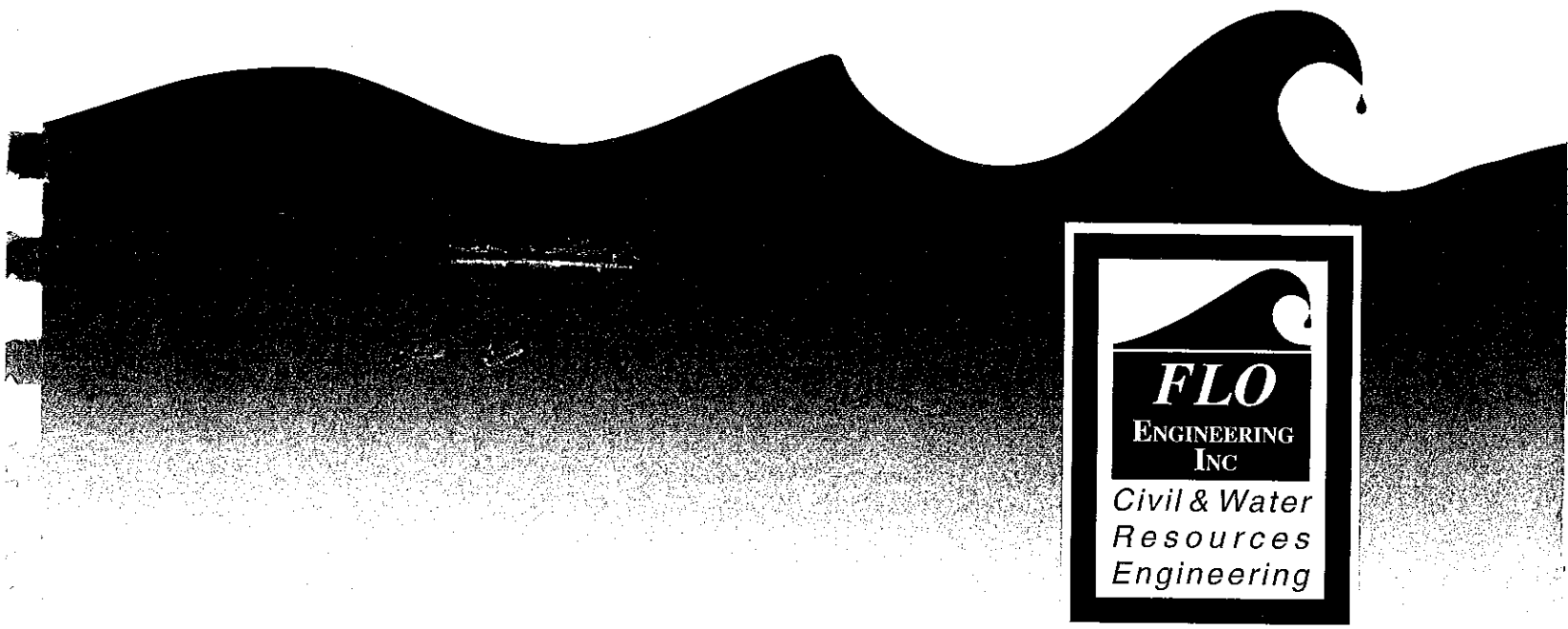
Broadmoor Residential Resort Community
North Master Development Drainage Plan



FLO
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Civil & Water
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Engineering

Broadmoor Residential Resort Community
North Master Development Drainage Plan

Prepared for:

C.O.G. Land and Development Company
10 Lake Circle
Colorado Springs, Colorado 80906

Submitted by:

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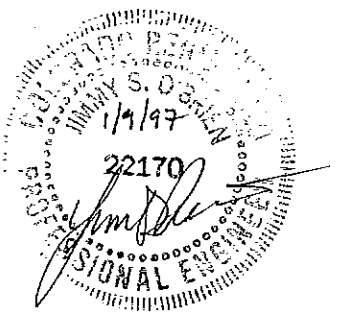
September, 1996
Revised January, 1997

Broadmoor Residential Resort Community
North Master Development Drainage Plan

Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria establish by the City/County for master drainage plans. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

Jimmy S. O'Brien, Ph.D., P.E.



Developer's Statement:

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

C.O.G. Land and Development Company

By: _____

Title: Developer

Address: 10 Lake Circle
Colorado Springs, CO 80906

City of Colorado Springs

Filed in accordance with Section 15-3-906 of the code of the City of Colorado Springs, 1980, as amended.

_____ 11/12/97
City Engineer Date

Broadmoor Residential Resort Community
North Master Development Drainage Plan
September, 1996
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General

The purpose of this Master Development Drainage Plan (MDDP) is to identify the major drainage basins, conveyance channels and structures which are effected by the Broadmoor Residential Resort Community on the Broadmoor property north of the Fisher's Canyon drainage basin. This report will present estimates of storm runoff and will recommend drainage facilities associated with the proposed development. Site specific hydraulic and construction design will be completed with the individual final drainage plans and reports submitted for platting. This MDDP report should serve as a guide for future planning and drainage facility design. The design storm discharges and developed runoff are estimated to assess drainage facility size.

In 1982, KLH prepared a Master Drainage Plan for the Broadmoor South - Neal Ranch development. This drainage plan encompassed the entire area of the Broadmoor Residential Resort Communities proposed for development. Most of the proposed subdivisions in this development have less density than that outlined in the 1982 KLH study. The 100-year design storm peak discharges have been estimated at the design points presented in the KLH report for comparison. A review of the off-site discharges and downstream drainage facility conveyance capacity is provided in this report.

In February, 1995, a FLO Engineering report was submitted to the City of Colorado Springs entitled, "Broadmoor South Property Design Flood Hydrology." The report was reviewed by the City Engineering Division. It identified the watershed fan apex design point flows for off-site watershed discharges. This included all the sub-basins along the eastern front of the Cheyenne Mountain effected by the Broadmoor South property development. The FLO Engineering Design Flood Hydrology Report is presented in Appendix A.

The KLH (1982) Master Drainage Plan identified that some areas of the Broadmoor South were subject to hyperconcentrated sediment flows associated with extreme rainfall events. While mud and debris flows were not analyzed in the study, KLH recognized that the flood conveyance facilities must be designed to accommodate the potential for bulking, surging and plugging associated with high concentrations of sediment and debris. KLH (1982) reported that, "(p)rior to final design of drainage structures in affected areas...(the) impact of potential debris flows must be considered." This includes all downstream flood conveyance facilities in the drainage basin.

General Location and Description

Location

The Broadmoor Residential Resort Community North is located in the southwestern corner of the City of Colorado Springs in portions of Sections 1, 2, 11, and 12 of Township 15 South, Range 67 West of the 6th Prime Meridian. The watersheds effecting this property extend into Sections 10, 13, 14 and 15 of Township 15 South, Range 67 West of the 6th Prime Meridian. The proposed development is bordered on the west and south by unplatted Broadmoor property and on the north by the Cheyenne Mountain Zoo. Portions of the proposed development are bordered on the east by unplatted Broadmoor property, the South Broadmoor golf course, and Farthing Drive. The Broadmoor Residential Resort Community development is zoned as a Planned Unit Development (PUD) and will consist of single family residential buildings, multiple family condominiums and apartment complexes.

General

The development will encompass approximately 370 acres north of the Fisher Canyon drainage, of which 17.9 acres are already under preliminary construction. The residential lots will range from approximately 1/4 acre to 5 acres or more. The general scope of the development plan is presented in Exhibit A. A large portion of the proposed development property will remain as open space or 'no build' areas which leave large tracts of land undisturbed with native vegetation. Steep slopes to the west will prevent development on the eastern slope of Cheyenne Mountain. All streets and drainage improvements located within the Broadmoor Residential Resort Community will be private and will be owned and maintained by the Resort Community Home Owner's Association.

Soils

The Broadmoor South Property soils were described in previous reports (KLH, 1982; Weiss, 1987; RCI, 1989; Muller, 1991). The soils can be described as loamy with some significant percentages of clay in some locations. In the higher elevations of the drainages on Cheyenne Mountain, rock outcrops are prevalent. Along the base of Cheyenne Mountain, coalescing alluvial fans have created diverse soil groups. The majority of soils in the areas to be developed consist of the Bresser and Jarre-Tecolate Complex which are deep and well-drained. The clayey soils in the eastern portion of the property consist of the Razor and Razor-Midway complex. Other soils found in the vicinity include the Coldcreek-Tolman complex. The Coldcreek soil is deep and well-drained while the Tolman soil is shallow and well-drained.

The hydrologic classifications of these soils range from Group A to Group D. These classifications are referenced with a map in the KLH (1982) report and are listed in Table 1. For the hydrologic analysis of the rainfall-runoff, the Soil Conservation Service (SCS) curve numbers associated with these soils range from 69 to 84 depending on location and the density of the

proposed development. The weighted average for curve numbers applied in previous studies for the developed condition in the project area generally range from 72 to 78 (KLH, 1982; RCI, 1991). Lower curve numbers were applied by Weiss (1987).

Drainage Basin Description

Major Drainages and Channels

The proposed development for the Broadmoor Residential Resort Community North encompasses two major drainages (Zoo and Ski Area Basins), one minor drainage (Basin 13) and several small interior basins identified as subbasins F, FA, 13A and D (Figure 1 and Exhibit B). In reference to previous drainage reports, the Zoo Basin includes Basins 16, 17 and Z and the Ski Area Basin consists of Basins 14, 15 and 18. The Ski Area basin includes most of the South Course when the subbasins are labeled as Basins GC. Both the Zoo and Ski Area Basins originate at the north-south trending Cheyenne Mountain ridge. Where the Zoo and Ski Area Basins join, the drainage was delineated into subbasins identified with a ZX designation. Basin 13 headwaters on the Cheyenne Mountain eastern face, but the Fisher Canyon drainage and the Ski Area Basin drain the area above it. In 1965, mud and debris flows were generated in the Zoo and Ski Area Basin channels. Basin 13 has no evidence of historic mud and debris flows.

The Zoo Basin channel and the Basin 13 channel are ephemeral. The Ski Area Basin has several springs and combined with the South Golf Course irrigation drainage creates a perennial stream at the eastern golf course boundary. This perennial flow is usually less than one cfs except during storm runoff.

Zoo Basin

The Zoo basin off-site watershed covers an area of approximately 0.26 square miles upstream of the zoo. The basin is characterized by very steep, rugged terrain and steep stream gradients (38% average channel slope upstream of the Zoo). On the slopes of Cheyenne Mountain, the basin is characterized by escarpments, talus slopes and 20% forestation. At the base of the mountain front along the Ute Pass Fault, a series of coalescing alluvial fans have evolved. The Zoo basin alluvial fan is relatively small corresponding to the size of its watershed and has been partially obscured by the zoo development and the parking lot. Existing development in the basin upstream of the Broadmoor property include the buildings, the paved roads and parking areas of the Zoo. In June, 1965, damage was incurred at the Zoo when several of the buildings were inundated by mud and debris.

The percent forest cover increases to about 60 percent downstream of the Zoo. Off the Broadmoor property to the east, there are a few multiple family building complexes located along the golf course and seven single family residential structures located off the Genesis Place cul-de-sac. The old Zoo water treatment facility is located on the bluff above the channel.

Figure 1. Location of the Broadmoor North Residential Resort Community Development

The Zoo Basin channel flows through a culvert under the Cheyenne Mountain Zoo parking lot and enters a deep ravine which extends to the eastern boundary of the South Broadmoor Golf Course. The channel ravine also constitutes a portion of the northern boundary of the golf course. The 100-year flood would be contained by this ravine to the golf course boundary. The FEMA Federal Insurance Rate Map (FIRM) Panel #080059 0290C indicates this portion of the Broadmoor property is unmapped. None of the buildings in the vicinity of the Genesis Place cul-de-sac would be inundated by the 100-year flood. The channel leaves the Broadmoor property just upstream of the Genesis Place culverts. Culvert capacities will be discussed later in the report.

Historically, the extreme flood events may have been dominated by debris flows in this basin. Large boulders (>5 ft diameter) are found along the water course which were transported by large flood events possibly during a post-glacial period. The source of rock and debris is the Pikes Peak Granite and the potential for generating debris flows in the basin still exists. An inspection of the upper basin revealed that some channels were charged with boulders and forest litter debris. The Shrine Road was constructed across the erodible slopes of Cheyenne Mountain, enhancing runoff and contributing loose material for generating debris flows.

Ski Area Basin

The Ski Area Basin also headwaters at the top of Cheyenne Mountain. Upstream of the Ski Area parking lot, the basin watershed covers an area of approximately 0.33 square miles. The upper basin is characterized by escarpments, talus slopes and 20% forestation. Some of the bedrock slopes approach near vertical. Downstream of the bedrock outcrops, the watershed is characterized by steep, partially forested terrain and steep stream gradients (16% average channel slope from the bedrock outcrops to the Ski area parking lot). Just upstream of the parking lot, at the base of the mountain front along the Ute Pass Fault, the two principal drainages form a coalescing alluvial fan. The alluvial fan is relatively small, corresponding to the lower portion of the Ski Area slope and has been partially obscured by the Ski Area development and parking lot. The channels from Basins 14 and 15 have a confluence just upstream of the parking lot.

Downstream of the Ski Area parking lot, the only building within the property boundaries of the Ski Area basin is the South Golf Course Clubhouse. The golf course is split in half (north and south halves) by the main channel. The channel is entrenched in a ravine through the golf course and would contain the 100-year water flood and mudflow. The forest cover is more dense along and in this ravine. East of the South Golf Course, the channel passes through a residential subdivision before turning north to join the Zoo Basin channel. During the 1965 flood event, a debris flow filled the channel and avulsed, the flow following the eastern property boundary until it spilled into the Zoo Basin channel.

The FEMA Federal Insurance Rate Map (FIRM) Panel #080059 0290C indicates that the Broadmoor property in the Ski Area Basin is unmapped. Like the Zoo basin, post-glacial melting may have generated significant debris flows. The potential for generating mud and debris flows in the basin still exists. An inspection of the upper basin channels revealed that some of the

watercourses were charged with boulders and trees. Throughout the basin, the source of rock and debris is the Pikes Peak Granite. Much of the sediment available for creating debris flows originates from sheet flow and gullying. The 1965 storm created a debris flow in the Basin 15 channel which removed a swatch of trees in its path just upstream of the fan apex.

Basin 13

Basin 13 is located between the Ski Area watershed and Fisher's Canyon watershed and it originates on the lower portion of steep slopes of Cheyenne Mountain. Upstream of Fisher's Canyon Reservoir, the basin watershed is approximately 0.045 square miles and is drained by several small swales and channels. Most of these swales and channels are poorly defined. The upper basin is characterized by escarpments, talus slopes and about 70% forestation. Some of the exposed bedrock outcrop slopes approach near vertical. Downstream of the bedrock outcrops, the watershed is characterized by steep, forested terrain, and steep stream gradients (20% average channel slope upstream Fisher Canyon Reservoir). Downstream of the reservoir the channel slope averages 12%.

There is no evidence of any significant mud and debris flows in this small drainage. In recent history, the basin flooding has been dominated by water flood events. At one time, the Basin 13 channel downstream of Fisher Canyon Reservoir may have been created by flows from Fisher Canyon as the Fisher Canyon alluvial fan evolved. This channel is now separated from the Fisher Canyon alluvial fan by a small ridge south of the Basin 13 drainage way. There is no definitive alluvial fan in this watershed and thus there is no distinctive depositional zone for sediment accumulation. Downstream of the reservoir, the channel has incised through an older alluvial fan surface. Part of this alluvial surface may have been constructed by the ancient landslides off Cheyenne Mountain.

In June, 1965, intense thunderstorms on the east slope of Cheyenne Mountain, the Ski Area Basin (the next basin to the north of Basin 13) experienced debris flows. A review of the 1967 aerial photographs reveals some channel scour in Basin 13 near the rock outcrops in the upper watershed downstream to about Fisher Canyon Reservoir. No significant effects of the storm runoff including debris or boulder deposits are evident in the channel farther downstream.

The FEMA Federal Insurance Rate Map (FIRM) Panel #080059 0290C (revised March, 1989) indicates that the Broadmoor property in this basin is unmapped for flood insurance purposes. The channel is entrenched through the proposed drainage and would contain the 100-year water flood. There is no existing development from Fisher Canyon Reservoir to Farthing Drive. At Farthing Drive, a 5 ft diameter cmp culvert conveys the flow to the Fisher Canyon north channel. Downstream of Farthing Drive, the channel enters a deeply entrenched ravine.

Small Interior Drainages

There are four small interior drainages that may be effected by future Broadmoor development. All of these small basins are surrounded by Broadmoor property and drain the lower

portion of the property. A brief description of each basin follows.

The first basin is referred to as Basin 13A and extends from the Fisher Canyon Reservoir to the east Broadmoor Property boundary. It is bounded by Basin 13 to the south and the Broadmoor South Golf Course to the north. Most of the drainage consists of oak brush vegetation and there is no existing development or drainage facilities in this basin. A small channel exists in a deep swale through the middle of the basin. The channel loses its definition as it approaches the property boundary to the east.

The next two interior basins are located immediately to the north of Basin 13A. Basin F drains the narrow strip of land in the southeast corner of the South Golf Course with the headwaters just to the north of Fisher Canyon Reservoir. The upper portion of the basin is forested with both oak brush and pine coniferous trees and is drained by a well-developed swale. The lower drainage on the golf course is poorly defined. A small swale leaves the Broadmoor property to the east.

Basin FA is located entirely on the South Golf Course to the north of Basin F. It drains the area from the golf course maintenance building to the east property boundary. The drainage in this basin is poorly defined because of the grading for the golf course. Two swales have a confluence near the property boundary.

The last drainage, Basin D, covers the north portion of the South Golf Course. It is bounded by the Zoo Basin on the West and the Ski Basin on the South. It drains the area from the existing Cheyenne Mountain Zoo Road to South Club Drive near Marland Court. The channel from South Club Drive enters the Zoo Basin Channel just downstream of the Genesis Place culverts. The upper portion of the drainage is forested and the lower portion drains the golf course. The Marland Court area has a significant amounted of impervious area.

Subbasin Delineations

The major basins described in the previous section have been divided into numerous subbasins for flood routing purposes. The subbasins represent areas of essentially similar hydrologic characteristics and were generally limited to 0.1 mi^2 or less. The subbasins are outlined in Exhibit B and are organized by watershed according the original KLH subbasin delineations in Table 1.

The upper portions of the watershed were divided into subbasins for rainfall/runoff routing and no development is planned on the steep slopes of Cheyenne Mountain. Most of proposed development extends downslope of a line drawn from Cheyenne Mountain Zoo Road to Fisher Canyon Reservoir and all of the delineated subbasins in this lower portion of the watershed will be effect by the development except subbasin FA. In addition, the northeast corner of the South Golf Course extending from Marland Court to the property boundary will not be effected by the proposed development and was not evaluated in this drainage analysis.

Drainage Criteria and Hydrologic Results

References

The current City of Colorado Springs & El Paso County Drainage Criteria Manual as revised (1994) was used to determine the rainfall/runoff in the delineated basins. The runoff for the 5 year and 100 year return period storms were simulated using the Corps of Engineers HEC-1 hydrologic model and the SCS curve number method. The results were compared with the KLH (1982) Master Drainage Plan results. The proposed Broadmoor Residential Resort Community North development does not significantly deviate from the KLH Master Drainage Plan. In most subbasins the proposed development is smaller in scope and density that originally considered in the KLH plan.

Hydrologic Criteria

In February 1995, a FLO Engineering report was submitted to the City of Colorado Springs entitled the "Broadmoor South Property Design Flood Hydrology" (Appendix A). The report was reviewed by the City Engineering Division. It identified the fan apex design point flows for the off-site drainages along the eastern front of Cheyenne Mountain. A brief discussion of the important aspects of that report is presented herein.

There are no stream gages in the project watershed. It was also determined that there were no stream gages in the project vicinity that could be used to transpose a frequency analysis. Furthermore, a review of regression relationships for estimating peak discharges in the region led to the conclusion that none of the relationships were applicable. To generate rainfall-runoff estimates for the series of watersheds along the eastern front of Cheyenne Mountain, the Army Corps of Engineers HEC-1 model was applied using the rainfall-runoff criteria from the Colorado Springs & El Paso Drainage Criteria Manual.

The Drainage Criteria Manual requires that storm runoff be computed for the 5-year and 100-year storms. The hydrology in the FLO report for off-site flows was initially computed for the 10-year storm. The City revised the criteria for the initial design storm frequency from a ten-year storm to a five-year storm in October 1994. For all facilities, the 5-year and 100-year storm runoff must be passed with no loss of life or major property damage. The design storm will be the storm distribution which requires the greatest level of flood protection. In all cases for the off-site drainage the 100-year storm will dictate the size of flood facilities.

The drainage manual recommends a method to estimate the total rainfall for the 5-year and 100-year storms from the NOAA Atlas, Volume III. To verify the NOAA Atlas total storm precipitation for application to the higher elevations of the Broadmoor property on Cheyenne Mountain, daily precipitation records for five rain gage stations in the vicinity were analyzed. The precipitation depth frequency analysis for these five gages indicated that the 100-year, 24-hour storm derived with the Drainage Manual correlated well with the gage data. Several of the gaging station storm distributions were plotted against the Drainage Criteria Manual rainfall distribution for the 2-

hr and 24-hr storms. This plot demonstrated that the Drainage Criteria Manual storm distributions correlated well with actual storms in terms of rainfall intensity and duration.

Since the Broadmoor South property watersheds were ungaged, the HEC-1 hydrologic parameters were calibrated using a small gaged basin (Rock Creek) whose headwaters were contiguous to the Broadmoor property headwaters on south peak of Cheyenne Mountain. Two storms were calibrated for peak flow and volume. Both the SCS curve number and the Green-Ampt infiltration methods were applied for computing runoff. The calibrated SCS curve numbers correlated well with the curve numbers used in other local hydrology studies. Curve numbers for all the subbasins are presented in the FLO report (Appendix A) and ranged from 74 to 76 for historical conditions. For comparison, RCI (1989) used 75 and 76 for the upper Fisher's Canyon watershed, Weiss (1987), Drexel Barrell (1990) and KLH (1982) applied a range of curve numbers from 69 to 80 for various levels of development in the general vicinity of the project area. These curve number values generally correspond to a antecedent moisture condition type II (AMC II).

The hydrologic variables which significantly effect the magnitude of the peak discharge are presented in Table 1. Variations in the subbasin areas between the KLH study and this investigation are the result of the difference in the delineation of the subbasin perimeters and the less accurate mapping used in the KLH analysis. In many instances the variation in the peak discharge can be directly attributed to the estimates of subbasin area. Almost without exception the curve numbers used in this study for the developed condition were equal to or greater than the curve numbers used by KLH. The other parameter which significantly effects runoff is the estimated impervious area which is based on the density of proposed development in a given subbasin. For most of the subbasins, the estimated development density in the KLH study was greater. In the two major basins, the Ski Area Basin and the Zoo Basin, the percent impervious area used in this analysis was greater than that used in the KLH study. In the remaining small subbasins, the percent impervious area used in the two studies is variable. Generally, the percent impervious area in a given subbasin ranged from 2 to 5 %.

Table 1. Hydrologic Parameters								
Subbasin		Basin Area (mi^2)		Soil Type	Curve Number		% Impervious Area	
KLH	FLO	KLH	FLO	KLH	KLH	FLO	KLH[8]	FLO
Zoo Basin								
D-1	Basin 16[1]	0.153	0.193	B	76.0	74.8	0	3.7
D-2	Basin 17[2]	0.075	0.0738	B	71.0	74.7	0	2.0
D-3	Basin Z[3]	0.082	0.0676	C	75.0	80.7	3.7	8.1
Total or Average		0.310	0.334	-	74.0	76.1	3.7	4.2
Ski Area Basin								
E-1	Basin 14[4]	0.423	0.149	C & D	74.8	75.1	0.9	1.9
	Basin 15[5]		0.192			77.0		3.1
	Basin 18[6]		0.0963			75.2		1.5
Total or Average		0.423	0.437	-	74.8	76.0	0.9	2.3
E-2	Basin GC[7]	0.168	0.156	B	71.6	80.4	5.7	3.0
Total or Average		0.591	0.593	-	73.9	77.1	2.3	2.5
Basin 13								
H-2	Basin 13	0.059	0.0454	C	74.0	78.0	5.8	7.0
H-3	Basin 13.1, 2	0.078	0.0630	B	72.8	80.6	8.7	4.0
H-4	Basin 13.3	0.021	0.0176	C	70.3	80.0	9.7	3.0
Total or Average		0.158	0.126	-	72.9	79.6	7.7	4.9
Basin 13a								
G-1	Basin 13A.1, 2, 3	0.037	0.0382	B	70.2	78.2	8.5	2.6
G-2	Basin 13A.4	0.013	0.0107	C	73.3	79.0	11.9	2.0
Total or Average		0.050	0.0489	-	71.0	78.4	9.4	2.5
Basin F								
F-1	Basin F.1, 2	0.039	0.0437	C	70.2	79.1	8.4	1.8
F-2	Basin F.3	0.078	0.0669	C	76.8	76.0	7.7	1.0
Total or Average		0.117	0.111	-	74.6	76.9	7.9	1.3
Basin FA								
F-3	Basin FA	0.045	0.0353	C	76.0	80.0	3.1	2.0
Basin D								
D-4	Basin D.1	0.045	0.0257	C	75.8	80.0	2.1	3.0
D-5	Basin D.2	0.005	0.0386	C	79.8	82.0	9.1	16.7
Total or Average		0.050	0.0643	-	76.2	81.2	2.8	11.2

Table 1. Hydrologic Parameters

[1]Includes subbasins 16.1, 16.2, 16.3, 16.4, 16a, 16b, 16c
[2]Includes subbasins 17, 17ab, 17c, 17d
[3]Includes subbasins Z.1 to Z.6
[4]Includes subbasins 14.1 to 14.5, 14a
[5]Includes subbasins 15.1 to 15.3, 15a, 1415
[6]Includes subbasins 18.11 to 18.13, 18.21 to 18.23, 18.31 to 18.33
[7]Includes subbasins GC-1 to GC-11
[8]Essentially impervious consisting of streets and walks.

Hydrologic Results

The 100-year, 2-hour storm resulted in a higher peak discharge than that computed for the 100-year, 24-hour storm and therefore it was selected as the design storm. The steep watersheds, percent impervious areas (rock outcrops), and rainfall intensity were all considered in the selection of the 100-yr, 2-hr storm as the design storm. It should be noted that the rainfall intensity curves provided in the Drainage Criteria Manual 1994 revisions do not correlate well with actual rainfall data provided in Figure 1 in FLO Engineering Hydrology report. The Drainage Criteria Manual rainfall intensity figure (as revised) indicates that the highest rainfall intensity occur at the outset of the storm whereas the actual storm data shows that the rainfall intensities are highest during the period from 15 to 30 minutes after the storm initiates.

Flood hydrographs were computed using the HEC-1 model. Peak discharges in the various off-site drainages across the front of Cheyenne Mountain ranged from 15 cfs to 560 cfs with unit runoff ranging from 1,030 to 1,440 cfs/mi^2. The unit runoff values compared well with unit runoffs reported in other studies. For example, RCI (1989) reported unit runoff for watersheds in the Colorado Springs area ranging from 950 to 1,140 cfs/mi^2 for basins smaller than 2 mi^2 in area. The HEC-1 results are summarized in Tables 2 and 3. The design points corresponding to those in the KLH (1982) or other reports as effected by the proposed development are located on Exhibit B.

Table 2 indicates that all of the 100-year return period peak discharges computed in this study are equal to or less than the estimated peak discharges in the 1982 KLH or other drainage report except for two small subbasins Basin D and Basin 13A. The 100-yr peak discharge for Basin 13A was calculated to be 70 cfs compared to 61 cfs in the KLH study. This difference in discharge is insignificant and should be considered within the range of accuracy for the design storm. On the other hand, the predicted Basin D 100-yr peak discharge is significantly greater than the KLH comparable discharge (131 cfs vs. 85 cfs). The difference can attributed primarily to the difference in basin areas. In the KLH study, the Basin D area was underestimated as result of the complex drainage pattern on the South Golf Course. In addition, KLH underestimated the impervious area associated with the lower subbasin. Despite this discharge difference in Basin D, the downstream developed peak discharges in the Zoo channel are less than the estimate peak discharges in the previous drainage reports. The higher peak discharge from Basin D does not exceed any downstream drainage facility conveyance capacity.

Table 2. 100-yr Return Period Peak Water Discharge			
Basin Design Point (DP)	Previously Reported Developed Peak Discharge (cfs)	HEC-1 Historic Peak Discharge (cfs)	HEC-1 Developed Peak Discharge (cfs)
DP 13-1	103[1]	81	103
DP 13-2	203[1]	152	204
DP 13A-1	61[1] 108[2]	44	70
DP Ski-1	622[1]	457	518
DP Ski-2	728[1]	576	693
DP Zoo-1	366[1]	322	322
DP Zoo-2	425[6] 423[1]	381	421
DP F	161[1]	137	153
DP FA	74[1]	60	60
DP D	85[1]	90	131
DP ZX-3	856[3]	640	729
DP ZX-1	1590[4] 1755[5]	1395	1509

[1] KLH (1982) Report.
[2]Drexel Barrell (1992), Drainage Report for Broadmoor Hills Park Filing No. 10
[3]R. L. Husmann (1978), Drainage Report for Roxbury Park
[4]Drexel Barrell (1981), Drainage Report for Oak Bridge Park
[5]R. L. Husmann (1977), Drainage Report for Regency Park
[6]KLH (1981) Drainage Report for Broadmoor Subdivision Filing No. 1

In Table 3, all the computed peak discharges equal or exceed the KLH (1982) reported peak discharges for the 5-yr return period design storm. Since the hydrologic parameters used for the 5-yr HEC-1 computed discharges are the same as the 100-yr parameters, the higher discharges are presumed to be the result of the design storm characteristics. The revised rainfall intensity criteria from the updated Drainage Criteria Manual was applied. Similar to the 100-yr design storm, the peak period of rainfall intensity for the 5-yr occurs during the initial 5 minute interval. This is overly conservative and unrealistic. The 5-yr design storm produces smaller discharges than the 100-yr design storm and as a result the 100-yr return period design storm peak discharge will be applied for the sizing of drainage facilities.

A careful review of the peak discharges for the proposed development indicates that although the 100-yr peak discharges for the two large basins are less than the KLH study, the basin area, curve number and percent impervious area were all greater in this study than in the KLH study. This implies that the hydrology characteristics of the storm or the method of computation used in the KLH study resulted in higher peak flows. The revisions in the Drainage Criteria Manual hydrology

since 1982, may have resulted in the computation of a smaller rainfall intensity. Since the 100-yr, 2-hr storm derived in the FLO Engineering Hydrology Report was supported by both rain gage and stream record transformation and because the selected hydrologic parameters are conservative compared to the KLH study, the 100-yr peak discharges should be appropriate for flood conveyance facility design.

Table 3. 5-yr Return Period Storm Peak Water Discharge

Basin Design Point	Previously Reported Developed Peak Discharge (cfs)	HEC-1 Developed Peak Discharge (cfs)
DP 13-1	33[1]	32
DP 13-2	64[1]	92
DP 13A-1	18[1] 50[2]	31
DP Ski-1[1]	206[1]	230
DP Ski-2	232[1]	310
DP Zoo-1	109[1]	141
DP Zoo-2	151[4] 136[1]	185
DP F	53[1]	67
DP FA	25[1]	26
DP D	29[1]	55
DP ZX-3	286[3]	344
DP ZX-1	-	720

[1]KLH (1982) Report.
[2]Drexel Barrell (1992), Drainage Report for Broadmoor Hills Park Filing No. 10
[3]R. L. Husmann (1978), Drainage Report for Roxbury Park
[4]KLH (1981) Drainage Report for Broadmoor Subdivision Filing No. 1

Drainage and Conveyance Facilities

Existing Drainage Facilities

Most of the existing drainage facilities consist of culverts located off the project site. This includes culverts in the Zoo, Ski Area, and Basin 13 channels. On-site facilities include culverts on South Club Drive and a culvert at the South Golf Course parking lot. Several small culverts are located throughout the golf course, but these are inconsequential to the overall drainage plan and downstream conveyance facilities. The important existing drainage facilities and their capacities shown in Table 4 will be discussed in this section.

Zoo Basin

Upstream of the Zoo parking lot, from the Shrine Road to the 6 ft dia cmp culvert under the Zoo parking lot, the Zoo Basin channel has been soil cemented. The culvert under the parking lot has a capacity of 260 cfs which is smaller than the design flood peak discharge (Q_{100} = 322 cfs). This culvert is expected to be plugged during a large flood event. There is a metal grate covering the culvert inlet for animal control which will collect debris in the flood frontal wave. If debris plugs the culvert, flood waters will flow over the Zoo parking lot and will re-enter the Zoo drainage channel downstream.

A 30" dia. cmp culvert conveys off-site flows from Basin 17 across the Zoo parking lot. In its existing condition, this culvert is essentially plugged with sediment and debris. Flood overflows would cross the parking lot and enter the Zoo channel upstream of the newly constructed Stone Manor Heights culvert. This culvert is tentatively planned for replacement.

Downstream, there are two sets of culverts at the Genesis Place and South Club Drive intersection. At the Genesis Place cul-de-sac, there are two 4 ft dia. cmp culverts with seven foot of headwater depth. These culverts were constructed with a discharge capacity of about 250 cfs for the 5-year flood event which is now estimated at 185 cfs. The original estimate of the 5-year flood event was 151 cfs (KLH, 1981), but this value has increased as a result of the changes in the design storm criteria. The four foot diameter culverts do not have sufficient capacity to convey the 100-yr design flood peak discharge of 421 cfs. The original estimate of the 100-yr peak discharge was 425 cfs (KLH, 1981). If the culverts are plugged or overtopped, the flow would proceed over the cul-de-sac and return to the channel without any significant property damage. This cul-de-sac overflow for flood discharges greater than the 5-yr design flood event will occur as stated in the 1981 KLH report (page 2, paragraph 4).

Under South Club Drive, there are two nine ft dia cmp culverts with five foot of headwater and one six foot culvert with eight feet of available headwater depth. This downstream set of three culverts have adequate capacity to convey the 100-yr peak water flow. The plugging or failure of these sets of culverts would not be a hazard to property or life. The flood overflow would pass over the roadway and would return to the ravine where the flow would be conveyed downstream.

At the end of the study reach, the Zoo Basin channel flows pass through the Broadmoor Valley Road twin 7 ft x 12 ft box culverts. This set of culverts is downstream of the confluence with the Ski Area channel and has a discharge capacity of approximately 1680 cfs. It is in good condition and can convey the 100-year flood peak discharge (1509 cfs). Overflow or failure of this box culvert would result in flow over the road without damage to surrounding properties. Backwater effects due to plugging of the culvert may inundate some properties upstream.

Ski Area Basin

The culvert at the Ski Area parking lot has been replaced with a temporary 3 ft dia. cmp culvert in preparation for the construction of the Stone Manor Heights road extension. This culvert

does not have sufficient capacity to convey the 100-yr flood. Downstream of the parking lot, the channel enters the South Golf Course. There are several footbridges and one vehicle bridge over the channel, all with sufficient freeboard to pass the 100-yr flood. The loss of any of these bridges would not create a flood hazard.

Near the South Golf Course Clubhouse, the Ski Area Basin channel has been reconstructed around the parking lot. At the clubhouse, the channel flows through two four foot diameter culverts. This culvert crossing is used by golf course personnel and failure of the culverts would not present a flood hazard downstream. Plugging of these culverts and loss of conveyance capacity may cause the floodwaters to flow over the parking lot and inundate the clubhouse. There are no other drainage facilities on this channel downstream to the Broadmoor property boundary.

Within the Ski Area Basin, there are two additional culvert crossings along South Club Drive. These are located between Marland Courts and the South Golf Course parking lot. The culverts convey discharge from the interior drainage between South Club Drive and the Cheyenne Mountain Zoo Road. These two small basin areas consist primarily of the South Golf Course fairways. The culverts have been over-designed and greatly exceed the 100-year flood peak discharge. Loss of conveyance capacity in these culverts would cause the flood flow to cross South Club Drive and re-enter the channel downstream.

Along the South Club Drive from the South Golf Course parking lot to the maintenance building there are two 42 inch cmp culverts. These culverts convey only the discharge from the Basin 18 drainage upstream. Failure of these culverts would result in the loss of the maintenance road. The discharge would cross the road and return to the channel. The culverts can convey the 100-yr design storm peak discharge.

Before joining the Zoo Basin Channel upstream of Broadmoor Valley Road, the Ski Area Basin channel passes through a twin box culvert at Roxbury Circle. This set of box culverts each measure 5.1 ft by 7.8 ft and have a total conveyance capacity of 760 cfs. The 100-year water flood peak discharge (729 cfs) can be conveyed through these box culverts. Failure of the box culverts to convey the 100-year flood peak discharge would results in the flow overtopping the road and returning to the channel downstream without damage to other properties. The culvert and entrance are in excellent condition.

Basin 13 and 13A

The only existing drainage facility in these basins is off-site at the Farthing Drive culvert crossing. This culvert is a 5 ft dia. cmp with 8 ft of headwater. This culvert can pass the 100-yr design storm peak discharge. Loss of conveyance capacity would result in floodwaters crossing Farthing Drive and re-entering the channel downstream without the loss of property. The backwater ponding upstream of the plugged culvert could result in inundation of property near the culvert.

Miscellaneous Small Interior Drainages

Basin D drainage has two South Club Drive culvert crossings near Marland Courts. The first culvert is located on South Club Drive at the entrance to Marland Courts. This culvert is a 4 ft diameter cmp with 13 ft of possible headwater. The second culvert is a 3 ft diameter culvert with 16 ft of headwater. Both of these culverts can convey the 100-yr design storm peak discharge. The loss of conveyance in either of these culverts could result in local flooding around Marland Courts.

Table 4. Existing Drainage and Conveyance Facilities

Location	Type and Size	Capacity (cfs)	Convey 100-yr Q_p	Failure Hazard	Hydraulic Condition
Zoo Basin - Zoo Parking Lot	6' dia cmp	260	no	yes	poor
Zoo Basin - Zoo Parking Lot	30" dia cmp	blocked	no	no	poor
Zoo Basin - Genesis Place	2 x 4' dia cmp	250	no	no	good
Zoo Basin - South Club Drive	6' dia, 2 x 9' dia cmp	2,150	yes	no	excellent
Zoo Basin - Broadmoor Valley Road	2 x 7' x 12' box culverts	1,680	yes	no	good
Ski Area Basin - Parking Lot	6' dia cmp	removed	-	-	-
Ski Area Basin - South Golf Course	2 x 4' dia cmp	290	no	no	good
Ski Area Basin - South Club Drive South of South Club Courts	66" x 51" arch cmp and 48" cmp	280	yes	no	good
Ski Area Basin - South Club Drive	81" x 59" arch cmp	400	yes	no	good
Basin 13 - Farthing Drive	5' dia cmp	215	yes	no	good
Ski Basin - Maintenance Road	2 x 42" cmp	220	yes	no	good
Ski Basin - Roxbury Circle	2 x 5.1' x 7.8 box culverts	760	yes	no	excellent
D Basin - South Club Drive, near Marland Court	4' dia cmp	200	yes	yes	good
D Basin - South Club Drive, Marland Court Entrance	18" dia cmp	10	yes	yes	good

Proposed Drainage Facilities

All drainage improvements to the Broadmoor South Property are to be private facilities constructed by the Broadmoor Residential Resort Community. The Phase I drainage improvements in the Zoo Basin have been partially constructed. Drainage improvements to the Ski Area are to be initiated in the fall of 1996 and continue through 1997. Maintenance of the drainage facilities will be provided by the Broadmoor Residential Resort Community Home Owners Association.

The proposed drainage facilities will incorporate conventional water flood conveyance

The proposed drainage facilities will incorporate conventional water flood conveyance structures in the main channels, local rainfall/runoff drainage improvements to convey overland flow to collector and main channels, and mitigation measures for hyperconcentrated sediment flows (mud and debris flows). A discussion of debris flows are presented in a later section.

Conventional water flooding for the proposed development will not exceed the previous 100-yr design storm peak discharges estimated by the KLH (1982) study for all of the major basins. Only the small interior Basin D has a design storm peak discharge that exceeds the original estimates of the 1982 KLH study. These results indicate that predicted design storm discharges are in accordance with the previous Master Drainage Development Plan estimates (KLH, 1982). Existing off-site downstream drainage facilities in the major channels have been evaluated and will convey the 100-year conventional water flood for the developed condition. Conveyance facilities and improvements will be recommended for on-site drainage. Detailed design plans for the drainage improvements will be presented in the Final Drainage Reports to be submitted for the phased development.

Zoo Basin

The Stone Manor Heights Drive channel crossing just downstream of the Zoo parking lot has been constructed with an arch-type cmp culvert (17 ft x 12 ft). The capacity of this culvert is approximately 2,500 cfs. It was designed for the potential to convey the worst case hyperconcentrated sediment flow and its capacity significantly exceeds the 100-yr design storm peak discharge for water. Both upstream and downstream aprons and cutoff walls have constructed for this culvert as well as bank stability measures. Plugging of this culvert during a debris flow event would result in overtopping of the roadway, but the flow would be confined to the channel ravine and no other property damage would be incurred.

The Broadmoor is currently working with the Zoo administration to improve drainage and flood conveyance in the Zoo parking lot. The purpose of this effort is to contain flood flows related to the potential plugging of the 6 ft cmp culvert under the Zoo parking lot. Several alternative drainage improvement schemes have been developed and further consultation with the Zoo administration is necessary to resolve this issue. In addition, the 30 inch cmp culvert under the Zoo parking lot is also being considered for replacement.

Local drainage improvements for the Zoo Basin were discussed in the Final Drainage Report for the Broadmoor Residential Community, Phase I, Filing No. 1. The development includes nine estate lots to the east of the Zoo parking lot. Proposed drainage improvements included curb and gutter, 2 ft dia culverts and Type R inlets for routing flows to the major drainages. A cobble-lined 230 ft swale was designed to route the flow in one of the small interior drainages. Riprap and other erosion control measures were recommended. A Private drainage easement was designated for the Zoo Basin channel downstream of the arch culvert.

The proposed development between the Broadmoor Estates and Genesis Place in subbasins Z-1, Z-2 and Z-3 will require curb and gutter and culverts to direct runoff into the Zoo Basin channel. A private drainage easement will also be assigned for this reach of the Zoo Basin channel. The proposed road shown on Exhibit B will require a second 12 ft x 17 ft arch-type cmp culvert. Drainage details and cost estimates for this proposed development will be assessed in the Final Drainage Plan.

