150.	.00	.000	12.
70.	.06	.001	86.	155.	.00	.000	10.
75.	.06	.002	77.	160.	.00	.000	5.
80.	.04	.000	67.	165.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.132 INCHES
VOLUME OF EXCESS PRECIP = 10.27 ACRE-FEET
PEAK Q = 125. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.89 IN/HR DECAY = .00080 FNINF = .96 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBD -- BASIN COMMENT: RED ROCK CANYON SUBBASIN D

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.38	1.30	.66	8.50	.0470	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.131	.254

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .08	D= .17

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
17.77	638.72	241.44	20.16

WIDTH AT 50 = 47. MIN. WIDTH AT 75 = 24. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.79 IN./HR. DECAY = .00120/SECOND FNINFL = .83 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	70.	88.	140.	22.
5.	73.	75.	80.	145.	20.
10.	178.	80.	72.	150.	18.
15.	235.	85.	66.	155.	16.
20.	238.	90.	59.	160.	15.
25.	213.	95.	54.	165.	14.
30.	185.	100.	49.	170.	12.
35.	180.	105.	44.	175.	11.
40.	164.	110.	40.	180.	10.
45.	149.	115.	36.	185.	9.
50.	133.	120.	33.	190.	8.
55.	119.	125.	30.	195.	7.
60.	107.	130.	27.	200.	0.
65.	97.	135.	24.	0.	0.

1 BASIN ID: RRCSBD -- BASIN COMMENT: RED ROCK CANYON SUBBASIN D

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)

0.	.00	.000	0.	120.	.04	.000	97.
5.	.03	.000	0.	125.	.00	.000	88.
10.	.09	.001	0.	130.	.00	.000	80.
15.	.14	.002	0.	135.	.00	.000	72.
20.	.24	.007	1.	140.	.00	.000	66.
25.	.41	.097	9.	145.	.00	.000	59.
30.	.74	.629	65.	150.	.00	.000	54.
35.	.41	.319	160.	155.	.00	.000	49.
40.	.24	.151	240.	160.	.00	.000	44.
45.	.18	.104	281.	165.	.00	.000	40.
50.	.15	.073	288.	170.	.00	.000	36.
55.	.12	.047	280.	175.	.00	.000	33.
60.	.12	.049	276.	180.	.00	.000	30.
65.	.12	.050	267.	185.	.00	.000	27.
70.	.06	.004	254.	190.	.00	.000	24.
75.	.06	.004	235.	195.	.00	.000	22.
80.	.04	.000	214.	200.	.00	.000	20.
85.	.04	.000	193.	205.	.00	.000	18.
90.	.04	.000	175.	210.	.00	.000	16.
95.	.04	.000	159.	215.	.00	.000	15.
100.	.04	.000	144.	220.	.00	.000	13.
105.	.04	.000	131.	225.	.00	.000	7.
110.	.04	.000	118.	230.	.00	.000	5.
115.	.04	.000	107.	235.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.541 INCHES
VOLUME OF EXCESS PRECIP = 31.06 ACRE-FEET
PEAK Q = 288. CFS TIME OF PEAK = 50. MIN.
INFILT.= 4.79 IN/HR DECAY = .00120 FNINF = .83 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBE -- BASIN COMMENT: RED ROCK CANYON SUBBASIN E

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.24	1.52	.89	6.01	.0480	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.141	.247

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT) R= .07

FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT) D= .12

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
22.73	469.59	113.17	12.85

WIDTH AT 50 = 64. MIN. WIDTH AT 75 = 33. MIN. K50 = .21 K75 = .29

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .25 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.79 IN./HR. DECAY = .00120/SECOND FNINFL = .83 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	80.	52.	160.	18.
5.	23.	85.	48.	165.	17.
10.	64.	90.	45.	170.	16.
15.	96.	95.	42.	175.	15.
20.	111.	100.	40.	180.	14.
25.	112.	105.	37.	185.	13.
30.	104.	110.	35.	190.	12.
35.	92.	115.	32.	195.	11.
40.	84.	120.	30.	200.	11.
45.	83.	125.	28.	205.	10.
50.	81.	130.	27.	210.	9.
55.	76.	135.	25.	215.	9.
60.	70.	140.	23.	220.	8.
65.	65.	145.	22.	225.	8.
70.	60.	150.	20.	230.	0.
75.	55.	155.	19.	0.	0.

1 BASIN ID: RRCSBE -- BASIN COMMENT: RED ROCK CANYON SUBBASIN E

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	135.	.00	.000	59.
5.	.03	.000	0.	140.	.00	.000	55.
10.	.09	.000	0.	145.	.00	.000	52.
15.	.14	.001	0.	150.	.00	.000	49.
20.	.24	.004	0.	155.	.00	.000	45.
25.	.41	.131	3.	160.	.00	.000	43.
30.	.74	.627	23.	165.	.00	.000	40.
35.	.41	.317	61.	170.	.00	.000	37.
40.	.24	.149	99.	175.	.00	.000	35.
45.	.18	.103	127.	180.	.00	.000	33.
50.	.15	.072	142.	185.	.00	.000	31.
55.	.12	.045	145.	190.	.00	.000	29.
60.	.12	.048	141.	195.	.00	.000	27.
65.	.12	.049	137.	200.	.00	.000	25.
70.	.06	.003	135.	205.	.00	.000	23.
75.	.06	.003	132.	210.	.00	.000	22.
80.	.04	.000	126.	215.	.00	.000	21.
85.	.04	.000	119.	220.	.00	.000	19.
90.	.04	.000	111.	225.	.00	.000	18.
95.	.04	.000	103.	230.	.00	.000	17.
100.	.04	.000	95.	235.	.00	.000	16.
105.	.04	.000	89.	240.	.00	.000	15.
110.	.04	.000	83.	245.	.00	.000	14.
115.	.04	.000	78.	250.	.00	.000	12.
120.	.04	.000	73.	255.	.00	.000	7.
125.	.00	.000	68.	260.	.00	.000	4.
130.	.00	.000	63.	265.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.554 INCHES
VOLUME OF EXCESS PRECIP = 19.97 ACRE-FEET
PEAK Q = 145. CFS TIME OF PEAK = 55. MIN.
INFILT.= 4.79 IN/HR DECAY = .00120 FNINF = .83 IN/HR
MAX.PERV.RET.= .25 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBF -- BASIN COMMENT: RED ROCK CANYON SUBBASIN F

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.28	1.31	.62	4.50	.0320	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.146	.260

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .09

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
20.65	550.75	153.11	14.83

WIDTH AT 50 = 54. MIN. WIDTH AT 75 = 28. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .25 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.84 IN./HR. DECAY = .00100/SECOND FNINFL = .88 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	75.	63.	150.	18.
5.	37.	80.	58.	155.	17.
10.	97.	85.	53.	160.	16.
15.	139.	90.	49.	165.	14.
20.	153.	95.	45.	170.	13.
25.	147.	100.	42.	175.	12.
30.	132.	105.	38.	180.	11.
35.	117.	110.	35.	185.	10.
40.	115.	115.	32.	190.	9.
45.	107.	120.	30.	195.	9.
50.	98.	125.	28.	200.	8.
55.	90.	130.	25.	205.	7.
60.	81.	135.	23.	210.	0.
65.	74.	140.	22.	0.	0.
70.	68.	145.	20.	0.	0.

1 BASIN ID: RRCSBF -- BASIN COMMENT: RED ROCK CANYON SUBBASIN F

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	125.	.00	.000	64.
5.	.03	.000	0.	130.	.00	.000	59.
10.	.09	.000	0.	135.	.00	.000	55.
15.	.14	.001	0.	140.	.00	.000	50.
20.	.24	.001	0.	145.	.00	.000	46.
25.	.41	.076	3.	150.	.00	.000	43.
30.	.74	.606	30.	155.	.00	.000	39.
35.	.41	.297	80.	160.	.00	.000	36.
40.	.24	.133	129.	165.	.00	.000	33.

45.	.18	.088	161.	170.	.00	.000	31.
50.	.15	.059	174.	175.	.00	.000	28.
55.	.12	.035	172.	180.	.00	.000	26.
60.	.12	.038	165.	185.	.00	.000	24.
65.	.12	.041	162.	190.	.00	.000	22.
70.	.06	.001	157.	195.	.00	.000	20.
75.	.06	.001	148.	200.	.00	.000	19.
80.	.04	.000	138.	205.	.00	.000	17.
85.	.04	.000	126.	210.	.00	.000	16.
90.	.04	.000	115.	215.	.00	.000	15.
95.	.04	.000	106.	220.	.00	.000	14.
100.	.04	.000	97.	225.	.00	.000	12.
105.	.04	.000	90.	230.	.00	.000	11.
110.	.04	.000	82.	235.	.00	.000	6.
115.	.04	.000	76.	240.	.00	.000	3.
120.	.04	.000	70.	245.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.378 INCHES
VOLUME OF EXCESS PRECIP = 20.43 ACRE-FEET
PEAK Q = 174. CFS TIME OF PEAK = 50. MIN.
INFILT.= 4.84 IN/HR DECAY = .00100 FNINF = .88 IN/HR
MAX.PERV.RET.= .25 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBG -- BASIN COMMENT: RED ROCK CANYON SUBBASIN G

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.33	1.03	.57	9.10	.0520	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.129	.247

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .08	D= .18

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
14.71	775.73	255.99	17.60

WIDTH AT 50 = 39. MIN. WIDTH AT 75 = 20. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.43 IN./HR. DECAY = .00150/SECOND FNINFL = .69 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	60.	88.	120.	21.
5.	102.	65.	78.	125.	18.
10.	222.	70.	69.	130.	16.
15.	256.	75.	61.	135.	14.

20.	231.	80.	54.	140.	13.
25.	196.	85.	48.	145.	11.
30.	186.	90.	43.	150.	10.
35.	166.	95.	38.	155.	9.
40.	146.	100.	33.	160.	8.
45.	127.	105.	30.	165.	0.
50.	112.	110.	26.	0.	0.
55.	99.	115.	23.	0.	0.

1 BASIN ID: RRCSBG -- BASIN COMMENT: RED ROCK CANYON SUBBASIN G

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	110.	.04	.001	107.
5.	.03	.000	0.	115.	.04	.001	95.
10.	.09	.001	0.	120.	.04	.001	85.
15.	.14	.002	0.	125.	.00	.000	75.
20.	.24	.014	2.	130.	.00	.000	67.
25.	.41	.167	21.	135.	.00	.000	59.
30.	.74	.658	109.	140.	.00	.000	53.
35.	.41	.344	228.	145.	.00	.000	47.
40.	.24	.173	304.	150.	.00	.000	41.
45.	.18	.124	327.	155.	.00	.000	37.
50.	.15	.091	323.	160.	.00	.000	32.
55.	.12	.063	319.	165.	.00	.000	29.
60.	.12	.064	306.	170.	.00	.000	25.
65.	.12	.064	291.	175.	.00	.000	22.
70.	.06	.006	270.	180.	.00	.000	20.
75.	.06	.006	244.	185.	.00	.000	16.
80.	.04	.001	217.	190.	.00	.000	10.
85.	.04	.001	193.	195.	.00	.000	6.
90.	.04	.001	172.	200.	.00	.000	5.
95.	.04	.001	153.	205.	.00	.000	3.
100.	.04	.001	136.	210.	.00	.000	2.
105.	.04	.001	120.	215.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.791 INCHES
VOLUME OF EXCESS PRECIP = 31.53 ACRE-FEET
PEAK Q = 327. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.43 IN/HR DECAY = .00150 FNINF = .69 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBH -- BASIN COMMENT: RED ROCK CANYON SUBBASIN H

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.32	1.25	.59	8.80	.0400	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.130	.246

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED

IMPERVIOUS DRAINAGE
(DEFAULT)
R= .08

RR10005Cuout
TO DRAINAGE SYSTEM
(DEFAULT)
D= .18

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
17.13	645.88	204.10	16.85

WIDTH AT 50 = 46. MIN. WIDTH AT 75 = 24. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.68 IN./HR. DECAY = .00140/SECOND FNINFL = .74 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	81.	130.	23.
5.	65.	70.	74.	135.	21.
10.	155.	75.	67.	140.	19.
15.	200.	80.	61.	145.	17.
20.	199.	85.	55.	150.	15.
25.	175.	90.	50.	155.	14.
30.	153.	95.	45.	160.	13.
35.	150.	100.	41.	165.	11.
40.	137.	105.	37.	170.	10.
45.	124.	110.	34.	175.	9.
50.	111.	115.	30.	180.	9.
55.	99.	120.	28.	185.	8.
60.	90.	125.	25.	190.	0.

