HYDROLOGIC AND HYDRAULICS DESIGN DETAILS MEMORANDUM WHITE TANKS FLOOD RETARDING STRUCTURE NO. 3 REMEDIATION PROJECT

Prepared for
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

URS Job No. 23443748
July 29, 2004

Technical Memorandum

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From Todd Ringsmuth, PE

Date July 29, 2004

Subject Hydrology and Hydraulics Design Details
White Tanks FRS No. 3 – Remediation Project

The purpose of this memorandum is to provide the hydrologic and hydraulic design details of the White Tanks FRS No. 3 – Remediation Project for your review. We understand that this document will be provided to Arizona Department of Water Resources – Dam Safety Section for their review. The memorandum includes the following attachments:

- Appendix A – Sections 8.0, 9.0, and 10.0, and referenced tables and drawings from the Design Report
- Appendix B – Calculation packages. An index to the calculations is provided.

This memo does not include figures and appendices that were included in the 60 Percent Design Report. The calculation packages include those relevant to satisfying ADWR design criteria. A compact disk is also provided and includes the TR-20 input and output files. A separate package will be submitted to address NRCS design criteria.

The hydrologic and hydraulic information provided with this memorandum, and previously provided with the 60 Percent Design Report, will be used in support of the request for freeboard variance. A variance submittal is currently being prepared for submittal.

APPENDIX A
SECTIONS 8.0, 9.0, AND 10.0 FROM THE DESIGN REPORT AND REFERENCED TABLES AND DRAWINGS

8.0 HYDROLOGY

8.1 GENERAL

The White Tanks FRS No.3 was constructed in 1954 by the SCS to protect farmland and irrigation facilities from runoff collected off the White Tank Mountains. The structure was built with a crest length of 1.5 miles and designed to impound runoff from a drainage area approximately 24 square miles. The capacity of the reservoir at the time of construction was 2,655 ac-ft below the crest of the emergency spillway.

Since the original design in 1954, several characteristics related to the hydrology and hydraulics for the structure have changed. A Phase II flood study performed by the Flood Control District in 1984 noted that portions of the watershed had been removed due to the breaching of training dikes and diversion channels north of Northern Avenue and the redirection of flows from the Caterpillar Test grounds. These changes reduced the tributary area of the structure to approximately 20.5 square miles, a reduction of 3.5 square miles. In addition, it was also found in previous studies that the portions of the White Tanks FRS No. 3 structure crest elevation are lower than the original design elevations due to subsidence caused by the extensive withdrawal of groundwater in the region. The current survey data shows a storage volume of 3,153 ac-ft below the emergency spillway crest elevation of 1,212 feet (NAVD 88).

As a part of the current study, URS reviewed existing hydrologic/hydraulic analysis and models developed by the Natural Resources Conservation Service (NRCS) and documented in the report titled as *Hydrologic Analysis of the White Tank Mountains on Flood Retarding Structure # 3* (NRCS 1998). URS staff conducted a site visit in April 2004 to verify watershed conditions. The NRCS hydrologic models reflect current watershed conditions. The models were updated to reflect anticipated future development. Additional models were developed as identified by the District. The procedures and methodologies used to develop the updated models are discussed in the following sections. Details of the modeling and calculations are provided in Appendix B.

8.2 REVIEW OF EXISTING MODELS

URS reviewed the existing hydrologic/hydraulic analyses and models documented by Natural Resource Conservation Services (NRCS) in their hydrology report (NRCS 1998). NRCS developed flood hydrographs for a range of storms including the 100-year, 24-hour; 100-year, 10-day; Emergency Spillway Hydrograph (ESH); and the Probable Maximum Precipitation (PMP). A summary of the results for the 100-year, 24-hour storm is provided in Table II of the

NRCS hydrology report (NRCS 1998). The ESH hydrograph is based on a hyetograph that combines the 100-year, 6-hour and 6-hour Local PMP. NRCS developed Probable Maximum Flood (PMF) hydrographs based on PMP distributions for 6-hour Local and 6-, 12-, 18-, 24-, 48- and 72-hour General storms using TR-20 computer model. NRCS routed these inflow hydrographs through the reservoir with the spillway elevation set at 1210 feet (NGVD 29). The peak inflows and the corresponding outflows are summarized in Table III of NRCS hydrology report (NRCS 1998).

The derivation of the various PMFs presented in the NRCS hydrologic report (NRCS 1998) includes the generally accepted rainfall estimation procedures in Hydrometeorological Report No. 49 (HMR-49). The TR-20 input files provided by the District show that AMC II curve numbers were used in the PMF analysis. The derivation of the 100-year, 24-hour and 100-year, 10-day hydrographs appear to be developed in accordance with the cited references (Chapter 21 of NEH-4, and Hydrologic Notes PO-4 and PO-6). It should be noted that 100-year, 10-day hydrograph does not have a shape similar to that expected from a typical 10-day extreme rainfall. URS noted that in deriving the 100-year 10-day hydrograph, NRCS applied a Channel Loss Factor (CLF) to computed runoff to account for infiltration into the channel beds. This factor for this watershed is 0.55. The result is that the runoff volume from the 100-year, 10-day storm is less than that for the 100-year, 24-hour storm. In sum, NRCS's derivations of design hydrographs for the White Tanks FRS No. 3 watershed appear to be reasonable.

The electronic versions of the NRCS's TR-20 models provided by the District were also reviewed. Details of the TR-20 models and the results are summarized in Table 8-1. Peak inflows were compared for each storm obtained from the District provided output files with the ones tabulated in Tables II and III of NRCS hydrology report (NRCS 1998) and found an exact agreement between them (see Table 8-1). The input files provided by the District were executed and compared to the generated peak inflows with the NRCS results. Minor discrepancies were found for the 6-, 12-, 48-, 72-hour General PMP storms, ESH, and 100-year, 24-hour storm events (see Table 8-1). Although these discrepancies are of minor nature, they have been documented as a part of the review process.

8.3 DEVELOP DESIGN MODELS

The existing TR-20 computer models were modified to reflect anticipated future development. The steps involved in developing these models are described in the following sections.