Ski Area Basin

The proposed development plan for the ski basin drainage is not complete. Therefore the extent of the drainage improvements can only be estimated. Mitigation for mud and debris flows will be incorporated into the drainage improvements in the Final Drainage Plan Report. The following drainage improvements are being considered for this basin.

If development is proposed for the basin upstream of the Ski Area parking lot, then the Basin 14 and 15 channels will be enlarged and improved. The improvements will consist of a constructed channel confluence at the location of the 1965 debris deposits in Basin 15. An enlarged channel will be stabilized and berms will be constructed from the confluence to the Ski Area parking lot for debris storage in the overbank areas. At the Stone Manor Heights Drive crossing, a 17 ft x 12 ft arch-type cmp culvert will be constructed. Downstream of the culvert, the Ski Area Basin channel will be reconstructed near the South Golf Course parking lot.

In the Final Drainage Report for the Broadmoor Residential Resort Community Phase I, Filing No. 2, drainage improvements were designed for the villas and the cluster homes located between the Ski Area parking lot and the Zoo parking lot. These improvements consisted of channel enlargement and a containment berm for the Basin 15 channel. Local runoff conveyance facilities were also proposed. The Filing 2 Final Drainage Report should be reviewed for details of the channel mitigation measures and drainage facilities. The next phase of the Broadmoor Residential Resort Community for the area upstream of the Ski Area parking lot will include further mitigation measures for mud and debris flows. These mitigation measures and any changes in the flood or mudflow hydrology in the Ski Area Basin will be analyzed in detail in the proposed drainage report. A constructed confluence of the Basins 14 and 15 channels and other channel improvements are being considered and if constructed, the local mudflow mitigation for the Villas proposed in the Phase I, Filing No. 2 Final Drainage Report will not be necessary.

Other drainage improvements sited in the Filing No. 2 Final Drainage Plan Report include two 24" storm sewers which will direct street flow into the Basin 15 channel, curb and gutters, and two 24" storm sewers to direct street runoff into the Basin 14 channel. Riprap pads and other erosion control methods will be included in the construction of the drainage improvements.

Drainage improvements were proposed for the Shrine Road in the Phase I, Filing No. 2 Final Drainage Plan Report. The intent of these drainage improvements is to reduce the potential for

debris flows to follow the Shrine Road to the switchback and down the slope to the proposed Villas. In 1965, a subbasin in the Zoo drainage generated a small debris flow which inundated the slope area above the Villas. The mitigation measures will consist of a small dip in the Shrine Road to convey the flow across the road and downslope the existing drainageway. The road will be constructed with a 3% cross slope. The proposed drainage improvements will not effect the natural drainage in the Zoo Basin.

Additional channel improvements in the Ski Area Basin may be considered for the channel near South Golf Course Clubhouse. These improvements will include replacement of the two four foot diameter cmp culverts for the Golf Course access road and channel enlargement and stabilization around the parking lot (Exhibit B). Since these improvements will only effect the potential flood inundation in the South Golf Course parking lot, the Broadmoor has not committed to these improvements. Downstream of the clubhouse the 100-yr design storm will be contained within the channel ravine to the eastern Broadmoor property boundary as shown in the Final Drainage Plan Report for Phase I, Filing 2.

Proposed private roads for the Broadmoor Village and the west portion of South Golf Course have not yet been identified, so local drainage improvements in the vicinity of the Ski Area parking lot and within the boundaries of the South Golf Course will have to be assessed in the Final Drainage Plan. The drainage for this area will be directed into the Ski Basin channel and has been accounted for in the HEC-1 rainfall/runoff analysis.

Basin 13 and Basin 13A

The proposed development for the Basins 13 and 13A drainages involves 47 single family dwellings as indicated in the Final Drainage Plan Report for the Broadmoor Residential Resort Community Phase II. This report as been submitted for preliminary review to the City of Colorado Springs Engineering Division. Additional development is proposed for both Basin 13 and 13A downstream of Fisher's Canyon Reservoir. This additional development and the required private roads are in the planning stages. Specific drainage facilities for this additional development will be addressed in a future Final Drainage Plan Report.

The proposed drainage improvements include two 24" dia. cmp culverts, one 30" dia. cmp culvert, two 6 ft cross pans for a street intersection, two 24" storm sewers, and curb and gutters. All the drainage will be directed into the Basin 13 and 13A main channels. The Farthing Drive five ft cmp culvert crossing is sufficient to convey the design storm runoff under the developed conditions. The Basin 13A design storm flows off-site at a peak discharge approximately equal to the estimated KLH (1982) peak discharge.

Basin F and Basin FA

The proposed development for Basins F and FA has not been planned in sufficient detail to size and locate specific drainage facilities. A 24" dia. cmp culvert will be necessary for the Stone Manor Height Drive crossing. Other drainage improvements will be directed to the main channels

in these subbasins where the proposed 100-yr design storm peak discharge is less than the estimated KLH (1982) peak discharge at the Broadmoor property boundary. Most of the drainage improvements will be in concert with the South Golf Course drainage.

Basin D

The drainage from the proposed expansion in the vicinity of Marland Courts will be directed into the existing drainage system. This includes South Club Drive drainage and drainage around the Marland Courts multi-family buildings. The additional developed runoff will not be direct through any of the South Club Drive culverts, but will increase the design storm peak discharge at the confluence with the Zoo Basin channel. The developed flows are less than the drainage facilities conveyance capacity in the lower basin. Specific drainage improvements around Marland Courts will be addressed in the Final Drainage Plan Report for this phase of the development.

Hyperconcentrated Sediment Flows

All the drainage analyses in this investigation have been prepared using conventional HEC-1 water flood routing procedures. All of the previous drainage studies by other consultants for the project basins have been completed without evaluating the potential for hyperconcentrated sediment flows. Both the Ski Area and Zoo Basins can generate mud and debris flows. The probability of hyperconcentrated sediment flows events occurring with design storm magnitude flow events is high, but must be evaluated on a watershed basis. Some basins are charged with sediment and debris which is stored in the channels. Other basins have channels that are relatively free of boulders and detritus. In addition, there is no criteria for comparing mud and debris flow events with the existing KLH master drainage plan estimated peak discharges.

Specific mud and debris flow mitigation measures have not yet been designed for the Ski Area Basin. When these mudflow mitigation measures have been formulated, an analysis of the effects on the floodwave progression downstream to determine any incremental increases or decrease in the peak discharge will be conducted. To analyze the worst case mud or debris flow requires a two-dimensional flood routing model with the capability of simulating the physical processes of hyperconcentrated sediment flows. The FLO-2D model will route a mud or debris flow hydrograph overland or in channels with rainfall and infiltration accounting for loss of storage due to buildings or obstructions. To apply the FLO-2D model and analyze mud and debris flow mitigation measures, it is necessary to have a complete development plan. There is no method for locating or estimating generalized development and drainage facilities in the FLO-2D data files similar to predict HEC-1 rainfall/runoff. For this reason, the on-site mud and debris flow mitigation measures will be analyzed in the Final Drainage Plans for future phases of the Broadmoor Residential Resort Community Development. This has already been accomplished in the Phase I, Filings 1 and 2 Final Drainage Plan Reports. Basin 13 has no evidence of historical mud and debris flows and the Phase II Final Drainage Plan does not address hyperconcentrated sediment flows.

Flood mitigation measures for potential mud and debris flows will be designed for hazard avoidance. All the mitigation structures will be evaluated for both mud and debris flow and water flooding. Most of the watersheds analyzed will have the potential for a minimum sediment concentration of 20% by volume resulting in a bulking factor of 1.25 for the peak discharge and the hydrograph volume.

Conclusions and Recommendations

The results of this Master Development Drainage Plan investigation confirm the validity of the KLH (1982) Master Drainage Plan. All of the Design Point 100-yr design storm peak discharges are less than or equal to the peak discharges estimated in the 1982 KLH report or the other previous drainage studies except for the discharge from one of the small interior basins. For most of the project area, the development densities are less than those proposed in the KLH study, but all of the hydrologic parameters used in this study equal or exceed that in the KLH study which results in a more conservative estimate of the excess runoff. Any difference in peak discharges results from a difference in the design storm characteristics used in the two studies.

Based on an analysis of the off-site downstream drainage facilities, the 100-year developed water flood flows can be conveyed by the existing structures. Drainage improvements will be limited to the on-site flood conveyance. Downstream improvements to drainage facilities will not be necessary for conventional water flooding, however, the City should review the adequacy of the flood conveyance structures for potential hyperconcentrated sediment flows. It is recommended that City address the potential for sediment bulking of flood flows and the loss of conveyance capacity related to debris plugging. The drainage plan reports for the Broadmoor Residential Resort Community will address on-site mitigation for potential mud and debris flows in those basins where there is evidence of historical hyperconcentrated sediment flows.

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Appendices

APPENDIX A

FLO Engineering, Inc.
Design Flood Hydrology Report

CITY OF COLORADO SPRINGS

CITY ENGINEERING DIVISION
Stormwater and Subdivision

February 15, 1995

Dennis Minchow
Rockwell Minchow Consultants
2920 Straus Lane, Suite 100
Colorado Springs CO 80907

BROADMOOR SOUTH HYDROLOGY STUDY

Dear Dennis,

The above referenced hydrology study prepared by FLO Engineering Inc. has been reviewed and a meeting was held on January 30, 1995 with you, Jimmy O'Brien of FLO Engineering, John Maynard and Nolan Shriner of N.E.S., and our staff to discuss the study. We also discussed the use of the *FLO-2D* model.

The engineer examined available rain gauge data in his attempt to select the most appropriate design storm. Upon a frequency analysis of the available data for the 24-hr storm it was determined that the City Criteria 24-hr, 100-yr total rainfall of 4.5 inches is supportable by the data and the assumption was made that the City Criteria 2-hr, 100-yr total rainfall of 3.1 inches is also acceptable. The available data also confirmed the storm distributions per City Criteria for both the 24-hr and the 2-hr storm.

City Criteria requires use of the storm distribution "producing the greatest level protection..." as quoted in the study. The engineer calibrated the hydrologic parameters of the HEC-1 model using gauge data in the adjacent Rock Creek drainage basin. The HEC-1 results for the Broadmoor South basins yield higher peak flows in the 2-hr storm.

Table 6 gives the peak flows for the key design points above the project area. (The flow rates will be bulked to account for mud and debris flow.) These design points are at the apex of the alluvial fans. The developable portion of the site is below these design points on the alluvial fans. No hydrology has been done for the developable site yet.

It is our understanding that once the site layout is determined, the *FLO-2D* model will generate the hydrology for the rest of the site at the same time the mud and debris flows are simulated. We have requested some additional information about how the *FLO-2D* model makes these calculations.

One of the key design issues will be the evaluation of mud/debris flow and requirements for mitigation. To my knowledge we have not addressed this issue on any other development proposals. The *FLO-2D* model will be used to simulate mud/debris flows. This is new to us and we look forward to learning more about it.

This letter will serve as our acceptance of the hydrology report and the apex design point flows.

Sincerely,

David R. Lethbridge
Subdivision Development Specialist

c. Bruce Thorson, Ken Sampley, Robin Kidder, Tim Mitros

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Broadmoor South Property
Design Flood Hydrology

Broadmoor South Master Drainage Plan
FLO Project No. 10522

Prepared For:

Broadmoor Hotel, Inc.
10 Lake Circle
Colorado Springs, CO 80906

Prepared by:

FLO Engineering, Inc.
P.O. Box 1659
Breckenridge, CO 80424
Ph: (303) 453-6394

Revised as Final
December 4, 1995

BROADMOOR SOUTH PROPERTY
DESIGN FLOOD HYDROLOGY

Introduction

The Broadmoor South property is located on a series of coalescing alluvial fans located at the eastern base of Cheyenne Mountain in Colorado Springs, Colorado. In recent history, large magnitude floods in the project vicinity, including those generating mud and debris flows, have been caused by summer convective thunderstorms. Recent mudflow events have occurred from late May to mid-September, but heavy rainfall is also possible in April and October. Mudflows are dependent on the availability of loose sediment and debris in the watershed. Watershed channels may be charged with sediment and produce a mudflow or the channel may be scoured relatively free of sediment from recent storms and create only a water flood. Rainfall that produces mudflow in one basin may not generate a mudflow in a contiguous basin. The frequency of mudflow events for any given watershed is small and if a mudflow event appears in the record, it is usually not representative of the flood populations because the historical record is so short.

Stream Gaging Records

The delineation of flood and debris flow hazards on the property requires the prediction of a design flood event. Large infrequent floods, assigned the status of a design flood event, are commonly determined by a statistical flood frequency analysis of stream gaging station records or by estimating the design rainfall event and simulating the flood with a rainfall-runoff model. The application of regression equations developed from other local or regional stream gages may supplement or replace the analysis of gaging station records if these records are either short or nonexistent.

There are no stream gages in the project watershed. The watersheds are small and very steep, the largest watershed being slightly less than one-half square mile. The nearest stream gage is located on Rock Creek on the southern end of Cheyenne Mountain approximately three miles from the project site. The northern most portion of the Rock Creek watershed is contiguous to the Fisher Canyon basin with the top of Cheyenne Mountain dividing the two basins. The Rock Creek stream gaging station monitors flows for a 6.7 square mile drainage. This drainage is too large to transpose a frequency analysis to the project watersheds, but the stream gaging data can be utilized to calibrate watershed parameters in a rainfall-runoff model.

A review of regression relationships for estimating peak discharges in this region led to the conclusion that application of these equations for the project watersheds was inappropriate. McCain and Jarrett (1976) and Livingston (1981) developed power law regression relationships for peak discharge as a function of basin area. These studies had regressed stream gaging data

for Arkansas River gaging stations on the eastern plains. The location of the project site in the foothills of the Rocky Mountains and the relatively small size of the project basins effectively precludes the application of these regression equations for predicting peak flow. Regression relationships for mountain watersheds as presented in McCain and Jarrett (1976) were also determined to be invalid for this area. Regional regression relationships were not used for the prediction of a design flood peak discharge in this investigation.

Rainfall-Runoff Modeling

The Army Corps of Engineers rainfall-runoff simulation model HEC-1 (COE, 1990) was applied to determine flood hydrographs at the watershed mouths for various frequency rainfall events. The HEC-1 model uses as input: rainfall, topographic characteristics of area and slope, soil type, vegetative cover and land use. Channel routing and overland flow are simulated by the model using a kinematic wave representation of the momentum equation.

The 100-year flood constitutes the design flood. To construct the 100-year rainfall event, the rain gage records of five rain stations in the Colorado Springs area were reviewed. In addition, the City of Colorado Springs and El Paso County Drainage Criteria Manual (Drainage Manual) was consulted to determine storm duration and rainfall distribution. The following sections discuss the features of the 100-year storm, watershed parameter calibration and the HEC-1 flood hydrograph simulation.

Precipitation

The Drainage Manual recommends a method to estimate the total rainfall for the 10-yr and 100-yr storms. These total rainfalls are derived from the NOAA Atlas, Volume III. Two storm distributions (for the 2-hr and 24-hr storms) are then applied to construct a potential design storm. The Drainage Manual requires that the "storm distribution producing the greatest level of protection for flood conveyance and storage facilities...," should be used to define the design storm. The 24-hr duration storm was distributed according to the SCS Type IIA storm distribution and the 2-hr storm was distributed on the basis of the Colorado Urban Hydrograph Procedure.

The magnitude of the flood and mud/debris flow hazard is controlled in large measure by the volume and intensity of the rainstorm which is subject to interpretation by the engineer. It is important, therefore, to document the selection of the design storm with supporting data. The rainfall depth and distribution for the project area was analyzed with a data base created with resources available from the National Weather Service and Colorado State University Library.

Available data from local precipitation stations included:

Fort Carson - 1981 to 1990, 10 years of data
Manitou Springs - 1949 to 1986, 38 years of record, missing last few years of data
Fountain - 1954 to 1990, 31 years of record, some missing data
Colorado Springs Airport - 1950 to 1990, 41 years of record
Ruxton Park - 1960 to 1990, 31 years of record

Daily precipitation records were used in this analysis. The maximum historical daily rainfall recorded at the various gages around the project area is presented in Table 1. Four probability distributions were applied to the daily precipitation data: extreme value, log extreme value, log Pearson Type III, and log normal. The applicability of a particular distribution to predict rare rainfall events is a function of the linearity of the plot of the data. The extreme value distribution is the frequency distribution usually applied by the National Weather Service for rainfall analysis. The Water Resources Council (Bulletin 17B, 1981) favors the log Pearson Type III distribution but recognizes that the extreme value distribution is proven to be more appropriate for shorter duration storms such as those used in engineering analyses. Some longer duration rainfalls show tendencies toward the log normal distribution. After a review of the plots of each of these distributions, it was apparent that for the Colorado Springs area the log normal plot produces a more linear relationship and a better predictor of the extreme rainfall events.

Table 1. Historical Maximum 24-hour Rainfall

Station	Maximum Precipitation (inches)
Ft. Carson	2.29" Aug. 8, 1986
Fountain	4.70" June 17, 1965
Manitou Springs	4.75" Oct. 1, 1959
Colorado Springs	3.00" July 22, 1952
Ruxton Park	2.35" April 27, 1967

Table 2 shows the results of the frequency analysis for the 10-year and 100-year, 24 hour storm using the extreme value and log normal distributions.

Table 2. Precipitation Depth Frequency Analysis

Station or Source (Elev.)	10-Year, 24-hour Precipitation (inches)		100-year, 24-hour Precipitation (inches)	
	Extreme Value	Log Normal	Extreme Value	Log Normal
Fort Carson (5870)	2.43	2.59	3.57	4.07
Fountain (5570)	2.95	2.65	4.78	4.35
Manitou Springs (6630)	3.1	2.92	4.88	4.67
Colorado Springs (6090)	2.46	2.49	3.6	3.7
Ruxton Park (9050)	2.17	2.16	2.97	2.84

The selected total storm rainfall using the Drainage Manual criteria results are presented in Table 3, line 1. The selected rainfall totals in other drainage reports are also presented in Table 3. The results indicate a consistency in the analysis of the design storm criteria.

Table 3. Estimated Storm Total Precipitation Depths

Source of Data	10-Year Rainfall (inches)		100-year Rainfall (inches)	
	2-Hour Storm	24-Hour Storm	2-Hour Storm	24-Hour Storm
Drainage Manual	2.3	3.2	3.1[1]	4.5
Muller Report	2.1	3.2	3.1	4.5
RCI Report	2.06	3.2	3.05	4.5
Drexel Barrell Report	1.9	2.9	3	4.6

[1]Adjusted for elevation this value would be 2.83 inches

The 24-hour, 100-yr estimated precipitation depths listed in the various reports compare well with the frequency analysis of the daily rainfall data for the Fountain and Manitou Springs gages. The rainfall depths for Ft. Carson and Colorado Springs gages are less than 4.5 inches, only a fair comparison and the Ruxton Park 100-yr, 24-hr predicted depth of 2.84 inches is a poor comparison. The difference between the frequency analysis and the drainage manual 100-year storm depth is related to elevation. The Colorado Springs' airport rain gage is several miles east on the plains and may not reflect the orographic effects of the foothills that the other gages experience. Two of the rain gages have higher maximum rainfalls than the 24-hr, 100-yr predicted rainfall depth of 4.5 inches, but the difference is not significant and it was concluded that these two gages have experienced a 100-yr return period rainstorm.

Based on the frequency analysis, the 4.5 inches total rainfall predicted with the Drainage Manual criteria is a good estimate of the precipitation for the 100-year, 24-hr storm for the Broadmoor South property. Since the Drainage Manual results for the 24 hour storm were supportable, it was assumed that the 2-hr storm also derived from the application of the Drainage Manual criteria would be acceptable. The 2-hr, 100-year rainfall derived from the Drainage Manual by the various studies was approximately 3.1 inches. The Broadmoor South property was higher in average elevation than project areas in the other studies and the adjustment for elevation, according to the Manual, reduced the 2-hr, 100-yr storm from 3.1 inches to 2.83 inches. To conservatively predict runoff, however, 3.1 inches total rainfall was used in the rainfall/runoff simulation.

Rainfall Distribution

The available rainfall gage record was scanned for hourly data to compare with the 2-hour and 24-hour storm distributions recommended by the Drainage Manual. The Drainage Manual requests that both the 2-hr and 24-storm be applied to determine the design storm. The 10-yr and 100-yr, 2-hr storms were plotted in Figure 1 and the 24-hr storm distribution was plotted in Figure 2. The storms with best corresponding distribution found in the historical data were plotted with these prescribed distributions. The most important aspect of the rainfall distribution is the period of most intense rainfall represented by the steepest portion of the duration curve. The period of most intense rainfall fills the potential infiltration with the highest efficiency and generates the most runoff. Several of the 2-hour storms and one of the 24-hour storms have appropriate distributions and intense rainfall periods representative of the prescribed Manual distributions. The actual storm data confirmed the applicability of the Drainage Manual storm distribution criteria for the Colorado Springs area.

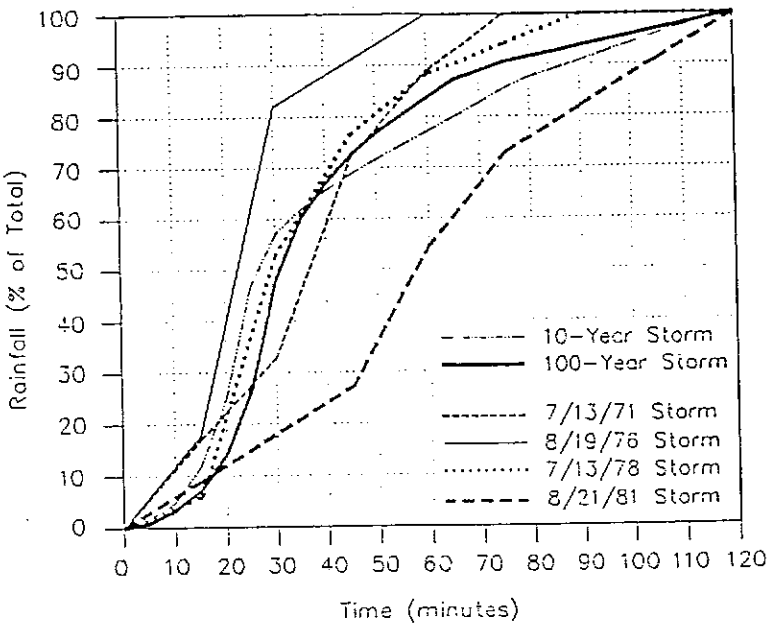

Figure 1. 2-Hour Storm Distributions

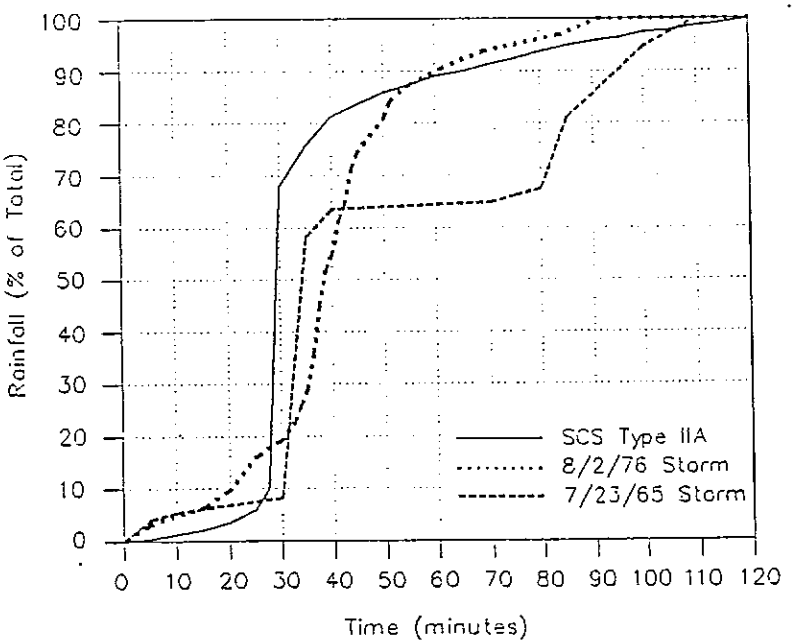

Figure 2. 24-Hour Storm Distributions

HEC-1 Model Calibration

Since the watersheds affecting the Broadmoor South property are small and ungaged, the design storm flood hydrology was predicted with the Corps of Engineers HEC-1 rainfall/runoff model. The application of this watershed model to the project area is appropriate because it is formulated with a kinematic wave approximation to the momentum equation which will accurately simulate flood wave progression on steep slopes (Ponce, et al., 1978). HEC-1 transforms excess rainfall/runoff computed by the SCS curve number method or the Green-Ampt infiltration model into subbasin outflow which is then routed to the watershed mouth as channel flow using the kinematic wave equation.

To estimate HEC-1 hydrologic parameters for the Broadmoor South Property, a nearby gaged watershed was calibrated. The calibrated parameters were then transposed to the study watersheds on the South Broadmoor Property. The final parameters used in the rainfall/runoff simulation were then compared with those applied in other studies in the Colorado Springs area. A brief description of the calibration procedure follows.

Rock Creek is a small watershed to the south of Cheyenne Mountain whose northernmost subbasin extends to the top of Cheyenne Mountain (elev. 9,400 ft). The Rock Creek basin is contiguous to the upper portion the Fisher Canyon watershed (Figure 3). This watershed is gaged near its canyon mouth (elev. 6,400 ft). Most of the basin is vegetated with coniferous trees of the lower Montane ecosystem. The understory is sparsely vegetated. There are numerous exposed outcrops throughout the basin, but the largest outcrops are located in the lower portion of the basin where the channel is confined by vertical canyon walls. Impervious areas were determined based on the percentage of exposed outcrop.

The USGS was consulted in locating Rock Creek gaging records for which there was a corresponding rainfall event recorded in the local rain gage records. Specifically, the Ft. Carson, Fountain, Manitou Springs and Ruxton Park rain gage records were reviewed. The storms producing significant runoff events in Rock Creek were generally local to the watershed and only a few runoff events had a corresponding significant amount of recorded rainfall. Two storms were chosen for the calibration, September 3-4, 1991 and July 19-20, 1985. These were the most recent gaging data with discharge related to summer storm activity. The first storm was used to calibrate the watershed parameters and the second storm was used to verify the accuracy of the parameters.

The Rock Creek discharge data was available in 15 minute increments. The rainfall data for the September, 1991 storm was available in hourly increments for Manitou Springs. The same storm did not rain on the Fountain gage and there was only a minor amount of rain at the Ft. Carson gage. The Mantiou Springs rainfall was assumed to occur on the Rock Creek watershed. It was evident from the stream gaging record that more rainfall fell for a longer duration on the Rock Creek basin than on the Manitou Springs gage because of the protracted period of high flow after the peak discharge passed. For that reason, a calibration was

MOUNT BIG CHIEF QUADRANGLE
COLORADO
7.5 MINUTE SERIES (TOPOGRAPHIC)
NW/4 MOUNT BIG CHIEF 15' QUADRANGLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

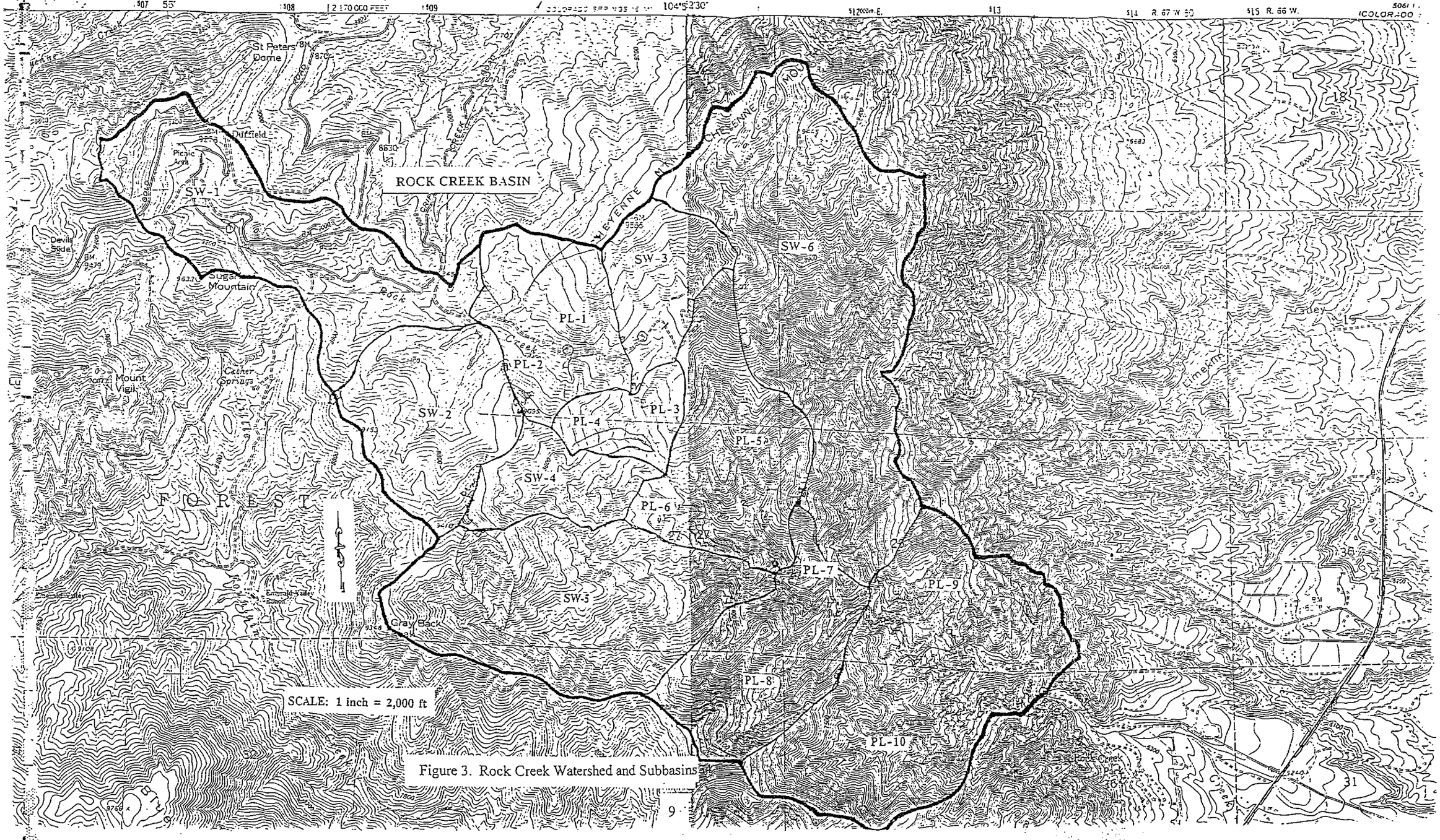

Figure 3. Rock Creek Watershed and Subbasins

performed to match the rising limb and peak discharge and not the volume of the entire hydrograph. A storm distribution roughly approximating the prescribed Drainage Manual criteria for the two-hour rainfall event was assumed and adjusted to help match the timing of the peak. The results of the calibration for the September, 1991 storm are shown in Figure 4 for the SCS curve number and Green-Ampt infiltration methods. The calibrated curve numbers and Green-Ampt infiltration parameters are presented in Table 4.

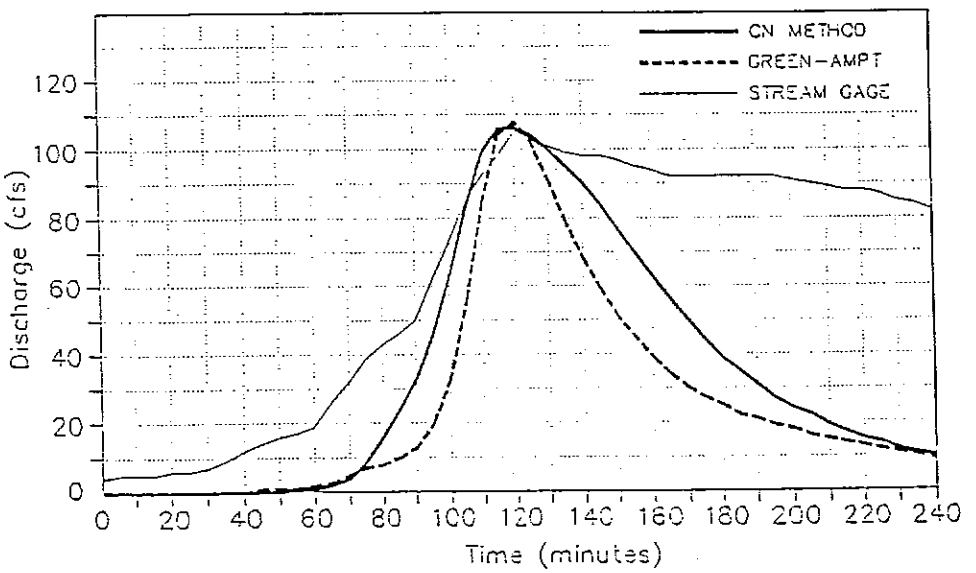

Figure 4. Rock Creek Storm Calibration for the September 3 and 4, 1991 Storm

The July, 1985 rainfall data at the Fountain and Manitou Springs rain gages were very dissimilar. It was noted that Rock Creek is approximately half way between the two gages and therefore the rain gage data were combined to produce a 4-hour, 0.9 inch rainfall on the watershed. Again, the rainfall distribution was adjusted slightly to more closely match the timing of the peak. The rainfall was increased slightly at the outset and was distributed more uniformly on the falling limb of the hydrograph. The assumed storm distribution closely resembled a condensed Type II, 24 hour storm (Figure 5). This second calibration utilized the same curve numbers employed in the initial calibration. Although the discharge was smaller for this storm, the calibration was highly correlated with the measured runoff as shown in Figure 6. No Green-Ampt infiltration parameter calibration was performed on the second storm because the excellent replication was achieved with measured runoff for the first storm using the SCS curve number method.

Table 4. Hydrology Parameters for the Rock Creek Watershed - HEC-1 Calibration

Peak Flow = 105 cfs
Volumes[1]: Vol_{CN} = 10.7 ac-ft, Vol_{GA} = 8.2 ac-ft

Basin	Curve Number CN	Initial Loss (in.)	Volume Moisture Deficiency (in.)	Wetting Front Suction (in.)	Hydraulic Conduct. (in.)
SW-1	74	.10	.20	4.15	.46
SW-2	74	.10	.20	4.15	.46
SW-3	75	.10	.20	4.15	.46
SW-4	76	.10	.20	4.15	.46
SW-5	76	.10	.20	4.17	.48
SW-6	75	.10	.20	4.17	.48
PL-12	74	.10	.20	4.17	.48
PL-34	76	.10	.20	4.17	.48
PL-56	74	.10	.20	4.17	.48
PL-78	76	.10	.20	4.17	.48
PL-910	76	.10	.20	4.17	.48

[1]Vol_{CN} = SCS Curve Number, Hydrograph Volume
Vol_{GA} = Green-Ampt Infiltration, Hydrograph Volume

The Green-Ampt infiltration method tends to produce more defined peaks with less volume of water in the hydrograph. Figure 4 indicates that the calibration using the Green-Ampt method is not as satisfactory as the Curve Number method. The second storm calibration using curve numbers was excellent (Figure 6) and therefore, it was decided to apply the SCS curve number method in the HEC-1 simulation for the Broadmoor South watersheds. The curve number approach will be more conservative with respect to the hydrograph volume.

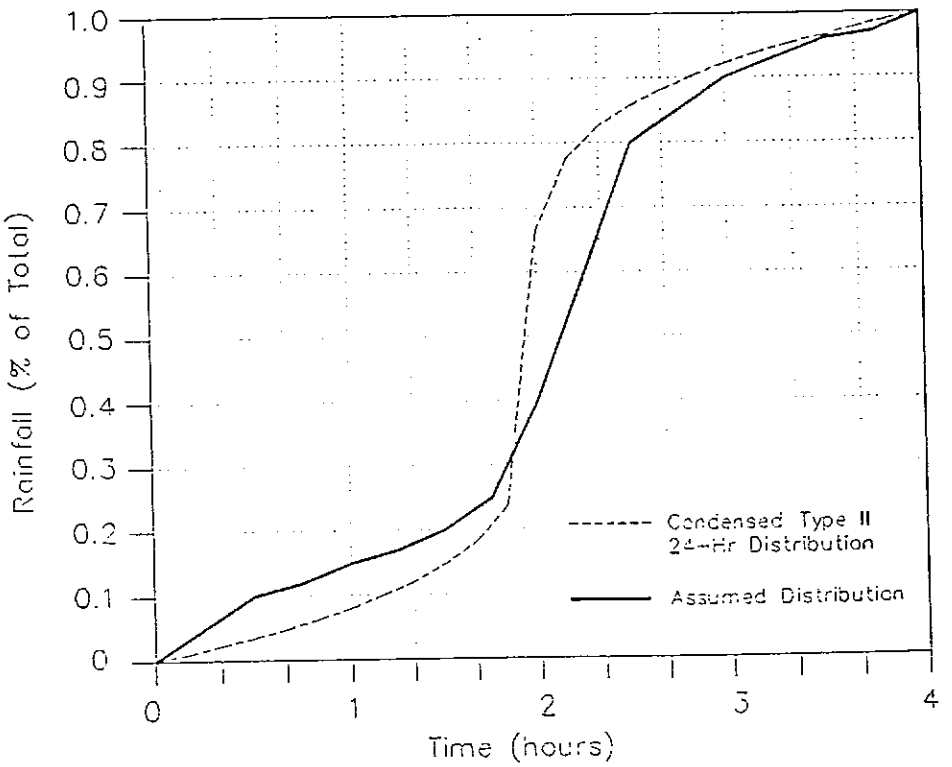

Figure 5. Storm Distribution for the Second Rock Creek Calibration

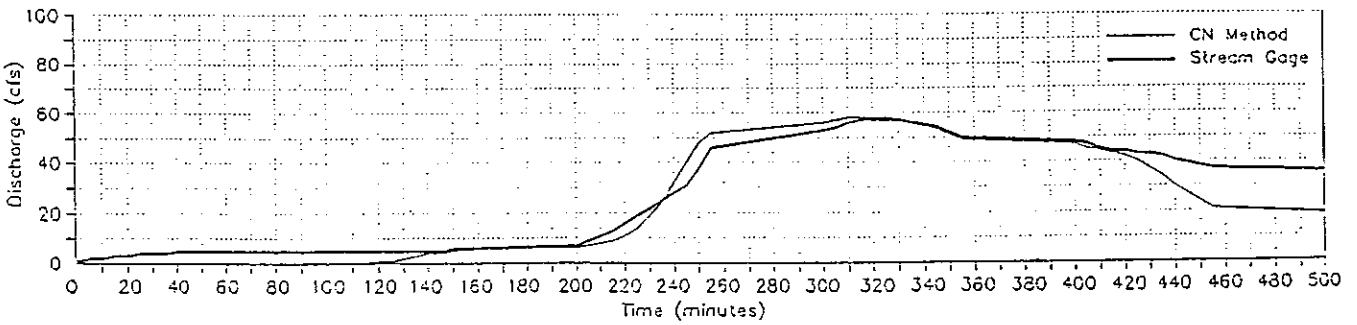

Figure 6. Rock Creek Storm Calibration for the July 19 and 20, 1985 Storm Using the SCS Curve Number Method

Hydrologic Modeling of the Broadmoor South Watersheds

The Broadmoor South Property is located on a series of coalescing alluvial fans formed by a number of small watersheds on the east slope of Cheyenne Mountain. The basins are labeled as numbers 3 to 17 in Figure 7 and extend from the NORAD entrance north to the Cheyenne Mountain Zoo. Basin 12, Fishers Canyon is the largest of these study basins. Subbasins modeled in the HEC-1 simulation as individual watershed units are identified by hyphenated numbers, e.g. 12-1.

Watersheds along the east slope of Cheyenne Mountain are extremely steep with numerous exposed rock outcrops. Cheyenne Mountain reaches an elevation of approximately 9,440 ft and the watershed alluvial fans begin between an elevation of 7,000 and 7,200 ft. Channel slopes in the upper watershed approach 60%. Rock outcrops are near vertical in many areas. Vegetation is sparse to moderate, with the north facing slope having slightly more vegetative cover. The alluvial fan project area lies in the lower Montane ecozone, an upland forest area of conifers and deciduous trees dominated by ponderosa pines, lodgepole, and blue spruce. Scrub oak are found throughout the basin along the channels.

For the purpose of hydrologic modeling, some impervious area (area of zero infiltration) in each basin was designated. The percent impervious area was estimated from aerial photos and the USGS Cheyenne Mountain 7.5 minute quadrangle map showing relative amounts of soil and bedrock. Based on the exposed bedrock estimates for the Rock Creek basin, percent impervious areas were estimated for the Broadmoor South watersheds. The impervious area was assumed to be approximately 5% of the estimated area of exposed bedrock.

Comparisons were made between the physical, topographic, and vegetative features of the Broadmoor South and the Rock Creek subbasins to estimate SCS curve numbers. The curve numbers for all the subbasins are presented in Appendix Tables A.1 and A.2. The curve numbers range from 74 to 76. For comparison, RCI (1989) used curve numbers of 75 and 76 for the upper watershed of Fishers's Canyon. Weiss (1987), Drexel Barrell (1990) and KLH (1982) applied a range of curve numbers to the hydrologic analysis of various urbanized watersheds. The range of curve numbers for analyses similar to the Broadmoor South was from 69 to 80.

The Green-Ampt infiltration parameters were also applied to determine excess rainfall on the Broadmoor South watersheds. Initially, the assigned parameters were the same as those used in the calibration of Rock Creek on the basis of elevation and vegetative cover. The parameters were then adjusted to first match the peak discharge and second to match the volume for the 100-year, 2-hr storm predicted by the curve number method for each basin. The final Green-Ampt parameters are presented in Appendix Tables A.1 and A.2.