1 BASIN ID: RRCSBH -- BASIN COMMENT: RED ROCK CANYON SUBBASIN H

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	120.	.04	.001	91.
5.	.03	.000	0.	125.	.00	.000	82.
10.	.09	.001	0.	130.	.00	.000	75.
15.	.14	.002	0.	135.	.00	.000	68.
20.	.24	.011	1.	140.	.00	.000	62.
25.	.41	.141	11.	145.	.00	.000	56.
30.	.74	.648	67.	150.	.00	.000	51.
35.	.41	.335	153.	155.	.00	.000	46.
40.	.24	.166	223.	160.	.00	.000	42.
45.	.18	.117	256.	165.	.00	.000	38.
50.	.15	.085	261.	170.	.00	.000	34.
55.	.12	.057	254.	175.	.00	.000	31.
60.	.12	.059	252.	180.	.00	.000	28.
65.	.12	.060	246.	185.	.00	.000	25.
70.	.06	.005	234.	190.	.00	.000	23.
75.	.06	.005	217.	195.	.00	.000	21.
80.	.04	.001	197.	200.	.00	.000	19.
85.	.04	.001	178.	205.	.00	.000	17.
90.	.04	.001	162.	210.	.00	.000	15.
95.	.04	.001	147.	215.	.00	.000	9.
100.	.04	.001	134.	220.	.00	.000	5.
105.	.04	.001	121.	225.	.00	.000	4.
110.	.04	.001	110.	230.	.00	.000	3.
115.	.04	.001	100.	235.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.700 INCHES
VOLUME OF EXCESS PRECIP = 28.66 ACRE-FEET
PEAK Q = 261. CFS TIME OF PEAK = 50. MIN.
INFILT.= 4.68 IN/HR DECAY = .00140 FNINF = .74 IN/HR
MAX.PERV.RET.= .30 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBI -- BASIN COMMENT: RED ROCK CANYON SUBBASIN I

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.30	1.34	.79	10.90	.0290	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.241

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
20.43	515.70	154.71	16.00

WIDTH AT 50 = 58. MIN. WIDTH AT 75 = 30. MIN. K50 = .21 K75 = .29

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.98 IN./HR. DECAY = .00180/SECOND FNINFL = .57 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	80.	63.	160.	19.
5.	37.	85.	58.	165.	17.
10.	99.	90.	54.	170.	16.
15.	141.	95.	50.	175.	15.
20.	155.	100.	47.	180.	14.
25.	148.	105.	43.	185.	13.
30.	131.	110.	40.	190.	12.
35.	116.	115.	37.	195.	11.
40.	112.	120.	34.	200.	10.
45.	111.	125.	32.	205.	10.
50.	103.	130.	30.	210.	9.
55.	95.	135.	27.	215.	8.
60.	87.	140.	25.	220.	8.
65.	79.	145.	24.	225.	0.
70.	73.	150.	22.	0.	0.
75.	68.	155.	20.	0.	0.

1 BASIN ID: RRCSBI -- BASIN COMMENT: RED ROCK CANYON SUBBASIN I

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME	INCREMENT RAINFALL	TOTAL* EXCESS	STORM** HYDROGRAPH	TIME	INCREMENT RAINFALL	TOTAL* EXCESS	STORM** HYDROGRAPH

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.54 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	55.	86.	110.	22.
5.	98.	60.	76.	115.	19.
10.	208.	65.	67.	120.	17.
15.	232.	70.	59.	125.	15.
20.	205.	75.	52.	130.	13.
25.	175.	80.	46.	135.	12.
30.	165.	85.	41.	140.	10.
35.	146.	90.	36.	145.	9.
40.	127.	95.	32.	150.	8.
45.	110.	100.	28.	155.	0.
50.	98.	105.	25.	0.	0.

1 BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN J

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	105.	.04	.003	111.
5.	.03	.000	0.	110.	.04	.003	98.
10.	.09	.003	0.	115.	.04	.003	88.
15.	.14	.005	1.	120.	.04	.003	78.
20.	.24	.021	4.	125.	.00	.000	70.
25.	.41	.126	18.	130.	.00	.000	62.
30.	.74	.670	98.	135.	.00	.000	55.
35.	.41	.354	209.	140.	.00	.000	48.
40.	.24	.183	278.	145.	.00	.000	43.
45.	.18	.132	297.	150.	.00	.000	38.
50.	.15	.099	294.	155.	.00	.000	33.
55.	.12	.070	290.	160.	.00	.000	29.
60.	.12	.071	279.	165.	.00	.000	26.
65.	.12	.071	265.	170.	.00	.000	23.
70.	.06	.013	246.	175.	.00	.000	19.
75.	.06	.013	224.	180.	.00	.000	12.
80.	.04	.003	200.	185.	.00	.000	8.
85.	.04	.003	177.	190.	.00	.000	6.
90.	.04	.003	158.	195.	.00	.000	4.
95.	.04	.003	140.	200.	.00	.000	3.
100.	.04	.003	124.	205.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.859 INCHES
VOLUME OF EXCESS PRECIP = 28.65 ACRE-FEET
PEAK Q = 297. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.54 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN Z

AREA LENGTH OF BASIN DIST TO CENTROID IMPERV. AREA SLOPE UNIT DURATION

(SQMI)	(MI)	(MI)	(PCT)	(FT/FT)	(MIN)
.09	.56	.24	28.00	.0280	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.101	.264

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .15	D= .56

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
8.06	26.00	1822.85	162.23	4.75

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 7.97)

WIDTH AT 50 = 16. MIN. WIDTH AT 75 = 9. MIN. K50 = .29 K75 = .40

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .30 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.54 IN./HR. DECAY = .00170/SECOND FNINFL = .64 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	60.	50.	14.
5.	130.	30.	45.	55.	11.
10.	154.	35.	33.	60.	8.
15.	110.	40.	25.	65.	0.
20.	80.	45.	19.	0.	0.

1 BASIN ID: RRCSBJ -- BASIN COMMENT: RED ROCK CANYON SUBBASIN Z

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	70.	.06	.020	74.
5.	.03	.000	0.	75.	.06	.020	58.
10.	.09	.010	1.	80.	.04	.008	45.
15.	.14	.020	4.	85.	.04	.008	34.
20.	.24	.059	12.	90.	.04	.008	23.
25.	.41	.240	44.	95.	.04	.008	16.
30.	.74	.675	134.	100.	.04	.008	12.
35.	.41	.361	184.	105.	.04	.008	10.
40.	.24	.189	179.	110.	.04	.008	8.
45.	.18	.139	159.	115.	.04	.008	7.
50.	.15	.105	138.	120.	.04	.008	6.
55.	.12	.077	118.	125.	.00	.000	4.
60.	.12	.078	102.	130.	.00	.000	3.
65.	.12	.078	90.	135.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TIME (MIN.)	RAINFALL (IN)	EXCESS PRECIP	HYDROGRAPH (CFS)	TIME (MIN.)	RAINFALL (IN)	EXCESS PRECIP	HYDROGRAPH (CFS)
0.	.00	.000	0.	110.	.04	.005	142.
5.	.03	.000	0.	115.	.04	.005	126.
10.	.09	.005	1.	120.	.04	.005	113.
15.	.14	.010	3.	125.	.00	.000	100.
20.	.24	.037	9.	130.	.00	.000	88.
25.	.41	.183	39.	135.	.00	.000	77.
30.	.74	.672	155.	140.	.00	.000	67.
35.	.41	.357	315.	145.	.00	.000	59.
40.	.24	.185	424.	150.	.00	.000	51.
45.	.18	.135	463.	155.	.00	.000	45.
50.	.15	.101	461.	160.	.00	.000	39.
55.	.12	.073	447.	165.	.00	.000	34.
60.	.12	.073	426.	170.	.00	.000	30.
65.	.12	.074	401.	175.	.00	.000	26.
70.	.06	.015	371.	180.	.00	.000	21.
75.	.06	.016	336.	185.	.00	.000	14.
80.	.04	.005	299.	190.	.00	.000	9.
85.	.04	.005	264.	195.	.00	.000	7.
90.	.04	.005	233.	200.	.00	.000	5.
95.	.04	.005	206.	205.	.00	.000	4.
100.	.04	.005	182.	210.	.00	.000	3.
105.	.04	.005	161.	215.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.979 INCHES
VOLUME OF EXCESS PRECIP = 43.07 ACRE-FEET
PEAK Q = 463. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.55 IN/HR DECAY = .00170 FNINF = .64 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBL -- BASIN COMMENT: RED ROCK CANYON SUBBASIN L

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.38	1.28	.61	13.60	.0410	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.120	.254

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .10	D= .27

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
16.24	710.62	272.88	20.48

WIDTH AT 50 = 42. MIN. WIDTH AT 75 = 22. MIN. K50 = .23 K75 = .31

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .35 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 3.79 IN./HR. DECAY = .00180/SECOND FNINFL = .55 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	65.	95.	130.	22.
5.	94.	70.	85.	135.	20.
10.	218.	75.	76.	140.	18.
15.	271.	80.	68.	145.	16.
20.	260.	85.	61.	150.	14.
25.	225.	90.	54.	155.	13.
30.	203.	95.	49.	160.	11.
35.	190.	100.	43.	165.	10.
40.	171.	105.	39.	170.	9.
45.	151.	110.	35.	175.	8.
50.	133.	115.	31.	180.	0.
55.	119.	120.	28.	0.	0.
60.	106.	125.	25.	0.	0.

1 BASIN ID: RRCSBL -- BASIN COMMENT: RED ROCK CANYON SUBBASIN L

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

(MIN.)	INCREMENT (IN)	TOTAL* PRECIP	STORM** (CFS)	(MIN.)	INCREMENT (IN)	TOTAL* PRECIP	STORM** (CFS)
0.	.00	.000	0.	120.	.04	.004	125.
5.	.03	.000	0.	125.	.00	.000	113.
10.	.09	.002	0.	130.	.00	.000	101.
15.	.14	.005	1.	135.	.00	.000	91.
20.	.24	.028	4.	140.	.00	.000	81.
25.	.41	.209	28.	145.	.00	.000	73.
30.	.74	.681	119.	150.	.00	.000	65.
35.	.41	.363	248.	155.	.00	.000	58.
40.	.24	.191	344.	160.	.00	.000	52.
45.	.18	.139	384.	165.	.00	.000	46.
50.	.15	.105	388.	170.	.00	.000	42.
55.	.12	.077	383.	175.	.00	.000	37.
60.	.12	.077	376.	180.	.00	.000	33.
65.	.12	.077	364.	185.	.00	.000	30.
70.	.06	.019	344.	190.	.00	.000	27.
75.	.06	.019	318.	195.	.00	.000	24.
80.	.04	.004	289.	200.	.00	.000	20.
85.	.04	.004	261.	205.	.00	.000	12.
90.	.04	.004	235.	210.	.00	.000	9.
95.	.04	.004	211.	215.	.00	.000	6.
100.	.04	.004	190.	220.	.00	.000	5.
105.	.04	.004	171.	225.	.00	.000	3.
110.	.04	.004	154.	230.	.00	.000	2.
115.	.04	.004	139.	235.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.024 INCHES
VOLUME OF EXCESS PRECIP = 41.45 ACRE-FEET
PEAK Q = 388. CFS TIME OF PEAK = 50. MIN.
INFILT.= 3.79 IN/HR DECAY = .00180 FNINF = .55 IN/HR
MAX.PERV.RET.= .35 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBM -- BASIN COMMENT: RED ROCK CANYON SUBBASIN M

AREA LENGTH OF BASIN DIST TO CENTROID IMPERV. AREA SLOPE UNIT DURATION

(SQMI)	(MI)	(MI)	(PCT)	(FT/FT)	(MIN)
.68	2.14	1.46	11.10	.0160	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.272

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .09	D= .22

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
37.17	301.56	204.16	36.11

WIDTH AT 50 = 99. MIN. WIDTH AT 75 = 52. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .05 IN.
INFILTRATION = 4.22 IN./HR. DECAY = .00180/SECOND FNINFL = .58 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	135.	84.	270.	24.
5.	19.	140.	81.	275.	23.
10.	57.	145.	77.	280.	22.
15.	103.	150.	73.	285.	21.
20.	144.	155.	70.	290.	20.
25.	175.	160.	67.	295.	19.
30.	195.	165.	64.	300.	18.
35.	203.	170.	61.	305.	18.
40.	203.	175.	58.	310.	17.
45.	196.	180.	56.	315.	16.
50.	185.	185.	53.	320.	15.
55.	173.	190.	51.	325.	15.
60.	162.	195.	49.	330.	14.
65.	153.	200.	46.	335.	13.
70.	151.	205.	44.	340.	13.
75.	151.	210.	42.	345.	12.
80.	145.	215.	40.	350.	12.
85.	138.	220.	39.	355.	11.
90.	132.	225.	37.	360.	11.
95.	126.	230.	35.	365.	10.
100.	120.	235.	34.	370.	10.
105.	114.	240.	32.	375.	9.
110.	107.	245.	31.	380.	9.
115.	101.	250.	29.	385.	8.
120.	97.	255.	28.	390.	8.
125.	93.	260.	27.	395.	8.
130.	88.	265.	25.	400.	0.