8.3.1 Watershed Delineation

NRCS delineated the White Tank Watershed above FRS No. 3 into 7 basins, as shown on Figure 4 of the NRCS hydrology report (NRCS 1998). The drainage area of each basin is documented in Table I of NRCS hydrology report. The District was unable to provide the electronic version of the NRCS watershed map. However, the District provided URS with an electronic version of the watershed based on a modified version prepared by WLB, Inc. for a previous study. The modified map was not identical to the NRCS watershed map.

The watershed map developed by NRCS consisted of 7 major basin areas. The modified District delineations were placed onto USGS quadrangle maps and adjusted to match the contour lines (See Figure 8-1). The revised drainage areas, and those estimated by NRCS, are presented in Table 8-2. A review of Table 8-2 indicates that the drainage areas of each basin as determined by URS and NRCS are very similar, with the overall variation less than 0.5 percent. Therefore, the drainage areas developed by NRCS were used in the updated TR-20 models.

8.3.2 Reservoir Elevation-Area-Capacity Curve

A new elevation-area-capacity curve for the existing White Tank FRS No. 3 was developed using the 2003 and 2004 topographic mapping in combination with the modified 1998 topographic mapping, both of which were provided by the District. The elevation-area-capacity curve for the existing structure was established using the end-area method as described in Table 17-2 of *NEH-4 – Hydrology Manual* (USDA 1985A).

Construction of the remediation project will result in changes to the existing elevation-area-capacity curve. These changes will be caused by the upstream construction of the embankment, placement of aesthetic fill material on the upstream slope of the embankment, and excavation of the borrow sources. Initial evaluations suggest that these changes do not impact the results of the reservoir routing. Therefore, the existing elevation-area-capacity curve was used for reservoir routing.

The elevation-area-capacity data is summarized in Table 8-3 and presented graphically on Figure 8-2. The detailed computations related to determination of elevation-area-capacity curve for White Tank FRS No.3 are provided in a calculation package in Appendix B.

8.3.3 Sediment Pool

8.3.3.1 NRCS Sediment Yield Estimate

NRCS used the Pacific Southwest Inter-Agency Committee (PSIAC) Sediment Yield Evaluation Model to estimate the 100-year sediment accumulation at White Tanks FRS No. 3 (NRCS 1994). The NRCS estimated an annual sediment yield of 0.244 acre-feet/square mile, or 5 acre-feet for the 20.5 square mile watershed, for a total sediment yield of 500 acre-feet.

8.3.3.2 Other Sediment Yield Studies

Estimates of annual sediment yield were presented in the Spook Hill ADMP Update that ranged from 0.07 to 2.16 acre-feet/square mile for various structures throughout Arizona. The annual sediment yield for the structures within the Spook Hill area ranged from 0.07 to 0.16 acre-feet/square mile. The NRCS estimate would appear conservative when compared to the Spook Hill area estimates.

A detailed study of annual sediment yield for McMicken Dam was presented in the Draft Wittman ADMS Update (District 2004). The study indicates that a reasonable estimate of annual sediment yield is provided by the PSIAC model and ranges from 0.21 to 0.40 acre-feet/square mile. The NRCS estimate falls within this range of sediment yield estimates.

8.3.3.3 Design Sediment Accumulation

The design sediment accumulation for 100 years is based on the NRCS estimate of 500 acre-feet. This estimate appears reasonable when compare to the Spook Hill and McMicken Dam studies. The 500 acre-feet of sediment corresponds to an elevation of 1,199.2 ft (NAVD 88).

8.3.4 Reservoir Infiltration

The TR-20 models developed by NRCS included a seepage component in the outflow rating curve. As a part of a previous study conducted by Dames & Moore for White Tank FRS No. 3, infiltration tests were conducted within the White Tanks reservoir to collect site-specific infiltration values for. The results of the infiltration tests were presented in the *Draft Design Issues Report (DIR) – White Tanks FRS # 3 Modifications Design Project* (Dames & Moore 1998). The results estimated an infiltration rate of 0.002 in/hr for the sediment pool, and 0.26 in/hr for the natural ground making up the remainder of the reservoir pool area. The estimated infiltration rate for natural ground was compared with similar studies performed in the area and

determined to be reasonable. Estimated infiltration rates for different reservoir elevations are provided on Table 8-3.

8.3.5 Precipitation

As discussed previously, a review of the models prepared by NRCS and provided by the District indicated that the precipitation estimates appear to be derived in accordance with generally accepted procedures. Therefore, the precipitation values and rainfall distributions within the TR-20 models provided by the District were not modified.

Special note should be given to the 100-year, 10-day routing model, because it does not used precipitation within the model. To adjust for the longer duration storm, the 100-year, 10-day model uses a runoff hydrograph developed from a mass curve. The mass curve is derived using procedures presented in the *NEH-4 - Hydrology Manual* (USDA 1985a). With this approach, the runoff volume resulting from the precipitation is adjusted for an average watershed curve number. The 100-year, 10-day model was modified to reflect curve numbers estimated for future conditions (see Section 8.3.6).

8.3.6 Runoff Curve Number

The White Tanks FRS No. 3 watershed consists generally of undisturbed desert with mild slopes and mountain areas. The curve numbers presented in the NRCS hydrology report (NRCS 1998) are presented in Table 8-4. To address the issue of impacts resulting from potential future development in the watershed, the curve numbers used in the TR-20 models were modified to incorporate anticipated future land use.

8.3.6.1 Land Ownership and Future Land Use

The future land use of the White Tanks FRS No. 3 watershed was derived based on current land ownership. Land ownership information was obtained from Figure 2 in the *Draft Design Issues Report (DIR) – White Tanks FRS # 3 Modifications Design Project* (Dames & Moore 1998). The current land ownership was overlain on the watershed delineation map (See Figure 8-2). The 4 categories of land ownership are:

- State Trust Land
- Private Property
- Maricopa County Regional Park
- District Property

An approach was developed to determine which areas would be considered as being developable and undevelopable. Any areas within the County Regional Park and District property were considered to by undevelopable. In addition, lands within the mountainous terrain (i.e., steep slopes) were determined to be undevelopable. Lands considered to be mountainous terrain are shown on Figure 8-3. Private Property and State Trust Land were considered to be developable.