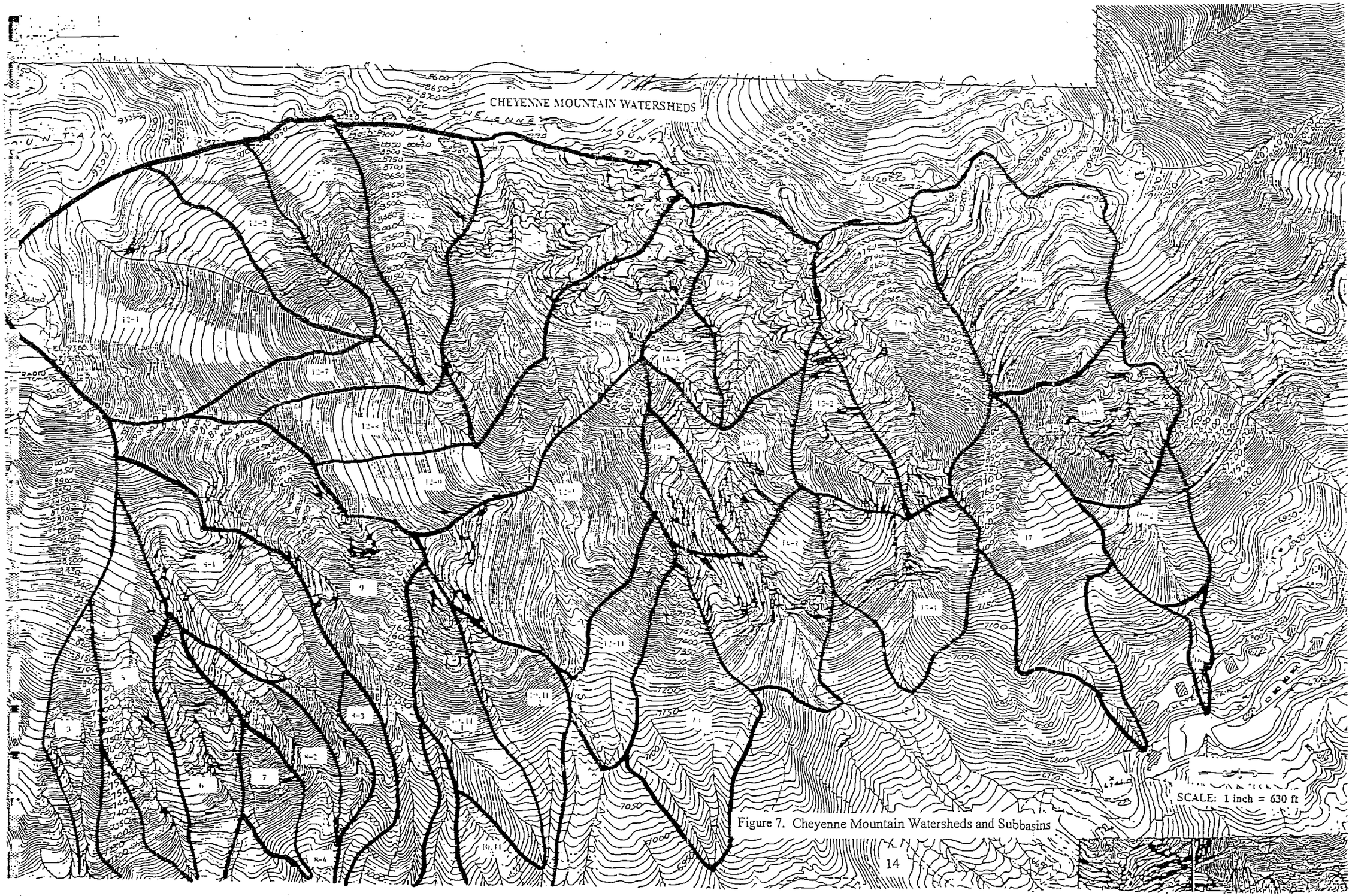

Figure 7. Cheyenne Mountain Watersheds and Subbasins

The peak discharges for the 10-yr and 100-yr, 2-hr and 24-hr storms using the SCS curve number method are shown in Table 5. The unit peak runoff for the 100-yr flood is presented in the last column of Table 5. RCI (1989) reported unit runoff for watersheds in the Colorado Springs area ranging from 950 to 1,140 cfs/mi^2 for basins less than 2 mi^2. The computed unit runoffs in this study generally fall within this range. The computed volumes and peaks using the Green-Ampt infiltration method are shown in Table 6.

Table 5 South Broadmoor Watershed HEC-1 Results

Basin # File	Area (mi^2)	HEC-1 Peak Flow (cfs) Using Curve Number Method				100-Year Peak Runoff (cfs/mi^2)
		10-Year		100-Year		
		2-hr	24-hr	2-hr	24-hr	2-hr
Basin 3	0.023	8	7	25	15	1,110
Basin 56	0.064	22	13	72	42	1,120
Basin 7	0.014	5	4	15	2	1,110
Basin 8	0.093	34	30	100	64	1,100
Basin 9	0.085	29	27	94	29	1,100
Basin 1011	0.072	24	21	77	47	1,070
Basin 12	0.494	190	140	560	310	1,140
Basin 13	0.045	15	14	50	30	1,100
Basin 14	0.132	49	42	150	87	1,130
Basin 15	0.126	48	31	150	87	1,170
Basin 16	0.131	72	55	190	110	1,440
Basin 17	0.055	19	16	50	30	1,030

The 100-yr, 2-hr storm results in a higher peak discharge than that computed for the 100-yr, 24 hour storm and was selected as the design storm. The 100-year, 2-hr hydrograph for Fisher's Canyon (Basin 12) is shown in Figure 8. This flood hydrograph is typical of the 100-yr flood hydrographs for other Broadmoor South watersheds. The HEC-1 simulated 100-yr, 2-hr hydrograph at the canyon mouth will constitute the inflow for the alluvial fan flood routing simulation to be performed with the 2-dimensional flood routing model FLO-2D.

Table 6. HEC-1 Results for South Broadmoor Watersheds Comparing Curve Number and Green-Ampt Infiltration Methods for the 100-Year Storm

Basin	Curve Number		Green-Ampt	
	Peak (cfs)	Volume (a-ft)	Volume (a-ft) Matching Peak	Peak (cfs) Matching Vol.
3	25	1.20	0.34	82
56	72	1.39	0.40	230
7	15	0.71	0.22	48
8	100	5.05	1.81	310
9	94	4.57	1.56	300
1011	77	3.80	1.43	220
12	560	28.80	9.91	1,500
13	50	2.40	0.93	153
14	150	7.14	2.14	430
15	150	7.10	2.09	440
16	190	9.38	2.57	570
17	57	2.66	0.63	190

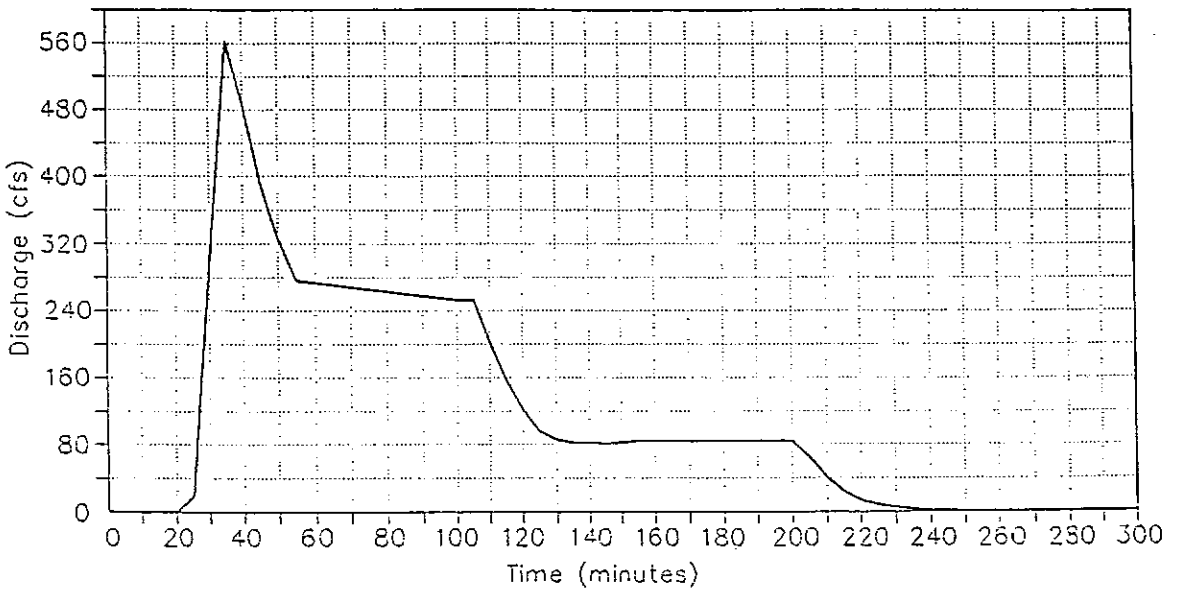

Figure 8. 100-Yr, 2-Hr Storm Discharge Hydrograph Fisher's Canyon, Basin 12

Summary

The Broadmoor South property extending from the NORAD entrance north to the Cheyenne Mountain Zoo is subject to flooding from the watersheds on the east slope of the Cheyenne Mountain. These watersheds, ranging in size from 0.014 to 0.494 square miles, have historically debouched mud and debris flows over the property and created small coalescing alluvial fans. To delineate the water flood and mud/debris flow hazard on the Broadmoor South property, a design rain storm was simulated in the upper watersheds.

The Broadmoor South watersheds were ungaged. It was necessary, therefore, to predict the flood hydrograph at the watershed mouth by simulating the rainfall-runoff for a design storm using the Corps of Engineers HEC-1 hydrologic model. The City of Colorado Springs and El Paso County Drainage Criteria Manual was consulted in formulating the design storm. Based on the Drainage Manual criteria, the selected design storm was the 100-yr 2-hr storm with a total rainfall of 3.1 inches. The Manual prescribed 2-hr rainfall distribution was applied in the HEC-1 simulation.

Hydrologic HEC-1 parameters for the Broadmoor South watersheds were calibrated using a small gaged basin (Rock Creek) to the south of Cheyennc Mountain. Two storms were calibrated for peak flow and volume. Both the SCS curve number and the Green-Ampt infiltration methods for computing runoff were attempted. The calibrated SCS curve numbers correlated well with the curve numbers used in other local studies. The second HEC-1 calibration resulted an excellent correlation with the measured runoff.

Flood hydrographs at the fan apex for the 100-yr flood were computed with HEC-1 for all the Broadmoor South watersheds. Peak discharges ranged from 15 to 560 cfs with unit runoff ranging from 1,030 to 1,440 cfs/mi^2. The unit runoff values fell with the range of unit runoffs computed in other studies. These flood hydrographs will be bulked for mud and debris flow simulation over the alluvial fans using a two-dimensional flood routing model FLO-2D.

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*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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BASIN F, BROADMOOR SOUTH
FLO ENGINEERING, INC.

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                     IPLOT         0  PLOT CONTROL
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               PRECIPITATION DEPTH    INCHES
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               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


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 11 KK      *         F1  *
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                          RUNOFF FROM BASIN F1

               SUBBASIN RUNOFF DATA

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                      TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

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 17 PW                        WEIGHTS       1.00

 14 PR             RECORDING STATIONS        ST2
 15 PW                        WEIGHTS       1.00

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                    CRVNBR        76.00  CURVE NUMBER
                     RTIMP         1.00  PERCENT IMPERVIOUS AREA

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	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
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	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
21 RK	MAIN CHANNEL		
	L	1050.	CHANNEL LENGTH
	S	.1250	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.02	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	1.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

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.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

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3	4.16	1.33	.18	66.67	28.41	30.61	1.10	6.14
4	4.01	1.34	.62	350.00	27.80	33.54	1.10	9.39

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INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

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1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.36	.01	0.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.49	.18	22.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.21	.17	28.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.10	.11	20.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.08	.09	16.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.06	.08	14.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.06	12.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.04	.06	11.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.04	.07	11.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.03	8.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	6.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	5.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	4.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	4.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	4.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	4.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.02	4.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	4.	1		0455	60	.00	.00	.00	0.
1		0155	24	.03	.01	.02	4.	1		0500	61	.00	.00	.00	0.
1		0200	25	.03	.01	.02	4.	1		0505	62	.00	.00	.00	0.
1		0205	26	.00	.00	.00	2.	1		0510	63	.00	.00	.00	0.
1		0210	27	.00	.00	.00	1.	1		0515	64	.00	.00	.00	0.
1		0215	28	.00	.00	.00	1.	1		0520	65	.00	.00	.00	0.
1		0220	29	.00	.00	.00	0.	1		0525	66	.00	.00	.00	0.
1		0225	30	.00	.00	.00	0.	1		0530	67	.00	.00	.00	0.
1		0230	31	.00	.00	.00	0.	1		0535	68	.00	.00	.00	0.
1		0235	32	.00	.00	.00	0.	1		0540	69	.00	.00	.00	0.
1		0240	33	.00	.00	.00	0.	1		0545	70	.00	.00	.00	0.
1		0245	34	.00	.00	.00	0.	1		0550	71	.00	.00	.00	0.
1		0250	35	.00	.00	.00	0.	1		0555	72	.00	.00	.00	0.
1		0255	36	.00	.00	.00	0.	1		0600	73	.00	.00	.00	0.
1		0300	37	.00	.00	.00	0.								

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.00, TOTAL EXCESS = 1.10

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	6.00-HR
(CFS)	(HR)					
		(CFS)				
28.	.58		3.	3.	3.	3.
		(INCHES)	1.114	1.114	1.114	1.114
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

*** ***

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          **************
          *            *
22 KK     *        F2  *
          *            *
          **************
```

RUNOFF FROM BASIN F2

SUBBASIN RUNOFF DATA

24 BA SUBBASIN CHARACTERISTICS

TAREA	.02	SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS	ST100	
17 PW WEIGHTS	1.00	
14 PR RECORDING STATIONS	ST2	
15 PW WEIGHTS	1.00	

25 LS SCS LOSS RATE

STRTL	.44	INITIAL ABSTRACTION
CRVNBR	82.00	CURVE NUMBER
RTIMP	8.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

26 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.1500	SLOPE
N	.080	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

27 RK COLLECTOR CHANNEL

L	200.	CHANNEL LENGTH
S	.1300	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

28 RK MAIN CHANNEL

L	1020.	CHANNEL LENGTH
S	.1200	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.02	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	1.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.21	1.67	.38	20.00	53.29	29.83	1.59	.87
3	4.16	1.33	.15	66.67	53.04	29.82	1.59	7.19
4	3.93	1.34	.49	340.00	72.61	30.92	1.35	11.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.285 EXCESS= 1.873 OUTFLOW= 3.155 BASIN STORAGE= .000 PERCENT ERROR= .116

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.93	1.34	5.00		67.70	30.00	1.36

****

HYDROGRAPH AT STATION F2

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.07	.01	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.11	.01	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.20	.02	2.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.29	.08	9.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.35	.31	68.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.14	.23	67.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.07	.15	48.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.05	.12	38.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.04	.10	32.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.03	.08	27.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.08	25.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.02	.08	25.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.01	.04	18.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.01	.04	14.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	11.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	8.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.03	8.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	8.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	8.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.03	8.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	8.	1		0455	60	.00	.00	.00	0.

1	0155	24	.03	.01	.03	8.	*	1	0500	61	.00	.00	.00	0.
1	0200	25	.03	.01	.03	8.	*	1	0505	62	.00	.00	.00	0.
1	0205	26	.00	.00	.00	5.	*	1	0510	63	.00	.00	.00	0.
1	0210	27	.00	.00	.00	3.	*	1	0515	64	.00	.00	.00	0.
1	0215	28	.00	.00	.00	1.	*	1	0520	65	.00	.00	.00	0.
1	0220	29	.00	.00	.00	1.	*	1	0525	66	.00	.00	.00	0.
1	0225	30	.00	.00	.00	0.	*	1	0530	67	.00	.00	.00	0.
1	0230	31	.00	.00	.00	0.	*	1	0535	68	.00	.00	.00	0.
1	0235	32	.00	.00	.00	0.	*	1	0540	69	.00	.00	.00	0.
1	0240	33	.00	.00	.00	0.	*	1	0545	70	.00	.00	.00	0.
1	0245	34	.00	.00	.00	0.	*	1	0550	71	.00	.00	.00	0.
1	0250	35	.00	.00	.00	0.	*	1	0555	72	.00	.00	.00	0.
1	0255	36	.00	.00	.00	0.	*	1	0600	73	.00	.00	.00	0.
1	0300	37	.00	.00	.00	0.	*							
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.51, TOTAL EXCESS = 1.59

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	6.00-HR
+	(CFS)	(HR)					
			(CFS)				
+	68.	.50		6.	6.	6.	6.
			(INCHES)	1.360	1.360	1.360	1.360
			(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .04 SQ MI

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          **************
          *            *
29 KK     *        F3  *
          *            *
          **************
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RUNOFF FROM BASIN F3

SUBBASIN RUNOFF DATA

31 BA SUBBASIN CHARACTERISTICS

TAREA .07 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

32 LS SCS LOSS RATE

STRTL .63 INITIAL ABSTRACTION

CRVNBR 76.00 CURVE NUMBER

RTIMP 1.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

33 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.1000	SLOPE
N	.080	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

34 RK COLLECTOR CHANNEL

L	200.	CHANNEL LENGTH
S	.0900	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

35 RK MAIN CHANNEL

L	1200.	CHANNEL LENGTH
S	.0800	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.07	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	2.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.89	1.67	.54	20.00	90.93	30.18	1.10	.61
3	2.60	1.33	.22	66.67	89.81	30.65	1.10	5.06
4	3.05	1.35	.56	400.00	154.48	31.79	1.20	11.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.172 EXCESS= 3.936 OUTFLOW= 7.101 BASIN STORAGE= .000 PERCENT ERROR= .093

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.05	1.35	5.00	152.87	35.00	1.22

HYDROGRAPH AT STATION F3

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.36	.01	5.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.49	.18	120.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.21	.17	153.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.10	.11	115.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.08	.09	91.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.06	.08	76.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.06	64.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.04	.06	59.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.04	.07	60.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.03	45.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	35.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	27.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	21.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	19.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	19.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	19.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.02	19.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	19.	1		0455	60	.00	.00	.00	0.
1		0155	24	.03	.01	.02	20.	1		0500	61	.00	.00	.00	0.
1		0200	25	.03	.01	.02	20.	1		0505	62	.00	.00	.00	0.
1		0205	26	.00	.00	.00	14.	1		0510	63	.00	.00	.00	0.
1		0210	27	.00	.00	.00	8.	1		0515	64	.00	.00	.00	0.
1		0215	28	.00	.00	.00	4.	1		0520	65	.00	.00	.00	0.
1		0220	29	.00	.00	.00	2.	1		0525	66	.00	.00	.00	0.
1		0225	30	.00	.00	.00	1.	1		0530	67	.00	.00	.00	0.
1		0230	31	.00	.00	.00	1.	1		0535	68	.00	.00	.00	0.
1		0235	32	.00	.00	.00	1.	1		0540	69	.00	.00	.00	0.
1		0240	33	.00	.00	.00	0.	1		0545	70	.00	.00	.00	0.
1		0245	34	.00	.00	.00	0.	1		0550	71	.00	.00	.00	0.
1		0250	35	.00	.00	.00	0.	1		0555	72	.00	.00	.00	0.
1		0255	36	.00	.00	.00	0.	1		0600	73	.00	.00	.00	0.
1		0300	37	.00	.00	.00	0.								

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.00, TOTAL EXCESS = 1.10

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	6.00-HR
(CFS)	(HR)				
		(CFS)			
153.	.58	14.	14.	14.	14.
		(INCHES) 1.216	1.216	1.216	1.216
		(AC-FT) 7.	7.	7.	7.

CUMULATIVE AREA = .11 SQ MI

1

RUNOFF SUMMARY

FLOW IN CUBIC FEET PER SECOND

TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	F1	28.	.58	3.	3.	3.	.02		
HYDROGRAPH AT	F2	68.	.50	6.	6.	6.	.04		
HYDRCGRAPH AT	F3	153.	.58	14.	14.	14.	.11		

1

SUMMARY OF KINEMATIC WAVE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
F1	4	.62	27.80	33.54	1.10	5.00	27.69	35.00	1.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.272 OUTFLOW= 1.270 BASIN STORAGE= .000 PERCENT ERROR= .163

F2	4	.49	72.61	30.92	1.35	5.00	67.70	30.00	1.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.285 EXCESS= 1.873 OUTFLOW= 3.155 BASIN STORAGE= .000 PERCENT ERROR= .116

F3	4	.56	154.48	31.79	1.20	5.00	152.87	35.00	1.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.172 EXCESS= 3.936 OUTFLOW= 7.101 BASIN STORAGE= .000 PERCENT ERROR= .093

*** NORMAL END OF HEC-1 ***

APPENDIX B

HEC-1 Results for the 100-Year Design Storm

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/05/1996  TIME  10:37:07 *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 551-1748               *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
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*** FREE ***
*** NOLIST ***
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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/05/1996  TIME  10:37:07 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 551-1748               *
*                                       *
*****************************************
```


BASIN 13A, BROADMOOR SOUTH
PLO ENGINEERING, INC.

```
5 IO          OUTPUT CONTROL VARIABLES
                    IPRNT         0  PRINT CONTROL
                    IPLOT         0  PLOT CONTROL
```

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                    QSCAL          0.  HYDROGRAPH PLOT SCALE

 4 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN            5  TIME INTERVAL IN MINUTES
                   JXDATE      1     0  STARTING DATE
                   JXTIME            0  STARTING TIME

   IT          HYDROGRAPH TIME DATA
                     NMIN            5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1     0  STARTING DATE
                    ITIME         0000  STARTING TIME
                       NQ           73  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1     0  ENDING DATE
                    NDTIME         0600  ENDING TIME
                    ICENT           19  CENTURY MARK

                COMPUTATION INTERVAL      .08 HOURS
                    TOTAL TIME BASE     6.00 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 11 KK      *     13A.1  *
            *            *
            **************
                          RUNOFF FROM SUB-1

              SUBBASIN RUNOFF DATA

 13 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .02  SUBBASIN AREA

               PRECIPITATION DATA

 16 PT           TOTAL STORM STATIONS      ST100
 17 PW                        WEIGHTS       1.00

 14 PR             RECORDING STATIONS        ST2
 15 PW                        WEIGHTS       1.00

 18 LS          SCS LOSS RATE
                      STRTL          .60  INITIAL ABSTRACTION
                     CRVNBR        77.00  CURVE NUMBER
                      RTIMP         2.00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
 19 UK           OVERLAND-FLOW ELEMENT NO. 1
```

	L	100.	OVERLAND FLOW LENGTH
	S	.1800	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
20 RK	COLLECTOR CHANNEL		
	L	200.	CHANNEL LENGTH
	S	.1500	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.04	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
21 RK	MAIN CHANNEL		
	L	983.	CHANNEL LENGTH
	S	.1200	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.02	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.32	1.67	.50	20.00	24.63	29.87	1.18	.67
3	3.61	1.33	.10	66.67	24.48	30.33	1.18	10.65
4	3.76	1.38	.59	327.67	23.38	32.39	1.17	9.21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.038 OUTFLOW= 1.034 BASIN STORAGE= .000 PERCENT ERROR= .432

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.76	1.38	5.00		22.72	35.00	1.19

****

HYDROGRAPH AT STATION 13A.1

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.35	.02	1.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.47	.20	20.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.20	.18	23.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.10	.12	16.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.07	.10	13.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.05	.08	11.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.07	9.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.04	.07	9.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.04	.07	9.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.04	6.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	5.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	4.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	3.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	3.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	3.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	3.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.02	3.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	3.	1		0455	60	.00	.00	.00	0.
1		0155	24	.03	.01	.02	3.	1		0500	61	.00	.00	.00	0.
1		0200	25	.03	.01	.02	3.	1		0505	62	.00	.00	.00	0.
1		0205	26	.00	.00	.00	2.	1		0510	63	.00	.00	.00	0.
1		0210	27	.00	.00	.00	1.	1		0515	64	.00	.00	.00	0.
1		0215	28	.00	.00	.00	0.	1		0520	65	.00	.00	.00	0.
1		0220	29	.00	.00	.00	0.	1		0525	66	.00	.00	.00	0.
1		0225	30	.00	.00	.00	0.	1		0530	67	.00	.00	.00	0.
1		0230	31	.00	.00	.00	0.	1		0535	68	.00	.00	.00	0.
1		0235	32	.00	.00	.00	0.	1		0540	69	.00	.00	.00	0.
1		0240	33	.00	.00	.00	0.	1		0545	70	.00	.00	.00	0.
1		0245	34	.00	.00	.00	0.	1		0550	71	.00	.00	.00	0.
1		0250	35	.00	.00	.00	0.	1		0555	72	.00	.00	.00	0.
1		0255	36	.00	.00	.00	0.	1		0600	73	.00	.00	.00	0.
1		0300	37	.00	.00	.00	0.								

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.92, TOTAL EXCESS = 1.18

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	6.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 23.	.58		2.	2.	2.	2.
		(INCHES)	1.191	1.191	1.191	1.191
		(AC-PT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
22 KK       *    13A.2   *
            *            *
            **************
                          RUNOFF FROM SUB-2

              SUBBASIN RUNOFF DATA

24 BA           SUBBASIN CHARACTERISTICS
                      TAREA          .01  SUBBASIN AREA

                PRECIPITATION DATA

16 PT            TOTAL STORM STATIONS     ST100
17 PW                         WEIGHTS      1.00

14 PR              RECORDING STATIONS      ST2
15 PW                         WEIGHTS      1.00

25 LS           SCS LOSS RATE
                      STRTL          .53  INITIAL ABSTRACTION
                     CRVNBR        79.00  CURVE NUMBER
                      RTIMP         3.00  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
26 UK             OVERLAND-FLOW ELEMENT NO. 1
                          L         100.  OVERLAND FLOW LENGTH
                          S        .1500  SLOPE
                          N         .100  ROUGHNESS COEFFICIENT
                         PA        100.0  PERCENT OF SUBBASIN
                      DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
27 RK             COLLECTOR CHANNEL
                          L         166.  CHANNEL LENGTH
                          S        .1300  SLOPE
                          N         .080  CHANNEL ROUGHNESS COEFFICIENT
                         CA          .03  CONTRIBUTING AREA
                      SHAPE         TRAP  CHANNEL SHAPE
                         WD         1.00  BOTTOM WIDTH OR DIAMETER
                          Z         1.00  SIDE SLOPE
                      DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
28 RK             MAIN CHANNEL
                          L        1150.  CHANNEL LENGTH
                          S        .1100  SLOPE
                          N         .060  CHANNEL ROUGHNESS COEFFICIENT
                         CA          .01  CONTRIBUTING AREA
                      SHAPE         TRAP  CHANNEL SHAPE
                         WD         3.00  BOTTOM WIDTH OR DIAMETER
                          Z         1.00  SIDE SLOPE
                      DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                     RUPSTQ          YES  ROUTE UPSTREAM HYDROGRAPH

                                                   ***

              PRECIPITATION STATION DATA
```

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.77	1.67	.49	20.00	22.76	29.88	1.32	.68
3	3.39	1.33	.10	55.33	22.63	29.90	1.32	9.46
4	3.60	1.38	.63	383.33	41.70	32.22	1.24	10.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.048 EXCESS= .885 OUTFLOW= 1.931 BASIN STORAGE= .000 PERCENT ERROR= .119

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.60	1.38	5.00		41.53	35.00	1.26

****

HYDROGRAPH AT STATION 13A.2

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	*	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	*	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	*	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.01	0.	*	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.34	.04	1.	*	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.43	.24	34.	*	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.18	.20	42.	*	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.09	.13	31.	*	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.06	.11	25.	*	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.05	.09	21.	*	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.07	17.	*	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.07	16.	*	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.03	.08	16.	*	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.04	12.	*	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	9.	*	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	7.	*	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	6.	*	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	5.	*	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	5.	*	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	5.	*	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.03	5.	*	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	5.	*	1		0455	60	.00	.00	.00	0.

1	0155	24	.03	.01	.03	5.	*	1	0500	61	.00	.00	.00	0.
1	0200	25	.03	.01	.02	5.	*	1	0505	62	.00	.00	.00	0.
1	0205	26	.00	.00	.00	4.	*	1	0510	63	.00	.00	.00	0.
1	0210	27	.00	.00	.00	2.	*	1	0515	64	.00	.00	.00	0.
1	0215	28	.00	.00	.00	1.	*	1	0520	65	.00	.00	.00	0.
1	0220	29	.00	.00	.00	1.	*	1	0525	66	.00	.00	.00	0.
1	0225	30	.00	.00	.00	0.	*	1	0530	67	.00	.00	.00	0.
1	0230	31	.00	.00	.00	0.	*	1	0535	68	.00	.00	.00	0.
1	0235	32	.00	.00	.00	0.	*	1	0540	69	.00	.00	.00	0.
1	0240	33	.00	.00	.00	0.	*	1	0545	70	.00	.00	.00	0.
1	0245	34	.00	.00	.00	0.	*	1	0550	71	.00	.00	.00	0.
1	0250	35	.00	.00	.00	0.	*	1	0555	72	.00	.00	.00	0.
1	0255	36	.00	.00	.00	0.	*	1	0600	73	.00	.00	.00	0.
1	0300	37	.00	.00	.00	0.	*							
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.78, TOTAL EXCESS = 1.32

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	6.00-HR
+	(CFS)	(HR)					
			(CFS)				
+	42.	.58		4.	4.	4.	4.
			(INCHES)	1.257	1.257	1.257	1.257
			(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .03 SQ MI

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          **************
          *            *
29 KK     *     13A.3  *
          *            *
          **************
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RUNOFF FROM SUB-3

SUBBASIN RUNOFF DATA

31 BA SUBBASIN CHARACTERISTICS

TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

32 LS SCS LOSS RATE

STRTL .53 INITIAL ABSTRACTION

CRVNBR 79.00 CURVE NUMBER

RTIMP 3.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

33 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.1500	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

34 RK COLLECTOR CHANNEL

L	50.	CHANNEL LENGTH
S	.1200	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.02	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

35 RK MAIN CHANNEL

L	667.	CHANNEL LENGTH
S	.1250	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	2.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.77	1.67	.49	20.00	16.50	29.88	1.32	.68
3	3.23	1.33	.03	16.67	16.41	29.87	1.32	8.44
4	4.15	1.36	.43	222.33	15.97	30.71	1.32	8.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .641 OUTFLOW= .641 BASIN STORAGE= .000 PERCENT ERROR= .129

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.15	1.36	5.00		15.44	30.00	1.33

HYDROGRAPH AT STATION 13A.3

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.01	0.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.34	.04	1.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.43	.24	15.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.18	.20	14.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.09	.13	9.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.06	.11	8.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.05	.09	6.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.07	5.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.07	5.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.03	.08	5.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.04	3.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	3.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	2.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	2.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	2.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	2.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	2.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.03	2.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	2.	1		0455	60	.00	.00	.00	0.
1		0155	24	.03	.01	.03	2.	1		0500	61	.00	.00	.00	0.
1		0200	25	.03	.01	.02	2.	1		0505	62	.00	.00	.00	0.
1		0205	26	.00	.00	.00	1.	1		0510	63	.00	.00	.00	0.
1		0210	27	.00	.00	.00	0.	1		0515	64	.00	.00	.00	0.
1		0215	28	.00	.00	.00	0.	1		0520	65	.00	.00	.00	0.
1		0220	29	.00	.00	.00	0.	1		0525	66	.00	.00	.00	0.
1		0225	30	.00	.00	.00	0.	1		0530	67	.00	.00	.00	0.
1		0230	31	.00	.00	.00	0.	1		0535	68	.00	.00	.00	0.
1		0235	32	.00	.00	.00	0.	1		0540	69	.00	.00	.00	0.
1		0240	33	.00	.00	.00	0.	1		0545	70	.00	.00	.00	0.
1		0245	34	.00	.00	.00	0.	1		0550	71	.00	.00	.00	0.
1		0250	35	.00	.00	.00	0.	1		0555	72	.00	.00	.00	0.
1		0255	36	.00	.00	.00	0.	1		0600	73	.00	.00	.00	0.
1		0300	37	.00	.00	.00	0.								

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.78, TOTAL EXCESS = 1.32

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	6.00-HR
(CFS)	(HR)					
		(CFS)				
15.	.50		1.	1.	1.	1.
		(INCHES)	1.333	1.333	1.333	1.333
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

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          *            *
36 KK     *   13A.23   *
          *            *
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COMBINE BASINS SUB-2 AND SUB-3

38 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

****

HYDROGRAPH AT STATION 13A.23

SUM OF 2 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0135	20	7.	1		0310	39	0.	1		0445	58	0.
1		0005	2	0.	1		0140	21	7.	1		0315	40	0.	1		0450	59	0.
1		0010	3	0.	1		0145	22	7.	1		0320	41	0.	1		0455	60	0.
1		0015	4	0.	1		0150	23	7.	1		0325	42	0.	1		0500	61	0.
1		0020	5	0.	1		0155	24	7.	1		0330	43	0.	1		0505	62	0.
1		0025	6	2.	1		0200	25	7.	1		0335	44	0.	1		0510	63	0.
1		0030	7	50.	1		0205	26	5.	1		0340	45	0.	1		0515	64	0.
1		0035	8	56.	1		0210	27	3.	1		0345	46	0.	1		0520	65	0.
1		0040	9	41.	1		0215	28	1.	1		0350	47	0.	1		0525	66	0.
1		0045	10	32.	1		0220	29	1.	1		0355	48	0.	1		0530	67	0.
1		0050	11	27.	1		0225	30	0.	1		0400	49	0.	1		0535	68	0.
1		0055	12	23.	1		0230	31	0.	1		0405	50	0.	1		0540	69	0.
1		0100	13	21.	1		0235	32	0.	1		0410	51	0.	1		0545	70	0.
1		0105	14	21.	1		0240	33	0.	1		0415	52	0.	1		0550	71	0.
1		0110	15	16.	1		0245	34	0.	1		0420	53	0.	1		0555	72	0.
1		0115	16	12.	1		0250	35	0.	1		0425	54	0.	1		0600	73	0.
1		0120	17	9.	1		0255	36	0.	1		0430	55	0.					
1		0125	18	7.	1		0300	37	0.	1		0435	56	0.					
1		0130	19	7.	1		0305	38	0.	1		0440	57	0.					

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	6.00-HR
(CFS)	(HR)					
		(CFS)				
56.	.58		5.	5.	5.	5.
		(INCHES)	1.275	1.275	1.275	1.275
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .04 SQ MI

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          *            *
39 KK     *    13A.4   *
          *            *
          **************
                    RUNOFF FROM SUB-4

               SUBBASIN RUNOFF DATA

41 BA            SUBBASIN CHARACTERISTICS
                       TAREA          .01  SUBBASIN AREA

                 PRECIPITATION DATA

16 PT             TOTAL STORM STATIONS      ST100
17 PW                         WEIGHTS       1.00

14 PR               RECORDING STATIONS        ST2
15 PW                         WEIGHTS       1.00

42 LS            SCS LOSS RATE
                       STRTL          .53  INITIAL ABSTRACTION
                      CRVNBR         79.00  CURVE NUMBER
                       RTIMP          2.00  PERCENT IMPERVIOUS AREA

                 KINEMATIC WAVE
43 UK              OVERLAND-FLOW ELEMENT NO. 1
                           L          100.  OVERLAND FLOW LENGTH
                           S         .1500  SLOPE
                           N          .100  ROUGHNESS COEFFICIENT
                          PA         100.0  PERCENT OF SUBBASIN
                        DXMIN             5  MINIMUM NUMBER OF DX INTERVALS
44 RK              COLLECTOR CHANNEL
                           L           50.  CHANNEL LENGTH
                           S         .1300  SLOPE
                           N          .080  CHANNEL ROUGHNESS COEFFICIENT
                          CA           .02  CONTRIBUTING AREA
                       SHAPE          TRAP  CHANNEL SHAPE
                          WD          1.00  BOTTOM WIDTH OR DIAMETER
                           Z          1.00  SIDE SLOPE
                        DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
45 RK              MAIN CHANNEL
                           L          1233.  CHANNEL LENGTH
                           S         .0940  SLOPE
                           N          .060  CHANNEL ROUGHNESS COEFFICIENT
                          CA           .01  CONTRIBUTING AREA
                       SHAPE          TRAP  CHANNEL SHAPE
                          WD          3.00  BOTTOM WIDTH OR DIAMETER
                           Z          1.00  SIDE SLOPE
                        DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
                       RUPSTQ           YES  ROUTE UPSTREAM HYDROGRAPH

                                                                    ***

               PRECIPITATION STATION DATA
```

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.77	1.67	.49	20.00	19.06	30.02	1.30	.68
3	3.39	1.33	.03	16.67	19.03	30.01	1.30	9.07
4	3.33	1.38	.63	411.00	70.86	35.71	1.30	10.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2.600 EXCESS= .741 OUTFLOW= 3.399 BASIN STORAGE= .000 PERCENT ERROR= -1.719

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.33	1.38	5.00		70.35	35.00	1.31

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HYDROGRAPH AT STATION 13A.4

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.34	.04	10.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.43	.23	52.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.18	.20	70.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.09	.13	56.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.06	.10	44.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.05	.09	36.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.07	30.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.07	28.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.03	.08	27.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.04	22.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	17.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	13.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	10.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	9.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	9.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	9.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.03	9.	1		0450	59	.00	.00	.00	0.

1	0150	23	.03	.01	.02	9.	*	1	0455	60	.00	.00	.00	0.
1	0155	24	.03	.01	.03	9.	*	1	0500	61	.00	.00	.00	0.
1	0200	25	.03	.01	.02	9.	*	1	0505	62	.00	.00	.00	0.
1	0205	26	.00	.00	.00	7.	*	1	0510	63	.00	.00	.00	0.
1	0210	27	.00	.00	.00	4.	*	1	0515	64	.00	.00	.00	0.
1	0215	28	.00	.00	.00	3.	*	1	0520	65	.00	.00	.00	0.
1	0220	29	.00	.00	.00	1.	*	1	0525	66	.00	.00	.00	0.
1	0225	30	.00	.00	.00	1.	*	1	0530	67	.00	.00	.00	0.
1	0230	31	.00	.00	.00	1.	*	1	0535	68	.00	.00	.00	0.
1	0235	32	.00	.00	.00	0.	*	1	0540	69	.00	.00	.00	0.
1	0240	33	.00	.00	.00	0.	*	1	0545	70	.00	.00	.00	0.
1	0245	34	.00	.00	.00	0.	*	1	0550	71	.00	.00	.00	0.
1	0250	35	.00	.00	.00	0.	*	1	0555	72	.00	.00	.00	0.
1	0255	36	.00	.00	.00	0.	*	1	0600	73	.00	.00	.00	0.
1	0300	37	.00	.00	.00	0.	*							
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.80, TOTAL EXCESS = 1.30

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	6.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 70.	.58		7.	7.	7.	7.
		(INCHES)	1.311	1.311	1.311	1.311
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .05 SQ MI

1

RUNOFF SUMMARY

FLOW IN CUBIC FEET PER SECOND

TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+					6-HOUR	24-HOUR	72-HOUR			
	HYDROGRAPH AT									
+		13A.1	23.	.58	2.	2.	2.	.02		
	HYDROGRAPH AT									
+		13A.2	42.	.58	4.	4.	4.	.03		
	HYDROGRAPH AT									
+		13A.3	15.	.50	1.	1.	1.	.01		
	2 COMBINED AT									
+		13A.23	56.	.58	5.	5.	5.	.04		
	HYDROGRAPH AT									
+		13A.4	70.	.58	7.	7.	7.	.05		

1

SUMMARY OF KINEMATIC WAVE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

						INTERPOLATED TO COMPUTATION INTERVAL		
ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME

		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
13A.1	4	.59	23.38	32.39	1.17	5.00	22.72	35.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.038 OUTFLOW= 1.034 BASIN STORAGE= .000 PERCENT ERROR= .432

13A.2	4	.63	41.70	32.22	1.24	5.00	41.53	35.00	1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.048 EXCESS= .885 OUTFLOW= 1.931 BASIN STORAGE= .000 PERCENT ERROR= .119

13A.3	4	.43	15.97	30.71	1.32	5.00	15.44	30.00	1.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .641 OUTFLOW= .641 BASIN STORAGE= .000 PERCENT ERROR= .129

13A.4	4	.63	70.86	35.71	1.30	5.00	70.35	35.00	1.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2.600 EXCESS= .741 OUTFLOW= 3.399 BASIN STORAGE= .000 PERCENT ERROR= -1.719

*** NORMAL END OF HEC-1 ***

Appendix A

Hydrologic Parameters for the
Broadmoor South Watersheds

Table A.1: Broadmoor South Watersheds Hydrologic Parameters For Matching the Peak Discharge Computed with Curve Numbers

Basin	Curve Numbers CN	Initial Loss (in)	Volume Moisture Deficiency (in)	Wetting Front Suction (in)	Hydraulic Conductivity (in)
3	74	0.40	0.30	5.50	1.55
5	74	0.40	0.30	5.50	1.43
6	74	0.40	0.30	5.50	1.43
7	74	0.40	0.30	5.05	1.40
8-1	74	0.40	0.30	5.00	1.50
8-2	75	0.40	0.30	5.10	1.50
8-3	74	0.40	0.30	5.10	1.50
8-4	74	0.40	0.30	5.10	1.50
9	74	0.40	0.30	5.13	1.50
1011-1	74	0.40	0.30	5.27	1.30
1011-2	74	0.40	0.30	5.27	1.30
1011-3	74	0.40	0.30	5.40	1.40
12-1	76	0.40	0.30	5.20	1.48
12-2	76	0.40	0.30	5.20	1.48
12-3	76	0.40	0.30	5.20	1.48
12-4	75	0.40	0.30	5.20	1.48
12-5	76	0.40	0.30	5.20	1.48
12-6	76	0.40	0.30	5.20	1.48
12-7	75	0.40	0.30	5.30	1.60
12-8	75	0.40	0.30	5.30	1.60
12-9	75	0.40	0.30	5.30	1.60
12-10	75	0.40	0.30	5.30	1.60
12-11	74	0.40	0.30	5.40	1.70
13	74	0.40	0.30	5.00	1.37
14-1	74	0.40	0.30	5.20	1.70
14-2	75	0.40	0.30	5.20	1.68

Table A.1. Broadmoor South Watersheds Hydrologic Parameters For Matching the Peak Discharge Computed with Curve Numbers

Basin	Curve Numbers CN	Initial Loss (in)	Volume Moisture Deficiency (in)	Wetting Front Suction (in)	Hydraulic Conductivity (in)
14-3	76	0.40	0.30	5.20	1.58
14-4	76	0.40	0.30	5.20	1.55
14-5	76	0.40	0.30	5.20	1.55
15-1	74	0.40	0.30	5.60	1.80
15-2	76	0.40	0.30	5.55	1.70
15-3	75	0.40	0.30	5.35	1.38
16-1	74	0.40	0.30	5.50	1.70
16-2	74	0.40	0.30	5.50	1.70
16-3	76	0.40	0.30	5.40	1.60
16-4	75	0.40	0.30	5.42	1.65
17	74	0.40	0.30	5.50	1.67

Table A.2: Broadmoor South Watersheds Hydrologic Parameters For Matching the Volume Computed with Curve Numbers

Basin	Curve Number CN	Initial Loss (in)	Volume Moisture Deficiency (in)	Wetting Front Suction (in)	Hydraulic Conductivity (in)
3	74	0.30	0.20	4.40	0.77
5	74	0.30	0.20	4.50	0.78
6	74	0.30	0.20	4.50	0.78
7	74	0.30	0.20	4.40	0.77
8-1	74	0.30	0.20	4.30	0.77
8-2	75	0.30	0.20	4.30	0.80
8-3	74	0.30	0.20	4.30	0.80
8-4	74	0.30	0.20	4.30	0.80
9	74	0.30	0.20	4.40	0.76
1011-1	74	0.30	0.20	4.40	0.76
1011-2	74	0.30	0.20	4.40	0.76
1011-3	74	0.30	0.20	4.40	0.80
12-1	76	0.30	0.20	4.40	0.63
12-2	76	0.30	0.20	4.40	0.63
12-3	76	0.30	0.20	4.40	0.63
12-4	75	0.30	0.20	4.40	0.63
12-5	76	0.30	0.20	4.40	0.63
12-6	76	0.30	0.20	4.40	0.63
12-7	75	0.30	0.20	4.50	0.80
12-8	75	0.30	0.20	4.50	0.80
12-9	75	0.30	0.20	4.40	0.80
12-10	75	0.30	0.20	4.50	0.80
12-11	74	0.30	0.20	4.50	0.80
13	74	0.30	0.20	4.40	0.74
14-1	74	0.30	0.20	4.50	0.75
14-2	75	0.30	0.20	4.50	0.75

Table A.2 Broadmoor South Watersheds Hydrologic Parameters For Matching the Volume Computed with Curve Numbers

Basin	Curve Number CN	Initial Loss (in)	Volume Moisture Deficiency (in)	Wetting Front Suction (in)	Hydraulic Conductivity (in)
14-3	76	0.30	0.20	4.40	0.65
	76	0.30	0.20	4.40	0.65
14-5	76	0.30	0.20	4.40	0.65
15-1	74	0.30	0.20	4.60	0.80
15-2	76	0.30	0.20	4.40	0.64
15-3	75	0.30	0.20	4.50	0.70
16-1	74	0.30	0.20	4.50	0.80
16-2	74	0.30	0.20	4.50	0.80
16-3	76	0.30	0.20	4.40	0.70
16-4	75	0.30	0.20	4.50	0.71
17	74	0.30	0.20	4.45	0.76

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/04/1996  TIME  13:37:12 *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET             *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX  XXXXX           XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
```

```
 *** FREE ***
 *** NOLIST ***
```


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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/04/1996  TIME  13:37:12 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET             *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
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BASIN 13, BROADMOOR SOUTH
FLO ENGINEERING, INC.