1 BASIN ID: RRCSBM -- BASIN COMMENT: RED ROCK CANYON SUBBASIN M

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	225.	.00	.000	96.
5.	.03	.000	0.	230.	.00	.000	92.
10.	.09	.002	0.	235.	.00	.000	88.

15.	.14	.003	0.	240.	.00	.000	84.
20.	.24	.016	1.	245.	.00	.000	80.
25.	.41	.142	4.	250.	.00	.000	76.
30.	.74	.677	23.	255.	.00	.000	73.
35.	.41	.360	63.	260.	.00	.000	70.
40.	.24	.187	118.	265.	.00	.000	67.
45.	.18	.136	177.	270.	.00	.000	64.
50.	.15	.102	231.	275.	.00	.000	61.
55.	.12	.073	276.	280.	.00	.000	58.
60.	.12	.074	309.	285.	.00	.000	55.
65.	.12	.074	330.	290.	.00	.000	53.
70.	.06	.015	341.	295.	.00	.000	50.
75.	.06	.016	342.	300.	.00	.000	48.
80.	.04	.003	335.	305.	.00	.000	46.
85.	.04	.003	325.	310.	.00	.000	44.
90.	.04	.003	314.	315.	.00	.000	42.
95.	.04	.003	305.	320.	.00	.000	40.
100.	.04	.003	299.	325.	.00	.000	38.
105.	.04	.003	289.	330.	.00	.000	37.
110.	.04	.003	278.	335.	.00	.000	35.
115.	.04	.003	267.	340.	.00	.000	33.
120.	.04	.003	257.	345.	.00	.000	32.
125.	.00	.000	246.	350.	.00	.000	30.
130.	.00	.000	235.	355.	.00	.000	29.
135.	.00	.000	224.	360.	.00	.000	28.
140.	.00	.000	213.	365.	.00	.000	26.
145.	.00	.000	203.	370.	.00	.000	25.
150.	.00	.000	193.	375.	.00	.000	24.
155.	.00	.000	184.	380.	.00	.000	23.
160.	.00	.000	176.	385.	.00	.000	22.
165.	.00	.000	168.	390.	.00	.000	21.
170.	.00	.000	160.	395.	.00	.000	20.
175.	.00	.000	153.	400.	.00	.000	19.
180.	.00	.000	146.	405.	.00	.000	18.
185.	.00	.000	139.	410.	.00	.000	17.
190.	.00	.000	133.	415.	.00	.000	17.
195.	.00	.000	127.	420.	.00	.000	15.
200.	.00	.000	121.	425.	.00	.000	9.
205.	.00	.000	116.	430.	.00	.000	6.
210.	.00	.000	111.	435.	.00	.000	4.
215.	.00	.000	106.	440.	.00	.000	3.
220.	.00	.000	101.	445.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.901 INCHES
VOLUME OF EXCESS PRECIP = 68.62 ACRE-FEET
PEAK Q = 342. CFS TIME OF PEAK = 75. MIN.
INFILT.= 4.22 IN/HR DECAY = .00180 FNINF = .58 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .05 IN.

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/13/2006 AT TIME 8: 8

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

RED ROCK CANYON DRAINAGE BASIN - 100 YEAR FULL DEVELOPED DRAINAGE ANALYS

BASIN ID: RRCSBN -- BASIN COMMENT: RED ROCK CANYON SUBBASIN N

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.42	1.14	.49	11.20	.0260	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.124	.253