Developable areas were separated into low-density and high-density areas based on the information available at Maricopa Association of Governments (MAG) website for Year 2030 growth projections. Based on this information, all the developable areas located north of Northern Avenue were considered to be low-density and all the developable areas located south of Northern Avenue were considered to be high-density. Details of the distribution of developable and undevelopable areas within the White Tanks FRS No.3 watershed is provided in Table 8-2 and shown on Figure 8-3.

Based on the criteria defined above, White Tank FRS No. 3 watershed was divided into 3 categories of future land use:

- Mountain Region (undevelopable)
- Valley Region (undevelopable)
- Valley Region (developable)

8.3.6.2 Curve Number Estimates

The White Tanks FRS No. 3 watershed is divided into 7 basins, as shown on Figure 8-1. Basins 1 and 3 are located entirely within the Mountain Region. Basins 2, 4, 5, 6, and 7 include both Valley and Mountain Region lands. Curve numbers for each basin were estimated using an area-weighted average.

A curve number of 87.2 was used for the Mountain Region, which was based on the NRCS estimate (NRCS 1998). The curve numbers estimated for the Valley Region vary depending on the proportion of developable and undevelopable lands. The curve numbers for the undevelopable portions of the Valley Region were calculated using the curve number estimates provided in the NRCS hydrology study (NRCS 1998). Curve numbers for developable land were estimated using *Urban Hydrology for Small Watersheds, Technical Release No. 55 (TR-55)* (USDA 1986). Because the difference between high-density and low-density development curve numbers was minor, the same curve number was applied to all developable areas.

The modified runoff curve number estimated for each basin is presented in Table 8-2. Details of the curve number derivations are presented in the calculation packages provided in Appendix B. ***[Note to Reviewers: The 90 Percent Submittal will included a discussion of the uncertainties involved with curve number estimation.]***

8.3.7 Diversions

expand per discussion

The TR-20 models developed by NRCS included two diversions from the watershed. The diversions occur along the eastern edge of the watershed at Olive Avenue and Northern Avenue where a stormwater channel is restricted by culverts at the road crossings. The effect of the diversions is to reduce the peak flow and volume reaching the reservoir from the northern half of the watershed. In general, 100-year, 24-hour flows reach the reservoir, but flows exceeding the restrictions are diverted out of the watershed.

At Olive Avenue, flows greater than 4,100 cfs are diverted out of the watershed. At Northern Avenue, flows greater than 11,000 cfs are diverted out of the watershed. The base hydraulic calculations for these diversion estimates were not presented in the NRCS hydrologic report (NRCS 1998), nor were the flows out of the reservoir watershed quantified.

8.3.8 Other Model Parameters

It should also be noted that only the curve numbers were modified for the design models. Basin lag times and antecedent moisture condition (AMC) for the basins were not modified.

9.0 HYDRAULICS

9.1 GENERAL

The emergency spillway at White Tanks FRS No. 3 will be significantly modified to improve spillway efficiency and reduce the maximum water surface in the reservoir during the PMF. A broad-crested weir will be constructed across the existing open channel spillway. The hydraulics of the broad-crested weir provides a control section that determines the flow depth within the reservoir. The submergence analysis was performed to verify that the broad-crested weir would not be drowned-out by the flow depths downstream of the spillway crest

The spillway control section will be constructed of soil cement and extend the spillway crest length. A channel will be excavated downstream to provide the required flow depth and conveyance. Soil will also be excavated upstream to provide the required approach depth and width. The Bethany Home Road Dike will be reconstructed on District property south of the downstream channel. Details of the emergency spillway design are provided in the design drawings.

9.2 SPILLWAY DESIGN

The spillway control section will be constructed of soil cement and extend the spillway crest length. The soil cement section of the emergency spillway will be constructed with a 10-ft crest and 1:1 upstream and downstream slopes. The crest of the emergency spillway will be set at elevation 1,212.0 ft (NAVD 88). The effective crest length of the emergency spillway will be 1,200 ft. Aesthetic fill will be placed over the upstream and downstream slopes no flatter than 10:1 and 4:1, respectively. The right and left abutments of the emergency spillway will be constructed at 2:1 slopes. No aesthetic fill will be placed over the abutments above the spillway crest elevation. Details of the emergency spillway design are provided in the design drawings.

9.3 DEVELOPMENT OF THE EMERGENCY SPILLWAY DISCHARGE RATING CURVE

The development of the discharge rating curve for the emergency spillway required the development of an initial rating curve for use in evaluating upstream and downstream flow conditions and their potential impacts on the rating. The final rating curve incorporates any potential upstream and downstream impacts.

9.3.1 INITIAL RATING CURVE

The emergency spillway is designed to function as a broad-crested weir. The hydraulic analysis used to develop the spillway rating curve are based on the following weir equation:

$$Q = CLH^{3/2},$$

where

'C' is the weir coefficient,

'L' is the spillway crest length, and

'H' is the depth of flow over the weir as measured in the reservoir.

The design weir coefficient (C) was estimated to be 2.64 using engineering references. The weir coefficient takes into account the placement of aesthetic fill. Details of the weir coefficient selection are presented in the calculation packages provided in Appendix B.

A design spillway crest length (L) of 1,200 ft was used to develop the rating curve. Although the actual spillway crest length is **approximately 1,230** ft, the rating curve was developed assuming the aesthetic fill placed across the spillway crest would remain during a flow event. The rating curve was developed using a range of depths (H).

Preliminary evaluations showed the 6-hr Local Storm PMF, under NRCS criteria, to be the worst-case condition resulting in a maximum water surface elevation of 1216.4 ft and a discharge of approximately 30,000 cfs (see Section 10.0).

9.3.2 ANALYSIS OF DOWNSTREAM FLOWS

The design of the broad-crested weir requires that downstream flows do not drown-out the weir during the maximum spillway discharge. To prevent the weir from becoming drowned-out, the downstream spillway channel must be excavated to provide sufficient elevation drop from the spillway crest to the top of the channel water surface during maximum discharge. The spillway channel will be excavated to provide 0.5 percent bottom slope to convey flow away from the weir. The channel maintains this slope until it intersects with the existing grade.

9.1.1.1 Downstream Flow Depth Estimate

The natural conveyance downstream of the spillway channel is steeper and wider than the proposed spillway channel. This suggests that flow depths in the natural conveyance will be less than in the spillway channel. In addition, analyses indicate that the flow in both areas is subcritical. Therefore, normal depth calculations were used to estimate the flow depth in the spillway channel downstream of the spillway weir.