 5 IO          OUTPUT CONTROL VARIABLES
                  IPRNT         0  PRINT CONTROL
                  IPLOT         0  PLOT CONTROL
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                    QSCAL          0.  HYDROGRAPH PLOT SCALE

 4 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN           5  TIME INTERVAL IN MINUTES
                    JXDATE      1    0  STARTING DATE
                    JXTIME           0  STARTING TIME

   IT          HYDROGRAPH TIME DATA
                      NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1    0  STARTING DATE
                     ITIME         0000  STARTING TIME
                        NQ          73  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1    0  ENDING DATE
                    NDTIME         0600  ENDING TIME
                     ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL      .08 HOURS
                      TOTAL TIME BASE     6.00 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


               ***************
               *             *
11 KK          *         13  *
               *             *
               ***************
                         RUNOFF FROM BASIN13

                 SUBBASIN RUNOFF DATA

13 BA             SUBBASIN CHARACTERISTICS
                       TAREA          .05  SUBBASIN AREA

                  PRECIPITATION DATA

16 PT              TOTAL STORM STATIONS     ST100
17 PW                           WEIGHTS      1.00

14 PR                RECORDING STATIONS       ST2
15 PW                           WEIGHTS      1.00

18 LS             SCS LOSS RATE
                       STRTL          .56  INITIAL ABSTRACTION
                      CRVNBR        78.00  CURVE NUMBER
                       RTIMP         7.00  PERCENT IMPERVIOUS AREA

                  KINEMATIC WAVE
19 OK               OVERLAND-FLOW ELEMENT NO. 1
```

	L	100.	OVERLAND FLOW LENGTH
	S	.3850	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
20 RK	COLLECTOR CHANNEL		
	L	200.	CHANNEL LENGTH
	S	.3000	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
21 RK	MAIN CHANNEL		
	L	1040.	CHANNEL LENGTH
	S	.2020	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.05	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	9.25	1.67	.37	20.00	83.37	29.77	1.33	.91
3	5.11	1.33	.16	66.67	82.98	30.02	1.33	6.99
4	4.88	1.38	.37	346.67	81.80	30.38	1.33	15.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 3.229 OUTFLOW= 3.226 BASIN STORAGE= .000 PERCENT ERROR= .086

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.88	1.38	5.00		80.91	30.00	1.34

****

HYDROGRAPH AT STATION 13

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.07	.01	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.11	.01	1.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.20	.02	3.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.33	.05	12.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.43	.24	81.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.18	.20	69.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.09	.13	45.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.06	.10	37.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.05	.09	31.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.07	26.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.07	25.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.03	.08	26.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.04	16.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	14.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	10.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	8.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	8.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	8.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	8.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.02	8.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	8.	1		0455	60	.00	.00	.00	0.
1		0155	24	.03	.01	.03	9.	1		0500	61	.00	.00	.00	0.
1		0200	25	.03	.01	.02	8.	1		0505	62	.00	.00	.00	0.
1		0205	26	.00	.00	.00	4.	1		0510	63	.00	.00	.00	0.
1		0210	27	.00	.00	.00	2.	1		0515	64	.00	.00	.00	0.
1		0215	28	.00	.00	.00	1.	1		0520	65	.00	.00	.00	0.
1		0220	29	.00	.00	.00	0.	1		0525	66	.00	.00	.00	0.
1		0225	30	.00	.00	.00	0.	1		0530	67	.00	.00	.00	0.
1		0230	31	.00	.00	.00	0.	1		0535	68	.00	.00	.00	0.
1		0235	32	.00	.00	.00	0.	1		0540	69	.00	.00	.00	0.
1		0240	33	.00	.00	.00	0.	1		0545	70	.00	.00	.00	0.
1		0245	34	.00	.00	.00	0.	1		0550	71	.00	.00	.00	0.
1		0250	35	.00	.00	.00	0.	1		0555	72	.00	.00	.00	0.
1		0255	36	.00	.00	.00	0.	1		0600	73	.00	.00	.00	0.
1		0300	37	.00	.00	.00	0.								

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.77, TOTAL EXCESS = 1.33

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	6.00-HR
(CFS)	(HR)					
		(CFS)				
81.	.50		7.	7.	7.	7.
		(INCHES)	1.341	1.341	1.341	1.341
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .05 SQ MI

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          **************
          *            *
22 KK     *      13.1  *
          *            *
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RUNOFF FROM BASIN13.1

SUBBASIN RUNOFF DATA

24 BA SUBBASIN CHARACTERISTICS

TAREA	.02	SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

25 LS SCS LOSS RATE

STRTL	.56	INITIAL ABSTRACTION
CRVNBR	78.00	CURVE NUMBER
RTIMP	2.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

26 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.2500	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

27 RK COLLECTOR CHANNEL

L	200.	CHANNEL LENGTH
S	.2000	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	1.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

28 RK MAIN CHANNEL

L	1001.	CHANNEL LENGTH
S	.1200	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.02	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.45	1.67	.43	20.00	35.57	29.83	1.24	.77
3	4.21	1.33	.16	66.67	35.50	29.85	1.24	7.13
4	3.76	1.38	.41	333.67	114.66	31.19	1.31	13.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.247 EXCESS= 1.420 OUTFLOW= 4.666 BASIN STORAGE= .000 PERCENT ERROR= .020

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.76	1.38	5.00		102.94	30.00	1.32

****

HYDROGRAPH AT STATION 13.1

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.00	2.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.35	.03	11.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.45	.22	103.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.19	.19	102.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.09	.12	71.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.07	.10	56.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.05	.08	47.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.04	.07	39.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.04	.07	37.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.04	.07	38.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.02	.04	26.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.02	.04	21.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	16.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	12.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.02	12.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	12.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	12.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.02	12.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	12.	1		0455	60	.00	.00	.00	0.

1	0155	24	.03	.01	.02	12.	*	1	0500	61	.00	.00	.00	0.
1	0200	25	.03	.01	.02	12.	*	1	0505	62	.00	.00	.00	0.
1	0205	26	.00	.00	.00	8.	*	1	0510	63	.00	.00	.00	0.
1	0210	27	.00	.00	.00	4.	*	1	0515	64	.00	.00	.00	0.
1	0215	28	.00	.00	.00	2.	*	1	0520	65	.00	.00	.00	0.
1	0220	29	.00	.00	.00	1.	*	1	0525	66	.00	.00	.00	0.
1	0225	30	.00	.00	.00	1.	*	1	0530	67	.00	.00	.00	0.
1	0230	31	.00	.00	.00	0.	*	1	0535	68	.00	.00	.00	0.
1	0235	32	.00	.00	.00	0.	*	1	0540	69	.00	.00	.00	0.
1	0240	33	.00	.00	.00	0.	*	1	0545	70	.00	.00	.00	0.
1	0245	34	.00	.00	.00	0.	*	1	0550	71	.00	.00	.00	0.
1	0250	35	.00	.00	.00	0.	*	1	0555	72	.00	.00	.00	0.
1	0255	36	.00	.00	.00	0.	*	1	0600	73	.00	.00	.00	0.
1	0300	37	.00	.00	.00	0.	*							
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.86, TOTAL EXCESS = 1.24

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	6.00-HR
+	(CFS)	(HR)					
			(CFS)				
+	103.	.50		9.	9.	9.	9.
			(INCHES)	1.320	1.320	1.320	1.320
			(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .07 SQ MI

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          **************
          *            *
29 KK     *      13.2  *
          *            *
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RUNOFF FROM BASIN13.2

SUBBASIN RUNOFF DATA

31 BA SUBBASIN CHARACTERISTICS

TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

32 LS SCS LOSS RATE

STRTL .44 INITIAL ABSTRACTION

CRVNBR 82.00 CURVE NUMBER

RTIMP 5.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

33 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.2200	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

34 RK COLLECTOR CHANNEL

L	200.	CHANNEL LENGTH
S	.2000	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	1.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

35 RK MAIN CHANNEL

L	1678.	CHANNEL LENGTH
S	.1180	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.04	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.99	1.67	.39	20.00	96.24	29.94	1.54	.84
3	4.21	1.33	.14	66.67	95.77	29.90	1.54	8.12
4	3.73	1.38	.59	559.33	191.46	31.75	1.40	15.68

CONTINUITY SUMMARY (AC-FT) - INFLOW= 4.708 EXCESS= 3.409 OUTFLOW= 8.109 BASIN STORAGE= .000 PERCENT ERROR= .092

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.73	1.38	5.00	177.21	35.00	1.41

HYDROGRAPH AT STATION 13.2

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.11	.01	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.01	1.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.30	.07	17.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.37	.30	168.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.15	.23	177.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.07	.14	129.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.05	.12	100.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.04	.10	82.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.03	.08	69.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.08	63.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.03	.08	64.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.01	.04	48.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.01	.04	37.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	29.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	22.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.03	20.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	20.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	20.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.03	20.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	20.	1		0455	60	.00	.00	.00	0.
1		0155	24	.03	.01	.03	21.	1		0500	61	.00	.00	.00	0.
1		0200	25	.03	.01	.02	21.	1		0505	62	.00	.00	.00	0.
1		0205	26	.00	.00	.00	15.	1		0510	63	.00	.00	.00	0.
1		0210	27	.00	.00	.00	8.	1		0515	64	.00	.00	.00	0.
1		0215	28	.00	.00	.00	4.	1		0520	65	.00	.00	.00	0.
1		0220	29	.00	.00	.00	2.	1		0525	66	.00	.00	.00	0.
1		0225	30	.00	.00	.00	1.	1		0530	67	.00	.00	.00	0.
1		0230	31	.00	.00	.00	1.	1		0535	68	.00	.00	.00	0.
1		0235	32	.00	.00	.00	1.	1		0540	69	.00	.00	.00	0.
1		0240	33	.00	.00	.00	0.	1		0545	70	.00	.00	.00	0.
1		0245	34	.00	.00	.00	0.	1		0550	71	.00	.00	.00	0.
1		0250	35	.00	.00	.00	0.	1		0555	72	.00	.00	.00	0.
1		0255	36	.00	.00	.00	0.	1		0600	73	.00	.00	.00	0.
1		0300	37	.00	.00	.00	0.								

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.56, TOTAL EXCESS = 1.54

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	6.00-HR
(CFS)	(HR)				
		(CFS)			
177.	.58	16.	16.	16.	16.
		(INCHES) 1.412	1.412	1.412	1.412
		(AC-FT) 8.	8.	8.	8.

CUMULATIVE AREA = .11 SQ MI

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          **************
          *            *
36 KK     *      13.3  *
          *            *
          **************
                    RUNOFF FROM BASIN13.3

               SUBBASIN RUNOFF DATA

38 BA            SUBBASIN CHARACTERISTICS
                       TAREA          .02  SUBBASIN AREA

                 PRECIPITATION DATA

16 PT             TOTAL STORM STATIONS      ST100
17 PW                          WEIGHTS       1.00

14 PR               RECORDING STATIONS        ST2
15 PW                          WEIGHTS       1.00

39 LS            SCS LOSS RATE
                       STRTL          .50  INITIAL ABSTRACTION
                      CRVNBR        80.00  CURVE NUMBER
                       RTIMP         3.00  PERCENT IMPERVIOUS AREA

                 KINEMATIC WAVE
40 UK              OVERLAND-FLOW ELEMENT NO. 1
                           L          100.  OVERLAND FLOW LENGTH
                           S        .1850  SLOPE
                           N         .100  ROUGHNESS COEFFICIENT
                          PA        100.0  PERCENT OF SUBBASIN
                        DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
41 RK              COLLECTOR CHANNEL
                           L          200.  CHANNEL LENGTH
                           S        .1800  SLOPE
                           N         .080  CHANNEL ROUGHNESS COEFFICIENT
                          CA          .00  CONTRIBUTING AREA
                       SHAPE         TRAP  CHANNEL SHAPE
                          WD         1.00  BOTTOM WIDTH OR DIAMETER
                           Z         1.00  SIDE SLOPE
                        DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
42 RK              MAIN CHANNEL
                           L         1085.  CHANNEL LENGTH
                           S        .0940  SLOPE
                           N         .060  CHANNEL ROUGHNESS COEFFICIENT
                          CA          .02  CONTRIBUTING AREA
                       SHAPE         TRAP  CHANNEL SHAPE
                          WD         3.00  BOTTOM WIDTH OR DIAMETER
                           Z         1.00  SIDE SLOPE
                        DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                       RUPSTQ          YES  ROUTE UPSTREAM HYDROGRAPH
```

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.41	1.67	.45	20.00	34.32	29.70	1.37	.75
3	3.99	1.33	.18	66.67	34.17	30.07	1.37	6.28
4	3.33	1.38	.42	361.67	204.79	35.82	1.41	14.34

CONTINUITY SUMMARY (AC-FT) - INFLOW= 8.165 EXCESS= 1.294 OUTFLOW= 9.448 BASIN STORAGE= .000 PERCENT ERROR= .115

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.33	1.38	5.00		204.02	35.00	1.42

****

HYDROGRAPH AT STATION 13.3

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.01	0.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.33	.05	13.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.41	.26	173.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.17	.21	204.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.08	.13	157.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.06	.11	121.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.04	.09	99.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.03	.08	83.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.07	75.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.03	.08	74.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.01	.04	59.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.01	.04	46.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	35.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	28.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.03	24.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	24.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	23.	1		0445	58	.00	.00	.00	0.

1	0145	22	.03	.01	.03	23.	*	1	0450	59	.00	.00	.00	0.
1	0150	23	.03	.01	.02	24.	*	1	0455	60	.00	.00	.00	0.
1	0155	24	.03	.01	.03	24.	*	1	0500	61	.00	.00	.00	0.
1	0200	25	.03	.01	.02	24.	*	1	0505	62	.00	.00	.00	0.
1	0205	26	.00	.00	.00	19.	*	1	0510	63	.00	.00	.00	0.
1	0210	27	.00	.00	.00	12.	*	1	0515	64	.00	.00	.00	0.
1	0215	28	.00	.00	.00	7.	*	1	0520	65	.00	.00	.00	0.
1	0220	29	.00	.00	.00	4.	*	1	0525	66	.00	.00	.00	0.
1	0225	30	.00	.00	.00	2.	*	1	0530	67	.00	.00	.00	0.
1	0230	31	.00	.00	.00	1.	*	1	0535	68	.00	.00	.00	0.
1	0235	32	.00	.00	.00	1.	*	1	0540	69	.00	.00	.00	0.
1	0240	33	.00	.00	.00	1.	*	1	0545	70	.00	.00	.00	0.
1	0245	34	.00	.00	.00	0.	*	1	0550	71	.00	.00	.00	0.
1	0250	35	.00	.00	.00	0.	*	1	0555	72	.00	.00	.00	0.
1	0255	36	.00	.00	.00	0.	*	1	0600	73	.00	.00	.00	0.
1	0300	37	.00	.00	.00	0.	*							
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.72, TOTAL EXCESS = 1.38

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	6.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 204.	.58		19.	19.	19.	19.
		(INCHES)	1.416	1.416	1.416	1.416
		(AC-FT)	10.	10.	10.	10.

CUMULATIVE AREA = .13 SQ MI

1

RUNOFF SUMMARY

FLOW IN CUBIC FEET PER SECOND

TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+					6-HOUR	24-HOUR	72-HOUR			
	HYDROGRAPH AT									
+		13	81.	.50	7.	7.	7.	.05		
	HYDROGRAPH AT									
+		13.1	103.	.50	9.	9.	9.	.07		
	HYDROGRAPH AT									
+		13.2	177.	.58	16.	16.	16.	.11		
	HYDROGRAPH AT									
+		13.3	204.	.58	19.	19.	19.	.13		

1

SUMMARY OF KINEMATIC WAVE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

							INTERPOLATED TO COMPUTATION INTERVAL		
ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)

13	4	.37	81.80	30.38	1.33	5.00	80.91	30.00	1.34

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 3.229 OUTFLOW= 3.226 BASIN STORAGE= .000 PERCENT ERROR= .086

13.1	4	.41	114.66	31.19	1.31	5.00	102.94	30.00	1.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.247 EXCESS= 1.420 OUTFLOW= 4.666 BASIN STORAGE= .000 PERCENT ERROR= .020

13.2	4	.59	191.46	31.75	1.40	5.00	177.21	35.00	1.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= 4.708 EXCESS= 3.409 OUTFLOW= 8.109 BASIN STORAGE= .000 PERCENT ERROR= .092

13.3	4	.42	204.79	35.82	1.41	5.00	204.02	35.00	1.42

CONTINUITY SUMMARY (AC-FT) - INFLOW= 8.165 EXCESS= 1.294 OUTFLOW= 9.448 BASIN STORAGE= .000 PERCENT ERROR= .115

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/24/1996  TIME  11:34:15 *
*                                       *
*****************************************
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```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
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```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
```

```
 *** FREE ***
 *** NOLIST ***
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             FEBRUARY 1981             *
 *           REVISED 02 AUG 88           *
 *                                       *
 *  RUN DATE  09/24/1996  TIME  11:34:15 *
 *                                       *
 *****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
```


BASIN FA, BROADMOOR SOUTH
FLO ENGINEERING, INC.

```
    5 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          0  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
```

```
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

 4 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          5  TIME INTERVAL IN MINUTES
                    JXDATE      1   0  STARTING DATE
                    JXTIME          0  STARTING TIME

   IT          HYDROGRAPH TIME DATA
                     NMIN          5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ         73  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0600  ENDING TIME
                    ICENT         19  CENTURY MARK

                COMPUTATION INTERVAL      .08 HOURS
                    TOTAL TIME BASE     6.00 HOURS

         ENGLISH UNITS
              DRAINAGE AREA          SQUARE MILES
              PRECIPITATION DEPTH    INCHES
              LENGTH, ELEVATION      FEET
              FLOW                   CUBIC FEET PER SECOND
              STORAGE VOLUME         ACRE-FEET
              SURFACE AREA           ACRES
              TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
 11 KK     *        FA  *
           *            *
           **************
                        RUNOFF FROM BASIN FA

              SUBBASIN RUNOFF DATA

 13 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .04  SUBBASIN AREA

                PRECIPITATION DATA

 16 PT           TOTAL STORM STATIONS      ST100
 17 PW                        WEIGHTS       1.00

 14 PR             RECORDING STATIONS        ST2
 15 PW                        WEIGHTS       1.00

 18 LS          SCS LOSS RATE
                     STRTL          .50  INITIAL ABSTRACTION
                    CRVNBR        80.00  CURVE NUMBER
                     RTIMP         2.00  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
 19 UK            OVERLAND-FLOW ELEMENT NO. 1
```

	L	100.	OVERLAND FLOW LENGTH
	S	.1000	SLOPE
	N	.080	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
20 RK	COLLECTOR CHANNEL		
	L	200.	CHANNEL LENGTH
	S	.0900	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
21 RK	MAIN CHANNEL		
	L	780.	CHANNEL LENGTH
	S	.0800	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.04	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	1.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.89	1.67	.48	20.00	66.70	30.04	1.36	.70
3	3.46	1.33	.19	66.67	66.02	30.16	1.36	5.80
4	3.21	1.34	.44	260.00	64.49	31.07	1.36	9.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 2.564 OUTFLOW= 2.560 BASIN STORAGE= .000 PERCENT ERROR= .149

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.21	1.34	5.00		60.49	30.00	1.37

****

HYDROGRAPH AT STATION FA

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0305	38	.00	.00	.00	0.
1		0005	2	.03	.03	.00	0.	1		0310	39	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0315	40	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0320	41	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0325	42	.00	.00	.00	0.
1		0025	6	.38	.33	.04	3.	1		0330	43	.00	.00	.00	0.
1		0030	7	.67	.42	.25	60.	1		0335	44	.00	.00	.00	0.
1		0035	8	.38	.17	.20	57.	1		0340	45	.00	.00	.00	0.
1		0040	9	.21	.08	.13	38.	1		0345	46	.00	.00	.00	0.
1		0045	10	.17	.06	.11	31.	1		0350	47	.00	.00	.00	0.
1		0050	11	.13	.04	.09	26.	1		0355	48	.00	.00	.00	0.
1		0055	12	.11	.03	.07	22.	1		0400	49	.00	.00	.00	0.
1		0100	13	.11	.03	.07	20.	1		0405	50	.00	.00	.00	0.
1		0105	14	.11	.03	.08	21.	1		0410	51	.00	.00	.00	0.
1		0110	15	.05	.01	.04	14.	1		0415	52	.00	.00	.00	0.
1		0115	16	.06	.01	.04	11.	1		0420	53	.00	.00	.00	0.
1		0120	17	.03	.01	.02	9.	1		0425	54	.00	.00	.00	0.
1		0125	18	.03	.01	.02	7.	1		0430	55	.00	.00	.00	0.
1		0130	19	.03	.01	.03	7.	1		0435	56	.00	.00	.00	0.
1		0135	20	.03	.01	.02	7.	1		0440	57	.00	.00	.00	0.
1		0140	21	.03	.01	.02	6.	1		0445	58	.00	.00	.00	0.
1		0145	22	.03	.01	.03	7.	1		0450	59	.00	.00	.00	0.
1		0150	23	.03	.01	.02	7.	1		0455	60	.00	.00	.00	0.
1		0155	24	.03	.01	.03	7.	1		0500	61	.00	.00	.00	0.
1		0200	25	.03	.01	.02	7.	1		0505	62	.00	.00	.00	0.
1		0205	26	.00	.00	.00	4.	1		0510	63	.00	.00	.00	0.
1		0210	27	.00	.00	.00	2.	1		0515	64	.00	.00	.00	0.
1		0215	28	.00	.00	.00	1.	1		0520	65	.00	.00	.00	0.
1		0220	29	.00	.00	.00	1.	1		0525	66	.00	.00	.00	0.
1		0225	30	.00	.00	.00	0.	1		0530	67	.00	.00	.00	0.
1		0230	31	.00	.00	.00	0.	1		0535	68	.00	.00	.00	0.
1		0235	32	.00	.00	.00	0.	1		0540	69	.00	.00	.00	0.
1		0240	33	.00	.00	.00	0.	1		0545	70	.00	.00	.00	0.
1		0245	34	.00	.00	.00	0.	1		0550	71	.00	.00	.00	0.
1		0250	35	.00	.00	.00	0.	1		0555	72	.00	.00	.00	0.
1		0255	36	.00	.00	.00	0.	1		0600	73	.00	.00	.00	0.
1		0300	37	.00	.00	.00	0.								

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.74, TOTAL EXCESS = 1.36

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	6.00-HR
(CFS)	(HR)				
		(CFS)			
60.	.50	5.	5.	5.	5.
		(INCHES) 1.371	1.371	1.371	1.371
		(AC-FT) 3.	3.	3.	3.

CUMULATIVE AREA = .04 SQ MI

1

RUNOFF SUMMARY

FLOW IN CUBIC FEET PER SECOND

TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	FA	60.	.50	5.	5.	5.	.04		

1

SUMMARY OF KINEMATIC WAVE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

							INTERPOLATED TO COMPUTATION INTERVAL		
ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FA	4	.44	64.49	31.07	1.36	5.00	60.49	30.00	1.37

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 2.564 OUTFLOW= 2.560 BASIN STORAGE= .000 PERCENT ERROR= .149

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/24/1996  TIME  11:35:18 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX  XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
```

```
 *** FREE ***
 *** NOLIST ***
```


```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/24/1996  TIME  11:35:18 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
```


BASIN D, BROADMOOR SOUTH
FLO ENGINEERING, INC.

```
    5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT         0  PRINT CONTROL
                      IPLOT         0  PLOT CONTROL
```

```
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

4 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN            5  TIME INTERVAL IN MINUTES
                   JXDATE      1     0  STARTING DATE
                   JXTIME            0  STARTING TIME

  IT          HYDROGRAPH TIME DATA
                    NMIN            5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1     0  STARTING DATE
                   ITIME         0000  STARTING TIME
                      NQ           48  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      1     0  ENDING DATE
                  NDTIME         0355  ENDING TIME
                   ICENT           19  CENTURY MARK

                COMPUTATION INTERVAL      .08 HOURS
                    TOTAL TIME BASE     3.92 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
11 KK     *       D.1  *
          *            *
          **************
                         RUNOFF FROM BASIN D.1

             SUBBASIN RUNOFF DATA

13 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .03  SUBBASIN AREA

               PRECIPITATION DATA

16 PT           TOTAL STORM STATIONS      ST100
17 PW                        WEIGHTS       1.00

14 PR             RECORDING STATIONS        ST2
15 PW                        WEIGHTS       1.00

18 LS          SCS LOSS RATE
                    STRTL          .50  INITIAL ABSTRACTION
                   CRVNBR        80.00  CURVE NUMBER
                    RTIMP         3.00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
19 UK            OVERLAND-FLOW ELEMENT NO. 1
```

	L	100.	OVERLAND FLOW LENGTH
	S	.1900	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
20 RK	COLLECTOR CHANNEL		
	L	100.	CHANNEL LENGTH
	S	.1700	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
21 RK	MAIN CHANNEL		
	L	770.	CHANNEL LENGTH
	S	.1500	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.03	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.49	1.67	.44	20.00	50.01	30.05	1.37	.75
3	3.85	1.33	.10	33.33	50.00	30.05	1.37	5.83
4	4.20	1.38	.35	256.67	49.23	30.49	1.37	12.25

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.888 OUTFLOW= 1.882 BASIN STORAGE= .000 PERCENT ERROR= .309

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.20	1.38	5.00		48.62	30.00	1.39

****

HYDROGRAPH AT STATION D.1

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	5.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	3.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	1.
1		0020	5	.22	.21	.01	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.33	.05	4.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.41	.26	49.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.17	.21	41.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.08	.13	27.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.06	.11	22.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.04	.09	18.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	16.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.07	15.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	15.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	10.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	8.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	6.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	5.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	5.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	5.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	5.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	5.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	5.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	5.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.72, TOTAL EXCESS = 1.38

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
49.	.50		6.	6.	6.	6.
		(INCHES)	1.391	1.391	1.391	1.391
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .03 SQ MI

*** ***

```
          ***************
          *             *
22 KK     *       D.2   *
          *             *
          ***************
```

RUNOFF FROM BASIN13.1

SUBBASIN RUNOFF DATA

24 BA SUBBASIN CHARACTERISTICS

TAREA	.04	SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS	ST100	
17 PW WEIGHTS	1.00	
14 PR RECORDING STATIONS	ST2	
15 PW WEIGHTS	1.00	

25 LS SCS LOSS RATE

STRTL	.44	INITIAL ABSTRACTION
CRVNBR	82.00	CURVE NUMBER
RTIMP	16.70	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

26 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.1500	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

27 RK COLLECTOR CHANNEL

L	100.	CHANNEL LENGTH
S	.1300	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	1.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

28 RK MAIN CHANNEL

L	1500.	CHANNEL LENGTH
S	.1000	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.04	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO	VOLUME	MAXIMUM

						PEAK		CELERITY
			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
1	5.77	1.67	.42	20.00	102.69	29.78	1.73	.80
3	3.39	1.33	.09	33.33	102.31	29.74	1.73	6.38
4	3.43	1.38	.60	500.00	142.38	31.52	1.59	13.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.906 EXCESS= 3.568 OUTFLOW= 5.467 BASIN STORAGE= .000 PERCENT ERROR= .105

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.43	1.38	5.00		131.36	30.00	1.60

****

HYDROGRAPH AT STATION D.2

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.03	13.
1		0005	2	.03	.02	.00	0.	1		0205	26	.00	.00	.00	9.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	5.
1		0015	4	.12	.10	.02	2.	1		0215	28	.00	.00	.00	2.
1		0020	5	.22	.18	.04	7.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.27	.11	26.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.32	.35	131.	1		0230	31	.00	.00	.00	1.
1		0035	8	.38	.13	.25	119.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.06	.15	81.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.04	.12	63.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.03	.10	52.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.02	.08	43.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.02	.08	40.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.02	.09	41.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	30.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	23.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.03	18.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.03	14.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	13.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.03	13.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.03	12.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	13.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.03	13.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	13.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.37, TOTAL EXCESS = 1.73

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 131.	.50		17.	17.	17.	17.
		(INCHES)	1.603	1.603	1.603	1.603
		(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .06 SQ MI

1

RUNOFF SUMMARY

FLOW IN CUBIC FEET PER SECOND

TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			
HYDROGRAPH AT	D.1	49.	.50	6.	6.	6.	.03		
HYDROGRAPH AT	D.2	131.	.50	17.	17.	17.	.06		

1

SUMMARY OF KINEMATIC WAVE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
D.1	4	.35	49.23	30.49	1.37	5.00	48.62	30.00	1.39

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.888 OUTFLOW= 1.882 BASIN STORAGE= .000 PERCENT ERROR= .309

D.2	4	.60	142.38	31.52	1.59	5.00	131.36	30.00	1.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.906 EXCESS= 3.568 OUTFLOW= 5.467 BASIN STORAGE= .000 PERCENT ERROR= .105

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/24/1996  TIME  11:36:12 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*          (916) 551-1748               *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
```

```
*** FREE ***
*** NOLIST ***
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/24/1996  TIME  11:36:12 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*          (916) 551-1748               *
*                                       *
*****************************************
```


SKI BASIN, BROADMOOR SOUTH
FLO ENGINEERING, INC.

```
    5 IO          OUTPUT CONTROL VARIABLES
                        IPRNT         0  PRINT CONTROL
                        IPLOT         0  PLOT CONTROL
```

```
                QSCAL          0.  HYDROGRAPH PLOT SCALE

4 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN            5  TIME INTERVAL IN MINUTES
               JXDATE      1     0  STARTING DATE
               JXTIME            0  STARTING TIME

 IT         HYDROGRAPH TIME DATA
                NMIN            5  MINUTES IN COMPUTATION INTERVAL
               IDATE      1     0  STARTING DATE
               ITIME         0000  STARTING TIME
                  NQ           48  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE      1     0  ENDING DATE
              NDTIME         0355  ENDING TIME
               ICENT           19  CENTURY MARK

            COMPUTATION INTERVAL      .08 HOURS
                TOTAL TIME BASE     3.92 HOURS

      ENGLISH UNITS
           DRAINAGE AREA          SQUARE MILES
           PRECIPITATION DEPTH    INCHES
           LENGTH, ELEVATION      FEET
           FLOW                   CUBIC FEET PER SECOND
           STORAGE VOLUME         ACRE-FEET
           SURFACE AREA           ACRES
           TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          ***************
          *             *
11 KK     *      14.4   *
          *             *
          ***************
                        RUNOFF FROM BAS144

            SUBBASIN RUNOFF DATA

13 BA         SUBBASIN CHARACTERISTICS
                 TAREA          .01  SUBBASIN AREA

              PRECIPITATION DATA

16 PT          TOTAL STORM STATIONS      ST100
17 PW                       WEIGHTS       1.00

14 PR            RECORDING STATIONS        ST2
15 PW                       WEIGHTS       1.00

18 LS         SCS LOSS RATE
                 STRTL          .63  INITIAL ABSTRACTION
                CRVNBR        76.00  CURVE NUMBER
                 RTIMP         2.50  PERCENT IMPERVIOUS AREA

              KINEMATIC WAVE
19 UK           OVERLAND-FLOW ELEMENT NO. 1
```

	L	200.	OVERLAND FLOW LENGTH
	S	.8000	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
20 RK	COLLECTOR CHANNEL		
	L	600.	CHANNEL LENGTH
	S	.7500	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
21 RK	MAIN CHANNEL		
	L	740.	CHANNEL LENGTH
	S	.6760	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.01	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	13.33	1.67	.50	40.00	14.45	29.90	1.13	1.34
3	8.08	1.33	.35	200.00	14.22	30.89	1.13	9.44
4	8.92	1.38	.27	246.67	14.12	31.71	1.13	15.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .629 OUTFLOW= .627 BASIN STORAGE= .000 PERCENT ERROR= .247

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	8.92	1.38	5.00		13.62	35.00	1.15

****

HYDROGRAPH AT STATION 14.4

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	2.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.36	.02	0.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.48	.19	13.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.21	.17	14.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.10	.11	10.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.09	8.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.08	7.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.07	6.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.07	5.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	5.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	4.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	3.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	2.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	2.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	2.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	2.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	2.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	2.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	2.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	2.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.97, TOTAL EXCESS = 1.13

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
14.	.58		2.	2.	2.	2.
		(INCHES)	1.146	1.146	1.146	1.146
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

22 KK 14.5

RUNOFF FROM BAS145

SUBBASIN RUNOFF DATA

24 BA SUBBASIN CHARACTERISTICS

TAREA	.04	SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

25 LS SCS LOSS RATE

STRTL	.63	INITIAL ABSTRACTION
CRVNBR	76.00	CURVE NUMBER
RTIMP	2.50	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

26 UK OVERLAND-FLOW ELEMENT NO. 1

L	200.	OVERLAND FLOW LENGTH
S	.8000	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

27 RK COLLECTOR CHANNEL

L	580.	CHANNEL LENGTH
S	.6900	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

28 RK MAIN CHANNEL

L	1640.	CHANNEL LENGTH
S	.6650	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.04	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO	VOLUME	MAXIMUM

						PEAK		CELERITY
			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
1	13.33	1.67	.50	40.00	55.44	29.90	1.13	1.34
3	7.75	1.33	.37	193.33	54.42	30.80	1.13	8.65
4	8.85	1.38	.42	546.67	53.60	32.48	1.13	21.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 2.412 OUTFLOW= 2.405 BASIN STORAGE= .000 PERCENT ERROR= .258

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	8.85	1.38	5.00		52.40	35.00	1.14

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HYDROGRAPH AT STATION 14.5

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	7.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	5.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	2.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	1.
1		0020	5	.22	.21	.01	0.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.36	.02	2.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.48	.19	43.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.21	.17	52.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.10	.11	37.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.09	30.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.08	25.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.07	22.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.07	20.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	21.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	15.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	11.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	9.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	7.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	7.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	7.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	7.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	7.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	7.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	7.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.97, TOTAL EXCESS = 1.13

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
52.	.58		7.	7.	7.	7.
		(INCHES)	1.141	1.141	1.141	1.141
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .04 SQ MI

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          **************
          *            *
29 KK     *    NODE1   *
          *            *
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COMBINE BASINS 14.4 AND 14.5

31 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION NODE1

SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0100	13	26.	*	1		0200	25	9.	*	1		0300	37	0.
1		0005	2	0.	*	1		0105	14	26.	*	1		0205	26	6.	*	1		0305	38	0.
1		0010	3	0.	*	1		0110	15	19.	*	1		0210	27	3.	*	1		0310	39	0.
1		0015	4	0.	*	1		0115	16	14.	*	1		0215	28	1.	*	1		0315	40	0.
1		0020	5	0.	*	1		0120	17	11.	*	1		0220	29	1.	*	1		0320	41	0.
1		0025	6	2.	*	1		0125	18	9.	*	1		0225	30	0.	*	1		0325	42	0.
1		0030	7	56.	*	1		0130	19	8.	*	1		0230	31	0.	*	1		0330	43	0.
1		0035	8	66.	*	1		0135	20	8.	*	1		0235	32	0.	*	1		0335	44	0.
1		0040	9	47.	*	1		0140	21	8.	*	1		0240	33	0.	*	1		0340	45	0.
1		0045	10	38.	*	1		0145	22	9.	*	1		0245	34	0.	*	1		0345	46	0.
1		0050	11	32.	*	1		0150	23	9.	*	1		0250	35	0.	*	1		0350	47	0.
1		0055	12	27.	*	1		0155	24	9.	*	1		0255	36	0.	*	1		0355	48	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 66.	.58		9.	9.	9.	9.
		(INCHES)	1.142	1.142	1.142	1.142
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .05 SQ MI

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          **************
          *            *
32 KK     *     14.3   *
          *            *
          **************
                    RUNOFF FROM BAS143

          SUBBASIN RUNOFF DATA

34 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .03  SUBBASIN AREA

               PRECIPITATION DATA

16 PT           TOTAL STORM STATIONS      ST100
17 PW                        WEIGHTS       1.00

14 PR             RECORDING STATIONS        ST2
15 PW                        WEIGHTS       1.00

35 LS          SCS LOSS RATE
                    STRTL          .63  INITIAL ABSTRACTION
                    CRVNBR       76.00  CURVE NUMBER
                    RTIMP         2.30  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
36 UK            OVERLAND-FLOW ELEMENT NO. 1
                         L         200.  OVERLAND FLOW LENGTH
                         S        .8000  SLOPE
                         N         .100  ROUGHNESS COEFFICIENT
                        PA        100.0  PERCENT OF SUBBASIN
                      DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
37 RK            COLLECTOR CHANNEL
                         L         540.  CHANNEL LENGTH
                         S        .8000  SLOPE
                         N         .080  CHANNEL ROUGHNESS COEFFICIENT
                        CA          .00  CONTRIBUTING AREA
                     SHAPE         TRAP  CHANNEL SHAPE
                        WD          .00  BOTTOM WIDTH OR DIAMETER
                         Z         1.00  SIDE SLOPE
                      DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
38 RK            MAIN CHANNEL
                         L         960.  CHANNEL LENGTH
                         S        .5310  SLOPE
                         N         .060  CHANNEL ROUGHNESS COEFFICIENT
                        CA          .03  CONTRIBUTING AREA
                     SHAPE         TRAP  CHANNEL SHAPE
                        WD         3.00  BOTTOM WIDTH OR DIAMETER
                         Z         1.00  SIDE SLOPE
                      DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                     RUPSTQ          YES  ROUTE UPSTREAM HYDROGRAPH

                                                                    ***

          PRECIPITATION STATION DATA

                  STATION    TOTAL    AVG. ANNUAL    WEIGHT
                    ST100     3.10             .00      1.00
```

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	13.33	1.67	.50	40.00	38.79	30.10	1.13	1.34
3	8.34	1.33	.31	180.00	38.29	30.51	1.13	9.58
4	7.91	1.38	.24	320.00	101.95	35.48	1.14	22.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.063 EXCESS= 1.680 OUTFLOW= 4.739 BASIN STORAGE= .000 PERCENT ERROR= .096

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	7.91	1.38	5.00	101.32	35.00	1.15

****

HYDROGRAPH AT STATION 14.3

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	13.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	9.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	5.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	2.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.36	.02	3.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.49	.18	86.	1		0230	31	.00	.00	.00	1.
1		0035	8	.38	.21	.17	101.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.10	.11	74.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.09	60.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.08	50.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.07	43.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.07	40.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	41.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	29.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	23.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	18.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	14.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	13.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	13.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	13.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	13.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	13.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	14.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.97, TOTAL EXCESS = 1.13

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 101.	.58		15.	15.	15.	15.
		(INCHES)	1.146	1.146	1.146	1.146
		(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .08 SQ MI

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          **************
          *            *
39 KK     *      14.2  *
          *            *
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RUNOFF FROM BAS142

SUBBASIN RUNOFF DATA

41 BA SUBBASIN CHARACTERISTICS

TAREA	.01	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

42 LS SCS LOSS RATE

STRTL	.67	INITIAL ABSTRACTION
CRVNBR	75.00	CURVE NUMBER
RTIMP	2.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

43 UK OVERLAND-FLOW ELEMENT NO. 1

L	200.	OVERLAND FLOW LENGTH
S	.7100	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

44 RK COLLECTOR CHANNEL

L	520.	CHANNEL LENGTH
S	.6150	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

45 RK MAIN CHANNEL

L	1240.	CHANNEL LENGTH
S	.5160	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	12.55	1.67	.54	40.00	17.74	30.39	1.07	1.24
3	7.31	1.33	.34	173.33	17.54	31.40	1.07	8.51
4	7.79	1.38	.48	413.33	17.33	33.41	1.07	14.43

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .803 OUTFLOW= .801 BASIN STORAGE= .000 PERCENT ERROR= .258

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	7.79	1.38	5.00		17.29	35.00	1.07

****

HYDROGRAPH AT STATION 14.2

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	2.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	2.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.36	.01	0.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.50	.17	12.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.22	.16	17.	1		0235	32	.00	.00	.00	0.