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM

100-YEAR UDSWM DATA

```
   2   1   1   2
   3   4
WATERSHED   1
RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 100 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005
        70  0 0  5.0                                                          1
         1    1
         2    1
         3  144
         4   18
         5   15
         6   18
         7   19
         8   19
         9  301
        10  201
        11   27
        12    3
        13  105
        14    4
        15    3

    0    1    0  0 3
    0    2   21  0 3
    0    3  102  0 3
    0    4  104  0 3
    0   10    1  0 1    40.0  1220.0   0.010     4.0     4.0    .035     8.0
    0   11   10  0 1    40.0   520.0   0.010     4.0     4.0    .035     8.0
    0   12   11  0 1    40.0   800.0   0.010     4.0     4.0    .035     8.0
    0   13   12  0 1    40.0  1580.0   0.010     4.0     4.0    .035     6.0
    0  141   13  0 1    32.0  1510.0   0.015     2.0     2.0    .056     7.5
    0  142  141  0 1    20.0   500.0   0.018     2.0     0.0    .056     9.5
    0  143  142  0 1    32.0   980.0   0.010     3.5     3.5    .044     7.0
    0  144  143  0 1    20.0   670.0   0.017     1.0     1.0    .044     9.5
    0  151  144  0 4     0.1   600.0   0.017     4.0     4.0    .056     3.0
                        50.0   600.0   0.017     4.0     1.5    .056    10.0
    0  152  151  0 4     5.0   410.0   0.017     1.0     8.0    .050     2.5
                        34.5   410.0   0.017     1.0     2.5    .050     6.0
    0   15  152  0 4     0.1  1410.0   0.017     5.0     5.0    .062     1.0
                        11.0  1410.0   0.017     2.0     2.0    .062    12.0
    0   16   15  0 4     0.1   880.0   0.021     5.0     5.0    .062     1.0
                        11.0   880.0   0.021     2.0     2.0    .062    12.0
    0   17   16  0 4     0.1   560.0   0.018     5.0     5.0    .062     1.0
                        11.0   560.0   0.018     2.0     2.0    .062    12.0
    0   18   17  0 4     0.1   620.0   0.019     5.0     5.0    .062     1.0
                        11.0   620.0   0.019     2.0     2.0    .062    12.0
    0   19   18  0 4     0.1  5420.0   0.024     5.0     5.0    .062     1.0
                        11.0  5420.0   0.024     2.0     2.0    .062    12.0
    0   20   19  0 4     0.1   970.0   0.019     5.0     5.0    .062     1.0
                        11.0   970.0   0.019     2.0     2.0    .062    12.0
    0   21   20  0 4     8.0  3890.0   0.015     1.0     1.0    .050     2.5
                        25.0  3890.0   0.015     1.0     2.0    .050    12.0
    0   22  201  0 4     0.1  3400.0   0.014     2.0     3.0    .050     5.0
                       105.0  3400.0   0.014     1.5    15.0    .050    10.0
    0   32    2  0 4     0.1   200.0   0.014     2.0     3.0    .030     5.0
                       105.0   200.0   0.014     1.5    15.0    .030    10.0
    0   23    3  0 4     0.1  2080.0   0.018     8.0     4.0    .050     8.0
                        96.0  2080.0   0.018    15.0    35.0    .050     8.0
    0   24  301  0 1     0.1  2850.0   0.022     5.0    10.0    .050    20.0
    0   30    2  0 1     0.1   300.0   0.022     5.0    10.0    .050    20.0
    0   25   18  0 1     0.1  1340.0   0.029     2.5     1.5    .062    20.0
    0   26   25  0 4     0.1  3680.0   0.024     6.0     6.0    .062     2.5
                        30.0  3680.0   0.024     2.0    10.0    .062    10.0
    0   27   26  0 4     0.1   780.0   0.028     5.0     5.0    .062     3.0
                        30.0   780.0   0.028     2.5     1.5    .062    10.0
    0   28  103  0 4     0.1  1000.0   0.018     8.0     4.0    .050     8.0
                        96.0  1000.0   0.018    15.0    35.0    .050     8.0
    0  301   30  7 2      .1     1.0   0.010       .0      .0    .016     0.1
       0.0     0.0       0.3    29.7             0.8    93.3     1.8    153.7
       3.6   214.1       6.5   255.3            10.8   290.8
    0  102   22 23 2      .1     1.0   0.010       .0      .0    .016     0.1
       0.0     0.0       0.7     2.0             2.1    14.0     3.7     33.0
       5.5    47.0       6.9    75.0             8.7   108.0    10.7    160.0
      12.8   210.0      15.1   244.0            17.5   274.0    20.1    298.0
      22.8   321.0      25.7   341.0            28.8   356.0    31.9    374.0
      35.5   390.0      39.3   408.0            43.3   428.0    47.7    600.0
      49.0  1100.0      50.0  2500.0            51.0  2800.0
    0  103   23  8 2      .1     1.0   0.010       .0      .0    .016     0.1
       0.0     0.0       0.1    20.0             0.5    60.0     1.2    140.0
```

```
                                                    SW10005Amen
      2.2      210.0       3.2      260.0        5.3      300.0       7.0      560.0
  0  104   28  4 2        .1     1.0   0.010       .0        .0      .016       0.1
      0.0        0.0       1.7      220.0        4.1      350.0       5.0      600.0
  0  105   24 13 2        .1     1.0   0.010       .0        .0      .016       0.1
      0.0        0.0       0.1        9.5        0.4       15.3       0.8       19.5
      1.4       22.9       2.3       25.9        3.4       28.5       5.0       31.0
      7.0      118.8       9.5      156.3       15.6      185.5      20.3      210.3
     30.8      232.3
  0  201   32 10 2        .1     1.0   0.010       .0        .0      .016       0.1
      0.0        0.0       0.5       18.5        1.3      109.0       2.4      153.7
      3.9      223.9       5.7      263.6        8.3      298.1      12.3      593.0
     18.2      757.2

  0
 37
  1    2    3    4   10   11   12   13  141  142  143  144  151  152   15   16
 17   18   19   20   21   22   23   24   25   26   27   28  301  102  103  104
 99  105  201   30   32
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 100 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

ONUMBER OF TIME STEPS 70
OINTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 100 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 15 SUBCATCHMENTS

TIME(HR/MIN)		1	2	3	4	5	6	7	8	9
		10	15	11	12	13	14				
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	0.	0.				
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	0.	0.				
0	10.	0.	1.	0.	0.	0.	0.	0.	0.	0.
0.		1.	1.	0.	0.	0.				
0	15.	0.	4.	0.	0.	0.	0.	0.	0.	0.
1.		4.	3.	1.	0.	1.				
0	20.	1.	12.	0.	1.	0.	0.	2.	1.	1.
4.		12.	9.	4.	1.	4.				
0	25.	4.	40.	3.	9.	3.	3.	21.	11.	8.
18.		44.	39.	28.	4.	30.				
0	30.	31.	144.	41.	65.	23.	30.	109.	67.	44.
98.		134.	155.	119.	23.	132.				
0	35.	88.	261.	95.	160.	61.	80.	228.	153.	105.
209.		184.	315.	248.	64.	276.				
0	40.	153.	315.	123.	240.	99.	129.	304.	223.	165.
278.		179.	424.	344.	118.	380.				
0	45.	209.	315.	125.	281.	127.	161.	327.	256.	205.
297.		159.	463.	384.	177.	423.				
0	50.	247.	300.	120.	288.	142.	174.	323.	261.	223.
294.		138.	461.	388.	232.	426.				
0	55.	264.	276.	114.	280.	145.	172.	319.	254.	224.
290.		118.	447.	383.	276.	421.				
1	0.	266.	251.	104.	276.	141.	165.	306.	252.	219.

279.		102.	426.	376.	309.	412.				
1 265.	5.	260.	230.	95.	267.	137.	162.	291.	246.	218.
		90.	401.	364.	330.	398.				
1 246.	10.	252.	206.	86.	254.	135.	157.	270.	234.	219.
		74.	371.	344.	341.	375.				
1 224.	15.	248.	178.	77.	235.	132.	148.	244.	217.	213.
		58.	336.	318.	342.	346.				
1 200.	20.	241.	151.	67.	214.	126.	138.	217.	197.	202.
		45.	299.	289.	335.	314.				
1 177.	25.	230.	129.	60.	193.	119.	126.	193.	178.	188.
		34.	264.	261.	325.	283.				
1 158.	30.	217.	109.	53.	175.	111.	115.	172.	162.	174.
		23.	233.	235.	314.	254.				
1 140.	35.	203.	93.	46.	159.	103.	106.	153.	147.	161.
		16.	206.	211.	305.	228.				
1 124.	40.	190.	79.	41.	144.	95.	97.	136.	134.	150.
		12.	182.	190.	299.	204.				
1 111.	45.	177.	68.	36.	131.	89.	90.	120.	121.	140.
		10.	161.	171.	289.	183.				
1 98.	50.	166.	59.	32.	118.	83.	82.	107.	110.	130.
		8.	142.	154.	278.	164.				
1 88.	55.	155.	51.	28.	107.	78.	76.	95.	100.	121.
		7.	126.	139.	267.	148.				
2 78.	0.	145.	44.	25.	97.	73.	70.	85.	91.	112.
		6.	113.	125.	257.	133.				
2 70.	5.	136.	38.	22.	88.	68.	64.	75.	82.	104.
		4.	100.	113.	246.	119.				
2 62.	10.	127.	32.	20.	80.	63.	59.	67.	75.	97.
		3.	88.	101.	235.	107.				
2 55.	15.	119.	25.	17.	72.	59.	55.	59.	68.	90.
		2.	77.	91.	224.	95.				
2 48.	20.	112.	17.	15.	66.	55.	50.	53.	62.	83.
		2.	67.	81.	213.	85.				
2 43.	25.	104.	12.	13.	60.	52.	46.	47.	56.	77.
		0.	59.	73.	203.	76.				
2 38.	30.	98.	9.	12.	54.	49.	43.	41.	51.	72.
		0.	51.	65.	193.	68.				
2 33.	35.	92.	6.	10.	49.	45.	39.	37.	46.	66.
		0.	45.	58.	184.	61.				

29.	2	40.	86.	5.	5.	44.	43.	36.	32.	42.	62.
			0.	39.	52.	176.	54.				
26.	2	45.	80.	4.	3.	40.	40.	33.	29.	38.	57.
			0.	34.	46.	168.	48.				
23.	2	50.	75.	3.	2.	36.	37.	31.	25.	34.	53.
			0.	30.	42.	160.	43.				
19.	2	55.	70.	2.	0.	33.	35.	28.	22.	31.	49.
			0.	26.	37.	153.	38.				
12.	3	0.	66.	0.	0.	30.	33.	26.	20.	28.	46.
			0.	21.	33.	146.	34.				
8.	3	5.	62.	0.	0.	27.	31.	24.	16.	25.	42.
			0.	14.	30.	139.	31.				
6.	3	10.	58.	0.	0.	24.	29.	22.	10.	23.	39.
			0.	9.	27.	133.	27.				
4.	3	15.	54.	0.	0.	22.	27.	20.	6.	21.	36.
			0.	7.	24.	127.	24.				
3.	3	20.	51.	0.	0.	20.	25.	19.	5.	19.	34.
			0.	5.	20.	121.	22.				
2.	3	25.	47.	0.	0.	18.	23.	17.	3.	17.	31.
			0.	4.	13.	116.	18.				
1.	3	30.	44.	0.	0.	16.	22.	16.	2.	15.	29.
			0.	3.	9.	111.	11.				
0.	3	35.	41.	0.	0.	15.	21.	15.	1.	9.	27.
			0.	2.	6.	106.	8.				
0.	3	40.	39.	0.	0.	13.	19.	14.	0.	5.	25.
			0.	0.	5.	101.	6.				
0.	3	45.	36.	0.	0.	7.	18.	12.	0.	4.	23.
			0.	0.	3.	96.	4.				
0.	3	50.	34.	0.	0.	5.	17.	11.	0.	3.	21.
			0.	0.	2.	92.	3.				
0.	3	55.	32.	0.	0.	3.	16.	6.	0.	2.	20.
			0.	0.	2.	88.	2.				
0.	4	0.	30.	0.	0.	2.	15.	3.	0.	0.	18.
			0.	0.	0.	84.	0.				
0.	4	5.	28.	0.	0.	0.	14.	2.	0.	0.	16.
			0.	0.	0.	80.	0.				
0.	4	10.	26.	0.	0.	0.	12.	1.	0.	0.	10.
			0.	0.	0.	76.	0.				
0.	4	15.	24.	0.	0.	0.	7.	0.	0.	0.	7.
			0.	0.	0.	73.	0.				

4	20.	23.	0.	0.	0.	4.	0.	0.	0.	5.
0.		0.	0.	0.	70.	0.				
4	25.	21.	0.	0.	0.	3.	0.	0.	0.	4.
0.		0.	0.	0.	67.	0.				
4	30.	20.	0.	0.	0.	2.	0.	0.	0.	3.
0.		0.	0.	0.	64.	0.				
4	35.	19.	0.	0.	0.	0.	0.	0.	0.	2.
0.		0.	0.	0.	61.	0.				
4	40.	18.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	58.	0.				
4	45.	16.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	55.	0.				
4	50.	15.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	53.	0.				
4	55.	14.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	50.	0.				
5	0.	13.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	48.	0.				
5	5.	12.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	46.	0.				
5	10.	7.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	44.	0.				
5	15.	4.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	42.	0.				
5	20.	3.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	40.	0.				
5	25.	2.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	38.	0.				
5	30.	1.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	37.	0.				
5	35.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	35.	0.				
5	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	33.	0.				
5	45.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	32.	0.				
5	50.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.		0.	0.	0.	30.	0.				

1

RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 100 YEAR DEVELOPED
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OVERBANK/SURCHARGE GUTTER MANNING NUMBER N	GUTTER DEPTH CONNECTION (FT)	NDP JK	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R
1	0	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
2	21	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
3	102	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
4	104	0	3		.0	0.	.0010	.0	.0
.001	10.00	0							
10	1	0	1	CHANNEL	40.0	1220.	.0100	4.0	4.0
.035	8.00	0							
11	10	0	1	CHANNEL	40.0	520.	.0100	4.0	4.0
.035	8.00	0							
12	11	0	1	CHANNEL	40.0	800.	.0100	4.0	4.0
.035	8.00	0							
13	12	0	1	CHANNEL	40.0	1580.	.0100	4.0	4.0
.035	6.00	0							
141	13	0	1	CHANNEL	32.0	1510.	.0150	2.0	2.0
.056	7.50	0							
142	141	0	1	CHANNEL	20.0	500.	.0180	2.0	.0
.056	9.50	0							
143	142	0	1	CHANNEL	32.0	980.	.0100	3.5	3.5
.044	7.00	0							
144	143	0	1	CHANNEL	20.0	670.	.0170	1.0	1.0
.044	9.50	0							
151	144	0	4	CHANNEL	.1	600.	.0170	4.0	4.0
.056	3.00	0							
				OVERFLOW	50.0	600.	.0170	4.0	1.5
.056	10.00								
152	151	0	4	CHANNEL	5.0	410.	.0170	1.0	8.0
.050	2.50	0							
				OVERFLOW	34.5	410.	.0170	1.0	2.5
.050	6.00								
15	152	0	4	CHANNEL	.1	1410.	.0170	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	1410.	.0170	2.0	2.0
.062	12.00								
16	15	0	4	CHANNEL	.1	880.	.0210	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	880.	.0210	2.0	2.0
.062	12.00								
17	16	0	4	CHANNEL	.1	560.	.0180	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	560.	.0180	2.0	2.0
.062	12.00								
18	17	0	4	CHANNEL	.1	620.	.0190	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	620.	.0190	2.0	2.0
.062	12.00								
19	18	0	4	CHANNEL	.1	5420.	.0240	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	5420.	.0240	2.0	2.0
.062	12.00								
20	19	0	4	CHANNEL	.1	970.	.0190	5.0	5.0
.062	1.00	0							
				OVERFLOW	11.0	970.	.0190	2.0	2.0
.062	12.00								
21	20	0	4	CHANNEL	8.0	3890.	.0150	1.0	1.0
.050	2.50	0							
				OVERFLOW	25.0	3890.	.0150	1.0	2.0
.050	12.00								
22	201	0	4	CHANNEL	.1	3400.	.0140	2.0	3.0
.050	5.00	0							
				OVERFLOW	105.0	3400.	.0140	1.5	15.0
.050	10.00								
32	2	0	4	CHANNEL	.1	200.	.0140	2.0	3.0
.030	5.00	0							

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                                                    RR10005Swout
                                                     OVERFLOW     105.0      200.     .0140      1.5  15.0
.030       10.00
   23            3          0          4      CHANNEL             .1      2080.     .0180      8.0   4.0
.050        8.00          0
                                                     OVERFLOW      96.0      2080.     .0180     15.0  35.0
.050        8.00
   24          301          0          1      CHANNEL             .1      2850.     .0220      5.0  10.0
.050       20.00          0
   30            2          0          1      CHANNEL             .1       300.     .0220      5.0  10.0
.050       20.00          0
   25           18          0          1      CHANNEL             .1      1340.     .0290      2.5   1.5
.062       20.00          0
   26           25          0          4      CHANNEL             .1      3680.     .0240      6.0   6.0
.062        2.50          0
                                                     OVERFLOW      30.0      3680.     .0240      2.0  10.0
.062       10.00
   27           26          0          4      CHANNEL             .1       780.     .0280      5.0   5.0
.062        3.00          0
                                                     OVERFLOW      30.0       780.     .0280      2.5   1.5
.062       10.00
   28          103          0          4      CHANNEL             .1      1000.     .0180      8.0   4.0
.050        8.00          0
                                                     OVERFLOW      96.0      1000.     .0180     15.0  35.0
.050        8.00
  301           30          7          2      PIPE                .1         1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0       .0        .3     29.7        .8     93.3       1.8    153.7       3.6
214.1        6.5    255.3
                         10.8    290.8
  102           22          23          2      PIPE                .1         1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0       .0        .7      2.0        2.1     14.0       3.7     33.0       5.5
47.0         6.9     75.0
                         8.7     108.0      10.7    160.0       12.8    210.0      15.1    244.0      17.5
274.0       20.1    298.0
                        22.8     321.0      25.7    341.0       28.8    356.0      31.9    374.0      35.5
390.0       39.3    408.0
                        43.3     428.0      47.7    600.0       49.0   1100.0      50.0   2500.0      51.0
2800.0
  103           23          8          2      PIPE                .1         1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0       .0        .1     20.0        .5     60.0       1.2    140.0       2.2
210.0        3.2    260.0
                         5.3     300.0       7.0    560.0
  104           28          4          2      PIPE                .1         1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0       .0       1.7    220.0        4.1    350.0       5.0    600.0
  105           24         13          2      PIPE                .1         1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0       .0        .1      9.5        .4     15.3        .8     19.5       1.4
22.9         2.3     25.9
                         3.4      28.5       5.0     31.0        7.0    118.8       9.5    156.3      15.6
185.5       20.3    210.3
                        30.8     232.3
  201           32          10          2      PIPE                .1         1.     .0100       .0   .0
.016         .10          0
                    RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                          .0       .0        .5     18.5        1.3    109.0       2.4    153.7       3.9
223.9        5.7     263.6
                         8.3     298.1      12.3    593.0       18.2    757.2        .0      .0
0TOTAL NUMBER OF GUTTERS/PIPES,  36
1
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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 100 YEAR DEVELOPED
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ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE D.A.(AC)	TRIBUTARY SUBAREA

0	10	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2737.3																			
0	11	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2737.3																			
0	12	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2737.3																			
0	13	0	141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2737.3																			
0	15	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
	0		0	2628.5																			
0	16	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2474.2																			
0	17	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2474.2																			
0	18	0	19	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6	0	0
	0		0	2474.2																			
0	19	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	8	0	0
	0		0	1793.3																			
0	20	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	1379.8																			
0	21	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	1379.8																			
0	22	0	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	569.6																			
0	23	0	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	266.9																			
0	24	0	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	433.3																			
0	25	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	261.1																			
0	26	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	261.1																			
0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0
	0		0	261.1																			
0	28	0	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	266.9																			
0	30	0	301	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	625.3																			
0	32	0	201	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	754.6																			
0	102	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	569.6																			
0	103	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	266.9																			
0	104	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	266.9																			
0	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0
	0		0	433.3																			
0	141	0	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2737.3																			
0	142	0	143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0		0	2737.3																			
	143		144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

```
    0    0    0    0  2737.3

        144        151     0    0    0    0    0    0    0    0              3    0    0    0    0    0
    0    0    0    0  2737.3

        151        152     0    0    0    0    0    0    0    0              0    0    0    0    0    0
    0    0    0    0  2628.5

        152         15     0    0    0    0    0    0    0    0              0    0    0    0    0    0
    0    0    0    0  2628.5

        201         22     0    0    0    0    0    0    0    0             10    0    0    0    0    0
    0    0    0    0   754.6

        301         24     0    0    0    0    0    0    0    0              9    0    0    0    0    0
    0    0    0    0   625.3
1
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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 100 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 37 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
(D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
(O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