FLOWMASTER, a computer program, was used to determine the normal flow depth within the spillway channel. The flow depth was evaluated for flow rate of 30,000 cfs, a channel bottom width of approximately 845 ft, and side-slope of 2:1(H:V). The District used Manning's roughness values of 0.045 for channel flows and 0.060 for overbank flows in its HECRAS model. Based on a field visit performed by URS staff, these estimates of Manning's Roughness appeared to be a reasonable representation of the actual conditions. FLOWMASTER requires the use of a single roughness coefficient. Therefore, an average of 0.05 was used for the spillway channel flow evaluation. The FLOWMASTER analysis indicated a normal flow depth of 5.45 ft within the spillway channel with the mean flow velocity equal to 6.45 ft/sec. Details of the FLOWMASTER output results are presented in the calculation packages provided Appendix B.

9.1.1.2 Submergence Effects Evaluation

The broad-crested weir was also checked against the possible submergence effects caused by the downstream flow conditions in the spillway channel. The evaluation assumed a minimum drop from the spillway crest to the spillway channel of 4.0 ft. The submergence analysis indicate the downstream flow conditions in the spillway channel do not submerge the spillway weir and no modifications to the rating curve are required. Details of the submergence analysis are presented in the calculation packages provided in Appendix B.

9.1.2 ANALYSIS OF UPSTREAM CONVEYANCE CAPACITY

The design of the emergency spillway is a significant modification to the existing structure. The design required the analysis of the conveyance capacity from the reservoir to the spillway crest. Reduction in conveyance capacity can result in an increase in the reservoir water surface upstream of the spillway.

The conveyance analysis indicated that the water surface elevation rises by approximately 0.25 ft moving south to north along the emergency spillway. The analysis also indicated that this rise in water surface only occurs at the spillway and does not continue to increase further in to the

reservoir. Details of the conveyance analysis are presented in the calculation packages provided Appendix B.

9.1.3 DESIGN DISCHARGE RATING CURVE

The design rating curve was developed by modifying the initial rating curve through incorporation of upstream and downstream impacts. Analyses showed no downstream impacts for the proposed spillway design. However, the spillway design does result in upstream impacts due to reduced conveyance capacity. The upstream impacts require that the spillway rating curve account for the increasing water surface along the spillway. The initial rating curve was modified by reducing the discharge to reflect the reduced effective depth over the spillway. The effective depth was reduced by 0.12 ft, which was the average depth reduction of the conveyance impact. The emergency spillway design discharge rating curve is presented in Table 9-1 and Figure 9-1. Details of the rating curve development are presented in the calculation packages provided Appendix B. **[Note to reviewers: Table 9-1 and Figure 9-1 have not been revised to reflect the conveyance impacts. However, the calculation packages provide the revised numbers and the TR-20 models included the revised design discharge rating curve.]**

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10.0 RESERVOIR ROUTING

10.1 GENERAL

Reservoir routing was performed for selected storm events to determine water surface elevations for embankment design. Reservoir routing was performed using the revised TR-20 models and input parameters discussed in the previous sections of this report. The following storm events were modeled:

- 100-year, 24-hour; 200-year, 24-hour; and 500-year, 24-hour
- 100-year, 10-day
- Probable Maximum Precipitation (PMP) (6-hour local, 6-hour general, 12-hour, 18-hour, 24-hour, 48-hour, and 72-hour)
- Emergency Spillway Hydrograph (ESH)

10.2 DEVELOP ROUTING MODELS

10.2.1 Routing Conditions

The installation of a principal spillway represents a significant change in the routing conditions for White Tanks FRS No. 3. The District plans to install a downstream conveyance channel in the future to control outflow from the principal spillway. However, until the conveyance channel is constructed the District intends to close the principal spillway to prevent uncontrolled outflow. The following routing conditions potentially exist and were evaluated:

- Interim Condition
- Future Condition (Principal Spillway Open)
- Future Condition (Principal Spillway Closed)

The resulting water levels estimated from the routing models will be evaluated against the design criteria. These 3 routing conditions are discussed in the following sections.

10.2.1.1 Interim Condition

The Interim Condition represents the time period following construction of the facilities included in the Remediation Project and the installation of the downstream conveyance channel. Since this time period is anticipated to be short (less than 10 years), it is assumed that no additional

sediment has accumulated in the reservoir. The principal spillway is closed and does not convey flow out of the reservoir. Under this condition the only outflow from the reservoir occurs through infiltration and flow through the emergency spillway.

10.2.1.2 Future Condition (Principal Spillway Open)

The Future Condition (Principal Spillway Open) represents the time period following construction of the downstream conveyance channel and the principal spillway is opened. The inlet to the principal spillway is set at elevation 1,200 feet (NAVD 88). It is assumed that the 100-year sediment volume (500 ac-ft) has accumulated in the reservoir. Under this condition outflow from the reservoir occurs through infiltration, flow through the principal spillway, and flow through the emergency spillway.

10.2.1.3 Future Condition (Principal Spillway Closed)

The Future Condition (Principal Spillway Closed) represents the condition where construction of the downstream conveyance channel does not occur and the principal spillway remains closed. It is assumed that the 100-year sediment volume (500 ac-ft) has accumulated in the reservoir. Under this condition outflow from the reservoir occurs through infiltration, and flow through the emergency spillway.

10.2.2 Routing Models

10.2.2.1 NRCS Models

Routing was performed for the 6-hour local, 6-hour general, 12-hour, 18-hour, 24-hour, 48-hour, and 72-hour PMF design floods, 100-year 10-day and ESH based on design criteria established by NRCS. The NRCS design criteria are detailed in Technical Release No. 60 (TR-60) (USDA 1985b), and include:

- For the Interim Condition and Future Condition (Principal Spillway Closed), routing was performed to verify that the water level resulting from back-to-back 100-year, 10-day storms did not exceed the emergency spillway crest elevation. This criteria is required because the reservoir has gated outlets and no principal spillway.
- For the Future Condition (Principal Spillway Open), routing was performed to verify that the principal spillway could convey a single 100-year, 10-day storm with the maximum water level below the emergency spillway crest and drain the associated water volume down to the principal spillway inlet elevation 10 days following the storm.