1	0040	9	.21	.11	.11	13.	*	1	0240	33	.00	.00	.00	0.
1	0045	10	.17	.08	.09	10.	*	1	0245	34	.00	.00	.00	0.
1	0050	11	.13	.06	.07	9.	*	1	0250	35	.00	.00	.00	0.
1	0055	12	.11	.05	.06	7.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.04	.06	7.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.04	.07	7.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.02	.03	5.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.02	.04	4.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	3.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	2.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	2.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	2.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	2.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	2.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	2.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	2.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.03, TOTAL EXCESS = 1.07

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 17.	.58		2.	2.	2.	2.
		(INCHES)	1.074	1.074	1.074	1.074
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

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          ***************
          *             *
 46 KK    *    NODE2    *
          *             *
          ***************
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COMBINE BASINS 14.2 AND 14.3

48 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE2

SUM OF 2 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0100	13	47.	*	1		0200	25	16.	*	1		0300	37	0.
1		0005	2	0.	*	1		0105	14	48.	*	1		0205	26	11.	*	1		0305	38	0.

1	0010	3	0.	*	1	0110	15	34.	*	1	0210	27	5.	*	1	0310	39	0.		
1	0015	4	0.	*	1	0115	16	27.	*	1	0215	28	3.	*	1	0315	40	0.		
1	0020	5	1.	*	1	0120	17	21.	*	1	0220	29	1.	*	1	0320	41	0.		
1	0025	6	3.	*	1	0125	18	16.	*	1	0225	30	1.	*	1	0325	42	0.		
1	0030	7	98.	*	1	0130	19	15.	*	1	0230	31	1.	*	1	0330	43	0.		
1	0035	8	119.	*	1	0135	20	15.	*	1	0235	32	0.	*	1	0335	44	0.		
1	0040	9	87.	*	1	0140	21	15.	*	1	0240	33	0.	*	1	0340	45	0.		
1	0045	10	70.	*	1	0145	22	16.	*	1	0245	34	0.	*	1	0345	46	0.		
1	0050	11	59.	*	1	0150	23	16.	*	1	0250	35	0.	*	1	0350	47	0.		
1	0055	12	50.	*	1	0155	24	16.	*	1	0255	36	0.	*	1	0355	48	0.		
				*					*					*						

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 119.	.58		17.	17.	17.	17.
		(INCHES)	1.135	1.135	1.135	1.135
		(AC-FT)	6.	6.	6.	6.

CUMULATIVE AREA = .09 SQ MI

*** ***

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          **************
          *            *
 49 KK    *      14.1  *
          *            *
          **************
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RUNOFF FROM BAS141

SUBBASIN RUNOFF DATA

51 BA SUBBASIN CHARACTERISTICS

TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

52 LS SCS LOSS RATE

STRTL .70 INITIAL ABSTRACTION

CRVNBR 74.00 CURVE NUMBER

RTIMP 1.30 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

53 UK OVERLAND-FLOW ELEMENT NO. 1

L 200. OVERLAND FLOW LENGTH

S .8000 SLOPE

N .100 ROUGHNESS COEFFICIENT

PA 100.0 PERCENT OF SUBBASIN

	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
54 RK	COLLECTOR CHANNEL		
	L	560.	CHANNEL LENGTH
	S	.8390	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
55 RK	MAIN CHANNEL		
	L	1360.	CHANNEL LENGTH
	S	.3160	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.04	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	13.33	1.67	.54	40.00	45.71	34.73	1.00	1.24
3	8.54	1.33	.30	186.67	45.61	34.63	1.00	10.26
4	6.10	1.38	.36	453.33	163.47	35.70	1.09	21.18

CONTINUITY SUMMARY (AC-FT) - INFLOW= 5.589 EXCESS= 2.133 OUTFLOW= 7.717 BASIN STORAGE= .000 PERCENT ERROR= .060

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	6.10	1.38	5.00		160.94	35.00	1.10

****

HYDROGRAPH AT STATION 14.1

****

DA	MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
							*							
1	0000	1	.00	.00	.00	0.	*	1	0200	25	.03	.01	.02	22.
1	0005	2	.03	.03	.00	0.	*	1	0205	26	.00	.00	.00	16.
1	0010	3	.08	.08	.00	0.	*	1	0210	27	.00	.00	.00	9.
1	0015	4	.12	.12	.00	0.	*	1	0215	28	.00	.00	.00	5.
1	0020	5	.22	.21	.00	0.	*	1	0220	29	.00	.00	.00	3.
1	0025	6	.38	.37	.01	2.	*	1	0225	30	.00	.00	.00	2.
1	0030	7	.67	.52	.15	117.	*	1	0230	31	.00	.00	.00	1.
1	0035	8	.38	.23	.15	161.	*	1	0235	32	.00	.00	.00	1.
1	0040	9	.21	.11	.10	125.	*	1	0240	33	.00	.00	.00	0.
1	0045	10	.17	.08	.08	100.	*	1	0245	34	.00	.00	.00	0.
1	0050	11	.13	.06	.07	84.	*	1	0250	35	.00	.00	.00	0.
1	0055	12	.11	.05	.06	71.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.04	.06	66.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.04	.06	67.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.02	.03	51.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.02	.03	39.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	30.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	24.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	22.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	22.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	21.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	22.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	22.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	22.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.10, TOTAL EXCESS = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 161.	.58		24.	24.	24.	24.
		(INCHES)	1.102	1.102	1.102	1.102
		(AC-FT)	8.	8.	8.	8.

CUMULATIVE AREA = .13 SQ MI

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          **************
          *            *
56 KK     *      14A   *
          *            *
          **************
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RUNOFF FROM BASIN14A

SUBBASIN RUNOFF DATA

58 BA SUBBASIN CHARACTERISTICS

TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

```
16 PT          TOTAL STORM STATIONS      ST100
17 PW                       WEIGHTS       1.00

14 PR            RECORDING STATIONS        ST2
15 PW                       WEIGHTS       1.00

59 LS          SCS LOSS RATE
                    STRTL         .70  INITIAL ABSTRACTION
                   CRVNBR       74.00  CURVE NUMBER
                    RTIMP        1.00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
60 UK            OVERLAND-FLOW ELEMENT NO. 1
                        L          50.  OVERLAND FLOW LENGTH
                        S       .1500  SLOPE
                        N        .100  ROUGHNESS COEFFICIENT
                       FA       100.0  PERCENT OF SUBBASIN
                     DXMIN           5  MINIMUM NUMBER OF DX INTERVALS
61 RK            COLLECTOR CHANNEL
                        L         150.  CHANNEL LENGTH
                        S       .1500  SLOPE
                        N        .060  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .04  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD        2.00  BOTTOM WIDTH OR DIAMETER
                        Z        2.00  SIDE SLOPE
                     DXMIN           2  MINIMUM NUMBER OF DX INTERVALS
62 RK            MAIN CHANNEL
                        L        2075.  CHANNEL LENGTH
                        S       .1250  SLOPE
                        N        .060  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .02  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD        3.00  BOTTOM WIDTH OR DIAMETER
                        Z        2.00  SIDE SLOPE
                     DXMIN           2  MINIMUM NUMBER OF DX INTERVALS
                   RUPSTQ         YES  ROUTE UPSTREAM HYDROGRAPH

                                                                  ***

PRECIPITATION STATION DATA

        STATION     TOTAL     AVG. ANNUAL     WEIGHT
          ST100      3.10             .00       1.00

TEMPORAL DISTRIBUTIONS

STATION       ST2,  WEIGHT =   1.00
    .01       .03       .04       .07       .12       .22       .12       .07       .05       .04
    .03       .03       .03       .02       .02       .01       .01       .01       .01       .01
    .01       .01       .01       .01
                        COMPUTED KINEMATIC PARAMETERS
                              VARIABLE TIME STEP
                           (DT SHOWN IS A MINIMUM)
  ELEMENT     ALPHA         M        DT        DX      PEAK   TIME TO      VOLUME   MAXIMUM
                                                              PEAK                  CELERITY
                                    (MIN)      (FT)    (CFS)   (MIN)        (IN)     (FPS)

        1      5.77      1.67          .39     10.00     19.07     34.63        .99        .43
```

3	4.18	1.35	.07	50.00	19.07	34.58	.99	11.28
4	3.59	1.36	.82	691.67	176.83	36.87	1.09	13.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= 7.778 EXCESS= .887 OUTFLOW= 8.640 BASIN STORAGE= .001 PERCENT ERROR= .277

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.59	1.36	5.00		164.84	35.00	1.09

****

HYDROGRAPH AT STATION 14A

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	25.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	21.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	14.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	8.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	5.
1		0025	6	.38	.37	.01	0.	1		0225	30	.00	.00	.00	3.
1		0030	7	.67	.52	.15	74.	1		0230	31	.00	.00	.00	2.
1		0035	8	.38	.23	.15	165.	1		0235	32	.00	.00	.00	1.
1		0040	9	.21	.11	.10	151.	1		0240	33	.00	.00	.00	1.
1		0045	10	.17	.08	.08	121.	1		0245	34	.00	.00	.00	1.
1		0050	11	.13	.06	.07	100.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	85.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	76.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	75.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	63.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	49.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	38.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	30.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	26.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	25.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	24.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	24.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	25.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	25.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.11, TOTAL EXCESS = .99

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 165.	.58		27.	27.	27.	27.
		(INCHES)	1.089	1.089	1.089	1.089
		(AC-FT)	9.	9.	9.	9.

CUMULATIVE AREA = .15 SQ MI

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          ***************
          *             *
63 KK     *      15.3   *
          *             *
          ***************
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RUNOFF FROM BAS153

SUBBASIN RUNOFF DATA

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65 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .06  SUBBASIN AREA

               PRECIPITATION DATA

16 PT           TOTAL STORM STATIONS      ST100
17 PW                        WEIGHTS       1.00

14 PR             RECORDING STATIONS        ST2
15 PW                        WEIGHTS       1.00

66 LS          SCS LOSS RATE
                    STRTL          .67  INITIAL ABSTRACTION
                   CRVNBR         75.00  CURVE NUMBER
                    RTIMP          1.70  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
67 UK            OVERLAND-FLOW ELEMENT NO. 1
                        L          200.  OVERLAND FLOW LENGTH
                        S         .6700  SLOPE
                        N          .100  ROUGHNESS COEFFICIENT
                       PA         100.0  PERCENT OF SUBBASIN
                     DXMIN             5  MINIMUM NUMBER OF DX INTERVALS
68 RK            COLLECTOR CHANNEL
                        L          520.  CHANNEL LENGTH
                        S         .6730  SLOPE
                        N          .080  CHANNEL ROUGHNESS COEFFICIENT
                       CA           .00  CONTRIBUTING AREA
                    SHAPE          TRAP  CHANNEL SHAPE
                       WD           .00  BOTTOM WIDTH OR DIAMETER
                        Z          1.00  SIDE SLOPE
                     DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
69 RK            MAIN CHANNEL
                        L         2060.  CHANNEL LENGTH
                        S         .6800  SLOPE
                        N          .060  CHANNEL ROUGHNESS COEFFICIENT
                       CA           .06  CONTRIBUTING AREA
                    SHAPE          TRAP  CHANNEL SHAPE
                       WD           .00  BOTTOM WIDTH OR DIAMETER
                        Z          1.00  SIDE SLOPE
                     DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
                    RUPSTQ            NO  ROUTE UPSTREAM HYDROGRAPH
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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	12.20	1.67	.55	40.00	79.06	30.20	1.06	1.22
3	7.65	1.33	.33	173.33	77.85	31.28	1.06	8.64
4	10.25	1.33	.47	686.67	76.92	33.75	1.06	24.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 3.568 OUTFLOW= 3.561 BASIN STORAGE= .000 PERCENT ERROR= .186

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	10.25	1.33	5.00		76.81	35.00	1.07

****

HYDROGRAPH AT STATION 15.3

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	11.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	7.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	3.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	2.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.36	.01	1.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.50	.17	55.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.22	.16	77.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.11	56.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.09	46.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	39.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	33.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	31.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	32.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	23.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	18.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	14.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	11.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	10.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	10.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	10.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	10.	1		0345	46	.00	.00	.00	0.

```
     1    0150   23    .03    .01    .02      10.      *      1    0350   47    .00    .00    .00      0.
     1    0155   24    .03    .01    .02      11.      *      1    0355   48    .00    .00    .00      0.
                                                      *
```

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.04, TOTAL EXCESS = 1.06

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 77.	.58		11.	11.	11.	11.
		(INCHES)	1.070	1.070	1.070	1.070
		(AC-FT)	4.	4.	4.	4.

CUMULATIVE AREA = .06 SQ MI

*** ***

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          **************
          *            *
70 KK     *      15.2  *
          *            *
          **************
```

RUNOFF FROM BAS152

SUBBASIN RUNOFF DATA

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72 BA     SUBBASIN CHARACTERISTICS
               TAREA         .02  SUBBASIN AREA

          PRECIPITATION DATA

16 PT      TOTAL STORM STATIONS     ST100
17 PW                   WEIGHTS      1.00

14 PR        RECORDING STATIONS       ST2
15 PW                   WEIGHTS      1.00

73 LS     SCS LOSS RATE
               STRTL          .63  INITIAL ABSTRACTION
              CRVNBR        76.00  CURVE NUMBER
               RTIMP         2.40  PERCENT IMPERVIOUS AREA

          KINEMATIC WAVE
74 UK       OVERLAND-FLOW ELEMENT NO. 1
                   L          200.  OVERLAND FLOW LENGTH
                   S         .8000  SLOPE
                   N          .100  ROUGHNESS COEFFICIENT
                  PA         100.0  PERCENT OF SUBBASIN
                DXMIN             5  MINIMUM NUMBER OF DX INTERVALS
75 RK       COLLECTOR CHANNEL
                   L          720.  CHANNEL LENGTH
                   S         .6940  SLOPE
                   N          .080  CHANNEL ROUGHNESS COEFFICIENT
                  CA           .00  CONTRIBUTING AREA
```

	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
76 RK	MAIN CHANNEL		
	L	1000.	CHANNEL LENGTH
	S	.6500	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.02	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	13.33	1.67	.50	40.00	32.42	29.99	1.13	1.34
3	7.77	1.33	.38	240.00	31.76	31.08	1.13	10.55
4	10.03	1.33	.29	333.33	31.55	31.70	1.13	19.09

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.406 OUTFLOW= 1.401 BASIN STORAGE= .000 PERCENT ERROR= .303

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	10.03	1.33	5.00	30.49	35.00	1.14

****

HYDROGRAPH AT STATION 15.2

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	4.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	2.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	1.

1	0020	5	.22	.21	.01	0.	*	1	0220	29	.00	.00	.00	0.
1	0025	6	.38	.36	.02	1.	*	1	0225	30	.00	.00	.00	0.
1	0030	7	.67	.48	.19	28.	*	1	0230	31	.00	.00	.00	0.
1	0035	8	.38	.21	.17	30.	*	1	0235	32	.00	.00	.00	0.
1	0040	9	.21	.10	.11	21.	*	1	0240	33	.00	.00	.00	0.
1	0045	10	.17	.07	.09	17.	*	1	0245	34	.00	.00	.00	0.
1	0050	11	.13	.06	.08	15.	*	1	0250	35	.00	.00	.00	0.
1	0055	12	.11	.04	.07	12.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.04	.07	12.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.04	.07	12.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.02	.03	8.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.02	.04	7.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	5.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	4.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	4.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	4.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	4.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	4.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	4.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	4.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.97, TOTAL EXCESS = 1.13

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	30.	.58		4.	4.	4.	4.
			(INCHES)	1.143	1.143	1.143	1.143
			(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

*** ***

77 KK

****
* *
* NODE1 *
* *
****

COMBINE BASINS 15.2 AND 15.3

79 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

****

HYDROGRAPH AT STATION NODE1

SUM OF 2 HYDROGRAPHS

****

* * *

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
					*						*						*					
1		0000	1	0.	*	1		0100	13	43.	*	1		0200	25	15.	*	1		0300	37	0.
1		0005	2	0.	*	1		0105	14	44.	*	1		0205	26	10.	*	1		0305	38	0.
1		0010	3	0.	*	1		0110	15	31.	*	1		0210	27	4.	*	1		0310	39	0.
1		0015	4	0.	*	1		0115	16	24.	*	1		0215	28	2.	*	1		0315	40	0.
1		0020	5	0.	*	1		0120	17	19.	*	1		0220	29	1.	*	1		0320	41	0.
1		0025	6	2.	*	1		0125	18	15.	*	1		0225	30	1.	*	1		0325	42	0.
1		0030	7	83.	*	1		0130	19	14.	*	1		0230	31	1.	*	1		0330	43	0.
1		0035	8	107.	*	1		0135	20	14.	*	1		0235	32	0.	*	1		0335	44	0.
1		0040	9	78.	*	1		0140	21	14.	*	1		0240	33	0.	*	1		0340	45	0.
1		0045	10	63.	*	1		0145	22	14.	*	1		0245	34	0.	*	1		0345	46	0.
1		0050	11	53.	*	1		0150	23	14.	*	1		0250	35	0.	*	1		0350	47	0.
1		0055	12	45.	*	1		0155	24	15.	*	1		0255	36	0.	*	1		0355	48	0.
					*						*						*					

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 107.	.58		15.	15.	15.	15.
		(INCHES)	1.089	1.089	1.089	1.089
		(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .09 SQ MI

*** ***

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          **************
          *            *
80 KK     *     15.1   *
          *            *
          **************
                    RUNOFF FROM BAS151

          SUBBASIN RUNOFF DATA

82 BA       SUBBASIN CHARACTERISTICS
              TAREA          .04  SUBBASIN AREA

            PRECIPITATION DATA

16 PT         TOTAL STORM STATIONS     ST100
17 PW                      WEIGHTS      1.00

14 PR           RECORDING STATIONS       ST2
15 PW                      WEIGHTS      1.00

83 LS       SCS LOSS RATE
              STRTL          .70  INITIAL ABSTRACTION
              CRVNBR       74.00  CURVE NUMBER
              RTIMP         1.20  PERCENT IMPERVIOUS AREA

            KINEMATIC WAVE
84 UK         OVERLAND-FLOW ELEMENT NO. 1
```

	L	200.	OVERLAND FLOW LENGTH
	S	.8000	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
85 RK	COLLECTOR CHANNEL		
	L	260.	CHANNEL LENGTH
	S	.7690	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
86 RK	MAIN CHANNEL		
	L	1360.	CHANNEL LENGTH
	S	.3270	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.04	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

[DT SHOWN IS A MINIMUM]

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	13.33	1.67	.54	40.00	44.95	34.83	1.00	1.24
3	8.18	1.33	.19	86.67	44.88	34.66	1.00	7.66
4	6.20	1.38	.36	453.33	151.14	35.70	1.06	21.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= 5.014 EXCESS= 2.097 OUTFLOW= 7.104 BASIN STORAGE= .000 PERCENT ERROR= .091

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	6.20	1.38	5.00		148.23	35.00	1.07

****

HYDROGRAPH AT STATION 15.1

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	21.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	15.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	8.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	4.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	2.
1		0025	6	.38	.37	.01	2.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.52	.15	105.	1		0230	31	.00	.00	.00	1.
1		0035	8	.38	.23	.15	148.	1		0235	32	.00	.00	.00	1.
1		0040	9	.21	.11	.10	115.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.08	92.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	78.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	66.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	62.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	63.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	47.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	36.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	28.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	22.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	20.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	20.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	20.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	20.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	21.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	21.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.10, TOTAL EXCESS = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
148.	.58		22.	22.	22.	22.
		(INCHES)	1.069	1.069	1.069	1.069
		(AC-FT)	7.	7.	7.	7.

CUMULATIVE AREA = .13 SQ MI

87 KK 15A

RUNOFF FROM BASIN 15A

SUBBASIN RUNOFF DATA

89 BA SUBBASIN CHARACTERISTICS

TAREA .03 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

90 LS SCS LOSS RATE

STRTL .50 INITIAL ABSTRACTION

CRVNBR 80.00 CURVE NUMBER

RTIMP 3.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

91 UK OVERLAND-FLOW ELEMENT NO. 1

L 100. OVERLAND FLOW LENGTH

S .3000 SLOPE

N .100 ROUGHNESS COEFFICIENT

PA 100.0 PERCENT OF SUBBASIN

DXMIN 5 MINIMUM NUMBER OF DX INTERVALS

92 RK COLLECTOR CHANNEL

L 200. CHANNEL LENGTH

S .2500 SLOPE

N .080 CHANNEL ROUGHNESS COEFFICIENT

CA .01 CONTRIBUTING AREA

SHAPE TRAP CHANNEL SHAPE

WD .00 BOTTOM WIDTH OR DIAMETER

Z 1.00 SIDE SLOPE

DXMIN 2 MINIMUM NUMBER OF DX INTERVALS

93 RK MAIN CHANNEL

L 1787. CHANNEL LENGTH

S .1340 SLOPE

N .060 CHANNEL ROUGHNESS COEFFICIENT

CA .03 CONTRIBUTING AREA

SHAPE TRAP CHANNEL SHAPE

WD 3.00 BOTTOM WIDTH OR DIAMETER

Z 2.00 SIDE SLOPE

DXMIN 2 MINIMUM NUMBER OF DX INTERVALS

RUPSTQ YES ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO	VOLUME	MAXIMUM

						PEAK		CELERITY
			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
1	8.16	1.67	.38	20.00	59.66	29.67	1.38	.87
3	4.66	1.33	.13	66.67	59.55	30.08	1.38	8.39
4	3.72	1.36	.67	595.67	193.39	36.20	1.13	14.84

CONTINUITY SUMMARY (AC-FT) - INFLOW= 7.168 EXCESS= 2.241 OUTFLOW= 9.390 BASIN STORAGE= .001 PERCENT ERROR= .194

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.72	1.36	5.00		185.00	35.00	1.14

****

HYDROGRAPH AT STATION 15A

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	27.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	21.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	13.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	7.
1		0020	5	.22	.21	.01	0.	1		0220	29	.00	.00	.00	4.
1		0025	6	.38	.33	.05	3.	1		0225	30	.00	.00	.00	2.
1		0030	7	.67	.41	.26	125.	1		0230	31	.00	.00	.00	2.
1		0035	8	.38	.17	.21	185.	1		0235	32	.00	.00	.00	1.
1		0040	9	.21	.08	.13	157.	1		0240	33	.00	.00	.00	1.
1		0045	10	.17	.06	.11	126.	1		0245	34	.00	.00	.00	1.
1		0050	11	.13	.04	.09	105.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	89.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.07	81.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	81.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	65.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	50.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	39.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	30.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	27.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	26.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	26.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	26.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	26.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	27.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.72, TOTAL EXCESS = 1.38

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 185.	.58		29.	29.	29.	29.
		(INCHES)	1.135	1.135	1.135	1.135
		(AC-FT)	9.	9.	9.	9.

CUMULATIVE AREA = .16 SQ MI

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        **************
        *            *
94 KK   *    NODE2   *
        *            *
        **************
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COMBINE BASINS 14 AND 15

96 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION NODE2

SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0100	13	157.	*	1		0200	25	52.	*	1		0300	37	1.
1		0005	2	0.	*	1		0105	14	156.	*	1		0205	26	42.	*	1		0305	38	0.
1		0010	3	0.	*	1		0110	15	128.	*	1		0210	27	27.	*	1		0310	39	0.
1		0015	4	0.	*	1		0115	16	99.	*	1		0215	28	15.	*	1		0315	40	0.
1		0020	5	0.	*	1		0120	17	77.	*	1		0220	29	9.	*	1		0320	41	0.
1		0025	6	3.	*	1		0125	18	60.	*	1		0225	30	5.	*	1		0325	42	0.
1		0030	7	198.	*	1		0130	19	53.	*	1		0230	31	3.	*	1		0330	43	0.
1		0035	8	350.	*	1		0135	20	51.	*	1		0235	32	2.	*	1		0335	44	0.
1		0040	9	308.	*	1		0140	21	50.	*	1		0240	33	2.	*	1		0340	45	0.
1		0045	10	247.	*	1		0145	22	50.	*	1		0245	34	1.	*	1		0345	46	0.
1		0050	11	204.	*	1		0150	23	51.	*	1		0250	35	1.	*	1		0350	47	0.
1		0055	12	173.	*	1		0155	24	52.	*	1		0255	36	1.	*	1		0355	48	0.

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	350.	.58		56.	56.	56.	56.
			(INCHES)	1.113	1.113	1.113	1.113
			(AC-FT)	18.	18.	18.	18.

CUMULATIVE AREA = .31 SQ MI

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          **************
          *            *
97 KK     *  BAS1415   *
          *            *
          **************
                        RUNOFF FROM BAS1415

               SUBBASIN RUNOFF DATA

99 BA            SUBBASIN CHARACTERISTICS
                      TAREA          .04  SUBBASIN AREA

                 PRECIPITATION DATA

16 PT             TOTAL STORM STATIONS      ST100
17 PW                         WEIGHTS       1.00

14 PR               RECORDING STATIONS        ST2
15 PW                         WEIGHTS       1.00

100 LS           SCS LOSS RATE
                     STRTL          .44  INITIAL ABSTRACTION
                    CRVNBR        82.00  CURVE NUMBER
                     RTIMP         8.00  PERCENT IMPERVIOUS AREA

                 KINEMATIC WAVE
101 UK             OVERLAND-FLOW ELEMENT NO. 1
                         L          100.  OVERLAND FLOW LENGTH
                         S         .3500  SLOPE
                         N          .100  ROUGHNESS COEFFICIENT
                        PA         100.0  PERCENT OF SUBBASIN
                     DXMIN             5  MINIMUM NUMBER OF DX INTERVALS
102 RK             COLLECTOR CHANNEL
                         L          600.  CHANNEL LENGTH
                         S         .1500  SLOPE
                         N          .060  CHANNEL ROUGHNESS COEFFICIENT
                        CA           .02  CONTRIBUTING AREA
                     SHAPE          TRAP  CHANNEL SHAPE
                        WD           .00  BOTTOM WIDTH OR DIAMETER
                         Z          1.00  SIDE SLOPE
                     DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
103 RK             MAIN CHANNEL
                         L          140.  CHANNEL LENGTH
                         S         .1000  SLOPE
                         N          .060  CHANNEL ROUGHNESS COEFFICIENT
                        CA           .04  CONTRIBUTING AREA
                     SHAPE          TRAP  CHANNEL SHAPE
                        WD          5.00  BOTTOM WIDTH OR DIAMETER
                         Z          2.00  SIDE SLOPE
                     DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
                    RUPSTQ           YES  ROUTE UPSTREAM HYDROGRAPH

                                                                    ***

                 PRECIPITATION STATION DATA

                      STATION    TOTAL    AVG. ANNUAL    WEIGHT
                        ST100     3.10             .00      1.00
```

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	8.81	1.67	.34	20.00	86.41	29.70	1.59	.99
3	4.82	1.33	.28	200.00	85.89	29.85	1.59	11.92
4	2.84	1.39	.05	46.67	414.32	35.10	1.16	16.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= 18.115 EXCESS= 3.025 OUTFLOW= 21.130 BASIN STORAGE= .000 PERCENT ERROR= .047

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.84	1.39	5.00		411.42	35.00	1.16

****

HYDROGRAPH AT STATION BAS1415

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.03	59.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	46.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	29.
1		0015	4	.12	.11	.01	2.	1		0215	28	.00	.00	.00	16.
1		0020	5	.22	.20	.02	3.	1		0220	29	.00	.00	.00	9.
1		0025	6	.38	.29	.08	23.	1		0225	30	.00	.00	.00	6.
1		0030	7	.67	.35	.31	280.	1		0230	31	.00	.00	.00	4.
1		0035	8	.38	.14	.23	411.	1		0235	32	.00	.00	.00	2.
1		0040	9	.21	.07	.15	350.	1		0240	33	.00	.00	.00	2.
1		0045	10	.17	.05	.12	281.	1		0245	34	.00	.00	.00	1.
1		0050	11	.13	.04	.10	233.	1		0250	35	.00	.00	.00	1.
1		0055	12	.11	.03	.08	197.	1		0255	36	.00	.00	.00	1.
1		0100	13	.11	.03	.08	180.	1		0300	37	.00	.00	.00	1.
1		0105	14	.11	.02	.08	179.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	142.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	112.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	86.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	68.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	60.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	58.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	57.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	57.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	58.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	59.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.51, TOTAL EXCESS = 1.59

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	411.	.58		65.	65.	65.	65.
			(INCHES)	1.164	1.164	1.164	1.164
			(AC-FT)	21.	21.	21.	21.

CUMULATIVE AREA = .34 SQ MI

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104 KK      **************
            *            *
            *      GC.2  *
            *            *
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SUBBASIN GC-2

SUBBASIN RUNOFF DATA

106 BA SUBBASIN CHARACTERISTICS

TAREA	.02	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

107 LS SCS LOSS RATE

STRTL	.44	INITIAL ABSTRACTION
CRVNBR	82.00	CURVE NUMBER
RTIMP	5.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

108 UK OVERLAND-FLOW ELEMENT NO. 1

L	25.	OVERLAND FLOW LENGTH
S	.1500	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

109 RK COLLECTOR CHANNEL

L	480.	CHANNEL LENGTH
S	.1300	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

110 RK MAIN CHANNEL

L	1370.	CHANNEL LENGTH
S	.1310	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.02	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	6.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.77	1.67	.19	5.00	37.34	29.90	1.54	.44
3	3.36	1.33	.43	160.00	37.15	29.95	1.54	6.14
4	3.07	1.40	.42	456.67	437.90	35.93	1.18	18.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= 21.166 EXCESS= 1.306 OUTFLOW= 22.447 BASIN STORAGE= .002 PERCENT ERROR= .102

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.07	1.40	5.00	416.73	35.00	1.19

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HYDROGRAPH AT STATION GC.2

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	62.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	52.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	35.
1		0015	4	.12	.11	.01	0.	1		0215	28	.00	.00	.00	22.
1		0020	5	.22	.21	.01	2.	1		0220	29	.00	.00	.00	13.
1		0025	6	.38	.30	.07	20.	1		0225	30	.00	.00	.00	8.
1		0030	7	.67	.37	.30	264.	1		0230	31	.00	.00	.00	5.
1		0035	8	.38	.15	.23	417.	1		0235	32	.00	.00	.00	3.

1	0040	9	.21	.07	.14	379.	*	1	0240	33	.00	.00	.00	2.
1	0045	10	.17	.05	.12	309.	*	1	0245	34	.00	.00	.00	2.
1	0050	11	.13	.04	.10	254.	*	1	0250	35	.00	.00	.00	1.
1	0055	12	.11	.03	.08	214.	*	1	0255	36	.00	.00	.00	1.
1	0100	13	.11	.03	.08	193.	*	1	0300	37	.00	.00	.00	1.
1	0105	14	.11	.03	.08	189.	*	1	0305	38	.00	.00	.00	1.
1	0110	15	.05	.01	.04	156.	*	1	0310	39	.00	.00	.00	1.
1	0115	16	.06	.01	.04	125.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	96.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	76.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.03	66.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	62.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	60.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.03	60.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	61.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.03	62.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.56, TOTAL EXCESS = 1.54

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	417.	.58	70.	70.	70.	70.
		(INCHES)	1.185	1.185	1.185	1.185
		(AC-FT)	23.	23.	23.	23.

CUMULATIVE AREA = .36 SQ MI

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          **************
          *            *
111 KK    *     18.31  *
          *            *
          **************
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RUNOFF BASIN18.31

SUBBASIN RUNOFF DATA

113 BA SUBBASIN CHARACTERISTICS

TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

114 LS SCS LOSS RATE

STRTL .67 INITIAL ABSTRACTION

CRVNBR 75.00 CURVE NUMBER

	RTIMP	1.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

115 UK OVERLAND-FLOW ELEMENT NO. 1

L	75.	OVERLAND FLOW LENGTH
S	.3000	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

116 RK COLLECTOR CHANNEL

L	100.	CHANNEL LENGTH
S	.2750	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

117 RK MAIN CHANNEL

L	600.	CHANNEL LENGTH
S	.2500	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	8.16	1.67	.39	15.00	11.15	28.65	1.05	.64
3	4.54	1.33	.10	33.33	11.13	30.12	1.05	5.77
4	6.22	1.33	.32	200.00	11.09	30.94	1.05	10.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .505 OUTFLOW= .504 BASIN STORAGE= .000 PERCENT ERROR= .129

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	6.22	1.33	5.00	10.97	30.00	1.06

HYDROGRAPH AT STATION 18.31

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	1.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.36	.01	0.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.51	.16	11.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.22	.16	11.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	7.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.09	6.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	5.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	4.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	4.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	5.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	3.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	2.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	2.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	1.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	1.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	1.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	1.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	2.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	1.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	2.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.05, TOTAL EXCESS = 1.05

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 11.	.50		2.	2.	2.	2.
		(INCHES)	1.061	1.061	1.061	1.061
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

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118 KK

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* *
* 18.32 *
* *
****

RUNOFF FROM BASIN 18.32

SUBBASIN RUNOFF DATA

120 SA SUBBASIN CHARACTERISTICS

TAREA	.00	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100
17 PW	WEIGHTS	1.00
14 PR	RECORDING STATIONS	ST2
15 PW	WEIGHTS	1.00

121 LS SCS LOSS RATE

STRTL	.67	INITIAL ABSTRACTION
CRVNBR	75.00	CURVE NUMBER
RTIMP	14.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

122 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.1600	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

123 RK COLLECTOR CHANNEL

L	100.	CHANNEL LENGTH
S	.1500	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	2.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

124 RK MAIN CHANNEL

L	350.	CHANNEL LENGTH
S	.1500	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	2.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.96	1.67	.32	10.00	6.82	29.72	1.32	.52
3	3.13	1.35	.13	33.33	6.80	29.94	1.32	4.25
4	4.18	1.35	.23	116.67	17.64	30.66	1.14	8.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .512 EXCESS= .272 OUTFLOW= .783 BASIN STORAGE= .000 PERCENT ERROR= .056

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.18	1.35	5.00		16.65	30.00	1.14

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HYDROGRAPH AT STATION 18.32

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	2.
1		0005	2	.03	.02	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.10	.02	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.19	.03	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.32	.06	2.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.44	.23	17.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.19	.18	16.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.09	.12	11.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.10	9.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.05	.08	8.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.07	7.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.07	6.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	7.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.04	4.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	4.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	3.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	2.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	2.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	2.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	2.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	2.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	2.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	2.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.78, TOTAL EXCESS = 1.32

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)				

```
                    (CFS)
+      17.     .50                2.          2.          2.          2.
                (INCHES)       1.142       1.142       1.142       1.142
                (AC-FT)           1.          1.          1.          1.

                CUMULATIVE AREA =     .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
125 KK    *     18.33  *
          *            *
          **************
                    RUNOFF FROM THE BASIN 18.33 PARKING LOT

          SUBBASIN RUNOFF DATA

127 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .00  SUBBASIN AREA

                PRECIPITATION DATA

 16 PT           TOTAL STORM STATIONS      ST100
 17 PW                        WEIGHTS       1.00

 14 PR             RECORDING STATIONS        ST2
 15 PW                        WEIGHTS       1.00

128 LS          SCS LOSS RATE
                     STRTL          .35  INITIAL ABSTRACTION
                    CRVNBR        85.00  CURVE NUMBER
                     RTIMP         2.00  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
129 UK            OVERLAND-FLOW ELEMENT NO. 1
                         L          20.  OVERLAND FLOW LENGTH
                         S       .0050  SLOPE
                         N        .030  ROUGHNESS COEFFICIENT
                        PA       100.0  PERCENT OF SUBBASIN
                      DXMIN           5  MINIMUM NUMBER OF DX INTERVALS
130 RK            MAIN CHANNEL
                         L         100.  CHANNEL LENGTH
                         S       .0050  SLOPE
                         N        .030  CHANNEL ROUGHNESS COEFFICIENT
                        CA         .00  CONTRIBUTING AREA
                     SHAPE        TRAP  CHANNEL SHAPE
                        WD      100.00  BOTTOM WIDTH OR DIAMETER
                         Z       20.00  SIDE SLOPE
                      DXMIN           2  MINIMUM NUMBER OF DX INTERVALS
                     RUPSTQ         YES  ROUTE UPSTREAM HYDROGRAPH

                                                                    ***

          PRECIPITATION STATION DATA
```

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	3.51	1.67	.21	4.00	2.24	29.94	1.70	.31
3	.34	1.46	.32	33.33	18.68	30.85	1.17	1.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .787 EXCESS= .074 OUTFLOW= .860 BASIN STORAGE= .000 PERCENT ERROR= .048

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

3	.34	1.46	5.00		18.10	35.00	1.18

****

HYDROGRAPH AT STATION 18.33

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.00	.03	2.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.28	.10	2.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.32	.35	17.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.12	.25	18.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.06	.16	13.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.04	.13	10.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.03	.10	9.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.02	.09	7.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.02	.08	7.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.02	.09	7.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	5.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.05	4.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.03	3.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.03	2.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	2.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.03	2.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.00	.03	2.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	2.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.00	.03	2.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	2.	1		0355	48	.00	.00	.00	0.

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*

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    TOTAL RAINFALL =    3.10, TOTAL LOSS =    1.40, TOTAL EXCESS =    1.70

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR       3.92-HR
+   (CFS)       (HR)
                        (CFS)
+      18.       .58                    3.           3.           3.           3.
                      (INCHES)       1.181        1.181        1.181        1.181
                      (AC-FT)           1.           1.           1.           1.

                      CUMULATIVE AREA =     .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
  131 KK  *     18.21  *
          *            *
          **************
                    RUNOFF FROM BAS18.21

              SUBBASIN RUNOFF DATA

  133 BA        SUBBASIN CHARACTERISTICS
                     TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

   16 PT         TOTAL STORM STATIONS      ST100
   17 PW                      WEIGHTS       1.00

   14 PR          RECORDING STATIONS         ST2
   15 PW                      WEIGHTS       1.00

  134 LS        SCS LOSS RATE
                     STRTL          .67  INITIAL ABSTRACTION
                     CRVNBR       75.00  CURVE NUMBER
                     RTIMP         1.00  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
  135 UK          OVERLAND-FLOW ELEMENT NO. 1
                        L          100.  OVERLAND FLOW LENGTH
                        S         .4500  SLOPE
                        N          .100  ROUGHNESS COEFFICIENT
                       PA         100.0  PERCENT OF SUBBASIN
                     DXMIN             5  MINIMUM NUMBER OF DX INTERVALS
  136 RK          MAIN CHANNEL
                        L          200.  CHANNEL LENGTH
                        S         .4000  SLOPE
                        N          .080  CHANNEL ROUGHNESS COEFFICIENT
                       CA           .02  CONTRIBUTING AREA
                    SHAPE          TRAP  CHANNEL SHAPE
                       WD           .00  BOTTOM WIDTH OR DIAMETER
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Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	10.00	1.67	.41	20.00	25.50	30.34	1.05	.81
3	5.90	1.33	.09	66.67	25.49	30.71	1.05	12.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.168 OUTFLOW= 1.165 BASIN STORAGE= .000 PERCENT ERROR= .199

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

3	5.90	1.33	5.00	25.38	30.00	1.06

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HYDROGRAPH AT STATION 18.21

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	3.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.36	.01	1.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.51	.16	25.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.22	.16	25.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	17.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.09	14.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	12.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	10.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	10.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	11.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	6.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	6.	1		0315	40	.00	.00	.00	0.

1	0120	17	.03	.01	.02	4.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	3.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	3.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	3.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	3.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	4.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	3.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	4.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.05, TOTAL EXCESS = 1.05

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 25.	.50		4.	4.	4.	4.
		(INCHES)	1.056	1.056	1.056	1.056
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

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              ***************
              *             *
137 KK        *     18.22   *
              *             *
              ***************
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RUNOFF FROM BAS18.22

SUBBASIN RUNOFF DATA

139 BA SUBBASIN CHARACTERISTICS

TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

140 LS SCS LOSS RATE

STRTL .67 INITIAL ABSTRACTION

CRVNBR 75.00 CURVE NUMBER

RTIMP 1.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

141 UK OVERLAND-FLOW ELEMENT NO. 1

L 100. OVERLAND FLOW LENGTH

S .1670 SLOPE

N .100 ROUGHNESS COEFFICIENT

PA 100.0 PERCENT OF SUBBASIN

	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
142 RK	COLLECTOR CHANNEL		
	L	200.	CHANNEL LENGTH
	S	.1600	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.01	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	1.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
143 RK	MAIN CHANNEL		
	L	500.	CHANNEL LENGTH
	S	.1500	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.04	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	1.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.09	1.67	.55	20.00	52.81	30.37	1.05	.61
3	3.41	1.34	.16	66.67	52.68	30.90	1.05	6.88
4	3.30	1.34	.28	166.67	67.48	31.67	2.05	10.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.662 EXCESS= 2.365 OUTFLOW= 6.038 BASIN STORAGE= .013 PERCENT ERROR= -.401

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.30	1.34	5.00		65.94	35.00	2.06

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HYDROGRAPH AT STATION 18.22

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*

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	18.	*	1		0200	25	.03	.01	.02	18.
1		0005	2	.03	.03	.00	17.	*	1		0205	26	.00	.00	.00	14.
1		0010	3	.08	.08	.00	17.	*	1		0210	27	.00	.00	.00	12.
1		0015	4	.12	.12	.00	16.	*	1		0215	28	.00	.00	.00	11.
1		0020	5	.22	.21	.00	16.	*	1		0220	29	.00	.00	.00	11.
1		0025	6	.38	.36	.01	17.	*	1		0225	30	.00	.00	.00	10.
1		0030	7	.67	.51	.16	61.	*	1		0230	31	.00	.00	.00	10.
1		0035	8	.38	.22	.16	66.	*	1		0235	32	.00	.00	.00	10.
1		0040	9	.21	.11	.10	51.	*	1		0240	33	.00	.00	.00	10.
1		0045	10	.17	.08	.09	44.	*	1		0245	34	.00	.00	.00	9.
1		0050	11	.13	.06	.07	39.	*	1		0250	35	.00	.00	.00	9.
1		0055	12	.11	.05	.06	35.	*	1		0255	36	.00	.00	.00	9.
1		0100	13	.11	.04	.06	34.	*	1		0300	37	.00	.00	.00	9.
1		0105	14	.11	.04	.07	34.	*	1		0305	38	.00	.00	.00	9.
1		0110	15	.05	.02	.03	26.	*	1		0310	39	.00	.00	.00	9.
1		0115	16	.06	.02	.04	24.	*	1		0315	40	.00	.00	.00	9.
1		0120	17	.03	.01	.02	21.	*	1		0320	41	.00	.00	.00	9.
1		0125	18	.03	.01	.02	19.	*	1		0325	42	.00	.00	.00	8.
1		0130	19	.03	.01	.02	19.	*	1		0330	43	.00	.00	.00	8.
1		0135	20	.03	.01	.02	18.	*	1		0335	44	.00	.00	.00	8.
1		0140	21	.03	.01	.02	18.	*	1		0340	45	.00	.00	.00	8.
1		0145	22	.03	.01	.02	18.	*	1		0345	46	.00	.00	.00	8.
1		0150	23	.03	.01	.02	18.	*	1		0350	47	.00	.00	.00	8.
1		0155	24	.03	.01	.02	18.	*	1		0355	48	.00	.00	.00	8.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.05, TOTAL EXCESS = 1.05

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 66.	.58		19.	19.	19.	19.
		(INCHES)	2.063	2.063	2.063	2.063
		(AC-FT)	6.	6.	6.	6.