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TIME(HR/MIN)      1         2         3         4        10        11        12        13       141
142
                143       144       151       152        15        16        17        18        19
 20
                 21        22        23        24        25        26        27        28       301
102
                103       104        99       105       201        30        32
   0    5.       0.        0.        0.        0.        0.        0.        0.        0.        0.
 0.
                 .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )
  .0( )
                  0.        0.        0.        0.        0.        0.        0.        0.        0.
 0.
                  .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )
  .0( )
                  0.        0.        0.        0.        0.        0.        0.        0.        0.
 0.
                  .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0(S)
  .0(S)
                  0.        0.        0.        0.        0.        0.        0.
                  .0(S)     .0(S)     .0( )     .0(S)     .0(S)     .0( )     .0( )
   0   10.       1.        0.        2.        0.        0.        0.        0.        0.        0.
 0.
                  .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )
  .0( )
                  0.        0.        0.        0.        0.        0.        0.        0.        0.
 0.
                  .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .1( )     .0( )
  .0( )
                  0.        0.        0.        0.        0.        0.        0.        0.        0.
 0.
                  .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .1( )     .0( )     .0(S)
  .0(S)
                  0.        0.        0.        0.        0.        0.        0.
                  .0(S)     .0(S)     .0( )     .0(S)     .0(S)     .0( )     .1( )
```

0 15.	5.	0.	5.	1.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.1( )	.1( )
.0(S)	0.	0.	0.	0.	0.	0.	1.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.3( )	.1( )	.0(S)
	0.	0.	0.	0.	0.	0.	0.		
	.0(S)	.0(S)	.0( )	.0(S)	.0(S)	.1( )	.2( )		
0 20.	13.	1.	16.	4.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.1( )	.0( )	.1( )	.3( )	.2( )
.1(S)	0.	0.	0.	0.	0.	0.	4.	0.	0.
	.0( )	.1( )	.0( )	.0( )	.1( )	.2( )	.6( )	.2( )	.0(S)
	0.	1.	0.	0.	1.	0.	0.		
	.0(S)	.0(S)	.0( )	.0(S)	.0(S)	.2( )	.3( )		
0 25.	44.	4.	71.	30.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	0.	0.	0.	0.	0.	0.	1.	5.	2.
0.	.0( )	.0( )	.0( )	.0( )	.3( )	.2( )	.5( )	.7( )	.5( )
1.	0.	0.	0.	0.	0.	1.	19.	3.	3.
.4(S)	.0( )	.2( )	.1( )	.1( )	.3( )	.4( )	1.2( )	.5( )	.0(S)
	1.	11.	0.	1.	3.	1.	2.		
	.0(S)	.1(S)	.0( )	.0(S)	.1(S)	.3( )	.6( )		
0 30.	175.	22.	254.	132.	0.	0.	0.	0.	0.
0.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.0( )	1.	16.	0.	2.	6.	6.	24.	56.	15.
0.	.1( )	.4( )	.3( )	.2( )	.8( )	.8( )	1.3( )	1.6( )	1.1( )
.2( )	1.	1.	1.	1.	3.	11.	93.	21.	15.
9.	.1( )	.4( )	.4( )	.3( )	.8( )	.9( )	2.1( )	1.1( )	.1(S)
1.5(S)	10.	54.	0.	7.	16.	9.	13.		
	.1(S)	.4(S)	.0( )	.1(S)	.4(S)	.7( )	1.1( )		
0 35.	349.	118.	439.	276.	0.	0.	0.	0.	0.
7.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
.3( )	22.	77.	10.	25.	42.	77.	172.	251.	67.
3.									

.6( )	.4( )	.9( )	1.1( )	1.0( )	1.5( )	1.8( )	2.5( )	2.9( )	1.6( )
33.	15.	4.	7.	2.	20.	53.	246.	85.	49.
3.7(S)	.7( )	.9( )	.8( )	.4( )	1.7( )	1.6( )	3.0( )	1.9( )	.5(S)
	36.	147.	0.	13.	90.	38.	80.		
	.3(S)	1.1(S)	.0( )	.3(S)	1.1(S)	1.3( )	2.3( )		
0 40.	468.	231.	551.	380.	0.	0.	0.	0.	9.
68.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.2( )
1.0( )									
25.	105.	187.	101.	170.	227.	348.	483.	558.	186.
1.3( )	1.0( )	1.6( )	2.5( )	2.3( )	2.8( )	3.2( )	3.8( )	4.1( )	2.4( )
72.	69.	16.	29.	6.	79.	140.	377.	185.	99.
6.8(S)	1.7( )	1.5( )	1.3( )	.6( )	2.8( )	2.4( )	3.4( )	2.6( )	.9(S)
	89.	240.	0.	20.	141.	89.	142.		
	.8(S)	2.1(S)	.0( )	.8(S)	2.1(S)	1.7( )	2.8( )		
0 45.	524.	310.	618.	423.	0.	0.	1.	12.	82.
240.	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.1( )	.2( )	.9( )
2.1( )									
92.	289.	416.	359.	517.	615.	725.	827.	890.	340.
1.9( )	1.7( )	2.5( )	3.6( )	3.3( )	4.3( )	4.5( )	4.9( )	5.0( )	3.1( )
143.	147.	46.	75.	10.	172.	228.	454.	264.	131.
10.1(S)	2.6( )	2.2( )	1.8( )	.7( )	3.8( )	2.7( )	3.6( )	2.9( )	1.4(S)
	158.	291.	0.	24.	188.	128.	182.		
	1.5(S)	3.0(S)	.0( )	1.7(S)	3.1(S)	2.0( )	3.1( )		
0 50.	547.	386.	662.	426.	1.	15.	44.	121.	331.
592.	.0( )	.0( )	.0( )	.0( )	.0( )	.2( )	.4( )	.8( )	2.0( )
3.6( )									
173.	673.	877.	858.	986.	1030.	1053.	1130.	1175.	492.
2.4( )	2.8( )	4.0( )	4.5( )	4.1( )	5.5( )	5.3( )	5.7( )	5.7( )	3.6( )
216.	207.	97.	135.	14.	266.	312.	463.	313.	160.
13.2(S)	2.9( )	3.0( )	2.3( )	.9( )	4.5( )	3.0( )	3.6( )	3.1( )	2.0(S)
	208.	333.	0.	27.	231.	154.	231.		
	2.2(S)	3.8(S)	.0( )	2.9(S)	4.2(S)	2.1( )	3.4( )		
0 55.	598.	430.	693.	421.	58.	207.	315.	481.	799.
1099.	.0( )	.0( )	.0( )	.0( )	.5( )	1.1( )	1.4( )	1.8( )	3.3( )
5.2( )									
247.	1173.	1326.	1253.	1303.	1341.	1303.	1353.	1383.	620.
2.8( )	3.8( )	5.0( )	5.0( )	4.6( )	6.2( )	5.8( )	6.2( )	6.2( )	4.0( )
259.	283.	157.	191.	19.	341.	370.	452.	361.	176.
16.3(S)	3.2( )	3.6( )	2.6( )	1.0( )	4.9( )	3.1( )	3.6( )	3.3( )	2.5(S)

	247.	385.	0.	30.	258.	175.	255.			
	2.9(S)	4.2(S)	.0( )	4.5(S)	5.4(S)	2.2( )	3.5( )			
1 0.	948.	467.	712.	412.	431.	745.	861.	1020.	1288.	1474.
	.0( )	.0( )	.0( )	.0( )	1.7( )	2.3( )	2.5( )	2.8( )	4.3( )	6.2( )
	1503.	1563.	1487.	1533.	1550.	1475.	1509.	1529.	723.	323.
	4.3( )	5.5( )	5.3( )	4.8( )	6.7( )	6.2( )	6.5( )	6.4( )	4.3( )	3.2( )
	352.	211.	234.	31.	386.	400.	434.	403.	191.	290.
	3.5( )	4.0( )	2.8( )	1.2( )	5.2( )	3.2( )	3.5( )	3.4( )	2.9(S)	19.2(S)
	271.	416.	0.	79.	278.	188.	278.			
	3.8(S)	4.3(S)	.0( )	6.1(S)	6.8(S)	2.3( )	3.6( )			
1 5.	1561.	500.	717.	398.	1071.	1297.	1361.	1447.	1581.	1661.
	.0( )	.0( )	.0( )	.0( )	2.8( )	3.1( )	3.2( )	3.3( )	4.8( )	6.7( )
	1680.	1730.	1652.	1672.	1686.	1593.	1615.	1628.	806.	388.
	4.6( )	5.9( )	5.5( )	5.0( )	6.9( )	6.4( )	6.7( )	6.6( )	4.5( )	3.4( )
	412.	255.	264.	58.	406.	409.	410.	411.	206.	315.
	3.7( )	4.3( )	2.9( )	1.5( )	5.3( )	3.2( )	3.5( )	3.5( )	3.4(S)	22.0(S)
	288.	405.	0.	128.	299.	204.	296.			
	4.7(S)	4.3(S)	.0( )	7.6(S)	8.3(S)	2.4( )	3.7( )			
1 10.	1973.	601.	705.	375.	1515.	1607.	1635.	1671.	1735.	1789.
	.0( )	.0( )	.0( )	.0( )	3.4( )	3.5( )	3.6( )	3.6( )	5.1( )	6.9( )
	1802.	1827.	1749.	1767.	1773.	1665.	1676.	1682.	869.	452.
	4.8( )	6.1( )	5.6( )	5.1( )	7.1( )	6.6( )	6.8( )	6.7( )	4.7( )	3.7( )
	477.	290.	287.	92.	407.	404.	383.	395.	219.	334.
	3.9( )	4.5( )	3.0( )	1.7( )	5.3( )	3.2( )	3.4( )	3.4( )	3.9(S)	24.7(S)
	311.	387.	0.	148.	392.	217.	384.			
	5.4(S)	4.2(S)	.0( )	9.0(S)	9.6(S)	2.4( )	4.1( )			
1 15.	2139.	678.	696.	346.	1714.	1755.	1770.	1792.	1832.	1861.
	.0( )	.0( )	.0( )	.0( )	3.7( )	3.7( )	3.7( )	3.8( )	5.2( )	7.1( )
	1866.	1880.	1809.	1814.	1818.	1694.	1697.	1697.	918.	528.
	4.9( )	6.2( )	5.7( )	5.2( )	7.2( )	6.6( )	6.8( )	6.8( )	4.8( )	4.0( )
	558.	316.	320.	120.	396.	388.	350.	373.	228.	348.
	4.1( )	4.6( )	3.1( )	1.9( )	5.2( )	3.2( )	3.3( )	3.3( )	4.6(S)	27.2(S)
	361.	361.	0.	160.	451.	227.	451.			