- For the Interim Condition and Future Condition (Principal Spillway Closed), the antecedent reservoir condition (ARC) for the PMF and ESH hydrographs will be based on the water surface elevation 10 days following the end of the 100-year, 10-day storm. Since the outlets are gated, drawdown of the reservoir for this case was the result of infiltration.
- For the Future Condition (Principal Spillway Open), the ARC for PMF and ESH hydrographs will be based on the inlet elevation of the principal spillway.
- The dam crest elevation will be set at an elevation above the maximum water level that results during routing of the required PMF hydrographs. The PMF hydrograph is considered the freeboard hydrograph for this structure.
- The emergency spillway must be shown to pass the ESH hydrograph at the safe velocity determined for the site. The ESH hyetograph is developed from a combination of the 100-year, 6-hour and 6-hour local PMP.

10.2.2.2 ADWR Models

Routing was performed for the 6-hour Local Storm PMF, 72-hour General Storm PMF, and 100-year 24-hour storm based on design criteria established by ADWR. The ADWR design criteria are provided in the *Draft Guidelines: Emergency Spillway Capacity, Reservoir Routing, and Freeboard Requirements* (ADWR 2004), and include:

- Based upon the size and hazard classification of the dam, the embankment crest will be set at an elevation equal to the maximum water level that results during routing of the required PMF hydrographs plus the residual freeboard.
- As per District recommendations, the residual freeboard will be 1 foot. **[Note to reviewers: A variance will be prepared for submittal to ADWR.]**
- For the Interim Condition, the ARC for the PMF hydrographs will be based on the water surface elevation equal to the invert of the lowest outlet. This ARC was selected after verifying that a single 48-inch outlet pipe could draw down 85 percent of the peak storage volume at the end of 10th day following the peak of 100-year 24-hour storm.
- For the Future Condition (Principal Spillway Closed), the ARC for PMF hydrographs will be based on the elevation of the 100-year sediment pool.
- For the Future Condition (Principal Spillway Open), the ARC for PMF hydrographs will be based on the inlet elevation of the principal spillway.

10.2.2.3 District Models

In addition to the 100-year, 24-hour storm event, the District requested that routing models be developed to evaluate reservoir conditions for the 200-year and 500-year, 24-hour storm events. TR-20 models for the 200-year and 500-year models were developed using the existing 100-year, 24-hour model. The storm events were modeled for the three routing conditions presented in Section 10.2.1.

The rainfall depth for 500-year, 24-hour storm was determined based on the methodology described in *Highway Drainage Design Manual – Hydrology, Arizona Department of Transportation* (ADOT 1993). However, ADOT manual did not provide necessary information required to develop 200-year, 24-hour rainfall depth. Therefore, 5-, 10-, 50- and 100-year, 24-hour rainfall depths were developed based on the methodology described in ADOT Drainage Manual. The depth-duration relationship of the 24-hour rainfall depths were plotted against the 5-, 10-, 25-, 100-, and 500-year duration on a semi-log scale. Based on this depth-duration relationship, the 200-year, 24-hour rainfall depth was estimated. The 200-year and 500-year, 24-hour rainfall depths were reduced for aerial reduction by the same factor by which the 100-year, 24-hour rainfall amount was reduced in the NRCS Hydrology Report (NRCS 1998). The computations related to development of the 200-year and 500-year, 24-hour rainfall depths are provided in a calculation package in Appendix B.

10.3 MODELING RESULTS

TR-20 modeling was performed using the criteria established by ADWR, NRCS, and the District. Reservoir routing results consisted of peak inflows, peak outflows, storage volume, and maximum reservoir stage. The results are summarized in Tables 9-3 and 9-4. The TR-20 input and output files are presented in the calculation packages provided in Appendix B.

10.3.1 NRCS Models

Based on the reservoir routing results for the NRCS models, the maximum reservoir stage occurs during routing of the 6-hr Local Storm PMF. The maximum reservoir stage for the 3 routing conditions occurs for the Future Condition (Principal Spillway Closed) at an elevation of 1,216.4 feet (NAVD 88).

For the Interim Condition and Future Condition (Principal Spillway Closed), the routing results show that back-to-back 100-year, 10-day storm events will be contained below the emergency spillway crest. For the Future Condition (Principal Spillway Open), the maximum water level for a single 100-year, 10-day storm was shown to be below the emergency spillway crest. The

results also show that the maximum water level resulting from routing of the ESH is below the was also routed through the reservoir. The antecedent reservoir condition for ESH was set same as of PMF design flood hydrographs.

10.3.2 ADWR Models

Based on the reservoir routing results for the ADWR models, the maximum reservoir stage occurs during routing of the 6-hr Local Storm PMF. The maximum reservoir stage for the 3 routing conditions occurs for the Future Condition (Principal Spillway Open) at an elevation of 1,216.0 feet (NAVD 88). The results show that the maximum water level during routing of the Future Condition (Principal Spillway Closed) model was 0.1 ft lower than the Future Condition (Principal Spillway Open) model. This lower water level is caused by the lower ARC elevation and the fact that the principal spillway outflow does not contribute significantly to lowering the water level during routing of the 6-hour Local Storm PMF.

10.3.3 District Models

Based on the reservoir routing results for the District models, the 100-year and 200-year, 24-hour storm events are contained below the emergency spillway crest for each of the routing conditions. The results indicate the 500-year storm event results in a discharge through the emergency spillway for the Interim Condition and the Future condition (Principal Spillway Closed).

TABLE 8-1
Summary of TR-20 Computer Model Review

Storm	Peak Inflows (NRCS Report, August 1998)[1] (cfs)	Peak Inflows (FCDMC Provided Output Files)[2] (cfs)	Peak Inflows (URS Execution of Input Files)[3] (cfs)
6-Hour Local PMP	66,122	66,122	66,122
6-Hour General PMP	34,212	34,212	34,216
12-Hour General PMP	32,435	32,435	32,278
18-Hour General PMP	26,905	26,905	26,905
24-Hour General PMP	23,800	23,800	23,800
48-Hour General PMP	31,819	31,819	31,696
72-Hour General PMP	32,300	32,300	32,296
100-Year, 24-hour	10,835	10,835	10,468
Emergency Spillway Hydrograph (ESH)	21,685	21,685	21,674
Principal Spillway (100-year 10-Day)	3,290	3,290	3,290

Notes

1. These peak inflows are tabulated in Table II and III of the NRCS Report Hydrologic Analysis of the White Tank Mountains on Flood Retarding Structure # 3 (NRCS, August 1998).
2. These peak inflows are obtained by opening up the TR-20 output files provided by FCDMC to URS.
3. These peak inflows are based on the output files generated by URS by executing the input files provided by FCDMC.