CUMULATIVE AREA = .06 SQ MI

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          **************
          *            *
144 KK    *     18.23  *
          *            *
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RUNOFF FROM BAS18.23 PARKING LOT

SUBBASIN RUNOFF DATA

146 BA SUBBASIN CHARACTERISTICS

TAREA .00 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

147 LS SCS LOSS RATE

STRTL	.35	INITIAL ABSTRACTION
CRVNBR	85.00	CURVE NUMBER
RTIMP	2.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

148 UK OVERLAND-FLOW ELEMENT NO. 1

L	20.	OVERLAND FLOW LENGTH
S	.0050	SLOPE
N	.035	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

149 RK MAIN CHANNEL

L	100.	CHANNEL LENGTH
S	.0050	SLOPE
N	.030	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	100.00	BOTTOM WIDTH OR DIAMETER
Z	20.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	3.01	1.67	.23	4.00	.35	30.00	1.70	.29
3	.34	1.46	.22	33.33	66.17	35.43	2.07	2.56

CONTINUITY SUMMARY (AC-FT) - INFLOW= 6.078 EXCESS= .012 OUTFLOW= 6.103 BASIN STORAGE= .012 PERCENT ERROR= -.422

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

		3	.34	1.46	5.00		65.74	35.00	2.07				

HYDROGRAPH AT STATION 18.23

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	18.	1		0200	25	.03	.00	.03	18.
1		0005	2	.03	.03	.00	17.	1		0205	26	.00	.00	.00	15.
1		0010	3	.08	.08	.00	17.	1		0210	27	.00	.00	.00	12.
1		0015	4	.12	.12	.00	16.	1		0215	28	.00	.00	.00	11.
1		0020	5	.22	.21	.01	16.	1		0220	29	.00	.00	.00	11.
1		0025	6	.38	.28	.10	17.	1		0225	30	.00	.00	.00	10.
1		0030	7	.67	.32	.35	57.	1		0230	31	.00	.00	.00	10.
1		0035	8	.38	.12	.25	66.	1		0235	32	.00	.00	.00	10.
1		0040	9	.21	.06	.16	52.	1		0240	33	.00	.00	.00	10.
1		0045	10	.17	.04	.13	45.	1		0245	34	.00	.00	.00	9.
1		0050	11	.13	.03	.10	40.	1		0250	35	.00	.00	.00	9.
1		0055	12	.11	.02	.09	35.	1		0255	36	.00	.00	.00	9.
1		0100	13	.11	.02	.08	34.	1		0300	37	.00	.00	.00	9.
1		0105	14	.11	.02	.09	34.	1		0305	38	.00	.00	.00	9.
1		0110	15	.05	.01	.04	27.	1		0310	39	.00	.00	.00	9.
1		0115	16	.06	.01	.05	24.	1		0315	40	.00	.00	.00	9.
1		0120	17	.03	.01	.03	21.	1		0320	41	.00	.00	.00	9.
1		0125	18	.03	.01	.03	19.	1		0325	42	.00	.00	.00	8.
1		0130	19	.03	.01	.03	19.	1		0330	43	.00	.00	.00	8.
1		0135	20	.03	.01	.03	18.	1		0335	44	.00	.00	.00	8.
1		0140	21	.03	.00	.03	18.	1		0340	45	.00	.00	.00	8.
1		0145	22	.03	.01	.03	18.	1		0345	46	.00	.00	.00	8.
1		0150	23	.03	.00	.03	18.	1		0350	47	.00	.00	.00	8.
1		0155	24	.03	.01	.03	18.	1		0355	48	.00	.00	.00	8.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.40, TOTAL EXCESS = 1.70

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 66.	.58		19.	19.	19.	19.
		(INCHES)	2.067	2.067	2.067	2.067
		(AC-FT)	6.	6.	6.	6.

CUMULATIVE AREA = .06 SQ MI

*** ***

150 KK

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* *
* NODE1 *
* *
****

COMBINE RUNOFF FROM 18.3 AND 18.2

152 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE1

SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	18.	1		0100	13	41.	1		0200	25	20.	1		0300	37	9.
1		0005	2	17.	1		0105	14	41.	1		0205	26	16.	1		0305	38	9.
1		0010	3	17.	1		0110	15	32.	1		0210	27	13.	1		0310	39	9.
1		0015	4	17.	1		0115	16	28.	1		0215	28	12.	1		0315	40	9.
1		0020	5	17.	1		0120	17	24.	1		0220	29	11.	1		0320	41	9.
1		0025	6	19.	1		0125	18	21.	1		0225	30	10.	1		0325	42	8.
1		0030	7	74.	1		0130	19	21.	1		0230	31	10.	1		0330	43	8.
1		0035	8	84.	1		0135	20	21.	1		0235	32	10.	1		0335	44	8.
1		0040	9	65.	1		0140	21	20.	1		0240	33	10.	1		0340	45	8.
1		0045	10	55.	1		0145	22	21.	1		0245	34	10.	1		0345	46	8.
1		0050	11	48.	1		0150	23	20.	1		0250	35	9.	1		0350	47	8.
1		0055	12	43.	1		0155	24	20.	1		0255	36	9.	1		0355	48	8.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 84.	.58		22.	22.	22.	22.
		(INCHES)	1.891	1.891	1.891	1.891
		(AC-FT)	7.	7.	7.	7.

CUMULATIVE AREA = .07 SQ MI

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153 KK * NODE2 *

ROUTE NODE1 TO NODE2

HYDROGRAPH ROUTING DATA

155 RK KINEMATIC WAVE STREAM ROUTING

L 450. CHANNEL LENGTH

S .0400 SLOPE

N .045 CHANNEL ROUGHNESS COEFFICIENT

CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	4.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
3	2.55	1.38	.27	150.00	83.70	35.59	1.90	9.15

CONTINUITY SUMMARY (AC-FT) - INFLOW= 6.969 EXCESS= .000 OUTFLOW= 6.985 BASIN STORAGE= .014 PERCENT ERROR= -.426

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

3	2.55	1.38	5.00	82.77	35.00	1.90

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HYDROGRAPH AT STATION NODE2

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	18.	1		0100	13	41.	1		0200	25	20.	1		0300	37	9.
1		0005	2	17.	1		0105	14	41.	1		0205	26	17.	1		0305	38	9.
1		0010	3	17.	1		0110	15	33.	1		0210	27	14.	1		0310	39	9.
1		0015	4	17.	1		0115	16	29.	1		0215	28	12.	1		0315	40	9.
1		0020	5	17.	1		0120	17	25.	1		0220	29	11.	1		0320	41	9.
1		0025	6	18.	1		0125	18	22.	1		0225	30	10.	1		0325	42	8.
1		0030	7	68.	1		0130	19	21.	1		0230	31	10.	1		0330	43	8.
1		0035	8	83.	1		0135	20	21.	1		0235	32	10.	1		0335	44	8.
1		0040	9	67.	1		0140	21	20.	1		0240	33	10.	1		0340	45	8.
1		0045	10	56.	1		0145	22	20.	1		0245	34	10.	1		0345	46	8.
1		0050	11	49.	1		0150	23	20.	1		0250	35	9.	1		0350	47	8.
1		0055	12	43.	1		0155	24	20.	1		0255	36	9.	1		0355	48	8.

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	3.92-HR
		(CFS)				
83.	.58		22.	22.	22.	22.
		(INCHES)	1.896	1.896	1.896	1.896
		(AC-FT)	7.	7.	7.	7.

CUMULATIVE AREA = .07 SQ MI

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          *            *
156 KK    *     18.11  *
          *            *
          **************
                        RUNOFF FROM BAS1811

               SUBBASIN RUNOFF DATA

158 BA           SUBBASIN CHARACTERISTICS
                       TAREA          .02  SUBBASIN AREA

                 PRECIPITATION DATA

 16 PT            TOTAL STORM STATIONS      ST100
 17 PW                         WEIGHTS       1.00

 14 PR              RECORDING STATIONS        ST2
 15 PW                         WEIGHTS       1.00

159 LS           SCS LOSS RATE
                      STRTL          .70  INITIAL ABSTRACTION
                     CRVNBR        74.00  CURVE NUMBER
                      RTIMP         1.00  PERCENT IMPERVIOUS AREA

                 KINEMATIC WAVE
160 UK             OVERLAND-FLOW ELEMENT NO. 1
                          L           50.  OVERLAND FLOW LENGTH
                          S        .2500  SLOPE
                          N         .100  ROUGHNESS COEFFICIENT
                         PA        100.0  PERCENT OF SUBBASIN
                       DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
161 RK             COLLECTOR CHANNEL
                          L          200.  CHANNEL LENGTH
                          S        .2200  SLOPE
                          N         .080  CHANNEL ROUGHNESS COEFFICIENT
                         CA          .00  CONTRIBUTING AREA
                      SHAPE         TRAP  CHANNEL SHAPE
                         WD          .00  BOTTOM WIDTH OR DIAMETER
                          Z         1.00  SIDE SLOPE
                       DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
162 RK             MAIN CHANNEL
                          L          600.  CHANNEL LENGTH
                          S        .2000  SLOPE
                          N         .060  CHANNEL ROUGHNESS COEFFICIENT
                         CA          .02  CONTRIBUTING AREA
                      SHAPE         TRAP  CHANNEL SHAPE
                         WD         2.00  BOTTOM WIDTH OR DIAMETER
                          Z         1.00  SIDE SLOPE
                       DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                      RUPSTQ           NO  ROUTE UPSTREAM HYDROGRAPH

                                                                  ***

               PRECIPITATION STATION DATA
```

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.45	1.67	.33	10.00	19.72	34.98	.99	.50
3	4.37	1.33	.17	66.67	19.72	34.97	.99	6.62
4	5.25	1.36	.31	200.00	19.72	34.85	.99	10.84

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .917 OUTFLOW= .916 BASIN STORAGE= .000 PERCENT ERROR= .109

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	5.25	1.36	5.00		19.71	35.00	1.00

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HYDROGRAPH AT STATION 18.11

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	3.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.37	.01	0.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.52	.15	19.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.23	.15	20.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	13.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.08	11.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	10.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	8.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	8.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	9.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	5.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	5.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	3.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	3.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	3.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	3.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	3.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	3.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	3.	1		0350	47	.00	.00	.00	0.

```
        1     0155   24      .03      .01      .02          3.        *         1     0355   48      .00      .00      .00          0.
                                                                                  *
*****************************************************************************************************************************************

    TOTAL RAINFALL =     3.10, TOTAL LOSS =     2.11, TOTAL EXCESS =      .99

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR       3.92-HR
+   (CFS)       (HR)
                        (CFS)
+       20.       .58                  3.           3.           3.           3.
                        (INCHES)    1.003        1.003        1.003        1.003
                        (AC-FT)        1.           1.           1.           1.

                        CUMULATIVE AREA =      .02 SQ MI


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              **************
              *            *
  163 KK      *     18.12  *
              *            *
              **************
                          RUNOFF FROM PARKING LOT

                 SUBBASIN RUNOFF DATA

  165 BA           SUBBASIN CHARACTERISTICS
                         TAREA          .00  SUBBASIN AREA

                   PRECIPITATION DATA

   16 PT            TOTAL STORM STATIONS      ST100
   17 PW                         WEIGHTS       1.00

   14 PR              RECORDING STATIONS        ST2
   15 PW                         WEIGHTS       1.00

  166 LS           SCS LOSS RATE
                        STRTL          .35  INITIAL ABSTRACTION
                       CRVNBR        85.00  CURVE NUMBER
                        RTIMP         2.00  PERCENT IMPERVIOUS AREA

                   KINEMATIC WAVE
  167 UK             OVERLAND-FLOW ELEMENT NO. 1
                            L           20.  OVERLAND FLOW LENGTH
                            S        .0050  SLOPE
                            N         .030  ROUGHNESS COEFFICIENT
                           PA        100.0  PERCENT OF SUBBASIN
                         DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
  168 RK             COLLECTOR CHANNEL
                            L          200.  CHANNEL LENGTH
                            S        .0050  SLOPE
                            N         .030  CHANNEL ROUGHNESS COEFFICIENT
                           CA          .00  CONTRIBUTING AREA
                        SHAPE         TRAP  CHANNEL SHAPE
```

	WD	100.00	BOTTOM WIDTH OR DIAMETER
	Z	20.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
169 RK	MAIN CHANNEL		
	L	200.	CHANNEL LENGTH
	S	.0400	SLOPE
	N	.045	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	4.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	3.51	1.67	.21	4.00	5.46	29.94	1.70	.31
3	.34	1.46	.91	66.67	5.17	30.17	1.70	1.23
4	2.55	1.38	.17	66.67	24.05	31.12	1.07	6.62

CONTINUITY SUMMARY (AC-FT) - INFLOW= .926 EXCESS= .181 OUTFLOW= 1.106 BASIN STORAGE= .000 PERCENT ERROR= .047

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.55	1.38	5.00	23.68	35.00	1.08

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HYDROGRAPH AT STATION 18.12

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.00	.03	3.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	2.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	0.	1		0220	29	.00	.00	.00	0.

1	0025	6	.38	.28	.10	1.	*	1	0225	30	.00	.00	.00	0.
1	0030	7	.67	.32	.35	23.	*	1	0230	31	.00	.00	.00	0.
1	0035	8	.38	.12	.25	24.	*	1	0235	32	.00	.00	.00	0.
1	0040	9	.21	.06	.16	17.	*	1	0240	33	.00	.00	.00	0.
1	0045	10	.17	.04	.13	14.	*	1	0245	34	.00	.00	.00	0.
1	0050	11	.13	.03	.10	11.	*	1	0250	35	.00	.00	.00	0.
1	0055	12	.11	.02	.09	10.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.02	.08	9.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.02	.09	10.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.01	.04	6.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.01	.05	5.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.03	4.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.03	3.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.03	3.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.03	3.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.00	.03	3.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.03	3.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.00	.03	3.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.03	3.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.40, TOTAL EXCESS = 1.70

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	24.	.58		3.	3.	3.	--- 3.
			(INCHES)	1.080	1.080	1.080	1.080
			(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

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* *
170 KK * NODE3 *
* *
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COMBINE FLOWS OFF BASIN 18

172 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE3

SUM OF 2 HYDROGRAPHS

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW

				*					*					*					
1	0000	1	18.	*	1	0100	13	51.	*	1	0200	25	23.	*	1	0300	37	9.
1	0005	2	17.	*	1	0105	14	51.	*	1	0205	26	19.	*	1	0305	38	9.
1	0010	3	17.	*	1	0110	15	40.	*	1	0210	27	14.	*	1	0310	39	9.
1	0015	4	17.	*	1	0115	16	34.	*	1	0215	28	12.	*	1	0315	40	9.
1	0020	5	17.	*	1	0120	17	28.	*	1	0220	29	11.	*	1	0320	41	9.
1	0025	6	19.	*	1	0125	18	25.	*	1	0225	30	11.	*	1	0325	42	8.
1	0030	7	90.	*	1	0130	19	24.	*	1	0230	31	10.	*	1	0330	43	8.
1	0035	8	106.	*	1	0135	20	24.	*	1	0235	32	10.	*	1	0335	44	8.
1	0040	9	84.	*	1	0140	21	23.	*	1	0240	33	10.	*	1	0340	45	8.
1	0045	10	70.	*	1	0145	22	24.	*	1	0245	34	10.	*	1	0345	46	8.
1	0050	11	61.	*	1	0150	23	24.	*	1	0250	35	9.	*	1	0350	47	8.
1	0055	12	53.	*	1	0155	24	24.	*	1	0255	36	9.	*	1	0355	48	8.
				*					*					*					

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 106.	.58		25.	25.	25.	25.
		(INCHES)	1.718	1.718	1.718	1.718
		(AC-FT)	8.	8.	8.	8.

CUMULATIVE AREA = .09 SQ MI

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          **************
          *            *
173 KK    *     GC.11  *
          *            *
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SUBBASIN ROUTING BASIN 18 FLOWS

SUBBASIN RUNOFF DATA

175 BA SUBBASIN CHARACTERISTICS

TAREA .00 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

176 LS SCS LOSS RATE

STRTL .44 INITIAL ABSTRACTION

CRVNBR 82.00 CURVE NUMBER

RTIMP 5.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

177 UK OVERLAND-FLOW ELEMENT NO. 1

L 25. OVERLAND FLOW LENGTH

	S	.1300	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
178 RK	COLLECTOR CHANNEL		
	L	50.	CHANNEL LENGTH
	S	.1200	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
179 RK	MAIN CHANNEL		
	L	920.	CHANNEL LENGTH
	S	.1100	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.37	1.67	.20	5.00	7.09	30.00	1.54	.42
3	3.23	1.33	.07	16.67	7.09	29.97	1.54	3.72
4	3.60	1.38	.40	306.67	111.34	35.83	1.72	12.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= 8.100 EXCESS= .248 OUTFLOW= 8.366 BASIN STORAGE= .022 PERCENT ERROR= -.482

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.60	1.38	5.00		109.14	35.00	1.72

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HYDROGRAPH AT STATION GC.11

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	18.	1		0200	25	.03	.01	.02	24.
1		0005	2	.03	.03	.00	17.	1		0205	26	.00	.00	.00	20.
1		0010	3	.08	.08	.00	17.	1		0210	27	.00	.00	.00	15.
1		0015	4	.12	.11	.01	17.	1		0215	28	.00	.00	.00	13.
1		0020	5	.22	.21	.01	17.	1		0220	29	.00	.00	.00	11.
1		0025	6	.38	.30	.07	20.	1		0225	30	.00	.00	.00	11.
1		0030	7	.67	.37	.30	85.	1		0230	31	.00	.00	.00	10.
1		0035	8	.38	.15	.23	109.	1		0235	32	.00	.00	.00	10.
1		0040	9	.21	.07	.14	91.	1		0240	33	.00	.00	.00	10.
1		0045	10	.17	.05	.12	75.	1		0245	34	.00	.00	.00	10.
1		0050	11	.13	.04	.10	65.	1		0250	35	.00	.00	.00	9.
1		0055	12	.11	.03	.08	57.	1		0255	36	.00	.00	.00	9.
1		0100	13	.11	.03	.08	53.	1		0300	37	.00	.00	.00	9.
1		0105	14	.11	.03	.08	53.	1		0305	38	.00	.00	.00	9.
1		0110	15	.05	.01	.04	43.	1		0310	39	.00	.00	.00	9.
1		0115	16	.06	.01	.04	36.	1		0315	40	.00	.00	.00	9.
1		0120	17	.03	.01	.02	30.	1		0320	41	.00	.00	.00	9.
1		0125	18	.03	.01	.02	26.	1		0325	42	.00	.00	.00	9.
1		0130	19	.03	.01	.03	25.	1		0330	43	.00	.00	.00	8.
1		0135	20	.03	.01	.02	24.	1		0335	44	.00	.00	.00	8.
1		0140	21	.03	.01	.02	24.	1		0340	45	.00	.00	.00	8.
1		0145	22	.03	.01	.03	24.	1		0345	46	.00	.00	.00	8.
1		0150	23	.03	.01	.02	24.	1		0350	47	.00	.00	.00	8.
1		0155	24	.03	.01	.03	24.	1		0355	48	.00	.00	.00	8.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.56, TOTAL EXCESS = 1.54

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
109.	.58		26.	26.	26.	26.
		(INCHES)	1.719	1.719	1.719	1.719
		(AC-FT)	8.	8.	8.	8.

CUMULATIVE AREA = .09 SQ MI

180 KK NODE

COMBINE BASIN 141S AND BASIN 18 FLOW

182 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE
SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	18.	1		0100	13	246.	1		0200	25	86.	1		0300	37	10.
1		0005	2	17.	1		0105	14	242.	1		0205	26	71.	1		0305	38	10.
1		0010	3	17.	1		0110	15	199.	1		0210	27	51.	1		0310	39	9.
1		0015	4	17.	1		0115	16	161.	1		0215	28	34.	1		0315	40	9.
1		0020	5	19.	1		0120	17	126.	1		0220	29	24.	1		0320	41	9.
1		0025	6	40.	1		0125	18	102.	1		0225	30	18.	1		0325	42	9.
1		0030	7	349.	1		0130	19	90.	1		0230	31	15.	1		0330	43	9.
1		0035	8	526.	1		0135	20	86.	1		0235	32	13.	1		0335	44	8.
1		0040	9	470.	1		0140	21	84.	1		0240	33	12.	1		0340	45	8.
1		0045	10	384.	1		0145	22	85.	1		0245	34	11.	1		0345	46	8.
1		0050	11	319.	1		0150	23	85.	1		0250	35	11.	1		0350	47	8.
1		0055	12	271.	1		0155	24	86.	1		0255	36	10.	1		0355	48	8.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
526.	.58		96.	96.	96.	96.
		(INCHES)	1.294	1.294	1.294	1.294
		(AC-FT)	31.	31.	31.	31.

CUMULATIVE AREA = .45 SQ MI

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          *            *
183 KK    *     GC.17  *
          *            *
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SUBBASINS GC-1 AND GC-7 COMBINED

SUBBASIN RUNOFF DATA

185 BA SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100
17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

186 LS SCS LOSS RATE

STRTL	.50	INITIAL ABSTRACTION
CRVNBR	80.00	CURVE NUMBER
RTIMP	3.00	PERCENT IMPERVIOUS AREA

LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT

STRTL	.04	INITIAL ABSTRACTION
CRVNBR	98.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

187 UK OVERLAND-FLOW ELEMENT NO. 1

L	250.	OVERLAND FLOW LENGTH
S	.1500	SLOPE
N	.080	ROUGHNESS COEFFICIENT
PA	85.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

188 UK OVERLAND-FLOW ELEMENT NO. 2

L	50.	OVERLAND FLOW LENGTH
S	.0500	SLOPE
N	.040	ROUGHNESS COEFFICIENT
PA	15.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

189 RK COLLECTOR CHANNEL

L	200.	CHANNEL LENGTH
S	.1000	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

190 RK MAIN CHANNEL

L	1240.	CHANNEL LENGTH
S	.8400	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.04	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	12.00	BOTTOM WIDTH OR DIAMETER
Z	.50	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.21	1.67	.75	50.00	54.59	30.80	1.38	1.12
2	8.33	1.67	.17	10.00	26.74	29.94	2.85	.97
3	2.95	1.33	.23	66.67	76.67	30.50	1.60	4.91
4	6.49	1.51	.15	413.33	589.15	35.30	1.32	45.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= 30.935 EXCESS= 3.016 OUTFLOW= 33.949 BASIN STORAGE= .020 PERCENT ERROR= -.055

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	6.49	1.51	5.00		579.10	35.00	1.32

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HYDROGRAPH AT STATION GC.17

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	18.	1		0200	25	.03	.01	.02	93.
1		0005	2	.03	.03	.00	17.	1		0205	26	.00	.00	.00	77.
1		0010	3	.08	.08	.00	17.	1		0210	27	.00	.00	.00	56.
1		0015	4	.12	.11	.01	19.	1		0215	28	.00	.00	.00	38.
1		0020	5	.22	.18	.03	26.	1		0220	29	.00	.00	.00	27.
1		0025	6	.38	.28	.09	54.	1		0225	30	.00	.00	.00	20.
1		0030	7	.67	.35	.32	398.	1		0230	31	.00	.00	.00	16.
1		0035	8	.38	.14	.23	579.	1		0235	32	.00	.00	.00	14.
1		0040	9	.21	.07	.14	517.	1		0240	33	.00	.00	.00	13.
1		0045	10	.17	.05	.12	424.	1		0245	34	.00	.00	.00	12.
1		0050	11	.13	.04	.10	352.	1		0250	35	.00	.00	.00	11.
1		0055	12	.11	.03	.08	298.	1		0255	36	.00	.00	.00	11.
1		0100	13	.11	.03	.08	270.	1		0300	37	.00	.00	.00	10.
1		0105	14	.11	.03	.08	265.	1		0305	38	.00	.00	.00	10.
1		0110	15	.05	.01	.04	218.	1		0310	39	.00	.00	.00	10.
1		0115	16	.06	.01	.04	177.	1		0315	40	.00	.00	.00	9.
1		0120	17	.03	.01	.02	139.	1		0320	41	.00	.00	.00	9.
1		0125	18	.03	.01	.02	112.	1		0325	42	.00	.00	.00	9.
1		0130	19	.03	.01	.03	99.	1		0330	43	.00	.00	.00	9.
1		0135	20	.03	.01	.02	93.	1		0335	44	.00	.00	.00	9.
1		0140	21	.03	.01	.02	91.	1		0340	45	.00	.00	.00	8.
1		0145	22	.03	.01	.03	92.	1		0345	46	.00	.00	.00	8.
1		0150	23	.03	.01	.02	92.	1		0350	47	.00	.00	.00	8.
1		0155	24	.03	.01	.03	93.	1		0355	48	.00	.00	.00	8.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.50, TOTAL EXCESS = 1.60

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR (CFS)	24-HR	72-HR	3.92-HR
+					

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+     579.      .58                105.       105.       105.       105.
                        (INCHES)    1.320      1.320      1.320      1.320
                        (AC-FT)       34.        34.        34.        34.

                        CUMULATIVE AREA =     .48 SQ MI
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          *            *
191 KK    *     GC.8   *
          *            *
          **************
                        SUBBASIN 8

                SUBBASIN RUNOFF DATA

193 BA            SUBBASIN CHARACTERISTICS
                       TAREA          .01  SUBBASIN AREA

                  PRECIPITATION DATA

 16 PT             TOTAL STORM STATIONS      ST100
 17 PW                          WEIGHTS       1.00

 14 PR               RECORDING STATIONS        ST2
 15 PW                          WEIGHTS       1.00

194 LS            SCS LOSS RATE
                      STRTL          .63  INITIAL ABSTRACTION
                     CRVNBR        76.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

                  KINEMATIC WAVE
195 UK              OVERLAND-FLOW ELEMENT NO. 1
                          L           50.  OVERLAND FLOW LENGTH
                          S        .1800  SLOPE
                          N         .100  ROUGHNESS COEFFICIENT
                         PA        100.0  PERCENT OF SUBBASIN
                      DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
196 RK              COLLECTOR CHANNEL
                          L          100.  CHANNEL LENGTH
                          S        .1500  SLOPE
                          N         .060  CHANNEL ROUGHNESS COEFFICIENT
                         CA          .00  CONTRIBUTING AREA
                      SHAPE         TRAP  CHANNEL SHAPE
                         WD          .00  BOTTOM WIDTH OR DIAMETER
                          Z         1.00  SIDE SLOPE
                      DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
197 RK              MAIN CHANNEL
                          L          740.  CHANNEL LENGTH
                          S        .1320  SLOPE
                          N         .050  CHANNEL ROUGHNESS COEFFICIENT
                         CA          .01  CONTRIBUTING AREA
                      SHAPE         TRAP  CHANNEL SHAPE
                         WD        12.00  BOTTOM WIDTH OR DIAMETER
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Z	.50	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.32	1.67	.35	10.00	9.77	29.84	1.08	.48
3	4.82	1.33	.08	33.33	9.76	30.14	1.08	6.71
4	2.57	1.51	.17	246.67	588.13	35.35	1.32	24.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= 34.039 EXCESS= .427 OUTFLOW= 34.477 BASIN STORAGE= .022 PERCENT ERROR= -.094

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.57	1.51	5.00		576.20	35.00	1.32

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HYDROGRAPH AT STATION GC.8

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	18.	1		0200	25	.03	.01	.02	94.
1		0005	2	.03	.03	.00	17.	1		0205	26	.00	.00	.00	80.
1		0010	3	.08	.08	.00	17.	1		0210	27	.00	.00	.00	59.
1		0015	4	.12	.12	.00	19.	1		0215	28	.00	.00	.00	41.
1		0020	5	.22	.22	.00	25.	1		0220	29	.00	.00	.00	29.
1		0025	6	.38	.36	.01	50.	1		0225	30	.00	.00	.00	21.
1		0030	7	.67	.50	.17	381.	1		0230	31	.00	.00	.00	17.
1		0035	8	.38	.21	.16	576.	1		0235	32	.00	.00	.00	15.
1		0040	9	.21	.11	.11	528.	1		0240	33	.00	.00	.00	13.
1		0045	10	.17	.08	.09	436.	1		0245	34	.00	.00	.00	12.
1		0050	11	.13	.06	.08	362.	1		0250	35	.00	.00	.00	11.
1		0055	12	.11	.04	.06	306.	1		0255	36	.00	.00	.00	11.
1		0100	13	.11	.04	.06	276.	1		0300	37	.00	.00	.00	10.
1		0105	14	.11	.04	.07	269.	1		0305	38	.00	.00	.00	10.
1		0110	15	.05	.02	.03	224.	1		0310	39	.00	.00	.00	10.

1	0115	16	.06	.02	.04	183.	*	1	0315	40	.00	.00	.00	9.
1	0120	17	.03	.01	.02	144.	*	1	0320	41	.00	.00	.00	9.
1	0125	18	.03	.01	.02	116.	*	1	0325	42	.00	.00	.00	9.
1	0130	19	.03	.01	.02	102.	*	1	0330	43	.00	.00	.00	9.
1	0135	20	.03	.01	.02	95.	*	1	0335	44	.00	.00	.00	9.
1	0140	21	.03	.01	.02	93.	*	1	0340	45	.00	.00	.00	8.
1	0145	22	.03	.01	.02	93.	*	1	0345	46	.00	.00	.00	8.
1	0150	23	.03	.01	.02	93.	*	1	0350	47	.00	.00	.00	8.
1	0155	24	.03	.01	.02	94.	*	1	0355	48	.00	.00	.00	8.
							*							

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TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.02, TOTAL EXCESS = 1.08

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	576.	.58		107.	107.	107.	107.
			(INCHES)	1.320	1.320	1.320	1.320
			(AC-FT)	35.	35.	35.	35.

CUMULATIVE AREA = .49 SQ MI

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          **************
          *            *
198 KK    *      GC.3  *
          *            *
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SUBBASIN 3

SUBBASIN RUNOFF DATA

200 BA SUBBASIN CHARACTERISTICS

TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

201 LS SCS LOSS RATE

STRTL .44 INITIAL ABSTRACTION

CRVNBR 82.00 CURVE NUMBER

RTIMP 5.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

202 UK OVERLAND-FLOW ELEMENT NO. 1

L 50. OVERLAND FLOW LENGTH

S .1700 SLOPE

N .100 ROUGHNESS COEFFICIENT

	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
203 RK	COLLECTOR CHANNEL		
	L	100.	CHANNEL LENGTH
	S	.1500	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
204 RK	MAIN CHANNEL		
	L	880.	CHANNEL LENGTH
	S	.1200	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.01	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	3.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.14	1.67	.28	10.00	31.66	29.95	1.54	.60
3	3.61	1.33	.11	33.33	31.62	29.86	1.54	4.89
4	3.76	1.38	.49	293.33	30.99	30.37	1.54	9.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.109 OUTFLOW= 1.107 BASIN STORAGE= .000 PERCENT ERROR= .170

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.76	1.38	5.00		30.78	30.00	1.55

****

HYDROGRAPH AT STATION GC.3

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	3.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.11	.01	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.30	.07	6.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.37	.30	31.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.15	.23	24.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.07	.14	15.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.05	.12	12.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.04	.10	10.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	9.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.08	8.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	9.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	5.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	4.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	3.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	3.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	3.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	3.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	3.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	3.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	3.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	3.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.56, TOTAL EXCESS = 1.54

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
31.	.50		3.	3.	3.	3.
		(INCHES)	1.548	1.548	1.548	1.548
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

205 KK GC.4

SUBBASIN 4

SUBBASIN RUNOFF DATA

207 BA SUBBASIN CHARACTERISTICS

TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

SCS LOSS RATE

208 LS	STRTL	.44 INITIAL ABSTRACTION
	CRVNBR	82.00 CURVE NUMBER
	RTIMP	5.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

OVERLAND-FLOW ELEMENT NO. 1

209 UK	L	50. OVERLAND FLOW LENGTH
	S	.1700 SLOPE
	N	.100 ROUGHNESS COEFFICIENT
	PA	100.0 PERCENT OF SUBBASIN
	DXMIN	5 MINIMUM NUMBER OF DX INTERVALS

COLLECTOR CHANNEL

210 RK	L	75. CHANNEL LENGTH
	S	.1500 SLOPE
	N	.080 CHANNEL ROUGHNESS COEFFICIENT
	CA	.00 CONTRIBUTING AREA
	SHAPE	TRAP CHANNEL SHAPE
	WD	.00 BOTTOM WIDTH OR DIAMETER
	Z	1.00 SIDE SLOPE
	DXMIN	2 MINIMUM NUMBER OF DX INTERVALS

MAIN CHANNEL

211 RK	L	300. CHANNEL LENGTH
	S	.1400 SLOPE
	N	.060 CHANNEL ROUGHNESS COEFFICIENT
	CA	.01 CONTRIBUTING AREA
	SHAPE	TRAP CHANNEL SHAPE
	WD	1.00 BOTTOM WIDTH OR DIAMETER
	Z	1.00 SIDE SLOPE
	DXMIN	2 MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO PEAK	VOLUME	MAXIMUM CELERITY
			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)

1	6.14	1.67	.28	10.00	22.30	29.95	1.54	.60
3	3.61	1.33	.08	25.00	22.29	29.94	1.54	5.31
4	4.69	1.33	.17	100.00	22.26	29.94	1.54	9.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .781 OUTFLOW= .780 BASIN STORAGE= .000 PERCENT ERROR= .158

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.69	1.33	5.00		22.25	30.00	1.55

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HYDROGRAPH AT STATION GC.4

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	2.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	12	.11	.01	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.30	.07	5.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.37	.30	22.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.15	.23	17.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.07	.14	11.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.05	.12	9.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.04	.10	7.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	6.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.08	6.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	6.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	3.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	3.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	2.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	2.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	2.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	2.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	2.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	2.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	2.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	2.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.56, TOTAL EXCESS = 1.54

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
22.	.50		2.	2.	2.	2.
		(INCHES)	1.546	1.546	1.546	1.546
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

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          *            *
212 KK    *     NODE2  *
          *            *
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COMBINE SUBBASINS 3 AND 4

214 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE2

SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0100	13	14.	1		0200	25	5.	1		0300	37	0.
1		0005	2	0.	1		0105	14	15.	1		0205	26	2.	1		0305	38	0.
1		0010	3	0.	1		0110	15	8.	1		0210	27	1.	1		0310	39	0.
1		0015	4	0.	1		0115	16	8.	1		0215	28	0.	1		0315	40	0.
1		0020	5	1.	1		0120	17	5.	1		0220	29	0.	1		0320	41	0.
1		0025	6	11.	1		0125	18	4.	1		0225	30	0.	1		0325	42	0.
1		0030	7	53.	1		0130	19	5.	1		0230	31	0.	1		0330	43	0.
1		0035	8	41.	1		0135	20	4.	1		0235	32	0.	1		0335	44	0.
1		0040	9	26.	1		0140	21	4.	1		0240	33	0.	1		0340	45	0.
1		0045	10	21.	1		0145	22	5.	1		0245	34	0.	1		0345	46	0.
1		0050	11	17.	1		0150	23	5.	1		0250	35	0.	1		0350	47	0.
1		0055	12	15.	1		0155	24	5.	1		0255	36	0.	1		0355	48	0.

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 53.	.50		6.	6.	6.	6.
		(INCHES)	1.547	1.547	1.547	1.547
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .02 SQ MI

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215 KK * GC.5 *
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SUBBASIN 5

SUBBASIN RUNOFF DATA

217 BA SUBBASIN CHARACTERISTICS

TAREA	.02	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100
17 PW	WEIGHTS	1.00
14 PR	RECORDING STATIONS	ST2
15 PW	WEIGHTS	1.00

218 LS SCS LOSS RATE

STRTL	.44	INITIAL ABSTRACTION
CRVNBR	82.00	CURVE NUMBER
RTIMP	5.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

219 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.1500	SLOPE
N	.080	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

220 RK COLLECTOR CHANNEL

L	100.	CHANNEL LENGTH
S	.1300	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

221 RK MAIN CHANNEL

L	780.	CHANNEL LENGTH
S	.0920	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.02	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	5.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.21	1.67	.39	20.00	44.24	29.75	1.54	.86
3	3.12	1.33	.12	33.33	44.04	29.74	1.54	4.47
4	2.81	1.42	.37	260.00	94.93	31.00	1.54	11.62

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.899 EXCESS= 1.569 OUTFLOW= 3.467 BASIN STORAGE= .000 PERCENT ERROR= .018

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.81	1.42	5.00		88.94	30.00	1.55

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HYDROGRAPH AT STATION GC.5

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	8.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	5.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	2.
1		0015	4	.12	.11	.01	0.	1		0215	28	.00	.00	.00	1.
1		0020	5	.22	.21	.01	1.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.30	.07	15.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.37	.30	89.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.15	.23	77.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.07	.14	51.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.05	.12	40.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.04	.10	33.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	27.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.08	26.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	27.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	18.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	14.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	11.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	8.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	8.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	8.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	8.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	8.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	8.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	9.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.56, TOTAL EXCESS = 1.54

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	89.	.50		11.	11.	11.	11.
			(INCHES)	1.554	1.554	1.554	1.554
			(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .04 SQ MI

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222 KK    *      GC.6  *
          *            *
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SUBBASIN 6

SUBBASIN RUNOFF DATA

224 BA SUBBASIN CHARACTERISTICS

TAREA	.01	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

225 LS SCS LOSS RATE

STRTL	.63	INITIAL ABSTRACTION
CRVNBR	76.00	CURVE NUMBER
RTIMP	7.77	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

226 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.1500	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

227 RK COLLECTOR CHANNEL

L	100.	CHANNEL LENGTH
S	.1300	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

228 RK MAIN CHANNEL

L	1000.	CHANNEL LENGTH
S	.1100	SLOPE

N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.77	1.67	.34	10.00	17.88	29.73	1.24	.50
3	4.16	1.33	.11	33.33	17.85	30.06	1.24	5.23
4	4.32	1.38	.38	333.33	106.00	30.92	1.49	14.50

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.490 EXCESS= .727 OUTFLOW= 4.214 BASIN STORAGE= .000 PERCENT ERROR= .054

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.32	1.38	5.00	94.51	30.00	1.50

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HYDROGRAPH AT STATION GC.6

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	10.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	7.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	4.
1		0015	4	.12	.11	.01	0.	1		0215	28	.00	.00	.00	2.
1		0020	5	.22	.20	.02	2.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.34	.04	14.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.46	.21	95.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.20	.18	94.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.10	.12	66.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.10	50.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.05	.08	41.	1		0250	35	.00	.00	.00	0.

1	0025	6	64.	*	1	0125	18	127.	*	1	0225	30	22.	*	1	0325	42	9.
1	0030	7	476.	*	1	0130	19	112.	*	1	0230	31	17.	*	1	0330	43	9.
1	0035	8	671.	*	1	0135	20	106.	*	1	0235	32	15.	*	1	0335	44	9.
1	0040	9	594.	*	1	0140	21	103.	*	1	0240	33	13.	*	1	0340	45	8.
1	0045	10	487.	*	1	0145	22	103.	*	1	0245	34	12.	*	1	0345	46	8.
1	0050	11	403.	*	1	0150	23	103.	*	1	0250	35	11.	*	1	0350	47	8.
1	0055	12	341.	*	1	0155	24	105.	*	1	0255	36	11.	*	1	0355	48	8.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 671.	.58		120.	120.	120.	120.
		(INCHES)	1.337	1.337	1.337	1.337
		(AC-FT)	39.	39.	39.	39.

CUMULATIVE AREA = .54 SQ MI

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*            *
232 KK  *    GC.10  *
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SUBBASIN 10

SUBBASIN RUNOFF DATA

234 BA SUBBASIN CHARACTERISTICS

TAREA	.03	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

235 LS SCS LOSS RATE

STRTL	.56	INITIAL ABSTRACTION
CRVNBR	78.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

236 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.1000	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

237 RK COLLECTOR CHANNEL

L	200.	CHANNEL LENGTH

	S	.0800	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
238 RK	MAIN CHANNEL		
	L	1180.	CHANNEL LENGTH
	S	.0700	SLOPE
	N	.050	CHANNEL ROUGHNESS COEFFICIENT
	CA	.03	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	15.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	4.71	1.67	.38	10.00	41.78	28.70	1.20	.44
3	2.45	1.33	.31	66.67	41.08	29.87	1.20	3.63
4	1.66	1.52	.33	393.33	706.29	35.65	1.33	19.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= 38.790 EXCESS= 1.658 OUTFLOW= 40.467 BASIN STORAGE= .047 PERCENT ERROR= -.164

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	1.66	1.52	5.00	680.92	35.00	1.34

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HYDROGRAPH AT STATION GC.10

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	18.	1		0200	25	.03	.01	.02	109.

1	0005	2	.03	.03	.00	17.	*	1	0205	26	.00	.00	.00	94.
1	0010	3	.08	.08	.00	17.	*	1	0210	27	.00	.00	.00	71.
1	0015	4	.12	.12	.00	18.	*	1	0215	28	.00	.00	.00	50.
1	0020	5	.22	.22	.00	21.	*	1	0220	29	.00	.00	.00	35.
1	0025	6	.38	.35	.02	52.	*	1	0225	30	.00	.00	.00	25.
1	0030	7	.67	.46	.21	451.	*	1	0230	31	.00	.00	.00	20.
1	0035	8	.38	.19	.18	681.	*	1	0235	32	.00	.00	.00	16.
1	0040	9	.21	.10	.12	629.	*	1	0240	33	.00	.00	.00	14.
1	0045	10	.17	.07	.10	523.	*	1	0245	34	.00	.00	.00	13.
1	0050	11	.13	.05	.08	434.	*	1	0250	35	.00	.00	.00	12.
1	0055	12	.11	.04	.07	366.	*	1	0255	36	.00	.00	.00	11.
1	0100	13	.11	.04	.07	328.	*	1	0300	37	.00	.00	.00	11.
1	0105	14	.11	.04	.07	317.	*	1	0305	38	.00	.00	.00	10.
1	0110	15	.05	.02	.04	267.	*	1	0310	39	.00	.00	.00	10.
1	0115	16	.06	.02	.04	218.	*	1	0315	40	.00	.00	.00	10.
1	0120	17	.03	.01	.02	173.	*	1	0320	41	.00	.00	.00	9.
1	0125	18	.03	.01	.02	139.	*	1	0325	42	.00	.00	.00	9.
1	0130	19	.03	.01	.02	120.	*	1	0330	43	.00	.00	.00	9.
1	0135	20	.03	.01	.02	112.	*	1	0335	44	.00	.00	.00	9.
1	0140	21	.03	.01	.02	108.	*	1	0340	45	.00	.00	.00	9.
1	0145	22	.03	.01	.02	108.	*	1	0345	46	.00	.00	.00	8.
1	0150	23	.03	.01	.02	108.	*	1	0350	47	.00	.00	.00	8.
1	0155	24	.03	.01	.02	109.	*	1	0355	48	.00	.00	.00	8.
							*							

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TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.90, TOTAL EXCESS = 1.20

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	681.	.58		126.	126.	126.	126.
			(INCHES)	1.337	1.337	1.337	1.337
			(AC-FT)	41.	41.	41.	41.

CUMULATIVE AREA = .57 SQ MI

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          *            *
239 KK    *     GC-9   *
          *            *
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SUBBASIN 9

SUBBASIN RUNOFF DATA

241 BA SUBBASIN CHARACTERISTICS

TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

242 LS SCS LOSS RATE

STRTL	.60	INITIAL ABSTRACTION
CRVNBR	77.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

243 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.1000	SLOPE
N	.080	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

244 RK COLLECTOR CHANNEL

L	200.	CHANNEL LENGTH
S	.0800	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

245 RK MAIN CHANNEL

L	950.	CHANNEL LENGTH
S	.0700	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.02	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.89	1.67	.35	10.00	22.84	29.72	1.14	.48
3	3.26	1.33	.25	66.67	22.78	30.12	1.14	4.41
4	3.05	1.33	.74	316.67	22.59	31.04	1.14	7.18

+	HYDROGRAPH AT	14.5	52.	.58	7.	7.	7.	.04
+	2 COMBINED AT	NODE1	66.	.58	9.	9.	9.	.05
+	HYDROGRAPH AT	14.3	101.	.58	15.	15.	15.	.08
+	HYDROGRAPH AT	14.2	17.	.58	2.	2.	2.	.01
+	2 COMBINED AT	NODE2	119.	.58	17.	17.	17.	.09
+	HYDROGRAPH AT	14.1	161.	.58	24.	24.	24.	.13
+	HYDROGRAPH AT	14A	165.	.58	27.	27.	27.	.15
+	HYDROGRAPH AT	15.3	77.	.58	11.	11.	11.	.06
+	HYDROGRAPH AT	15.2	30.	.58	4.	4.	4.	.02
+	2 COMBINED AT	NODE1	107.	.58	15.	15.	15.	.09
+	HYDROGRAPH AT	15.1	148.	.58	22.	22.	22.	.13
+	HYDROGRAPH AT	15A	185.	.58	29.	29.	29.	.16
+	2 COMBINED AT	NODE2	350.	.58	56.	56.	56.	.31
+	HYDROGRAPH AT	BAS1415	411.	.58	65.	65.	65.	.34
+	HYDROGRAPH AT	GC.2	417.	.58	70.	70.	70.	.36
+	HYDROGRAPH AT	18.31	11.	.50	2.	2.	2.	.01
+	HYDROGRAPH AT	18.32	17.	.50	2.	2.	2.	.01
+	HYDROGRAPH AT	18.33	18.	.58	3.	3.	3.	.01
+	HYDROGRAPH AT	18.21	25.	.50	4.	4.	4.	.02
+	HYDROGRAPH AT	18.22	66.	.58	19.	19.	19.	.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .955 OUTFLOW= .953 BASIN STORAGE= .000 PERCENT ERROR= .182

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.05	1.33	5.00	21.08	35.00	1.16

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HYDROGRAPH AT STATION GC-9

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		0200	25	.03	.01	.02	3.
1		0005	2	.03	.03	.00	0.	*	1		0205	26	.00	.00	.00	2.
1		0010	3	.08	.08	.00	0.	*	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.12	.00	0.	*	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.22	.00	0.	*	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.36	.02	0.	*	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.48	.19	20.	*	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.20	.17	21.	*	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.10	.11	15.	*	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.10	12.	*	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.05	.08	10.	*	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.07	9.	*	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.07	8.	*	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	8.	*	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	6.	*	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	4.	*	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	4.	*	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	3.	*	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	3.	*	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	3.	*	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	3.	*	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	3.	*	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	3.	*	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	3.	*	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.96, TOTAL EXCESS = 1.14

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 21.	.58		3.	3.	3.	3.
		(INCHES)	1.163	1.163	1.163	1.163
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

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	HYDROGRAPH AT						
+		18.23	66.	.58	19.	19.	19.	.06
	2 COMBINED AT						
+		NODE1	84.	.58	22.	22.	22.	.07
	ROUTED TO						
+		NODE2	83.	.58	22.	22.	22.	.07
	HYDROGRAPH AT						
+		18.11	20.	.58	3.	3.	3.	.02
	HYDROGRAPH AT						
+		18.12	24.	.58	3.	3.	3.	.02
	2 COMBINED AT						
+		NODE3	106.	.58	25.	25.	25.	.09
	HYDROGRAPH AT						
+		GC.11	109.	.58	26.	26.	26.	.09
	2 COMBINED AT						
+		NODE	526.	.58	96.	96.	96.	.45
	HYDROGRAPH AT						
+		GC.17	579.	.58	105.	105.	105.	.48
	HYDROGRAPH AT						
+		GC.8	576.	.58	107.	107.	107.	.49
	HYDROGRAPH AT						
+		GC.3	31.	.50	3.	3.	3.	.01
	HYDROGRAPH AT						
+		GC.4	22.	.50	2.	2.	2.	.01
	2 COMBINED AT						
+		NODE2	53.	.50	6.	6.	6.	.02
	HYDROGRAPH AT						
+		GC.5	89.	.50	11.	11.	11.	.04
	HYDROGRAPH AT						
+		GC.6	95.	.50	13.	13.	13.	.05
	2 COMBINED AT						
+		NODE3	671.	.58	120.	120.	120.	.54
	HYDROGRAPH AT						
+		GC.10	681.	.58	126.	126.	126.	.57
	HYDROGRAPH AT						
+		GC-9	21.	.58	3.	3.	3.	.02
	2 COMBINED AT						
+		NODE	702.	.58	129.	129.	129.	.59

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SUMMARY OF KINEMATIC WAVE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

INTERPOLATED TO

GC.2	4	.42	437.90	35.93	1.18	5.00	416.73	35.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= 21.166 EXCESS= 1.306 OUTFLOW= 22.447 BASIN STORAGE= .002 PERCENT ERROR= .102

18.31	4	.32	11.09	30.94	1.05	5.00	10.97	30.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .505 OUTFLOW= .504 BASIN STORAGE= .000 PERCENT ERROR= .129

18.32	4	.23	17.64	30.66	1.14	5.00	16.65	30.00	1.14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .512 EXCESS= .272 OUTFLOW= .783 BASIN STORAGE= .000 PERCENT ERROR= .056

18.33	3	.32	18.68	30.85	1.17	5.00	18.10	35.00	1.18

CONTINUITY SUMMARY (AC-FT) - INFLOW= .787 EXCESS= .074 OUTFLOW= .860 BASIN STORAGE= .000 PERCENT ERROR= .048

18.21	3	.09	25.49	30.71	1.05	5.00	25.38	30.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.168 OUTFLOW= 1.165 BASIN STORAGE= .000 PERCENT ERROR= .199

18.22	4	.28	67.48	31.67	2.05	5.00	65.94	35.00	2.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.662 EXCESS= 2.365 OUTFLOW= 6.038 BASIN STORAGE= .013 PERCENT ERROR= -.401

18.23	3	.22	66.17	35.43	2.07	5.00	65.74	35.00	2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= 6.078 EXCESS= .012 OUTFLOW= 6.103 BASIN STORAGE= .012 PERCENT ERROR= -.422

NODE2	3	.27	83.70	35.59	1.90	5.00	82.77	35.00	1.90

CONTINUITY SUMMARY (AC-FT) - INFLOW= 6.969 EXCESS= .000 OUTFLOW= 6.985 BASIN STORAGE= .014 PERCENT ERROR= -.426

18.11	4	.31	19.72	34.85	.99	5.00	19.71	35.00	1.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .917 OUTFLOW= .916 BASIN STORAGE= .000 PERCENT ERROR= .109

18.12	4	.17	24.05	31.12	1.07	5.00	23.68	35.00	1.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .926 EXCESS= .181 OUTFLOW= 1.106 BASIN STORAGE= .000 PERCENT ERROR= .047

GC.11	4	.40	111.34	35.83	1.72	5.00	109.14	35.00	1.72

CONTINUITY SUMMARY (AC-FT) - INFLOW= 8.100 EXCESS= .248 OUTFLOW= 8.366 BASIN STORAGE= .022 PERCENT ERROR= -.482

GC.17	4	.15	589.15	35.30	1.32	5.00	579.10	35.00	1.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= 30.935 EXCESS= 3.016 OUTFLOW= 33.949 BASIN STORAGE= .020 PERCENT ERROR= -.055

1	0055	12	.11	.04	.07	35.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.04	.07	32.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.04	.07	33.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.02	.04	23.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.02	.04	18.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	14.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	11.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	10.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	10.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	10.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	10.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	10.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	10.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.86, TOTAL EXCESS = 1.24

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	95.	.50		13.	13.	13.	13.
			(INCHES)	1.497	1.497	1.497	1.497
			(AC-FT)	4.	4.	4.	4.

CUMULATIVE AREA = .05 SQ MI

*** ***

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          **************
          *            *
229 KK    *     NODE3  *
          *            *
          **************
```