	5.7(S)	4.1(S)	.0( )	10.2(S)	10.4(S)	2.4( )	4.4( )			
1 20.	2208.	719.	683.	314.	1815.	1840.	1849.	1861.	1879.	1890.
	.0( )	.0( )	.0( )	.0( )	3.8( )	3.8( )	3.8( )	3.8( )	5.3( )	

7.2( )

606.

4.2( )

360.

29.5(S)

1 25. 1887.

7.2( )

669.

4.4( )

372.

31.6(S)

1 30. 1859.

7.1( )

714.

4.5( )

380.

33.3(S)

1 35. 1820.

7.0( )

744.

4.6( )

386.

34.6(S)

1 40. 1772.

6.9( )

761.

4.7( )

1892.	1894.	1825.	1825.	1824.	1695.	1692.	1690.	960.
4.9( )	6.2( )	5.7( )	5.2( )	7.2( )	6.6( )	6.8( )	6.8( )	4.9( )
631.	336.	348.	140.	376.	365.	315.	352.	238.
4.3( )	4.7( )	3.3( )	2.0( )	5.1( )	3.1( )	3.2( )	3.3( )	5.3(S)
362.	344.	0.	166.	486.	237.	482.		
5.7(S)	4.0(S)	.0( )	11.5(S)	10.8(S)	2.5( )	4.5( )		
2229.	753.	648.	283.	1871.	1881.	1883.	1886.	1889.
.0( )	.0( )	.0( )	.0( )	3.8( )	3.9( )	3.9( )	3.9( )	5.3( )
1883.	1877.	1814.	1809.	1807.	1678.	1673.	1669.	994.
4.9( )	6.2( )	5.7( )	5.2( )	7.1( )	6.6( )	6.8( )	6.7( )	5.0( )
687.	351.	353.	154.	351.	338.	280.	336.	248.
4.4( )	4.8( )	3.3( )	2.1( )	5.0( )	3.0( )	3.1( )	3.2( )	6.0(S)
350.	330.	0.	171.	505.	247.	506.		
5.6(S)	3.7(S)	.0( )	12.6(S)	11.1(S)	2.5( )	4.6( )		
2211.	766.	603.	254.	1885.	1884.	1883.	1880.	1871.
.0( )	.0( )	.0( )	.0( )	3.9( )	3.9( )	3.9( )	3.9( )	5.3( )
1855.	1845.	1786.	1780.	1776.	1651.	1644.	1638.	1018.
4.8( )	6.1( )	5.6( )	5.1( )	7.1( )	6.5( )	6.7( )	6.7( )	5.1( )
726.	364.	346.	163.	323.	309.	249.	319.	256.
4.5( )	4.9( )	3.2( )	2.2( )	4.8( )	3.0( )	3.0( )	3.1( )	6.6(S)
335.	310.	0.	176.	513.	255.	511.		
5.5(S)	3.4(S)	.0( )	13.6(S)	11.2(S)	2.6( )	4.6( )		
2167.	777.	560.	228.	1871.	1863.	1859.	1852.	1837.
.0( )	.0( )	.0( )	.0( )	3.8( )	3.8( )	3.8( )	3.8( )	5.3( )
1815.	1801.	1748.	1740.	1735.	1615.	1606.	1599.	1032.
4.8( )	6.0( )	5.6( )	5.1( )	7.0( )	6.5( )	6.7( )	6.6( )	5.1( )
751.	374.	332.	170.	295.	281.	218.	299.	260.
4.5( )	4.9( )	3.2( )	2.2( )	4.7( )	2.9( )	2.9( )	3.1( )	7.1(S)
317.	289.	0.	180.	515.	260.	517.		
5.4(S)	3.0(S)	.0( )	14.5(S)	11.2(S)	2.6( )	4.6( )		
2108.	776.	518.	204.	1839.	1827.	1821.	1812.	1793.
.0( )	.0( )	.0( )	.0( )	3.8( )	3.8( )	3.8( )	3.8( )	5.2( )
1766.	1751.	1702.	1693.	1687.	1571.	1560.	1552.	1034.
4.7( )	5.9( )	5.5( )	5.0( )	6.9( )	6.4( )	6.6( )	6.5( )	5.1( )

391.	765.	382.	316.	176.	267.	253.	191.	277.	264.	
35.7(S)	4.6( )	5.0( )	3.1( )	2.2( )	4.5( )	2.8( )	2.8( )	3.0( )	7.6(S)	
	299.	266.	0.	184.	513.	264.	512.			
	5.3(S)	2.5(S)	.0( )	15.3(S)	11.2(S)	2.6( )	4.6( )			
1 45.	2042.	777.	484.	183.	1797.	1781.	1775.	1764.	1742.	
1719.	.0( )	.0( )	.0( )	.0( )	3.8( )	3.7( )	3.7( )	3.7( )	5.1( )	
6.8( )										
770.	1711.	1694.	1649.	1639.	1632.	1520.	1507.	1498.	1028.	
4.7( )	4.6( )	5.8( )	5.5( )	5.0( )	6.8( )	6.3( )	6.5( )	6.4( )	5.1( )	
394.	771.	388.	303.	181.	241.	228.	169.	254.	268.	
36.4(S)	4.6( )	5.0( )	3.1( )	2.2( )	4.3( )	2.7( )	2.6( )	2.9( )	8.0(S)	
	295.	243.	0.	188.	509.	267.	510.			
	5.1(S)	2.1(S)	.0( )	16.0(S)	11.2(S)	2.6( )	4.6( )			
1 50.	1971.	772.	458.	164.	1747.	1729.	1722.	1710.	1685.	
1659.	.0( )	.0( )	.0( )	.0( )	3.7( )	3.7( )	3.7( )	3.7( )	5.0( )	
6.6( )										
773.	1651.	1633.	1591.	1580.	1573.	1465.	1451.	1442.	1014.	
4.7( )	4.6( )	5.7( )	5.4( )	4.9( )	6.7( )	6.2( )	6.4( )	6.3( )	5.0( )	
397.	773.	390.	296.	185.	217.	205.	150.	232.	270.	
36.9(S)	4.6( )	5.0( )	3.1( )	2.3( )	4.2( )	2.7( )	2.5( )	2.8( )	8.3(S)	
	289.	221.	0.	191.	502.	270.	502.			
	4.7(S)	1.7(S)	.0( )	16.7(S)	11.1(S)	2.6( )	4.5( )			
1 55.	1897.	768.	434.	148.	1691.	1672.	1664.	1650.	1624.	
1596.	.0( )	.0( )	.0( )	.0( )	3.6( )	3.6( )	3.6( )	3.6( )	4.9( )	
6.5( )										
772.	1588.	1568.	1531.	1519.	1512.	1409.	1395.	1386.	997.	
4.7( )	4.5( )	5.6( )	5.4( )	4.8( )	6.6( )	6.1( )	6.3( )	6.2( )	5.0( )	
398.	771.	391.	288.	189.	196.	185.	133.	202.	273.	
37.3(S)	4.6( )	5.0( )	3.0( )	2.3( )	4.0( )	2.6( )	2.4( )	2.7( )	8.6(S)	
	280.	182.	0.	194.	495.	272.	496.			
	4.3(S)	1.4(S)	.0( )	17.2(S)	11.0(S)	2.6( )	4.5( )			
2 0.	1821.	761.	410.	133.	1632.	1611.	1602.	1588.	1561.	
1532.	.0( )	.0( )	.0( )	.0( )	3.6( )	3.5( )	3.5( )	3.5( )	4.8( )	
6.3( )										
769.	1524.	1504.	1470.	1458.	1451.	1354.	1340.	1331.	977.	
4.7( )	4.4( )	5.4( )	5.3( )	4.8( )	6.5( )	6.0( )	6.1( )	6.0( )	5.0( )	
399.	768.	393.	279.	192.	178.	168.	119.	171.	275.	
37.4(S)	4.6( )	5.0( )	3.0( )	2.3( )	3.9( )	2.5( )	2.3( )	2.5( )	8.8(S)	
	269.	157.	0.	197.	487.	274.	487.			
	3.6(S)	1.2(S)	.0( )	17.7(S)	10.9(S)	2.6( )	4.5( )			

740.
4.6( )
3.9( ) 4.8( ) 5.0( ) 4.4( ) 5.9( ) 5.4( ) 5.6( ) 5.5( ) 4.7( )

388.
35.0(S)
737. 394. 159. 201. 98. 90. 63. 94. 279.
4.5( ) 5.0( ) 2.4( ) 2.3( ) 3.1( ) 2.0( ) 1.8( ) 2.0( ) 9.3(S)

130. 87. 0. 202. 450. 279. 450.
1.1(S) .7(S) .0( ) 18.7(S) 10.4(S) 2.6( ) 4.4( )

2 30. 1382. 722. 200. 68. 1275. 1256. 1248. 1235. 1211.
1187.
5.5( )
.0( ) .0( ) .0( ) .0( ) 3.1( ) 3.1( ) 3.1( ) 3.1( ) 4.2( )

733.
4.6( )
1180. 1164. 1145. 1136. 1130. 1062. 1052. 1045. 854.
3.8( ) 4.7( ) 4.9( ) 4.3( ) 5.7( ) 5.3( ) 5.5( ) 5.4( ) 4.7( )

383.
33.9(S)
731. 392. 135. 201. 87. 80. 55. 84. 278.
4.5( ) 5.0( ) 2.3( ) 2.3( ) 2.9( ) 1.9( ) 1.7( ) 1.9( ) 9.3(S)

107. 78. 0. 202. 443. 278. 443.
.9(S) .6(S) .0( ) 18.7(S) 10.3(S) 2.6( ) 4.3( )

2 35. 1321. 715. 172. 61. 1223. 1205. 1197. 1186. 1163.
1141.
5.3( )
.0( ) .0( ) .0( ) .0( ) 3.0( ) 3.0( ) 3.0( ) 3.0( ) 4.1( )

726.
4.6( )
1134. 1119. 1102. 1093. 1088. 1024. 1015. 1009. 836.
3.7( ) 4.6( ) 4.8( ) 4.3( ) 5.6( ) 5.2( ) 5.4( ) 5.3( ) 4.6( )

377.
32.5(S)
724. 390. 114. 202. 77. 71. 48. 75. 278.
4.5( ) 5.0( ) 2.1( ) 2.3( ) 2.8( ) 1.8( ) 1.7( ) 1.8( ) 9.2(S)

91. 69. 0. 201. 436. 278. 437.
.8(S) .5(S) .0( ) 18.6(S) 10.2(S) 2.6( ) 4.3( )

2 40. 1265. 707. 150. 54. 1175. 1157. 1150. 1139. 1118.
1096.
5.2( )
.0( ) .0( ) .0( ) .0( ) 3.0( ) 3.0( ) 2.9( ) 2.9( ) 4.0( )

719.
4.6( )
1090. 1075. 1063. 1054. 1049. 990. 981. 975. 820.
3.6( ) 4.5( ) 4.8( ) 4.2( ) 5.6( ) 5.1( ) 5.3( ) 5.2( ) 4.6( )

369.
31.1(S)
717. 384. 98. 201. 69. 63. 42. 67. 277.
4.5( ) 5.0( ) 2.0( ) 2.3( ) 2.7( ) 1.8( ) 1.6( ) 1.7( ) 9.2(S)

80. 62. 0. 201. 429. 277. 429.
.7(S) .5(S) .0( ) 18.5(S) 10.1(S) 2.6( ) 4.3( )

2 45. 1213. 697. 132. 48. 1129. 1113. 1106. 1095. 1075.
1054.
5.1( )
.0( ) .0( ) .0( ) .0( ) 2.9( ) 2.9( ) 2.9( ) 2.9( ) 3.9( )

711.
4.5( )
1048. 1035. 1026. 1018. 1013. 958. 950. 944. 804.
3.6( ) 4.4( ) 4.7( ) 4.2( ) 5.5( ) 5.1( ) 5.2( ) 5.2( ) 4.5( )

360.
709. 374. 86. 201. 61. 56. 37. 60. 276.
4.5( ) 4.9( ) 1.9( ) 2.3( ) 2.6( ) 1.7( ) 1.5( ) 1.7( ) 9.0(S)

29.5(S)

	71.	55.	0.	200.	420.	277.	420.		
	.6(S)	.4(S)	.0( )	18.3(S)	10.0(S)	2.6( )	4.2( )		
2 50.	1164.	685.	117.	43.	1086.	1071.	1064.	1054.	1035.
1016.	.0( )	.0( )	.0( )	.0( )	2.9( )	2.8( )	2.8( )	2.8( )	3.8( )
5.0( )									
	1011.	999.	992.	985.	980.	928.	920.	915.	788.
702.	3.5( )	4.3( )	4.7( )	4.1( )	5.4( )	5.0( )	5.2( )	5.1( )	4.5( )
4.5( )									
	699.	364.	76.	200.	54.	50.	33.	54.	275.
352.	4.4( )	4.9( )	1.8( )	2.3( )	2.5( )	1.6( )	1.4( )	1.6( )	8.9(S)
27.9(S)									
	63.	49.	0.	198.	409.	275.	410.		
	.5(S)	.4(S)	.0( )	18.0(S)	9.8(S)	2.6( )	4.2( )		
2 55.	1118.	672.	104.	38.	1047.	1032.	1026.	1017.	999.
982.	.0( )	.0( )	.0( )	.0( )	2.8( )	2.8( )	2.8( )	2.7( )	3.7( )
4.9( )									
	977.	966.	960.	953.	949.	900.	892.	887.	772.
692.	3.4( )	4.2( )	4.6( )	4.1( )	5.3( )	4.9( )	5.1( )	5.0( )	4.5( )
4.5( )									