TABLE 8-2
Watershed Basin Drainage Areas

Basin	Drainage Areas Estimated by NRCS[1] (square miles)	Drainage Areas Estimated by URS (square miles)	Difference in Drainage Areas (%)
1	2.45	2.46	0.41
2	2.34	2.38	1.68
3	3.96	3.94	-0.51
4	2.02	2.06	1.94
5	4.76	4.78	0.42
6	1.5	1.47	-2.04
7	3.46	3.48	0.57
Total	**20.49**	**20.57**	**0.39**

Notes:

1. These drainage areas are tabulated in Table I of the NRCS Report *Hydrologic Analysis of the White Tank Mountains on Flood Retarding Structure #3* (NRCS, August 1998).

TABLE 8-3
Elevation-Area-Capacity Data and Infiltration Estimates

Reservoir Elevation (NAVD 88) (feet)	Surface Area (acres)	Average Surface Area (acres)	Reservoir Storage (acre-feet)	Cumulative Storage (acre-feet)	Estimated Infiltration Rate – Interim Condition (cfs)[1]	Estimated Infiltration Rate – Future Condition (cfs)[2]	Comments
1178.0	0.10	0.10	0.00	0.00	0.026	0.000	
1179.0	0.51	0.302	0.30	0.30	0.133	0.001	
1180.0	1.05	0.778	0.78	1.08	0.275	0.002	
1181.0	1.76	1.403	1.40	2.48	0.461	0.004	
1182.0	3.07	2.415	2.42	4.90	0.806	0.006	
1183.0	4.79	3.932	3.93	8.83	1.256	0.010	
1184.0	5.82	5.305	5.30	14.14	1.525	0.012	
1185.0	6.60	6.210	6.21	20.35	1.731	0.013	
1186.0	7.44	7.022	7.02	27.37	1.951	0.015	
1187.0	8.65	8.048	8.05	35.42	2.269	0.017	
1188.0	10.32	9.487	9.49	44.90	2.706	0.021	
1189.0	11.93	11.125	11.13	56.03	3.128	0.024	
1190.0	13.93	12.930	12.93	68.96	3.652	0.028	
1191.0	15.98	14.955	14.96	83.91	4.189	0.032	
1192.0	22.46	19.220	19.22	103.13	5.888	0.045	
1193.0	**27.82**	**25.140**	**25.14**	**128.27**	**7.293**	**0.056**	**Gated Outlet Invert**
1194.0	33.83	30.825	30.83	159.10	8.869	0.068	
1195.0	44.05	38.940	38.94	198.04	11.548	0.089	
1196.0	56.65	50.350	50.35	248.39	14.852	0.114	
1196.8	67.18	61.914	50.77	299.16	17.612	0.135	
1197.0	69.49	68.334	12.30	311.46	18.218	0.140	
1198.0	83.88	76.685	76.69	388.14	21.991	0.169	
1199.0	98.77	91.325	91.33	479.47	25.894	0.199	
1199.2	**102.00**	**100.385**	**20.58**	**500.05**	**26.741**	**0.206**	**100-Year Sediment Pool Level**
1200.0	**112.95**	**107.475**	**85.44**	**585.49**	**29.612**	**4.516**	**Principal Spillway Inlet**
1200.1	115.02	113.985	13.79	599.28	30.154	5.187	
1201.0	130.05	122.535	107.71	706.99	34.095	10.165	
1202.0	147.55	138.800	138.80	845.79	38.683	15.989	
1203.0	165.40	156.475	156.48	1002.26	43.362	21.895	
1204.0	183.11	174.253	174.25	1176.52	48.004	27.758	

TABLE 8-3 (CONTINUED)
ELEVATION-AREA-CAPACITY DATA AND INFILTRATION ESTIMATES

Reservoir Elevation (NAVD 88) (feet)	Surface Area (acres)	Average Surface Area (acres)	Reservoir Storage (acre-feet)	Cumulative Storage (acre-feet)	Estimated Infiltration Rate – Interim Condition (cfs)[1]	Estimated Infiltration Rate – Future Condition (cfs)[2]	Comments
1205.0	199.09	191.098	191.10	1367.61	52.195	33.257	
1206.0	216.66	207.875	207.88	1575.49	56.801	38.912	
1207.0	234.81	225.735	225.74	1801.22	61.559	44.601	
1208.0	253.15	243.980	243.98	2045.20	66.367	50.266	
1209.0	274.77	263.960	263.96	2309.16	72.036	56.556	
1210.0	294.10	284.435	284.44	2593.60	77.103	62.352	
1211.0	313.41	303.755	303.76	2897.35	82.166	68.094	
1212.0	**327.85**	**320.630**	**320.63**	**3217.98**	**85.951**	**72.698**	**Emergency Spillway Crest**
1213.0	350.00	338.925	338.93	3556.91	91.758	78.958	
1214.0	368.69	359.345	359.35	3916.25	96.658	84.411	
1215.0	387.54	378.115	378.12	4294.37	101.600	89.861	
1216.0	409.55	398.545	398.55	4692.91	107.370	96.018	
1217.0	431.48	420.515	420.52	5113.43	113.120	102.143	
1218.0	454.15	442.815	442.82	5556.24	119.063	108.430	
1219.0	476.15	465.150	465.15	6021.39	124.831	114.544	

Notes:

1) Estimated Infiltration Rates – Interim Condition refers to the existing reservoir conditions.
2) Estimated Infiltration Rates – Future Condition refers to the reservoir condition assuming 500 ac-ft of sediment has accumulated.