COMBINE GC-8 AND GC-6

231 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

****

HYDROGRAPH AT STATION NODE3

SUM OF 2 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	0000		1	18.	*	1	0100		13	308.	*	1	0200		25	105.	*	1	0300		37	10.
1	0005		2	17.	*	1	0105		14	302.	*	1	0205		26	87.	*	1	0305		38	10.
1	0010		3	17.	*	1	0110		15	248.	*	1	0210		27	63.	*	1	0310		39	10.
1	0015		4	19.	*	1	0115		16	201.	*	1	0215		28	43.	*	1	0315		40	9.
1	0020		5	27.	*	1	0120		17	158.	*	1	0220		29	30.	*	1	0320		41	9.

```
              **************
              *            *
246 KK        *    NODE    *
              *            *
              **************
                          COMBINE 9 AND TOTAL


248 HC         HYDROGRAPH COMBINATION
                    ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                         ***

*********************************************************************************************

                              HYDROGRAPH AT STATION     NODE
                                 SUM OF  2 HYDROGRAPHS

*********************************************************************************************
```

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	18.	*	1		0100	13	336.	*	1		0200	25	112.	*	1		0300	37	11.
1		0005	2	17.	*	1		0105	14	326.	*	1		0205	26	96.	*	1		0305	38	10.
1		0010	3	17.	*	1		0110	15	272.	*	1		0210	27	72.	*	1		0310	39	10.
1		0015	4	18.	*	1		0115	16	223.	*	1		0215	28	50.	*	1		0315	40	10.
1		0020	5	23.	*	1		0120	17	176.	*	1		0220	29	35.	*	1		0320	41	9.
1		0025	6	52.	*	1		0125	18	142.	*	1		0225	30	26.	*	1		0325	42	9.
1		0030	7	470.	*	1		0130	19	123.	*	1		0230	31	20.	*	1		0330	43	9.
1		0035	8	702.	*	1		0135	20	114.	*	1		0235	32	16.	*	1		0335	44	9.
1		0040	9	643.	*	1		0140	21	110.	*	1		0240	33	14.	*	1		0340	45	9.
1		0045	10	535.	*	1		0145	22	110.	*	1		0245	34	13.	*	1		0345	46	8.
1		0050	11	444.	*	1		0150	23	111.	*	1		0250	35	12.	*	1		0350	47	8.
1		0055	12	374.	*	1		0155	24	112.	*	1		0255	36	11.	*	1		0355	48	8.

```
*********************************************************************************************

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                6-HR       24-HR       72-HR      3.92-HR
+  (CFS)       (HR)
                         (CFS)
+    702.       .58             129.        129.        129.        129.
                       (INCHES) 1.332       1.332       1.332       1.332
                        (AC-FT)   42.         42.         42.         42.

                    CUMULATIVE AREA =     .59 SQ MI

1
                                   RUNOFF SUMMARY
                              FLOW IN CUBIC FEET PER SECOND
                            TIME IN HOURS,  AREA IN SQUARE MILES

                                   PEAK   TIME OF    AVERAGE FLOW FOR MAXIMUM PERIOD    BASIN   MAXIMUM    TIME OF
        OPERATION       STATION    FLOW    PEAK                                          AREA    STAGE    MAX STAGE
+                                                    6-HOUR     24-HOUR    72-HOUR

        HYDROGRAPH AT
+                         14.4      14.     .58        2.         2.          2.          .01
```

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
14.4	4	.27	14.12	31.71	1.13	5.00	13.62	35.00	1.15
CONTINUITY SUMMARY (AC-FT) - INFLOW=		.000	EXCESS=	.629	OUTFLOW=	.627	BASIN STORAGE=	.000	PERCENT ERROR= .247
14.5	4	.42	53.60	32.48	1.13	5.00	52.40	35.00	1.14
CONTINUITY SUMMARY (AC-FT) - INFLOW=		.000	EXCESS=	2.412	OUTFLOW=	2.405	BASIN STORAGE=	.000	PERCENT ERROR= .258
14.3	4	.24	101.95	35.48	1.14	5.00	101.32	35.00	1.15
CONTINUITY SUMMARY (AC-FT) - INFLOW=		3.063	EXCESS=	1.680	OUTFLOW=	4.739	BASIN STORAGE=	.000	PERCENT ERROR= .096
14.2	4	.48	17.33	33.41	1.07	5.00	17.29	35.00	1.07
CONTINUITY SUMMARY (AC-FT) - INFLOW=		.000	EXCESS=	.803	OUTFLOW=	.801	BASIN STORAGE=	.000	PERCENT ERROR= .258
14.1	4	.36	163.47	35.70	1.09	5.00	160.94	35.00	1.10
CONTINUITY SUMMARY (AC-FT) - INFLOW=		5.589	EXCESS=	2.133	OUTFLOW=	7.717	BASIN STORAGE=	.000	PERCENT ERROR= .060
14A	4	.82	176.83	36.87	1.09	5.00	164.84	35.00	1.09
CONTINUITY SUMMARY (AC-FT) - INFLOW=		7.778	EXCESS=	.887	OUTFLOW=	8.640	BASIN STORAGE=	.001	PERCENT ERROR= .277
15.3	4	.47	76.92	33.75	1.06	5.00	76.81	35.00	1.07
CONTINUITY SUMMARY (AC-FT) - INFLOW=		.000	EXCESS=	3.568	OUTFLOW=	3.561	BASIN STORAGE=	.000	PERCENT ERROR= .186
15.2	4	.29	31.55	31.70	1.13	5.00	30.49	35.00	1.14
CONTINUITY SUMMARY (AC-FT) - INFLOW=		.000	EXCESS=	1.406	OUTFLOW=	1.401	BASIN STORAGE=	.000	PERCENT ERROR= .303
15.1	4	.36	151.14	35.70	1.06	5.00	148.23	35.00	1.07
CONTINUITY SUMMARY (AC-FT) - INFLOW=		5.014	EXCESS=	2.097	OUTFLOW=	7.104	BASIN STORAGE=	.000	PERCENT ERROR= .091
15A	4	.67	193.39	36.20	1.13	5.00	185.00	35.00	1.14
CONTINUITY SUMMARY (AC-FT) - INFLOW=		7.168	EXCESS=	2.241	OUTFLOW=	9.390	BASIN STORAGE=	.001	PERCENT ERROR= .194
BAS1415	4	.05	414.32	35.10	1.16	5.00	411.42	35.00	1.16
CONTINUITY SUMMARY (AC-FT) - INFLOW=		18.115	EXCESS=	3.025	OUTFLOW=	21.130	BASIN STORAGE=	.000	PERCENT ERROR= .047

GC.8	4	.17	588.13	35.35	1.32	5.00	576.20	35.00	1.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= 34.039 EXCESS= .427 OUTFLOW= 34.477 BASIN STORAGE= .022 PERCENT ERROR= -.094

GC.3	4	.49	30.99	30.37	1.54	5.00	30.78	30.00	1.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 1.109 OUTFLOW= 1.107 BASIN STORAGE= .000 PERCENT ERROR= .170

GC.4	4	.17	22.26	29.94	1.54	5.00	22.25	30.00	1.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .781 OUTFLOW= .780 BASIN STORAGE= .000 PERCENT ERROR= .158

GC.5	4	.37	94.93	31.00	1.54	5.00	88.94	30.00	1.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1.899 EXCESS= 1.569 OUTFLOW= 3.467 BASIN STORAGE= .000 PERCENT ERROR= .018

GC.6	4	.38	106.80	30.92	1.49	5.00	94.51	30.00	1.50

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.490 EXCESS= .727 OUTFLOW= 4.214 BASIN STORAGE= .000 PERCENT ERROR= .054

GC.10	4	.33	706.29	35.65	1.33	5.00	680.92	35.00	1.34

CONTINUITY SUMMARY (AC-FT) - INFLOW= 38.790 EXCESS= 1.658 OUTFLOW= 40.467 BASIN STORAGE= .047 PERCENT ERROR= -.164

GC-9	4	.74	22.59	31.04	1.14	5.00	21.08	35.00	1.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .955 OUTFLOW= .953 BASIN STORAGE= .000 PERCENT ERROR= .182

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  09/04/1996  TIME  18:39:03 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
         LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
```

```
 *** FREE ***
 *** NOLIST ***
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *             FEBRUARY 1981             *
 *           REVISED 02 AUG 88           *
 *                                       *
 *  RUN DATE  09/04/1996  TIME  18:39:03 *
 *                                       *
 *****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
```

BASIN 17, BROADMOOR SOUTH
FLO ENGINEERING, INC.

```
    5 IO          OUTPUT CONTROL VARIABLES
                        IPRNT         0  PRINT CONTROL
                        IPLOT         0  PLOT CONTROL
```

```
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

4 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN            5  TIME INTERVAL IN MINUTES
                   JXDATE      1     0  STARTING DATE
                   JXTIME            0  STARTING TIME

  IT          HYDROGRAPH TIME DATA
                     NMIN            5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1     0  STARTING DATE
                    ITIME         0000  STARTING TIME
                       NQ           48  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1     0  ENDING DATE
                    NDTIME         0355  ENDING TIME
                    ICENT           19  CENTURY MARK

                COMPUTATION INTERVAL      .08 HOURS
                    TOTAL TIME BASE     3.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
11 KK     *    17MAIN  *
          *            *
          **************
                         RUNOFF FROM MAIN WATERSHED BASIN17

             SUBBASIN RUNOFF DATA

13 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .05  SUBBASIN AREA

               PRECIPITATION DATA

16 PT           TOTAL STORM STATIONS      ST100
17 PW                        WEIGHTS       1.00

14 PR             RECORDING STATIONS        ST2
15 PW                        WEIGHTS       1.00

18 LS          SCS LOSS RATE
                     STRTL          .70  INITIAL ABSTRACTION
                    CRVNBR        74.00  CURVE NUMBER
                     RTIMP         1.00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
19 UK            OVERLAND-FLOW ELEMENT NO. 1
```

	L	100.	OVERLAND FLOW LENGTH
	S	.6000	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
20 RK	COLLECTOR CHANNEL		
	L	320.	CHANNEL LENGTH
	S	.5000	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
21 RK	MAIN CHANNEL		
	L	450.	CHANNEL LENGTH
	S	.2400	SLOPE
	N	.065	CHANNEL ROUGHNESS COEFFICIENT
	CA	.05	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	11.54	1.67	.39	20.00	57.10	34.63	.99	.86
3	6.59	1.33	.23	106.67	57.09	34.59	.99	7.84
4	5.62	1.33	.17	150.00	57.08	34.82	.99	14.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 2.655 OUTFLOW= 2.650 BASIN STORAGE= .000 PERCENT ERROR= .176

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	5.62	1.33	5.00		57.06	35.00	1.01

****

HYDROGRAPH AT STATION 17MAIN

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	8.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	3.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	1.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.37	.01	1.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.52	.15	56.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.23	.15	57.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	39.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.08	33.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	28.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	24.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	23.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	25.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	14.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	13.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	9.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	8.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	8.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	8.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	8.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	8.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	8.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	8.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.11, TOTAL EXCESS = .99

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
57.	.58		8.	8.	8.	8.
		(INCHES)	1.008	1.008	1.008	1.008
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .05 SQ MI

22 KK 17AB

RUNOFF FROM BASIN17AB

SUBBASIN RUNOFF DATA

24 BA SUBBASIN CHARACTERISTICS

TAREA	.01	SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

25 LS SCS LOSS RATE

STRTL	.70	INITIAL ABSTRACTION
CRVNBR	74.00	CURVE NUMBER
RTIMP	1.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

26 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.3500	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

27 RK COLLECTOR CHANNEL

L	100.	CHANNEL LENGTH
S	.2500	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

28 RK MAIN CHANNEL

L	457.	CHANNEL LENGTH
S	.2470	SLOPE
N	.065	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	2.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO	VOLUME	MAXIMUM

						PEAK		CELERITY
			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
1	8.81	1.67	.30	10.00	6.43	34.89	.99	.55
3	4.66	1.33	.11	33.33	6.43	34.84	.99	4.83
4	5.39	1.36	.18	152.33	63.40	35.28	1.01	14.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2.693 EXCESS= .299 OUTFLOW= 2.991 BASIN STORAGE= .000 PERCENT ERROR= .038

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	5.39	1.36	5.00		63.37	35.00	1.01

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HYDROGRAPH AT STATION 17AB

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	9.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	4.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	2.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	1.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.37	.01	1.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.52	.15	58.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.23	.15	63.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	45.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.08	37.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	32.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	27.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	26.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	27.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	17.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	15.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	10.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	9.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	9.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	9.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	8.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	9.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	9.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	9.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.11, TOTAL EXCESS = .99

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 63.	.58		9.	9.	9.	9.
		(INCHES)	1.011	1.011	1.011	1.011
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .06 SQ MI

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          **************
          *            *
29 KK     *      17C   *
          *            *
          **************
                    RUNOFF FROM BASIN17C

               SUBBASIN RUNOFF DATA

31 BA            SUBBASIN CHARACTERISTICS
                      TAREA          .01  SUBBASIN AREA

                 PRECIPITATION DATA

16 PT             TOTAL STORM STATIONS      ST100
17 PW                          WEIGHTS       1.00

14 PR               RECORDING STATIONS        ST2
15 PW                          WEIGHTS       1.00

32 LS            SCS LOSS RATE
                      STRTL          .70  INITIAL ABSTRACTION
                     CRVNBR         74.00  CURVE NUMBER
                      RTIMP          1.00  PERCENT IMPERVIOUS AREA

                 KINEMATIC WAVE
33 UK              OVERLAND-FLOW ELEMENT NO. 1
                          L           50.  OVERLAND FLOW LENGTH
                          S         .2500  SLOPE
                          N          .100  ROUGHNESS COEFFICIENT
                         PA         100.0  PERCENT OF SUBBASIN
                       DXMIN             5  MINIMUM NUMBER OF DX INTERVALS
34 RK              COLLECTOR CHANNEL
                          L          200.  CHANNEL LENGTH
                          S         .2500  SLOPE
                          N          .080  CHANNEL ROUGHNESS COEFFICIENT
                         CA           .01  CONTRIBUTING AREA
                      SHAPE          TRAP  CHANNEL SHAPE
                         WD           .00  BOTTOM WIDTH OR DIAMETER
                          Z          1.00  SIDE SLOPE
                       DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
35 RK              MAIN CHANNEL
                          L          250.  CHANNEL LENGTH
                          S         .0640  SLOPE
                          N          .060  CHANNEL ROUGHNESS COEFFICIENT
                         CA           .01  CONTRIBUTING AREA
                      SHAPE          TRAP  CHANNEL SHAPE
                         WD          2.00  BOTTOM WIDTH OR DIAMETER
                          Z          2.00  SIDE SLOPE
                       DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
                      RUPSTQ            NO  ROUTE UPSTREAM HYDROGRAPH
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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.45	1.67	.33	10.00	13.95	34.98	.99	.50
3	4.66	1.33	.15	66.67	13.95	34.91	.99	7.34
4	2.73	1.35	.23	83.33	13.95	34.78	.99	6.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .649 OUTFLOW= .648 BASIN STORAGE= .000 PERCENT ERROR= .105

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.73	1.35	5.00		13.95	35.00	1.00

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HYDROGRAPH AT STATION 17C

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	2.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.00	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.37	.01	0.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.52	.15	14.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.23	.15	14.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	9.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.08	8.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	7.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	6.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	6.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	6.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	3.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	3.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	2.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	2.	1		0325	42	.00	.00	.00	0.

1	0130	19	.03	.01	.02	2.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	2.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	2.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	2.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	2.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	2.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.11, TOTAL EXCESS = .99

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 14.	.58		2.	2.	2.	2.
		(INCHES)	1.002	1.002	1.002	1.002
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

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          **************
          *            *
36 KK     *    NODE1   *
          *            *
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COMBINE BASINS 17AB AND 17C

38 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE1

SUM OF 2 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0100	13	32.	*	1		0200	25	11.	*	1		0300	37	0.
1		0005	2	0.	*	1		0105	14	33.	*	1		0205	26	5.	*	1		0305	38	0.
1		0010	3	0.	*	1		0110	15	20.	*	1		0210	27	2.	*	1		0310	39	0.
1		0015	4	0.	*	1		0115	16	18.	*	1		0215	28	1.	*	1		0315	40	0.
1		0020	5	0.	*	1		0120	17	12.	*	1		0220	29	0.	*	1		0320	41	0.
1		0025	6	1.	*	1		0125	18	10.	*	1		0225	30	0.	*	1		0325	42	0.
1		0030	7	71.	*	1		0130	19	11.	*	1		0230	31	0.	*	1		0330	43	0.
1		0035	8	77.	*	1		0135	20	11.	*	1		0235	32	0.	*	1		0335	44	0.
1		0040	9	54.	*	1		0140	21	10.	*	1		0240	33	0.	*	1		0340	45	0.
1		0045	10	45.	*	1		0145	22	11.	*	1		0245	34	0.	*	1		0345	46	0.
1		0050	11	38.	*	1		0150	23	11.	*	1		0250	35	0.	*	1		0350	47	0.
1		0055	12	33.	*	1		0155	24	11.	*	1		0255	36	0.	*	1		0355	48	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
77.	.58		11.	11.	11.	11.
		(INCHES)	1.009	1.009	1.009	1.009
		(AC-FT)	4.	4.	4.	4.

CUMULATIVE AREA = .07 SQ MI

39 KK

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* *
* 17D *
* *
****

RUNOFF FROM BASIN17D

SUBBASIN RUNOFF DATA

41 BA SUBBASIN CHARACTERISTICS

TAREA	.00	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

42 LS SCS LOSS RATE

STRTL	.67	INITIAL ABSTRACTION
CRVNBR	75.00	CURVE NUMBER
RTIMP	21.60	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

43 UK OVERLAND-FLOW ELEMENT NO. 1

L	25.	OVERLAND FLOW LENGTH
S	.3330	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

44 RK COLLECTOR CHANNEL

L	150.	CHANNEL LENGTH
S	.2500	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

45 RK MAIN CHANNEL

L	301.	CHANNEL LENGTH
S	.0532	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	2.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	8.60	1.67	.16	5.00	3.64	29.71	1.47	.53
3	4.66	1.33	.16	50.00	3.64	29.74	1.47	5.27
4	2.49	1.35	.20	100.33	79.93	35.42	1.02	8.29

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.658 EXCESS= .138 OUTFLOW= 3.795 BASIN STORAGE= .000 PERCENT ERROR= .041

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.49	1.35	5.00		79.56	35.00	1.02

****

HYDROGRAPH AT STATION 17D

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	11.
1		0005	2	.03	.02	.01	0.	1		0205	26	.00	.00	.00	6.
1		0010	3	.08	.06	.02	0.	1		0210	27	.00	.00	.00	3.
1		0015	4	.12	.09	.03	0.	1		0215	28	.00	.00	.00	1.
1		0020	5	.22	.17	.05	1.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.29	.09	2.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.40	.27	69.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.17	.20	80.	1		0235	32	.00	.00	.00	0.

1	0040	9	.21	.09	.13	58.	*	1	0240	33	.00	.00	.00	0.
1	0045	10	.17	.06	.10	48.	*	1	0245	34	.00	.00	.00	0.
1	0050	11	.13	.05	.09	40.	*	1	0250	35	.00	.00	.00	0.
1	0055	12	.11	.04	.07	34.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.03	.07	33.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.03	.08	34.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.02	.04	22.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.02	.04	19.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	13.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	11.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	11.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	11.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	11.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	11.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	11.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.03	12.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.63, TOTAL EXCESS = 1.47

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	80.	.58		12.	12.	12.	12.
			(INCHES)	1.025	1.025	1.025	1.025
			(AC-FT)	4.	4.	4.	4.

CUMULATIVE AREA = .07 SQ MI

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          **************
          *            *
46 KK     *      17E   *
          *            *
          **************
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RUNOFF FROM BASIN17E

SUBBASIN RUNOFF DATA

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48 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .00  SUBBASIN AREA
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PRECIPITATION DATA

```
16 PT           TOTAL STORM STATIONS     ST100
17 PW                       WEIGHTS      1.00

14 PR             RECORDING STATIONS       ST2
15 PW                       WEIGHTS      1.00

49 LS          SCS LOSS RATE
                    STRTL          .30  INITIAL ABSTRACTION
                   CRVNBR        87.00  CURVE NUMBER
```

	RTIMP	10.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

50 UK	OVERLAND-FLOW ELEMENT NO. 1		
	L	25.	OVERLAND FLOW LENGTH
	S	.3330	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
51 RK	COLLECTOR CHANNEL		
	L	50.	CHANNEL LENGTH
	S	.3330	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
52 RK	MAIN CHANNEL		
	L	343.	CHANNEL LENGTH
	S	.0180	SLOPE
	N	.025	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	20.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	8.60	1.67	.13	5.00	13.17	29.61	1.95	.63
3	5.00	1.33	.04	16.67	13.17	29.30	1.95	7.20
4	1.48	1.51	.22	114.33	87.88	35.25	1.07	8.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.811 EXCESS= .421 OUTFLOW= 4.230 BASIN STORAGE= .000 PERCENT ERROR= .046

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

		4	1.48	1.51	5.00		87.47	35.00	1.08				

HYDROGRAPH AT STATION 17E

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.00	.03	12.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	7.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	4.
1		0015	4	.12	.11	.01	1.	1		0215	28	.00	.00	.00	2.
1		0020	5	.22	.18	.03	2.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.23	.15	7.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.25	.42	76.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.09	.28	87.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.04	.17	66.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.03	.14	53.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.02	.11	44.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.02	.09	38.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.02	.09	36.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.01	.09	37.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.05	25.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.05	21.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.00	.03	15.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.00	.03	12.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.00	.03	12.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.00	.03	12.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.00	.03	12.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.00	.03	12.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.00	.03	12.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.00	.03	12.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.15, TOTAL EXCESS = 1.95

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
87.	.58		13.	13.	13.	13.
		(INCHES)	1.081	1.081	1.081	1.081
		(AC-FT)	4.	4.	4.	4.

CUMULATIVE AREA = .07 SQ MI

53 KK 16.4

RUNOFF FROM BAS164

SUBBASIN RUNOFF DATA

55 BA SUBBASIN CHARACTERISTICS

TAREA	.07	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

56 LS SCS LOSS RATE

STRTL	.70	INITIAL ABSTRACTION
CRVNBR	74.00	CURVE NUMBER
RTIMP	2.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

57 UK OVERLAND-FLOW ELEMENT NO. 1

L	100.	OVERLAND FLOW LENGTH
S	.6000	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

58 RK COLLECTOR CHANNEL

L	380.	CHANNEL LENGTH
S	.3160	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

59 RK MAIN CHANNEL

L	500.	CHANNEL LENGTH
S	.6070	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.07	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	11.54	1.67	.38	20.00	79.69	28.73	1.01	.87
3	5.24	1.33	.31	126.67	79.24	32.16	1.01	6.75
4	8.45	1.38	.12	166.67	79.24	32.52	1.01	23.21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 3.702 OUTFLOW= 3.698 BASIN STORAGE= .000 PERCENT ERROR= .110

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	8.45	1.38	5.00		79.09	35.00	1.03

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HYDROGRAPH AT STATION 16.4

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	11.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	5.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	2.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	1.
1		0020	5	.22	.21	.00	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.36	.01	4.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.52	.15	78.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.23	.15	79.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	54.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.09	46.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	39.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	33.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	32.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	34.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	19.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	18.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	12.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	10.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	11.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	11.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	10.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	11.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	11.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	11.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.09, TOTAL EXCESS = 1.01

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	3.92-HR

```
                    (CFS)
+      79.    .58                12.         12.         12.         12.
                (INCHES)        1.028       1.028       1.028       1.028
                (AC-FT)           4.          4.          4.          4.

                CUMULATIVE AREA =     .07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 60 KK    *      16.3  *
          *            *
          **************
                    RUNOFF FROM BAS163