	688.	356.	67.	199.	48.	44.	28.	48.	274.
344.	4.4( )	4.8( )	1.8( )	2.3( )	2.4( )	1.5( )	1.4( )	1.5( )	8.7(S)
26.3(S)									
	56.	44.	0.	197.	398.	274.	398.		
	.5(S)	.3(S)	.0( )	17.7(S)	9.7(S)	2.6( )	4.2( )		
3 0.	1076.	658.	93.	34.	1010.	997.	991.	983.	966.
950.	.0( )	.0( )	.0( )	.0( )	2.7( )	2.7( )	2.7( )	2.7( )	3.7( )
4.8( )									
	945.	935.	930.	923.	919.	872.	865.	860.	756.
680.	3.4( )	4.1( )	4.6( )	4.0( )	5.2( )	4.9( )	5.0( )	4.9( )	4.4( )
4.4( )									
	676.	347.	60.	197.	43.	39.	24.	43.	272.
334.	4.4( )	4.8( )	1.7( )	2.3( )	2.3( )	1.5( )	1.3( )	1.5( )	8.6(S)
24.7(S)									
	51.	39.	0.	195.	385.	272.	386.		
	.4(S)	.3(S)	.0( )	17.4(S)	9.5(S)	2.6( )	4.1( )		
3 5.	1038.	643.	84.	31.	976.	964.	959.	951.	935.
920.	.0( )	.0( )	.0( )	.0( )	2.7( )	2.7( )	2.7( )	2.6( )	3.6( )
4.7( )									
	916.	906.	901.	894.	890.	846.	838.	833.	739.
667.	3.3( )	4.0( )	4.6( )	4.0( )	5.1( )	4.8( )	4.9( )	4.9( )	4.4( )
4.4( )									
	662.	337.	54.	196.	38.	34.	19.	38.	270.
322.	4.3( )	4.7( )	1.6( )	2.3( )	2.2( )	1.4( )	1.2( )	1.4( )	8.3(S)
23.0(S)									
	46.	35.	0.	193.	372.	271.	373.		
	.4(S)	.3(S)	.0( )	17.1(S)	9.3(S)	2.6( )	4.1( )		
3 10.	1003.	628.	75.	27.	945.	933.	928.	921.	906.
891.									

246.
15.3(S)

586. 271. 32. 185. 17. 14. 4. 21. 259.
4.1( ) 4.4( ) 1.3( ) 2.3( ) 1.6( ) 1.0( ) .6( ) 1.1( ) 7.0(S)

26. 17. 0. 182. 302. 260. 303.
.2(S) .1(S) .0( ) 14.9(S) 8.4(S) 2.6( ) 3.8( )

3 35.
748.
4.2( )

843. 553. 35. 8. 802. 790. 785. 778. 763.
.0( ) .0( ) .0( ) .0( ) 2.4( ) 2.4( ) 2.4( ) 2.4( ) 3.2( )

577.
4.1( )

744. 733. 729. 722. 718. 684. 677. 672. 622.
3.0( ) 3.6( ) 4.3( ) 3.7( ) 4.7( ) 4.3( ) 4.5( ) 4.4( ) 4.0( )

226.
13.9(S)

572. 254. 28. 183. 14. 12. 3. 17. 257.
4.1( ) 4.3( ) 1.3( ) 2.3( ) 1.5( ) .9( ) .6( ) 1.0( ) 6.7(S)

22. 13. 0. 180. 296. 257. 296.
.1(S) .1(S) .0( ) 14.4(S) 8.1(S) 2.6( ) 3.7( )

3 40.
721.
4.1( )

813. 545. 29. 6. 774. 763. 758. 750. 736.
.0( ) .0( ) .0( ) .0( ) 2.4( ) 2.3( ) 2.3( ) 2.3( ) 3.1( )

564.
4.1( )

717. 707. 702. 696. 692. 659. 652. 647. 603.
2.9( ) 3.5( ) 4.3( ) 3.7( ) 4.6( ) 4.3( ) 4.4( ) 4.3( ) 4.0( )

206.
12.6(S)

560. 236. 25. 181. 12. 10. 2. 13. 253.
4.1( ) 4.1( ) 1.2( ) 2.2( ) 1.4( ) .9( ) .5( ) .9( ) 6.3(S)

17. 9. 0. 177. 291. 254. 292.
.1(S) .1(S) .0( ) 13.9(S) 7.8(S) 2.6( ) 3.7( )

3 45.
695.
4.0( )

783. 535. 24. 4. 747. 736. 731. 724. 710.
.0( ) .0( ) .0( ) .0( ) 2.3( ) 2.3( ) 2.3( ) 2.3( ) 3.1( )

553.
4.0( )

691. 681. 676. 670. 665. 634. 626. 621. 586.
2.8( ) 3.4( ) 4.2( ) 3.6( ) 4.5( ) 4.2( ) 4.3( ) 4.3( ) 3.9( )

179.
11.5(S)

550. 215. 21. 178. 10. 8. 1. 10. 249.
4.1( ) 4.0( ) 1.1( ) 2.2( ) 1.3( ) .8( ) .4( ) .8( ) 6.0(S)

12. 6. 0. 175. 285. 249. 286.
.1(S) .0(S) .0( ) 13.3(S) 7.3(S) 2.5( ) 3.7( )

3 50.
669.
3.9( )

755. 523. 19. 3. 721. 710. 705. 698. 684.
.0( ) .0( ) .0( ) .0( ) 2.3( ) 2.2( ) 2.2( ) 2.2( ) 3.0( )

543.
4.0( )

665. 655. 651. 644. 640. 610. 603. 599. 571.
2.8( ) 3.3( ) 4.2( ) 3.6( ) 4.4( ) 4.1( ) 4.3( ) 4.2( ) 3.9( )

155.
10.5(S)

539. 192. 17. 176. 9. 7. 0. 7. 244.
4.0( ) 3.8( ) 1.0( ) 2.2( ) 1.2( ) .7( ) .3( ) .7( ) 5.7(S)

9. 5. 0. 172. 278. 245. 279.

		.0(S)	.0(S)	.0( )	12.8(S)	6.8(S)	2.5( )	3.6( )			
3	55.	727.	510.	15.	2.	695.	684.	680.	672.	658.	644.
		.0( )	.0( )	.0( )	.0( )	2.2( )	2.2( )	2.2( )	2.2( )	2.9( )	3.8( )
		640.	631.	626.	620.	616.	589.	583.	578.	557.	532.
		2.7( )	3.3( )	4.1( )	3.5( )	4.3( )	4.1( )	4.2( )	4.1( )	3.8( )	4.0( )
		528.	170.	13.	173.	7.	5.	0.	5.	239.	132.
		4.0( )	3.7( )	.9( )	2.2( )	1.1( )	.7( )	.2( )	.7( )	5.4(S)	9.6(S)
		7.	3.	0.	169.	270.	240.	270.			
		.0(S)	.0(S)	.0( )	12.2(S)	6.2(S)	2.5( )	3.6( )			
4	0.	700.	494.	11.	0.	670.	659.	655.	648.	634.	621.
		.0( )	.0( )	.0( )	.0( )	2.2( )	2.2( )	2.1( )	2.1( )	2.9( )	3.7( )
		617.	608.	604.	598.	595.	569.	563.	559.	544.	520.
		2.7( )	3.2( )	4.1( )	3.5( )	4.3( )	4.0( )	4.1( )	4.1( )	3.8( )	3.9( )
		515.	148.	11.	171.	6.	5.	0.	4.	235.	112.
		4.0( )	3.5( )	.9( )	2.2( )	1.1( )	.6( )	.2( )	.6( )	5.1(S)	8.9(S)
		5.	2.	0.	167.	258.	236.	259.			
		.0(S)	.0(S)	.0( )	11.7(S)	5.4(S)	2.5( )	3.5( )			
4	5.	674.	473.	8.	0.	646.	635.	631.	624.	611.	599.
		.0( )	.0( )	.0( )	.0( )	2.1( )	2.1( )	2.1( )	2.1( )	2.8( )	3.7( )
		596.	587.	584.	578.	575.	551.	546.	542.	531.	505.
		2.6( )	3.1( )	4.1( )	3.5( )	4.2( )	3.9( )	4.1( )	4.0( )	3.8( )	3.9( )
		500.	130.	8.	168.	5.	4.	0.	3.	230.	99.
		3.9( )	3.3( )	.8( )	2.2( )	1.0( )	.6( )	.2( )	.5( )	4.7(S)	8.2(S)
		4.	1.	0.	164.	241.	231.	242.			
		.0(S)	.0(S)	.0( )	11.1(S)	4.7(S)	2.5( )	3.5( )			
4	10.	649.	452.	7.	0.	623.	613.	609.	603.	591.	579.
		.0( )	.0( )	.0( )	.0( )	2.1( )	2.1( )	2.1( )	2.0( )	2.8( )	3.6( )
		576.	568.	565.	559.	556.	534.	529.	525.	516.	488.
		2.6( )	3.1( )	4.0( )	3.4( )	4.2( )	3.9( )	4.0( )	3.9( )	3.7( )	3.8( )
		481.	114.	7.	165.	4.	3.	0.	2.	226.	88.
		3.9( )	3.2( )	.7( )	2.2( )	.9( )	.6( )	.1( )	.4( )	4.4(S)	7.6(S)
		2.	0.	0.	161.	224.	226.	225.			
		.0(S)	.0(S)	.0( )	10.5(S)	3.9(S)	2.4( )	3.4( )			
4	15.	626.	417.	5.	0.	601.	592.	588.	583.	571.	560.
		.0( )	.0( )	.0( )	.0( )	2.0( )	2.0( )	2.0( )	2.0( )	2.7( )	3.5( )

467.	557.	549.	545.	539.	536.	517.	512.	508.	500.
3.7( )	2.5( )	3.0( )	4.0( )	3.4( )	4.1( )	3.8( )	3.9( )	3.9( )	3.7( )
78.	459.	101.	5.	163.	4.	3.	0.	1.	221.
7.1(S)	3.8( )	3.0( )	.7( )	2.2( )	.9( )	.5( )	.1( )	.4( )	4.1(S)
	2.	0.	0.	158.	192.	221.	195.		
	.0(S)	.0(S)	.0( )	9.9(S)	3.2(S)	2.4( )	3.2( )		
4 20.	604.	383.	4.	0.	581.	573.	569.	563.	552.
541.	.0( )	.0( )	.0( )	.0( )	2.0( )	2.0( )	2.0( )	2.0( )	2.6( )
3.4( )									
441.	537.	529.	525.	518.	515.	499.	493.	488.	481.
3.6( )	2.5( )	2.9( )	3.9( )	3.3( )	4.0( )	3.8( )	3.9( )	3.8( )	3.6( )
69.	431.	90.	4.	159.	3.	2.	0.	1.	216.
6.6(S)	3.7( )	2.9( )	.6( )	2.1( )	.8( )	.5( )	.1( )	.3( )	3.7(S)
	1.	0.	0.	154.	165.	216.	166.		
	.0(S)	.0(S)	.0( )	9.3(S)	2.7(S)	2.4( )	3.0( )		
4 25.	583.	354.	3.	0.	562.	553.	550.	544.	532.
520.	.0( )	.0( )	.0( )	.0( )	2.0( )	1.9( )	1.9( )	1.9( )	2.6( )
3.4( )									
413.	516.	508.	503.	497.	493.	479.	472.	467.	458.
3.5( )	2.4( )	2.9( )	3.9( )	3.3( )	3.9( )	3.7( )	3.8( )	3.7( )	3.5( )
61.	402.	80.	3.	155.	3.	2.	0.	0.	206.
6.2(S)	3.6( )	2.8( )	.5( )	2.1( )	.8( )	.5( )	.1( )	.3( )	3.4(S)
	1.	0.	0.	145.	144.	208.	146.		
	.0(S)	.0(S)	.0( )	8.8(S)	2.2(S)	2.4( )	2.9( )		
4 30.	563.	325.	2.	0.	543.	534.	530.	524.	512.
499.	.0( )	.0( )	.0( )	.0( )	1.9( )	1.9( )	1.9( )	1.9( )	2.5( )
3.3( )									
384.	495.	486.	482.	475.	471.	456.	448.	442.	434.
3.4( )	2.4( )	2.8( )	3.9( )	3.2( )	3.9( )	3.6( )	3.7( )	3.7( )	3.4( )
53.	374.	71.	2.	148.	2.	2.	0.	0.	195.
5.8(S)	3.5( )	2.6( )	.5( )	2.1( )	.7( )	.4( )	.1( )	.2( )	3.0(S)
	0.	0.	0.	137.	127.	197.	128.		
	.0(S)	.0(S)	.0( )	8.2(S)	1.8(S)	2.3( )	2.7( )		
4 35.	542.	301.	2.	0.	523.	514.	509.	503.	490.
477.	.0( )	.0( )	.0( )	.0( )	1.9( )	1.9( )	1.9( )	1.8( )	2.5( )
3.2( )									
357.	473.	463.	458.	451.	446.	431.	422.	417.	408.
3.3( )	2.3( )	2.7( )	3.8( )	3.2( )	3.8( )	3.5( )	3.6( )	3.6( )	3.3( )
47.	347.	63.	2.	141.	2.	1.	0.	0.	185.

		3.4( )	2.5( )	.4( )	2.0( )	.7( )	.4( )	.1( )	.2( )	2.7(s)	5.5(s)
		0.	0.	0.	130.	113.	187.	114.			
		.0(s)	.0(s)	.0( )	7.8(s)	1.4(s)	2.3( )	2.6( )			
4	40.	520.	267.	1.	0.	502.	493.	488.	482.	468.	454.
		.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.8( )	2.4( )	3.1( )