TABLE 8-4
Urban Growth Projections and Curve Number Estimation

Basin No.	Land Ownership Category	Urban Growth Status (Year 2030)	Drainage Area (sq mi)	NRCS Curve Numbers (Existing) (CN)	URS Curve Numbers (Future) (CN)	Average Curve Numbers (Future) (CN)
1	Regional Park	Undevelopable	2.460	87.2	87.2	87.2
2A	Regional Park	Undevelopable	1.020		87.2	
2B	Regional Park	Undevelopable	0.070	78.2	71.45	79.9
2C	State Trust Land	Developable (Low Density Population)	1.291		74.6	
3	Regional Park, Private Land, and State Trust Land	Undevelopable (Mountains)	3.940	87.2	87.2	87.2
4A	Regional Park Area	Undevelopable	0.430		87.2	
4B	Regional Park Area	Undevelopable	0.440	75.5	72.41	77.3
4C	State Trust Land and Private Land	Developable (Low Density Population)	1.190		75.5	
5A	Regional Park	Undevelopable	1.000		87.2	
5B	Regional Park	Undevelopable	0.879		73.67	
5C	State Trust Land and Private Land	Developable (Low Density Population)	0.978	76.5	76.6	78.8
5D	State Trust Land	Developable (High Density Population)	1.700		78.5	
5E	District Poperty	Undevelopable	0.222		73.67	
6A	State Trust Land	Developable (High Density Population)	0.310		87.2	
6B	Regional Park Area, Private Land, and State Trust Land	Undevelopable (Mountains)	1.160	87.2	87.2	87.7
7A	State Trust Land and Private Land	Undevelopable (Mountains)	1.098		87.2	
7B	FCDMC Area	Undevelopable	0.278	78.9	75.07	81.7
7C	State Trust Land and Private Land	Developable (High Density Population)	2.104		79.7	

TABLE 9-1
Emergency Spillway Discharge Rating Curve

Elevation (feet) (NAVD 88)[1]	Discharge (cfs)[2]
1,212	0
1,213	3,168
1,214	8,960
1,215	16,460
1,216	25,344
1,217	35,419
1,218	46,560
1,219	58,672

Notes:

1. The emergency spillway crest elevation is set at 1212.0 feet.
2. The emergency spillway discharge was estimated using the weir formula. The weir coefficient is 2.64. The spillway crest length is 1,200 feet.

TABLE 10-1
Reservoir Routing Results

Storm Event	Inflow to White Tanks FRS No. 3		Outflow from White Tanks FRS No. 3 (Interim Condition)						Outflow from White Tanks FRS No. 3 (Future Condition - Principal Spillway Open)						Outflow from White Tanks FRS No. 3 (Future Condition - Principal Spillway Closed)					
			NRCS Criteria			ADWR Criteria			NRCS Criteria			ADWR Criteria			NRCS Criteria			ADWR Criteria		
	Precipitation (inches)	Peak Inflow (cfs)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (feet)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (feet)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (feet)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (feet)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (feet)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (feet)
6-hr General PMP	8.80	35,610	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-hr General PMP	11.00	33,225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-hr General PMP	12.20	27,370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-hr General PMP	12.90	24,210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48-hr General PMP	15.00	32,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72-hr General PMP	15.80	32,700	-	-	-	1,193.0	21,911	1215.7	-	-	-	1,200.0	23,195	1,215.9	-	-	-	1,199.2	23,435	1,215.9
6-hr Local PMP	12.70	68,290	-	-	-	1,193.0	21,921	1,215.7	-	-	-	1,200.0	24,221	1,216.0	-	-	-	1,199.2	23,720	1,215.9
ESH	5.29	23,420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-year 10-Day	6.40[1]	2,180	-	-	-	N/A	N/A	N/A	1200.0	-	-	N/A	N/A	N/A	-	-	-	N/A	N/A	N/A
Back-To-Back 100-year 10-day storms	6.40	2,180	-	-	-	N/A	N/A	N/A	-	-	-	N/A	N/A	N/A	-	-	-	N/A	N/A	N/A

Notes:

1) The TR-20 model for the 100-year, 10-day storm events is set up different from the models for the other storm events. Due to the extended duration of the storm, the runoff depth of 1.64 inches is input to the model to reflect the total anticipated runoff.
2) The ARC for the second 100-year 10-day storm is based upon the reservoir elevation at the end of 10th day of the reservoir routing of first 100-year 10-day storm.
3) The peak outflow for 100-year 10-day and Back-Back 100-year 10-day storms reflects the infiltration amount only.
4) The ARC Elevation of:

   1193.0 ft corresponds to the invert level of the lowest outlet work,

   1199.2 ft corresponds to the100-year sediment pool level (500 acre-feet of sediment storage), and