             SUBBASIN RUNOFF DATA

 62 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .04  SUBBASIN AREA

                PRECIPITATION DATA

 16 PT           TOTAL STORM STATIONS      ST100
 17 PW                        WEIGHTS       1.00

 14 PR             RECORDING STATIONS        ST2
 15 PW                        WEIGHTS       1.00

 63 LS          SCS LOSS RATE
                      STRTL          .67  INITIAL ABSTRACTION
                     CRVNBR        75.00  CURVE NUMBER
                      RTIMP         2.40  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
 64 UK            OVERLAND-FLOW ELEMENT NO. 1
                          L          100.  OVERLAND FLOW LENGTH
                          S         .6630  SLOPE
                          N          .100  ROUGHNESS COEFFICIENT
                         PA         100.0  PERCENT OF SUBBASIN
                       DXMIN             5  MINIMUM NUMBER OF DX INTERVALS
 65 RK            COLLECTOR CHANNEL
                          L          560.  CHANNEL LENGTH
                          S         .6610  SLOPE
                          N          .080  CHANNEL ROUGHNESS COEFFICIENT
                         CA           .00  CONTRIBUTING AREA
                      SHAPE          TRAP  CHANNEL SHAPE
                         WD           .00  BOTTOM WIDTH OR DIAMETER
                          Z          1.00  SIDE SLOPE
                       DXMIN             2  MINIMUM NUMBER OF DX INTERVALS
 66 RK            MAIN CHANNEL
                          L         1160.  CHANNEL LENGTH
                          S         .5860  SLOPE
                          N          .060  CHANNEL ROUGHNESS COEFFICIENT
                         CA           .04  CONTRIBUTING AREA
                      SHAPE          TRAP  CHANNEL SHAPE
```

WD	3.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	12.13	1.67	.36	20.00	48.64	30.02	1.08	.93
3	7.58	1.33	.30	186.67	48.34	30.30	1.08	10.34
4	8.30	1.38	.26	386.67	126.53	30.80	1.04	24.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.750 EXCESS= 2.159 OUTFLOW= 5.906 BASIN STORAGE= .000 PERCENT ERROR= .046

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	8.30	1.38	5.00	125.36	35.00	1.05

****

HYDROGRAPH AT STATION 16.3

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	17.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	9.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	4.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	2.
1		0020	5	.22	.21	.01	1.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.36	.02	5.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.50	.17	117.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.22	.16	125.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.11	89.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.09	73.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.08	62.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	52.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	51.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	53.	1		0305	38	.00	.00	.00	0.

1	0110	15	.05	.02	.03	33.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.02	.04	28.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	20.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	17.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	17.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	17.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	16.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	17.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	17.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	18.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.02, TOTAL EXCESS = 1.08

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	125.	.58		18.	18.	18.	18.
			(INCHES)	1.052	1.052	1.052	1.052
			(AC-FT)	6.	6.	6.	6.

CUMULATIVE AREA = .11 SQ MI

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          **************
          *            *
67 KK     *      16.2  *
          *            *
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RUNOFF FROM BAS162

SUBBASIN RUNOFF DATA

69 BA SUBBASIN CHARACTERISTICS

TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

70 LS SCS LOSS RATE

STRTL .70 INITIAL ABSTRACTION

CRVNBR 74.00 CURVE NUMBER

RTIMP 1.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

71 UK OVERLAND-FLOW ELEMENT NO. 1

L 100. OVERLAND FLOW LENGTH

S .5000 SLOPE

	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
72 RK	COLLECTOR CHANNEL		
	L	240.	CHANNEL LENGTH
	S	.5420	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
73 RK	MAIN CHANNEL		
	L	840.	CHANNEL LENGTH
	S	.3450	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.02	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	8.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	10.54	1.67	.41	20.00	24.84	34.79	.99	.81
3	6.87	1.33	.21	80.00	24.84	34.62	.99	6.49
4	4.43	1.46	.24	280.00	149.72	35.28	1.04	19.81

CONTINUITY SUMMARY (AC-FT) - INFLOW= 5.950 EXCESS= 1.155 OUTFLOW= 7.101 BASIN STORAGE= .000 PERCENT ERROR= .057

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.43	1.46	5.00		149.35	35.00	1.05

****

HYDROGRAPH AT STATION 16.2

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	21.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	13.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	6.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	3.
1		0020	5	.22	.21	.00	1.	1		0220	29	.00	.00	.00	1.
1		0025	6	.38	.37	.01	5.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.52	.15	129.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.23	.15	149.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.10	110.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.08	89.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.07	75.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.05	.06	64.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	61.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.06	63.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	42.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.03	35.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	26.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	21.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	20.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	20.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	20.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	21.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	21.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	21.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.11, TOTAL EXCESS = .99

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 149.	.58		22.	22.	22.	22.
		(INCHES)	1.050	1.050	1.050	1.050
		(AC-FT)	7.	7.	7.	7.

CUMULATIVE AREA = .13 SQ MI

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          **************
          *            *
74 KK     *      16.1  *
          *            *
          **************
                    RUNOFF FROM BAS161

          SUBBASIN RUNOFF DATA

76 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .04  SUBBASIN AREA
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PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS		ST100
17 PW		WEIGHTS	1.00
14 PR	RECORDING STATIONS		ST2
15 PW		WEIGHTS	1.00

77 LS SCS LOSS RATE

STRTL	.67	INITIAL ABSTRACTION
CRVNBR	75.00	CURVE NUMBER
RTIMP	6.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

78 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.4000	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

79 RK MAIN CHANNEL

L	680.	CHANNEL LENGTH
S	.2160	SLOPE
N	.040	CHANNEL ROUGHNESS COEFFICIENT
CA	.04	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	12.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO PEAK	VOLUME	MAXIMUM CELERITY
			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
1	9.42	1.67	.26	10.00	60.58	29.88	1.15	.64
3	4.19	1.50	.16	226.67	202.03	35.02	1.07	23.30

CONTINUITY SUMMARY (AC-FT) - INFLOW= 7.155 EXCESS= 2.567 OUTFLOW= 9.717 BASIN STORAGE= .000 PERCENT ERROR= .055

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

3	4.19	1.50	5.00	201.95	35.00	1.08

HYDROGRAPH AT STATION 16.1

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	28.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	15.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	8.
1		0015	4	.12	.11	.01	2.	1		0215	28	.00	.00	.00	4.
1		0020	5	.22	.20	.01	4.	1		0220	29	.00	.00	.00	2.
1		0025	6	.38	.35	.03	13.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.48	.19	181.	1		0230	31	.00	.00	.00	1.
1		0035	8	.38	.21	.17	202.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.10	.11	148.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.09	121.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.08	101.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.06	86.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	82.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	85.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	56.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	47.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	34.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	28.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	28.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	27.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	27.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	28.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	27.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	29.	1		0355	48	.00	.00	.00	0.

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.95, TOTAL EXCESS = 1.15

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
202.	.58		30.	30.	30.	30.
		(INCHES)	1.079	1.079	1.079	1.079
		(AC-FT)	10.	10.	10.	10.

CUMULATIVE AREA = .17 SQ MI

80 KK 16B

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                RUNOFF FROM BASIN16B

          SUBBASIN RUNOFF DATA

82 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .01  SUBBASIN AREA

               PRECIPITATION DATA

16 PT           TOTAL STORM STATIONS      ST100
17 PW                        WEIGHTS       1.00

14 PR             RECORDING STATIONS        ST2
15 PW                        WEIGHTS       1.00

83 LS          SCS LOSS RATE
                    STRTL          .67  INITIAL ABSTRACTION
                   CRVNBR        75.00  CURVE NUMBER
                    RTIMP         1.00  PERCENT IMPERVIOUS AREA

                 LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT
                    STRTL          .63  INITIAL ABSTRACTION
                   CRVNBR        76.00  CURVE NUMBER
                    RTIMP         4.00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
84 UK            OVERLAND-FLOW ELEMENT NO. 1
                       L           50.  OVERLAND FLOW LENGTH
                       S        .2770  SLOPE
                       N         .100  ROUGHNESS COEFFICIENT
                      PA         50.0  PERCENT OF SUBBASIN
                    DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
85 UK            OVERLAND-FLOW ELEMENT NO. 2
                       L           50.  OVERLAND FLOW LENGTH
                       S        .1800  SLOPE
                       N         .100  ROUGHNESS COEFFICIENT
                      PA         50.0  PERCENT OF SUBBASIN
                    DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
86 RX            COLLECTOR CHANNEL
                       L          100.  CHANNEL LENGTH
                       S        .3000  SLOPE
                       N         .080  CHANNEL ROUGHNESS COEFFICIENT
                      CA          .00  CONTRIBUTING AREA
                   SHAPE         TRAP  CHANNEL SHAPE
                      WD          .00  BOTTOM WIDTH OR DIAMETER
                       Z         1.00  SIDE SLOPE
                    DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
87 RK            MAIN CHANNEL
                       L          100.  CHANNEL LENGTH
                       S        .1500  SLOPE
                       N         .080  CHANNEL ROUGHNESS COEFFICIENT
                      CA          .01  CONTRIBUTING AREA
                   SHAPE         TRAP  CHANNEL SHAPE
                      WD          .00  BOTTOM WIDTH OR DIAMETER
                       Z         1.00  SIDE SLOPE
                    DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                   RUPSTQ           NO  ROUTE UPSTREAM HYDROGRAPH
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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.84	1.67	.31	10.00	4.98	30.00	1.05	.54
2	6.32	1.67	.33	10.00	5.93	29.97	1.16	.50
3	5.11	1.33	.09	33.33	10.89	29.97	1.10	6.24
4	3.61	1.33	.08	33.33	10.88	30.08	1.10	6.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .472 OUTFLOW= .471 BASIN STORAGE= .000 PERCENT ERROR= .086

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	3.61	1.33	5.00		10.88	30.00	1.11

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HYDROGRAPH AT STATION 16B

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	1.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	0.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.12	.00	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	0.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.36	.02	1.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.49	.18	11.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.21	.16	10.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.11	.11	7.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.08	.09	6.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.06	.08	5.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.06	4.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.06	4.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	4.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.03	2.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	2.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	1.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	1.	1		0325	42	.00	.00	.00	0.

1	0130	19	.03	.01	.02	1.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	1.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	1.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	1.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	1.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	1.	*	1	0355	48	.00	.00	.00	0.
							*							

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TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.99, TOTAL EXCESS = 1.11

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 11.	.50		1.	1.	1.	1.
		(INCHES)	1.110	1.110	1.110	1.110
		(AC-FT)	0.	0.	0.	0.

CUMULATIVE AREA = .01 SQ MI

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88 KK

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* *
* NODE2 *
* *
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COMBINE BASIN16A AND CHANNEL 161

90 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE2

SUM OF 2 HYDROGRAPHS

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
					*						*						*					
1		0000	1	0.	*	1		0100	13	86.	*	1		0200	25	29.	*	1		0300	37	0.
1		0005	2	0.	*	1		0105	14	89.	*	1		0205	26	16.	*	1		0305	38	0.
1		0010	3	0.	*	1		0110	15	58.	*	1		0210	27	8.	*	1		0310	39	0.
1		0015	4	2.	*	1		0115	16	50.	*	1		0215	28	4.	*	1		0315	40	0.
1		0020	5	4.	*	1		0120	17	35.	*	1		0220	29	2.	*	1		0320	41	0.
1		0025	6	14.	*	1		0125	18	29.	*	1		0225	30	1.	*	1		0325	42	0.
1		0030	7	191.	*	1		0130	19	29.	*	1		0230	31	1.	*	1		0330	43	0.
1		0035	8	212.	*	1		0135	20	28.	*	1		0235	32	0.	*	1		0335	44	0.
1		0040	9	155.	*	1		0140	21	28.	*	1		0240	33	0.	*	1		0340	45	0.
1		0045	10	127.	*	1		0145	22	29.	*	1		0245	34	0.	*	1		0345	46	0.
1		0050	11	106.	*	1		0150	23	29.	*	1		0250	35	0.	*	1		0350	47	0.
1		0055	12	90.	*	1		0155	24	30.	*	1		0255	36	0.	*	1		0355	48	0.

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	212.	.58		32.	32.	32.	32.
			(INCHES)	1.080	1.080	1.080	1.080
			(AC-FT)	10.	10.	10.	10.

CUMULATIVE AREA = .18 SQ MI

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          *            *
91 KK     *       16C  *
          *            *
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RUNOFF FROM BASIN16C

SUBBASIN RUNOFF DATA

93 BA SUBBASIN CHARACTERISTICS

TAREA .00 SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

94 LS SCS LOSS RATE

STRTL .70 INITIAL ABSTRACTION

CRVNBR 74.00 CURVE NUMBER

RTIMP 8.00 PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

95 UK OVERLAND-FLOW ELEMENT NO. 1

L 25. OVERLAND FLOW LENGTH

S .3750 SLOPE

N .100 ROUGHNESS COEFFICIENT

PA 100.0 PERCENT OF SUBBASIN

DXMIN 5 MINIMUM NUMBER OF DX INTERVALS

96 RK COLLECTOR CHANNEL

L 100. CHANNEL LENGTH

S .3500 SLOPE

N .080 CHANNEL ROUGHNESS COEFFICIENT

CA .00 CONTRIBUTING AREA

SHAPE TRAP CHANNEL SHAPE

WD .00 BOTTOM WIDTH OR DIAMETER

Z 1.00 SIDE SLOPE

DXMIN 2 MINIMUM NUMBER OF DX INTERVALS

97 RK MAIN CHANNEL

L	100.	CHANNEL LENGTH
S	.0280	SLOPE
N	.025	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	20.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	9.12	1.67	.18	5.00	.30	29.94	1.14	.47
3	5.52	1.33	.18	33.33	.30	29.86	1.14	3.16
4	1.84	1.51	.04	33.33	212.31	35.07	1.08	13.65

CONTINUITY SUMMARY (AC-FT) - INFLOW= 10.230 EXCESS= .013 OUTFLOW= 10.242 BASIN STORAGE= .000 PERCENT ERROR= .009

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	1.84	1.51	5.00	212.00	35.00	1.08

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HYDROGRAPH AT STATION 16C

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	29.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	16.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	8.
1		0015	4	.12	.11	.01	2.	1		0215	28	.00	.00	.00	4.
1		0020	5	.22	.20	.02	4.	1		0220	29	.00	.00	.00	2.
1		0025	6	.38	.34	.03	14.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.49	.18	189.	1		0230	31	.00	.00	.00	1.
1		0035	8	.38	.21	.16	212.	1		0235	32	.00	.00	.00	0.

1	0040	9	.21	.11	.11	156.	*	1	0240	33	.00	.00	.00	0.
1	0045	10	.17	.08	.09	127.	*	1	0245	34	.00	.00	.00	0.
1	0050	11	.13	.06	.08	107.	*	1	0250	35	.00	.00	.00	0.
1	0055	12	.11	.04	.06	90.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.04	.06	87.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.04	.07	90.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.02	.03	59.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.02	.04	50.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	36.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	29.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.02	29.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	28.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	28.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.02	29.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	29.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.02	30.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.96, TOTAL EXCESS = 1.14

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)				
	(CFS)				
+ 212.	.58	32.	32.	32.	32.
	(INCHES)	1.081	1.081	1.081	1.081
	(AC-FT)	10.	10.	10.	10.

CUMULATIVE AREA = .18 SQ MI

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          *            *
 98 KK    *       16A  *
          *            *
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RUNOFF FROM BASIN16A

SUBBASIN RUNOFF DATA

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100 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .02  SUBBASIN AREA

                PRECIPITATION DATA

 16 PT           TOTAL STORM STATIONS     ST100
 17 PW                        WEIGHTS      1.00

 14 PR             RECORDING STATIONS       ST2
 15 PW                        WEIGHTS      1.00

101 LS          SCS LOSS RATE
                      STRTL         .63  INITIAL ABSTRACTION
                     CRVNBR       76.00  CURVE NUMBER
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	RTIMP	11.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

102 UK	OVERLAND-FLOW ELEMENT NO. 1		
	L	50.	OVERLAND FLOW LENGTH
	S	.3500	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	100.0	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
103 RK	COLLECTOR CHANNEL		
	L	100.	CHANNEL LENGTH
	S	.3000	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.01	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
104 RK	MAIN CHANNEL		
	L	100.	CHANNEL LENGTH
	S	.0280	SLOPE
	N	.025	CHANNEL ROUGHNESS COEFFICIENT
	CA	.02	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	20.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	8.81	1.67	.25	10.00	27.48	29.88	1.30	.66
3	5.11	1.33	.06	33.33	27.47	29.85	1.30	9.35
4	1.84	1.51	.04	33.33	234.32	35.06	1.10	14.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= 10.253 EXCESS= 1.086 OUTFLOW= 11.336 BASIN STORAGE= .000 PERCENT ERROR= .017

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4 1.84 1.51 5.00 234.13 35.00 1.10

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HYDROGRAPH AT STATION 16A

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	32.
1		0005	2	.03	.02	.00	0.	1		0205	26	.00	.00	.00	17.
1		0010	3	.08	.07	.01	1.	1		0210	27	.00	.00	.00	9.
1		0015	4	.12	.11	.01	3.	1		0215	28	.00	.00	.00	4.
1		0020	5	.22	.19	.02	7.	1		0220	29	.00	.00	.00	2.
1		0025	6	.38	.32	.05	20.	1		0225	30	.00	.00	.00	1.
1		0030	7	.67	.44	.23	213.	1		0230	31	.00	.00	.00	1.
1		0035	8	.38	.19	.19	234.	1		0235	32	.00	.00	.00	1.
1		0040	9	.21	.09	.12	172.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.07	.10	140.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.05	.08	117.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.04	.07	99.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.04	.07	95.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.04	.07	98.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.02	.04	64.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.02	.04	55.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	39.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	32.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.02	32.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	31.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	31.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.02	32.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	32.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.02	33.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.80, TOTAL EXCESS = 1.30

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
234.	.58		35.	35.	35.	35.
		(INCHES)	1.100	1.100	1.100	1.100
		(AC-FT)	11.	11.	11.	11.

CUMULATIVE AREA = .19 SQ MI

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105 KK

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* *
* NODE3 *
* *
****

COMBINE BASINS 16 AND 17

107 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE3

SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0100	13	131.	1		0200	25	44.	1		0300	37	0.
1		0005	2	0.	1		0105	14	135.	1		0205	26	25.	1		0305	38	0.
1		0010	3	1.	1		0110	15	89.	1		0210	27	12.	1		0310	39	0.
1		0015	4	4.	1		0115	16	75.	1		0215	28	6.	1		0315	40	0.
1		0020	5	9.	1		0120	17	54.	1		0220	29	3.	1		0320	41	0.
1		0025	6	26.	1		0125	18	44.	1		0225	30	2.	1		0325	42	0.
1		0030	7	289.	1		0130	19	44.	1		0230	31	1.	1		0330	43	0.
1		0035	8	322.	1		0135	20	43.	1		0235	32	1.	1		0335	44	0.
1		0040	9	238.	1		0140	21	42.	1		0240	33	0.	1		0340	45	0.
1		0045	10	193.	1		0145	22	44.	1		0245	34	0.	1		0345	46	0.
1		0050	11	162.	1		0150	23	44.	1		0250	35	0.	1		0350	47	0.
1		0055	12	137.	1		0155	24	45.	1		0255	36	0.	1		0355	48	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
322.	.58		48.	48.	48.	48.
		(INCHES)	1.095	1.095	1.095	1.095
		(AC-FT)	16.	16.	16.	16.

CUMULATIVE AREA = .27 SQ MI

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*            *
*       Z.1  *
*            *
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108 KK

RUNOFF FROM BASIN Z.1 ROUTE UPSTREAM

SUBBASIN RUNOFF DATA

110 BA SUBBASIN CHARACTERISTICS

TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

```
16 PT          TOTAL STORM STATIONS      ST100
17 PW                       WEIGHTS       1.00

14 PR          RECORDING STATIONS         ST2
15 PW                       WEIGHTS       1.00

111 LS         SCS LOSS RATE
                    STRTL          .50  INITIAL ABSTRACTION
                   CRVNBR        80.00  CURVE NUMBER
                    RTIMP         7.20  PERCENT IMPERVIOUS AREA

               LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT
                    STRTL          .44  INITIAL ABSTRACTION
                   CRVNBR        82.00  CURVE NUMBER
                    RTIMP         5.00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
112 UK          OVERLAND-FLOW ELEMENT NO. 1
                        L          50.  OVERLAND FLOW LENGTH
                        S        .2400  SLOPE
                        N         .100  ROUGHNESS COEFFICIENT
                       PA         80.0  PERCENT OF SUBBASIN
                     DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
113 UK          OVERLAND-FLOW ELEMENT NO. 2
                        L          50.  OVERLAND FLOW LENGTH
                        S        .2400  SLOPE
                        N         .100  ROUGHNESS COEFFICIENT
                       PA         20.0  PERCENT OF SUBBASIN
                     DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
114 RK          COLLECTOR CHANNEL
                        L         100.  CHANNEL LENGTH
                        S        .2100  SLOPE
                        N         .080  CHANNEL ROUGHNESS COEFFICIENT
                       CA          .01  CONTRIBUTING AREA
                    SHAPE         TRAP  CHANNEL SHAPE
                       WD          .00  BOTTOM WIDTH OR DIAMETER
                        Z         1.00  SIDE SLOPE
                     DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
115 RK          MAIN CHANNEL
                        L        1350.  CHANNEL LENGTH
                        S        .1500  SLOPE
                        N         .060  CHANNEL ROUGHNESS COEFFICIENT
                       CA          .02  CONTRIBUTING AREA
                    SHAPE         TRAP  CHANNEL SHAPE
                       WD         8.00  BOTTOM WIDTH OR DIAMETER
                        Z         2.00  SIDE SLOPE
                     DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                    RUPSTQ          YES  ROUTE UPSTREAM HYDROGRAPH

                                                                    ***

PRECIPITATION STATION DATA

          STATION     TOTAL     AVG. ANNUAL     WEIGHT
            ST100      3.10             .00       1.00

 TEMPORAL DISTRIBUTIONS

 STATION       ST2,  WEIGHT =   1.00
```

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.30	1.67	.26	10.00	40.88	29.94	1.45	.64
2	7.30	1.67	.25	10.00	11.27	29.89	1.54	.66
3	4.27	1.33	.06	33.33	52.11	29.84	1.47	8.68
4	2.94	1.42	.42	450.00	359.29	35.66	1.12	17.69

CONTINUITY SUMMARY (AC-FT) - INFLOW= 15.601 EXCESS= 1.882 OUTFLOW= 17.464 BASIN STORAGE= .001 PERCENT ERROR= .105

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.94	1.42	5.00		356.15	35.00	1.13

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HYDROGRAPH AT STATION Z.1

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	49.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	33.
1		0010	3	.08	.08	.01	0.	1		0210	27	.00	.00	.00	18.
1		0015	4	.12	.11	.01	2.	1		0215	28	.00	.00	.00	9.
1		0020	5	.22	.20	.01	8.	1		0220	29	.00	.00	.00	5.
1		0025	6	.38	.31	.06	29.	1		0225	30	.00	.00	.00	3.
1		0030	7	.67	.39	.28	291.	1		0230	31	.00	.00	.00	2.
1		0035	8	.38	.16	.22	356.	1		0235	32	.00	.00	.00	1.
1		0040	9	.21	.08	.14	279.	1		0240	33	.00	.00	.00	1.
1		0045	10	.17	.05	.11	223.	1		0245	34	.00	.00	.00	1.
1		0050	11	.13	.04	.09	186.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	157.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.08	146.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	149.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	108.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	87.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	65.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	52.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	49.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	48.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	47.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	48.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	48.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	50.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.63, TOTAL EXCESS = 1.47

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	3.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	356.	.58		54.	54.	54.	54.
			(INCHES)	1.131	1.131	1.131	1.131
			(AC-FT)	18.	18.	18.	18.

CUMULATIVE AREA = .29 SQ MI

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          *            *
116 KK    *       Z.2  *
          *            *
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RUNOFF FROM BASIN Z.2

SUBBASIN RUNOFF DATA

118 BA SUBBASIN CHARACTERISTICS

TAREA	.01	SUBBASIN AREA

PRECIPITATION DATA

16 PT	TOTAL STORM STATIONS	ST100	
17 PW	WEIGHTS	1.00	
14 PR	RECORDING STATIONS	ST2	
15 PW	WEIGHTS	1.00	

119 LS SCS LOSS RATE

STRTL	.50	INITIAL ABSTRACTION
CRVNBR	80.00	CURVE NUMBER
RTIMP	5.10	PERCENT IMPERVIOUS AREA

LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT

STRTL	.44	INITIAL ABSTRACTION
CRVNBR	82.00	CURVE NUMBER
RTIMP	5.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

120 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.2800	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	66.3	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

121 UK OVERLAND-FLOW ELEMENT NO. 2

L	50.	OVERLAND FLOW LENGTH
S	.2800	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	33.7	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

122 RK COLLECTOR CHANNEL

L	50.	CHANNEL LENGTH
S	.2500	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

123 RK MAIN CHANNEL

L	1000.	CHANNEL LENGTH
S	.1600	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	7.88	1.67	.25	10.00	10.47	29.97	1.41	.66
2	7.88	1.67	.24	10.00	6.06	29.94	1.54	.69
3	4.66	1.33	.04	16.67	16.52	29.93	1.46	6.54
4	4.62	1.33	.62	333.33	16.02	30.43	1.46	8.99

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .596 OUTFLOW= .595 BASIN STORAGE= .000 PERCENT ERROR= .085

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	4.62	1.33	5.00		15.91	30.00	1.46

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HYDROGRAPH AT STATION Z.2

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		0200	25	.03	.01	.02	1.
1		0005	2	.03	.03	.00	0.	*	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	*	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.11	.01	0.	*	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	0.	*	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.31	.06	1.	*	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.39	.28	16.	*	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.16	.22	13.	*	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.08	.14	8.	*	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.05	.11	7.	*	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.04	.09	6.	*	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	5.	*	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.08	5.	*	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	5.	*	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	3.	*	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	2.	*	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	2.	*	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	1.	*	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	1.	*	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	1.	*	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	1.	*	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	2.	*	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	1.	*	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	2.	*	1		0355	48	.00	.00	.00	0.
								*								

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TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.64, TOTAL EXCESS = 1.46

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 16.	.50		2.	2.	2.	2.
		(INCHES)	1.462	1.462	1.462	1.462
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

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          *            *
124 KK    *      NODE  *     4
          *            *
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COMBINE BASINS Z.1 AND Z.2

126 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE

SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0100	13	151.	1		0200	25	50.	1		0300	37	0.
1		0005	2	0.	1		0105	14	154.	1		0205	26	34.	1		0305	38	0.
1		0010	3	0.	1		0110	15	111.	1		0210	27	18.	1		0310	39	0.
1		0015	4	2.	1		0115	16	89.	1		0215	28	10.	1		0315	40	0.
1		0020	5	8.	1		0120	17	67.	1		0220	29	5.	1		0320	41	0.
1		0025	6	32.	1		0125	18	53.	1		0225	30	3.	1		0325	42	0.
1		0030	7	307.	1		0130	19	50.	1		0230	31	2.	1		0330	43	0.
1		0035	8	369.	1		0135	20	49.	1		0235	32	1.	1		0335	44	0.
1		0040	9	287.	1		0140	21	48.	1		0240	33	1.	1		0340	45	0.
1		0045	10	230.	1		0145	22	50.	1		0245	34	1.	1		0345	46	0.
1		0050	11	191.	1		0150	23	50.	1		0250	35	0.	1		0350	47	0.
1		0055	12	162.	1		0155	24	51.	1		0255	36	0.	1		0355	48	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 369.	.58		56.	56.	56.	56.
		(INCHES)	1.140	1.140	1.140	1.140
		(AC-FT)	18.	18.	18.	18.

CUMULATIVE AREA = .30 SQ MI

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              *            *
127 KK        *       Z.3  *
              *            *
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RUNOFF FROM BASIN Z.3

SUBBASIN RUNOFF DATA

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129 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .01  SUBBASIN AREA

                PRECIPITATION DATA

 16 PT            TOTAL STORM STATIONS     ST100
 17 PW                         WEIGHTS      1.00

 14 PR              RECORDING STATIONS       ST2
 15 PW                         WEIGHTS      1.00

130 LS          SCS LOSS RATE
```

STRTL	.44	INITIAL ABSTRACTION
CRVNBR	82.00	CURVE NUMBER
RTIMP	10.00	PERCENT IMPERVIOUS AREA

LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT

STRTL	.50	INITIAL ABSTRACTION
CRVNBR	80.00	CURVE NUMBER
RTIMP	10.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

131 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.2160	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	90.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

132 UK OVERLAND-FLOW ELEMENT NO. 2

L	50.	OVERLAND FLOW LENGTH
S	.2160	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	10.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

133 RK COLLECTOR CHANNEL

L	50.	CHANNEL LENGTH
S	.1500	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS

134 RK MAIN CHANNEL

L	940.	CHANNEL LENGTH
S	.1330	SLOPE
N	.060	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	12.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO PEAK	VOLUME	MAXIMUM CELERITY

			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
1	6.92	1.67	.25	10.00	18.98	29.98	1.62	.66
2	6.92	1.67	.27	10.00	1.88	29.94	1.50	.63
3	3.61	1.33	.05	16.67	20.85	29.94	1.61	5.58
4	2.27	1.46	.31	313.33	382.29	35.49	1.15	16.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= 18.166 EXCESS= .726 OUTFLOW= 18.879 BASIN STORAGE= .001 PERCENT ERROR= .062

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.27	1.46	5.00	376.54	35.00	1.16	

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HYDROGRAPH AT STATION Z.3

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.03	52.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	39.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	23.
1		0015	4	.12	.11	.01	1.	1		0215	28	.00	.00	.00	13.
1		0020	5	.22	.20	.02	6.	1		0220	29	.00	.00	.00	7.
1		0025	6	.38	.29	.09	31.	1		0225	30	.00	.00	.00	4.
1		0030	7	.67	.35	.32	289.	1		0230	31	.00	.00	.00	2.
1		0035	8	.38	.14	.23	377.	1		0235	32	.00	.00	.00	2.
1		0040	9	.21	.07	.15	308.	1		0240	33	.00	.00	.00	1.
1		0045	10	.17	.05	.12	246.	1		0245	34	.00	.00	.00	1.
1		0050	11	.13	.04	.10	204.	1		0250	35	.00	.00	.00	1.
1		0055	12	.11	.03	.08	172.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.08	158.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.02	.08	159.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	122.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	96.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	73.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	58.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	53.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	51.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	50.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	51.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.03	52.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	53.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.49, TOTAL EXCESS = 1.61

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 377.	.58		59.	59.	59.	59.
		(INCHES)	1.157	1.157	1.157	1.157
		(AC-FT)	19.	19.	19.	19.

CUMULATIVE AREA = .31 SQ MI

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*            *
135 KK  *      Z.4  *
*            *
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RUNOFF FROM BASIN Z.4

SUBBASIN RUNOFF DATA

137 BA SUBBASIN CHARACTERISTICS

TAREA	.01	SUBBASIN AREA

PRECIPITATION DATA

16 PT TOTAL STORM STATIONS ST100

17 PW WEIGHTS 1.00

14 PR RECORDING STATIONS ST2

15 PW WEIGHTS 1.00

138 LS SCS LOSS RATE

STRTL	.50	INITIAL ABSTRACTION
CRVNBR	80.00	CURVE NUMBER
RTIMP	5.30	PERCENT IMPERVIOUS AREA

LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT

STRTL	.44	INITIAL ABSTRACTION
CRVNBR	82.00	CURVE NUMBER
RTIMP	5.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

139 UK OVERLAND-FLOW ELEMENT NO. 1

L	50.	OVERLAND FLOW LENGTH
S	.1300	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	40.5	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

140 UK OVERLAND-FLOW ELEMENT NO. 2

L	50.	OVERLAND FLOW LENGTH
S	.1300	SLOPE
N	.100	ROUGHNESS COEFFICIENT
PA	59.5	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

141 RK COLLECTOR CHANNEL

L	50.	CHANNEL LENGTH
S	.1200	SLOPE
N	.080	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE

	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
142 RK	MAIN CHANNEL		
	L	1050.	CHANNEL LENGTH
	S	.1600	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.01	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	1.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	5.37	1.67	.32	10.00	9.59	29.94	1.42	.52
2	5.37	1.67	.30	10.00	16.02	29.82	1.54	.55
3	3.23	1.33	.04	16.67	25.57	29.77	1.49	6.58
4	5.02	1.33	.54	350.00	24.86	30.55	1.49	10.72

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .915 OUTFLOW= .914 BASIN STORAGE= .000 PERCENT ERROR= .091

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	5.02	1.33	5.00	24.74	30.00	1.50

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HYDROGRAPH AT STATION Z.4

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	2.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	1.
1		0010	3	.08	.08	.00	0.	1		0210	27	.00	.00	.00	0.
1		0015	4	.12	.11	.01	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.21	.01	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.31	.07	4.	1		0225	30	.00	.00	.00	0.

1	0030	7	.67	.38	.29	25.	*	1	0230	31	.00	.00	.00	0.
1	0035	8	.38	.15	.22	20.	*	1	0235	32	.00	.00	.00	0.
1	0040	9	.21	.07	.14	13.	*	1	0240	33	.00	.00	.00	0.
1	0045	10	.17	.05	.11	10.	*	1	0245	34	.00	.00	.00	0.
1	0050	11	.13	.04	.09	9.	*	1	0250	35	.00	.00	.00	0.
1	0055	12	.11	.03	.08	7.	*	1	0255	36	.00	.00	.00	0.
1	0100	13	.11	.03	.08	7.	*	1	0300	37	.00	.00	.00	0.
1	0105	14	.11	.03	.08	7.	*	1	0305	38	.00	.00	.00	0.
1	0110	15	.05	.01	.04	4.	*	1	0310	39	.00	.00	.00	0.
1	0115	16	.06	.01	.04	4.	*	1	0315	40	.00	.00	.00	0.
1	0120	17	.03	.01	.02	3.	*	1	0320	41	.00	.00	.00	0.
1	0125	18	.03	.01	.02	2.	*	1	0325	42	.00	.00	.00	0.
1	0130	19	.03	.01	.03	2.	*	1	0330	43	.00	.00	.00	0.
1	0135	20	.03	.01	.02	2.	*	1	0335	44	.00	.00	.00	0.
1	0140	21	.03	.01	.02	2.	*	1	0340	45	.00	.00	.00	0.
1	0145	22	.03	.01	.03	2.	*	1	0345	46	.00	.00	.00	0.
1	0150	23	.03	.01	.02	2.	*	1	0350	47	.00	.00	.00	0.
1	0155	24	.03	.01	.03	2.	*	1	0355	48	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.61, TOTAL EXCESS = 1.49

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 25.	.50		3.	3.	3.	3.
		(INCHES)	1.497	1.497	1.497	1.497
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

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          *            *
143 KK    *       Z.5  *
          *            *
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RUNOFF FROM BASIN Z.5

SUBBASIN RUNOFF DATA

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145 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .01  SUBBASIN AREA

                PRECIPITATION DATA

 16 PT           TOTAL STORM STATIONS     ST100
 17 PW                        WEIGHTS      1.00

 14 PR             RECORDING STATIONS       ST2
 15 PW                        WEIGHTS      1.00

146 LS          SCS LOSS RATE
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	STRTL	.44	INITIAL ABSTRACTION
	CRVNBR	82.00	CURVE NUMBER
	RTIMP	8.80	PERCENT IMPERVIOUS AREA

LOSS RATE VARIABLES FOR SECOND OVERLAND FLOW ELEMENT

	STRTL	.50	INITIAL ABSTRACTION
	CRVNBR	80.00	CURVE NUMBER
	RTIMP	5.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

147 UK	OVERLAND-FLOW ELEMENT NO. 1		
	L	50.	OVERLAND FLOW LENGTH
	S	.2000	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	57.1	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
148 UK	OVERLAND-FLOW ELEMENT NO. 2		
	L	50.	OVERLAND FLOW LENGTH
	S	.2000	SLOPE
	N	.100	ROUGHNESS COEFFICIENT
	PA	42.9	PERCENT OF SUBBASIN
	DXMIN	5	MINIMUM NUMBER OF DX INTERVALS
149 RK	COLLECTOR CHANNEL		
	L	50.	CHANNEL LENGTH
	S	.1500	SLOPE
	N	.080	CHANNEL ROUGHNESS COEFFICIENT
	CA	.00	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	.00	BOTTOM WIDTH OR DIAMETER
	Z	1.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
150 RK	MAIN CHANNEL		
	L	675.	CHANNEL LENGTH
	S	.2000	SLOPE
	N	.060	CHANNEL ROUGHNESS COEFFICIENT
	CA	.01	CONTRIBUTING AREA
	SHAPE	TRAP	CHANNEL SHAPE
	WD	1.00	BOTTOM WIDTH OR DIAMETER
	Z	2.00	SIDE SLOPE
	DXMIN	2	MINIMUM NUMBER OF DX INTERVALS
	RUPSTQ	YES	ROUTE UPSTREAM HYDROGRAPH

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PRECIPITATION STATION DATA

STATION	TOTAL	AVG. ANNUAL	WEIGHT
ST100	3.10	.00	1.00

TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO PEAK	VOLUME	MAXIMUM CELERITY

		(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
1	6.66	1.67	.26	10.00	9.72	29.84	1.60	.64
2	6.66	1.67	.28	10.00	6.10	29.81	1.41	.59
3	3.61	1.33	.05	16.67	15.81	29.78	1.52	5.28
4	5.08	1.34	.32	225.00	39.64	30.77	1.51	11.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .918 EXCESS= .562 OUTFLOW= 1.479 BASIN STORAGE= .000 PERCENT ERROR= .027

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	5.08	1.34	5.00		37.55	30.00	1.51

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HYDROGRAPH AT STATION Z.5

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	4.
1		0005	2	.03	.03	.00	0.	1		0205	26	.00	.00	.00	2.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	1.
1		0015	4	.12	.11	.01	0.	1		0215	28	.00	.00	.00	0.
1		0020	5	.22	.20	.02	1.	1		0220	29	.00	.00	.00	0.
1		0025	6	.38	.30	.07	7.	1		0225	30	.00	.00	.00	0.
1		0030	7	.67	.37	.30	38.	1		0230	31	.00	.00	.00	0.
1		0035	8	.38	.15	.22	33.	1		0235	32	.00	.00	.00	0.
1		0040	9	.21	.07	.14	22.	1		0240	33	.00	.00	.00	0.
1		0045	10	.17	.05	.12	17.	1		0245	34	.00	.00	.00	0.
1		0050	11	.13	.04	.09	14.	1		0250	35	.00	.00	.00	0.
1		0055	12	.11	.03	.08	12.	1		0255	36	.00	.00	.00	0.
1		0100	13	.11	.03	.08	11.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	11.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	7.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	6.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	4.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	4.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	4.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	4.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	3.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	4.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	4.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	4.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.58, TOTAL EXCESS = 1.52

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
38.	.50		5.	5.	5.	5.
		(INCHES)	1.513	1.513	1.513	1.513
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

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          **************
          *            *
151 KK    *      NODE  *     5
          *            *
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COMBINE Z.3 AND Z.5

153 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION NODE

SUM OF 2 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0100	13	169.	1		0200	25	56.	1		0300	37	0.
1		0005	2	0.	1		0105	14	170.	1		0205	26	41.	1		0305	38	0.
1		0010	3	0.	1		0110	15	129.	1		0210	27	24.	1		0310	39	0.
1		0015	4	1.	1		0115	16	102.	1		0215	28	13.	1		0315	40	0.
1		0020	5	7.	1		0120	17	78.	1		0220	29	7.	1		0320	41	0.
1		0025	6	38.	1		0125	18	61.	1		0225	30	4.	1		0325	42	0.
1		0030	7	327.	1		0130	19	56.	1		0230	31	2.	1		0330	43	0.
1		0035	8	409.	1		0135	20	55.	1		0235	32	2.	1		0335	44	0.
1		0040	9	329.	1		0140	21	54.	1		0240	33	1.	1		0340	45	0.
1		0045	10	263.	1		0145	22	55.	1		0245	34	1.	1		0345	46	0.
1		0050	11	218.	1		0150	23	55.	1		0250	35	1.	1		0350	47	0.
1		0055	12	183.	1		0155	24	56.	1		0255	36	0.	1		0355	48	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 409.	.58		63.	63.	63.	63.
		(INCHES)	1.177	1.177	1.177	1.177
		(AC-FT)	20.	20.	20.	20.

CUMULATIVE AREA = .33 SQ MI

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          **************
          *            *
154 KK    *       Z.6  *
          *            *
          **************
                    RUNOFF FROM BASIN Z.6 AND ROUTE

               SUBBASIN RUNOFF DATA

156 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .01  SUBBASIN AREA

                PRECIPITATION DATA

 16 PT           TOTAL STORM STATIONS      ST100
 17 PW                        WEIGHTS       1.00

 14 PR            RECORDING STATIONS        ST2
 15 PW                        WEIGHTS       1.00

157 LS          SCS LOSS RATE
                     STRTL          .50  INITIAL ABSTRACTION
                    CRVNBR        80.00  CURVE NUMBER
                     RTIMP        16.60  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
158 UK            OVERLAND-FLOW ELEMENT NO. 1
                         L          50.  OVERLAND FLOW LENGTH
                         S        .2000  SLOPE
                         N         .100  ROUGHNESS COEFFICIENT
                        PA        100.0  PERCENT OF SUBBASIN
                      DXMIN            5  MINIMUM NUMBER OF DX INTERVALS
159 RK            COLLECTOR CHANNEL
                         L          50.  CHANNEL LENGTH
                         S        .1500  SLOPE
                         N         .080  CHANNEL ROUGHNESS COEFFICIENT
                        CA          .00  CONTRIBUTING AREA
                     SHAPE         TRAP  CHANNEL SHAPE
                        WD          .00  BOTTOM WIDTH OR DIAMETER
                         Z         1.00  SIDE SLOPE
                      DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
160 RK            MAIN CHANNEL
                         L         440.  CHANNEL LENGTH
                         S        .1400  SLOPE
                         N         .060  CHANNEL ROUGHNESS COEFFICIENT
                        CA          .01  CONTRIBUTING AREA
                     SHAPE         TRAP  CHANNEL SHAPE
                        WD        12.00  BOTTOM WIDTH OR DIAMETER
                         Z         2.00  SIDE SLOPE
                      DXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                     RUPSTQ          YES  ROUTE UPSTREAM HYDROGRAPH

                                                                  ***

               PRECIPITATION STATION DATA

                    STATION     TOTAL     AVG. ANNUAL     WEIGHT
                      ST100      3.10             .00       1.00
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TEMPORAL DISTRIBUTIONS

STATION ST2, WEIGHT = 1.00

.01	.03	.04	.07	.12	.22	.12	.07	.05	.04
.03	.03	.03	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01						

COMPUTED KINEMATIC PARAMETERS

VARIABLE TIME STEP

(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
1	6.66	1.67	.26	10.00	22.07	29.86	1.62	.64
3	3.61	1.33	.04	16.67	22.06	29.80	1.62	6.83
4	2.33	1.46	.14	146.67	423.84	35.21	1.19	17.56

CONTINUITY SUMMARY (AC-FT) - INFLOW= 20.455 EXCESS= .782 OUTFLOW= 21.232 BASIN STORAGE= .001 PERCENT ERROR= .019

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

4	2.33	1.46	5.00	420.60	35.00	1.19

****

HYDROGRAPH AT STATION Z.6

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		0200	25	.03	.01	.02	58.
1		0005	2	.03	.02	.00	0.	1		0205	26	.00	.00	.00	43.
1		0010	3	.08	.07	.01	0.	1		0210	27	.00	.00	.00	26.
1		0015	4	.12	.10	.02	2.	1		0215	28	.00	.00	.00	15.
1		0020	5	.22	.18	.04	8.	1		0220	29	.00	.00	.00	8.
1		0025	6	.38	.28	.09	41.	1		0225	30	.00	.00	.00	5.
1		0030	7	.67	.35	.32	331.	1		0230	31	.00	.00	.00	3.
1		0035	8	.38	.14	.23	421.	1		0235	32	.00	.00	.00	2.
1		0040	9	.21	.07	.14	344.	1		0240	33	.00	.00	.00	1.
1		0045	10	.17	.05	.12	275.	1		0245	34	.00	.00	.00	1.
1		0050	11	.13	.04	.10	227.	1		0250	35	.00	.00	.00	1.
1		0055	12	.11	.03	.08	191.	1		0255	36	.00	.00	.00	1.
1		0100	13	.11	.03	.08	176.	1		0300	37	.00	.00	.00	0.
1		0105	14	.11	.03	.08	176.	1		0305	38	.00	.00	.00	0.
1		0110	15	.05	.01	.04	135.	1		0310	39	.00	.00	.00	0.
1		0115	16	.06	.01	.04	108.	1		0315	40	.00	.00	.00	0.
1		0120	17	.03	.01	.02	82.	1		0320	41	.00	.00	.00	0.
1		0125	18	.03	.01	.02	65.	1		0325	42	.00	.00	.00	0.
1		0130	19	.03	.01	.03	59.	1		0330	43	.00	.00	.00	0.
1		0135	20	.03	.01	.02	57.	1		0335	44	.00	.00	.00	0.
1		0140	21	.03	.01	.02	55.	1		0340	45	.00	.00	.00	0.
1		0145	22	.03	.01	.03	57.	1		0345	46	.00	.00	.00	0.
1		0150	23	.03	.01	.02	57.	1		0350	47	.00	.00	.00	0.
1		0155	24	.03	.01	.03	58.	1		0355	48	.00	.00	.00	0.

****

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.48, TOTAL EXCESS = 1.62

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	3.92-HR
(CFS)	(HR)					
		(CFS)				
421.	.58		66.	66.	66.	66.
		(INCHES)	1.192	1.192	1.192	1.192
		(AC-FT)	21.	21.	21.	21.

CUMULATIVE AREA = .33 SQ MI

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RUNOFF SUMMARY

FLOW IN CUBIC FEET PER SECOND

TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			
HYDROGRAPH AT	17MAIN	57.	.58	8.	8.	8.	.05		
HYDROGRAPH AT	17AB	63.	.58	9.	9.	9.	.06		
HYDROGRAPH AT	17C	14.	.58	2.	2.	2.	.01		
2 COMBINED AT	NODE1	77.	.58	11.	11.	11.	.07		
HYDROGRAPH AT	17D	80.	.58	12.	12.	12.	.07		
HYDROGRAPH AT	17E	87.	.58	13.	13.	13.	.07		
HYDROGRAPH AT	16.4	79.	.58	12.	12.	12.	.07		
HYDROGRAPH AT	16.3	125.	.58	18.	18.	18.	.11		
HYDROGRAPH AT	16.2	149.	.58	22.	22.	22.	.13		
HYDROGRAPH AT	16.1	202.	.58	30.	30.	30.	.17		
HYDROGRAPH AT	16B	11.	.50	1.	1.	1.	.01		
2 COMBINED AT	NODE2	212.	.58	32.	32.	32.	.18		
HYDROGRAPH AT	16C	212.	.58	32.	32.	32.	.18		

	HYDROGRAPH AT							
+		16A	234.	.58	35.	35.	35.	.19
	2 COMBINED AT							
+		NODE3	322.	.58	48.	48.	48.	.27
	HYDROGRAPH AT							
+		Z.1	356.	.58	54.	54.	54.	.29
	HYDROGRAPH AT							
+		Z.2	16.	.50	2.	2.	2.	.01
	2 COMBINED AT							
+		NODE	369.	.58	56.	56.	56.	.30
	HYDROGRAPH AT							
+		Z.3	377.	.58	59.	59.	59.	.31
	HYDROGRAPH AT							
+		Z.4	25.	.50	3.	3.	3.	.01
	HYDROGRAPH AT							
+		Z.5	38.	.50	5.	5.	5.	.02
	2 COMBINED AT							
+		NODE	409.	.58	63.	63.	63.	.33
	HYDROGRAPH AT							
+		Z.6	421.	.58	66.	66.	66.	.33

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SUMMARY OF KINEMATIC WAVE ROUTING

(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

						INTERPOLATED TO COMPUTATION INTERVAL			
ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
	17MAIN	4	.17	57.08	34.82	.99	5.00	57.06	35.00	1.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 2.655 OUTFLOW= 2.650 BASIN STORAGE= .000 PERCENT ERROR= .176

	17AB	4	.18	63.40	35.28	1.01	5.00	63.37	35.00	1.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2.693 EXCESS= .299 OUTFLOW= 2.991 BASIN STORAGE= .000 PERCENT ERROR= .038

	17C	4	.23	13.95	34.78	.99	5.00	13.95	35.00	1.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .649 OUTFLOW= .648 BASIN STORAGE= .000 PERCENT ERROR= .105

	17D	4	.20	79.93	35.42	1.02	5.00	79.56	35.00	1.02

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.658 EXCESS= .138 OUTFLOW= 3.795 BASIN STORAGE= .000 PERCENT ERROR= .041

17E	4	.22	87.88	35.25	1.07	5.00	87.47	35.00	1.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.811 EXCESS= .421 OUTFLOW= 4.230 BASIN STORAGE= .000 PERCENT ERROR= .046

16.4	4	.12	79.24	32.52	1.01	5.00	79.09	35.00	1.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= 3.702 OUTFLOW= 3.698 BASIN STORAGE= .000 PERCENT ERROR= .110

16.3	4	.26	126.53	30.80	1.04	5.00	125.36	35.00	1.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3.750 EXCESS= 2.159 OUTFLOW= 5.906 BASIN STORAGE= .000 PERCENT ERROR= .046

16.2	4	.24	149.72	35.28	1.04	5.00	149.35	35.00	1.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= 5.950 EXCESS= 1.155 OUTFLOW= 7.101 BASIN STORAGE= .000 PERCENT ERROR= .057

16.1	3	.16	202.03	35.02	1.07	5.00	201.95	35.00	1.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= 7.155 EXCESS= 2.567 OUTFLOW= 9.717 BASIN STORAGE= .000 PERCENT ERROR= .055

16B	4	.08	10.88	30.08	1.10	5.00	10.88	30.00	1.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .472 OUTFLOW= .471 BASIN STORAGE= .000 PERCENT ERROR= .086

16C	4	.04	212.31	35.07	1.08	5.00	212.00	35.00	1.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= 10.230 EXCESS= .013 OUTFLOW= 10.242 BASIN STORAGE= .000 PERCENT ERROR= .009

16A	4	.04	234.32	35.06	1.10	5.00	234.13	35.00	1.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= 10.253 EXCESS= 1.086 OUTFLOW= 11.336 BASIN STORAGE= .000 PERCENT ERROR= .017

Z.1	4	.42	359.29	35.66	1.12	5.00	356.15	35.00	1.13

CONTINUITY SUMMARY (AC-FT) - INFLOW= 15.601 EXCESS= 1.882 OUTFLOW= 17.464 BASIN STORAGE= .001 PERCENT ERROR= .105

Z.2	4	.62	16.02	30.43	1.46	5.00	15.91	30.00	1.46

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .596 OUTFLOW= .595 BASIN STORAGE= .000 PERCENT ERROR= .085

Z.3	4	.31	382.29	35.49	1.15	5.00	376.54	35.00	1.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= 18.166 EXCESS= .726 OUTFLOW= 18.879 BASIN STORAGE= .001 PERCENT ERROR= .062

Z.4	4	.54	24.86	30.55	1.49	5.00	24.74	30.00	1.50

CONTINUITY SUMMARY (AC-FT) - INFLOW= .000 EXCESS= .915 OUTFLOW= .914 BASIN STORAGE= .000 PERCENT ERROR= .091

Z.5	4	.32	39.64	30.77	1.51	5.00	37.55	30.00	1.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .918 EXCESS= .562 OUTFLOW= 1.479 BASIN STORAGE= .000 PERCENT ERROR= .027

Z.6	4	.14	423.84	35.21	1.19	5.00	420.60	35.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= 20.455 EXCESS= .782 OUTFLOW= 21.232 BASIN STORAGE= .001 PERCENT ERROR= .019

*** NORMAL END OF HEC-1 ***