		449.	438.	433.	425.	420.	405.	397.	391.	383.	331.
		2.2( )	2.6( )	3.8( )	3.1( )	3.7( )	3.4( )	3.5( )	3.5( )	3.3( )	3.2( )
		320.	57.	1.	134.	2.	1.	0.	0.	176.	44.
		3.4( )	2.4( )	.4( )	2.0( )	.7( )	.4( )	.1( )	.2( )	2.5(s)	5.2(s)
		0.	0.	0.	123.	88.	177.	90.			
		.0(s)	.0(s)	.0( )	7.3(s)	1.1(s)	2.2( )	2.4( )			
4	45.	497.	238.	1.	0.	481.	471.	466.	459.	444.	429.
		.0( )	.0( )	.0( )	.0( )	1.8( )	1.8( )	1.8( )	1.7( )	2.3( )	3.0( )
		424.	413.	408.	400.	395.	380.	371.	365.	357.	304.
		2.2( )	2.5( )	3.7( )	3.1( )	3.6( )	3.3( )	3.4( )	3.4( )	3.2( )	3.1( )
		292.	52.	1.	127.	1.	1.	0.	0.	166.	42.
		3.3( )	2.3( )	.4( )	2.0( )	.6( )	.4( )	.1( )	.1( )	2.2(s)	4.9(s)
		0.	0.	0.	113.	69.	168.	70.			
		.0(s)	.0(s)	.0( )	6.9(s)	.9(s)	2.2( )	2.2( )			
4	50.	474.	218.	1.	0.	459.	448.	443.	435.	420.	404.
		.0( )	.0( )	.0( )	.0( )	1.7( )	1.7( )	1.7( )	1.7( )	2.3( )	2.9( )
		399.	388.	383.	375.	369.	354.	345.	339.	331.	277.
		2.1( )	2.4( )	3.7( )	3.0( )	3.5( )	3.2( )	3.3( )	3.2( )	3.1( )	3.0( )
		266.	48.	1.	117.	1.	1.	0.	0.	157.	40.
		3.2( )	2.3( )	.3( )	1.9( )	.6( )	.4( )	.1( )	.1( )	1.9(s)	4.6(s)
		0.	0.	0.	97.	58.	159.	59.			
		.0(s)	.0(s)	.0( )	6.5(s)	.9(s)	2.1( )	2.0( )			
4	55.	450.	198.	1.	0.	435.	424.	419.	411.	396.	379.
		.0( )	.0( )	.0( )	.0( )	1.7( )	1.7( )	1.7( )	1.6( )	2.2( )	2.8( )
		375.	364.	358.	350.	344.	329.	320.	314.	306.	254.
		2.0( )	2.4( )	3.6( )	3.0( )	3.4( )	3.1( )	3.2( )	3.1( )	3.0( )	2.9( )
		244.	45.	1.	105.	1.	1.	0.	0.	143.	38.
		3.1( )	2.2( )	.3( )	1.8( )	.6( )	.3( )	.1( )	.1( )	1.6(s)	4.3(s)
		0.	0.	0.	85.	52.	146.	52.			
		.0(s)	.0(s)	.0( )	6.2(s)	.8(s)	2.1( )	1.9( )			
5	0.	425.	178.	1.	0.	412.	400.	395.	387.	371.	

355. .0( ) .0( ) .0( ) .0( ) 1.6( ) 1.6( ) 1.6( ) 1.6( ) 2.1( )
2.7( )

351. 339. 334. 325. 320. 305. 296. 290. 283.
232. 1.9( ) 2.3( ) 3.5( ) 2.9( ) 3.2( ) 3.0( ) 3.1( ) 3.0( ) 2.9( )
2.8( )

223. 42. 1. 94. 1. 1. 0. 0. 128.
36. 3.0( ) 2.2( ) .3( ) 1.8( ) .5( ) .3( ) .0( ) .1( ) 1.4(S)
4.1(S)

0. 0. 0. 76. 47. 131. 48.
.0(S) .0(S) .0( ) 6.0(S) .8(S) 2.0( ) 1.9( )

5 5. 400. 161. 1. 0. 388. 376. 371. 363. 348.
331. .0( ) .0( ) .0( ) .0( ) 1.6( ) 1.6( ) 1.5( ) 1.5( ) 2.0( )
2.6( )

327. 316. 310. 302. 296. 282. 273. 268. 261.
213. 1.9( ) 2.2( ) 3.5( ) 2.8( ) 3.1( ) 2.9( ) 3.0( ) 2.9( ) 2.8( )
2.7( )

205. 40. 1. 85. 1. 1. 0. 0. 115.
34. 2.9( ) 2.1( ) .3( ) 1.7( ) .5( ) .3( ) .0( ) .1( ) 1.2(S)
3.9(S)

0. 0. 0. 68. 44. 117. 44.
.0(S) .0(S) .0( ) 5.9(S) .7(S) 1.9( ) 1.8( )

5 10. 372. 146. 0. 0. 365. 353. 348. 340. 324.
308. .0( ) .0( ) .0( ) .0( ) 1.5( ) 1.5( ) 1.5( ) 1.5( ) 1.9( )
2.5( )

304. 293. 288. 279. 274. 260. 252. 247. 241.
196. 1.8( ) 2.1( ) 3.4( ) 2.8( ) 3.0( ) 2.8( ) 2.9( ) 2.8( ) 2.7( )
2.6( )

188. 38. 0. 76. 1. 1. 0. 0. 103.
32. 2.8( ) 2.1( ) .3( ) 1.6( ) .5( ) .3( ) .0( ) .1( ) 1.0(S)
3.6(S)

0. 0. 0. 62. 41. 105. 41.
.0(S) .0(S) .0( ) 5.7(S) .7(S) 1.8( ) 1.8( )

5 15. 347. 133. 0. 0. 342. 331. 325. 318. 302.
287. .0( ) .0( ) .0( ) .0( ) 1.5( ) 1.4( ) 1.4( ) 1.4( ) 1.9( )
2.3( )

282. 272. 267. 259. 254. 240. 233. 228. 222.
180. 1.7( ) 2.0( ) 3.4( ) 2.7( ) 2.9( ) 2.7( ) 2.8( ) 2.7( ) 2.6( )
2.5( )

173. 35. 0. 69. 1. 1. 0. 0. 92.
30. 2.7( ) 2.0( ) .2( ) 1.6( ) .5( ) .3( ) .0( ) .1( ) .8(S)
3.4(S)

0. 0. 0. 57. 38. 94. 39.
.0(S) .0(S) .0( ) 5.6(S) .7(S) 1.8( ) 1.7( )

5 20. 323. 116. 0. 0. 320. 309. 304. 296. 281.
266. .0( ) .0( ) .0( ) .0( ) 1.4( ) 1.4( ) 1.4( ) 1.4( ) 1.8( )
2.2( )

262. 253. 248. 240. 235. 222. 215. 211. 205.
166. 1.6( ) 1.9( ) 3.3( ) 2.7( ) 2.8( ) 2.7( ) 2.7( ) 2.7( ) 2.5( )

2.4( )

27.
3.2(S)

159. 33. 0. 63. 1. 0. 0. 0. 77.
2.6( ) 2.0( ) .2( ) 1.5( ) .4( ) .3( ) .0( ) .1( ) .7(S)

0. 0. 0. 53. 36. 80. 36.
.0(S) .0(S) .0( ) 5.5(S) .7(S) 1.7( ) 1.7( )

5 25.
248.
2.1( )

301. 102. 0. 0. 299. 288. 283. 276. 262.
.0( ) .0( ) .0( ) .0( ) 1.4( ) 1.3( ) 1.3( ) 1.3( ) 1.7( )

152.
2.3( )

244. 235. 230. 222. 217. 206. 199. 195. 189.
1.6( ) 1.8( ) 3.3( ) 2.6( ) 2.7( ) 2.6( ) 2.6( ) 2.6( ) 2.4( )

25.
3.0(S)

146. 31. 0. 58. 1. 0. 0. 0. 67.
2.6( ) 1.9( ) .2( ) 1.5( ) .4( ) .3( ) .0( ) .1( ) .6(S)

0. 0. 0. 49. 34. 68. 34.
.0(S) .0(S) .0( ) 5.4(S) .6(S) 1.6( ) 1.6( )

5 30.
230.
2.1( )

281. 94. 0. 0. 279. 269. 264. 257. 244.
.0( ) .0( ) .0( ) .0( ) 1.3( ) 1.3( ) 1.3( ) 1.3( ) 1.6( )

139.
2.2( )

227. 218. 214. 206. 201. 190. 184. 180. 175.
1.5( ) 1.7( ) 3.2( ) 2.5( ) 2.7( ) 2.5( ) 2.5( ) 2.5( ) 2.3( )

23.
2.9(S)

131. 29. 0. 54. 1. 0. 0. 0. 61.
2.4( ) 1.9( ) .2( ) 1.4( ) .4( ) .3( ) .0( ) .1( ) .5(S)

0. 0. 0. 46. 32. 62. 32.
.0(S) .0(S) .0( ) 5.3(S) .6(S) 1.5( ) 1.6( )

5 35.
214.
2.0( )

261. 86. 0. 0. 261. 251. 246. 240. 227.
.0( ) .0( ) .0( ) .0( ) 1.3( ) 1.2( ) 1.2( ) 1.2( ) 1.6( )

123.
2.1( )

211. 203. 199. 190. 186. 176. 170. 166. 161.
1.4( ) 1.7( ) 3.2( ) 2.5( ) 2.6( ) 2.4( ) 2.5( ) 2.4( ) 2.3( )

21.
2.7(S)

113. 27. 0. 51. 0. 0. 0. 0. 56.
2.2( ) 1.8( ) .2( ) 1.4( ) .4( ) .2( ) .0( ) .1( ) .5(S)

0. 0. 0. 43. 29. 56. 30.
.0(S) .0(S) .0( ) 5.3(S) .6(S) 1.5( ) 1.6( )

5 40.
199.
1.9( )

244. 80. 0. 0. 244. 234. 230. 224. 212.
.0( ) .0( ) .0( ) .0( ) 1.2( ) 1.2( ) 1.2( ) 1.2( ) 1.5( )

108.
2.0( )

196. 188. 184. 175. 172. 162. 156. 152. 146.
1.4( ) 1.6( ) 3.1( ) 2.4( ) 2.5( ) 2.3( ) 2.4( ) 2.3( ) 2.2( )

20.
2.6(S)

100. 25. 0. 47. 0. 0. 0. 0. 52.
2.1( ) 1.8( ) .2( ) 1.4( ) .4( ) .2( ) .0( ) .1( ) .5(S)

	0.	0.	0.	41.	27.	52.	28.		
	.0(S)	.0(S)	.0( )	5.2(S)	.6(S)	1.4( )	1.5( )		
5 45.	228.	74.	0.	0.	228.	218.	215.	209.	197.
185.	.0( )	.0( )	.0( )	.0( )	1.2( )	1.1( )	1.1( )	1.1( )	1.4( )
1.8( )									
	182.	174.	170.	162.	159.	148.	142.	138.	133.
97.	1.3( )	1.5( )	3.0( )	2.3( )	2.4( )	2.3( )	2.3( )	2.2( )	2.1( )
2.0( )									
	91.	23.	0.	44.	0.	0.	0.	0.	48.
18.	2.0( )	1.7( )	.2( )	1.3( )	.4( )	.2( )	.0( )	.1( )	.4(S)
2.5(S)									
	0.	0.	0.	39.	25.	49.	26.		
	.0(S)	.0(S)	.0( )	5.2(S)	.6(S)	1.4( )	1.5( )		
5 50.	213.	70.	0.	0.	213.	204.	200.	194.	183.
171.	.0( )	.0( )	.0( )	.0( )	1.1( )	1.1( )	1.1( )	1.1( )	1.4( )
1.7( )									
	168.	160.	156.	148.	145.	135.	129.	125.	121.
88.	1.3( )	1.4( )	3.0( )	2.2( )	2.3( )	2.2( )	2.2( )	2.2( )	2.0( )
1.9( )									
	83.	21.	0.	42.	0.	0.	0.	0.	45.
17.	1.9( )	1.7( )	.2( )	1.3( )	.4( )	.2( )	.0( )	.1( )	.4(S)
2.3(S)									
	0.	0.	0.	37.	24.	46.	24.		
	.0(S)	.0(S)	.0( )	5.1(S)	.5(S)	1.3( )	1.4( )		

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RED ROCK CANYON DRAINAGE BASIN DESIGN PLAN - 100 YEAR DEVELOPED
BOSCHEE ENGINEERING 2005 AMENDMENT DECEMBER 2005

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
4	426.	(DIRECT FLOW)		0 50.
104	416.	.1	4.3	1 0.
28	411.	3.5		1 5.
103	362.	.1	5.7	1 20.
23	353.	3.3		1 25.
3	717.	(DIRECT FLOW)		1 5.
105	202.	.1	18.7	2 25.
102	399.	.1	37.4	2 0.
24	202.	2.3		2 35.
22	395.	5.0		2 15.
301	279.	.1	9.3	2 25.
201	515.	.1	11.2	1 35.
30	279.	2.6		2 25.
32	517.	4.6		1 35.
2	777.	(DIRECT FLOW)		1 45.
27	463.	3.6		0 50.
21	773.	4.6		1 50.
26	409.	3.2		1 5.
20	773.	4.7		1 50.
25	407.	5.3		1 10.
19	1034.	5.1		1 40.
18	1697.	6.8		1 15.
17	1697.	6.8		1 15.
16	1695.	6.6		1 20.
15	1824.	7.2		1 20.
152	1825.	5.2		1 20.
151	1825.	5.7		1 20.

			RR10005Swout
144	1894.	6.2	1 20.
143	1892.	4.9	1 20.
142	1890.	7.2	1 20.
141	1889.	5.3	1 25.
13	1886.	3.9	1 25.
12	1883.	3.9	1 25.
11	1884.	3.9	1 30.
10	1885.	3.9	1 30.
1	2229.	(DIRECT FLOW)	1 25.