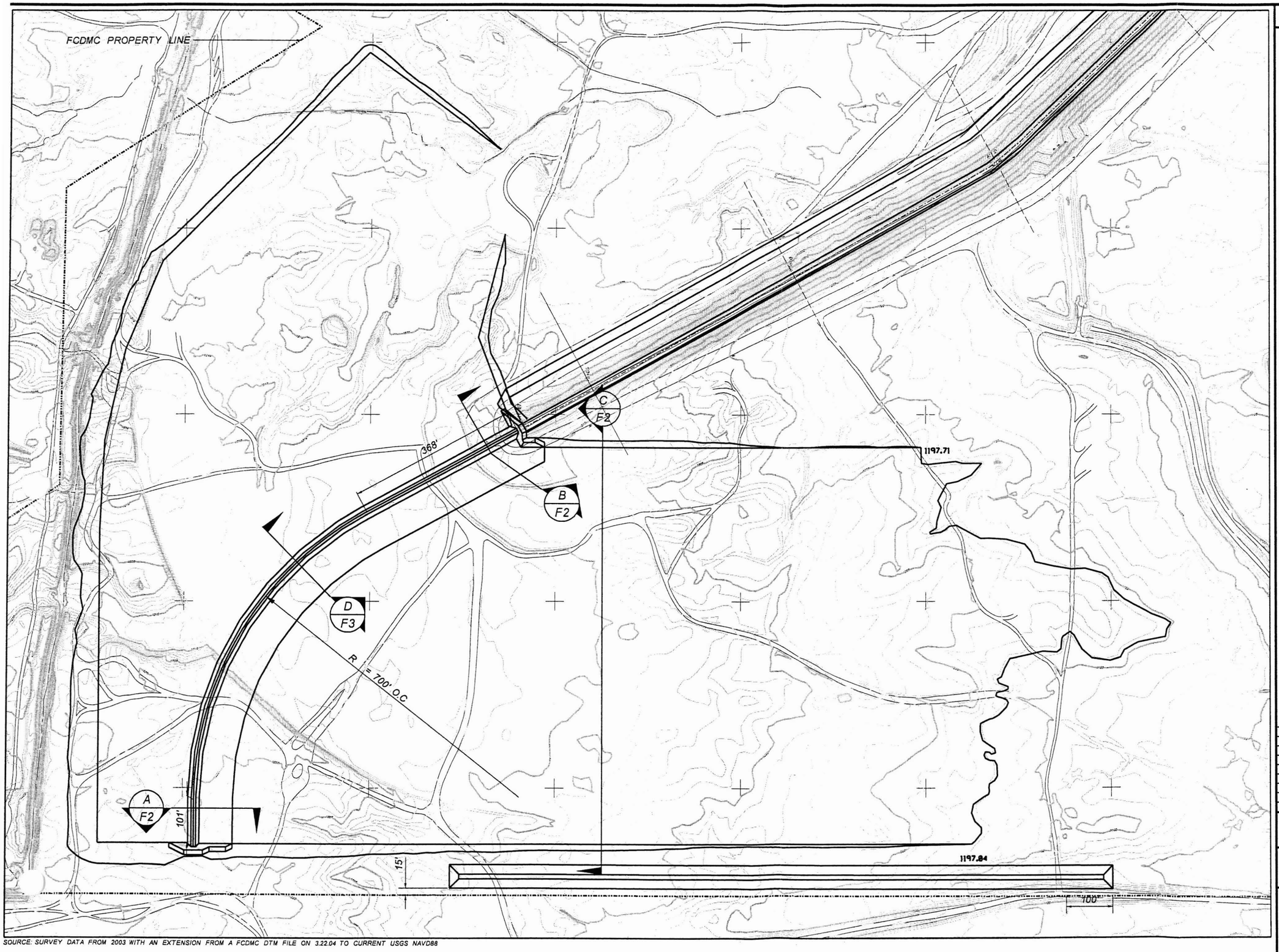
   1200.0 ft corresponds to the crest elevation of the principal spillway.

TABLE 10-2
Results of 24-Hour Storm Routing

Storm Event	Peak Inflow (cfs)	Antecedent Reservoir Condition (ARC)		Maximum Reservoir Elevation (NAVD 88)[1] (feet)
		Condition	Elevation (feet) (NAVD 88)	
100-year, 24-hour	11,750	Interim Condition	1,193.0	1,209.3
		Future Condition (Principal Spillway Open)	1,200.0	-
		Future Condition (Principal Spillway Closed)	1,199.2	1,210.6
200-year, 24-hour	14,530	Interim Condition	1,193.0	1,210.6
		Future Condition (Principal Spillway Open)	1,200.0	-
		Future Condition (Principal Spillway Closed)	1,199.2	1,211.8
500-year, 24-hour	17,182	Interim Condition	1,193.0	1,212.1
		Future Condition (Principal Spillway Open)	1,200.0	-
		Future Condition (Principal Spillway Closed)	1,199.2	1,212.2

Notes:

1. Emergency spillway crest is at 1212.0 feet (NAVD 88).



SOURCE: SURVEY DATA FROM 2003 WITH AN EXTENSION FROM A FCDMC DTM FILE ON 3.22.04 TO CURRENT USGS NAVD88

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XREFS: 52604,TOPO.DGN, PL-FCD.DGN

ITEM NO.	ITEM DESCRIPTION	QUANTITY

N

50 0 50 100
Scale in Feet

ONE FOOT CONTOURS

TWO WORKING DAYS BEFORE YOU DIG, CALL
263-1100
BLUE STAKE

ADWR APPROVAL

NO.	REVISION	BY	DATE
A	ADWR REVIEW SUBMITTAL	TER	7-04

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

WHITE TANKS FRS NO. 3
REMEDIATION DESIGN - PHASE1
PCN 470.04.30, FCD CONTRACT NO. 2004CO17

PRELIMINARY NOT FOR CONSTRUCTION

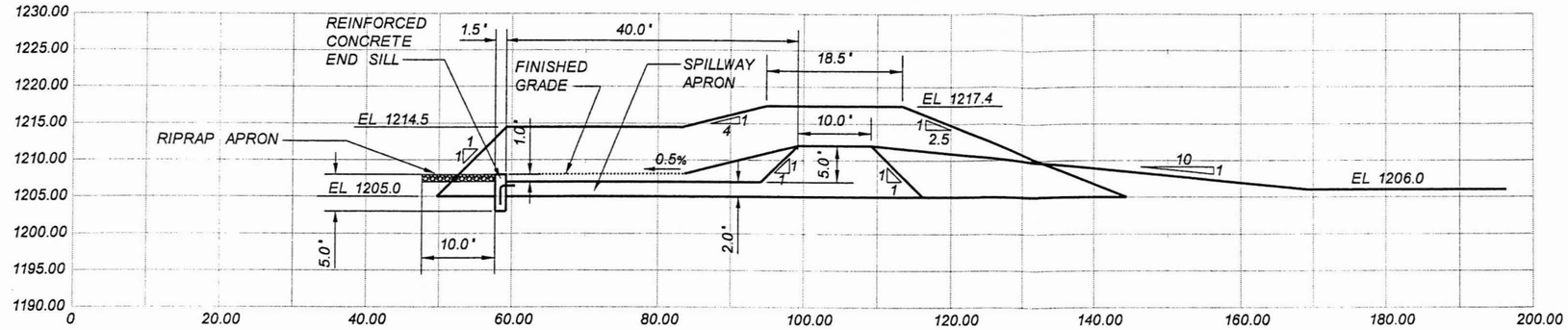
	BY	DATE
DESIGNED	TER	7-04
DRAWN	MSJ	7-04
CHECKED	RM	7-04

URS
7720 NORTH 16TH STREET
SUITE 100
PHOENIX, AZ 85020

DRAWING NO. FIGURE 1

EMERGENCY SPILLWAY PLAN

SHEET OF



SECTION A / F1
EMERGENCY SPILLWAY
RIGHT ABUTMENT

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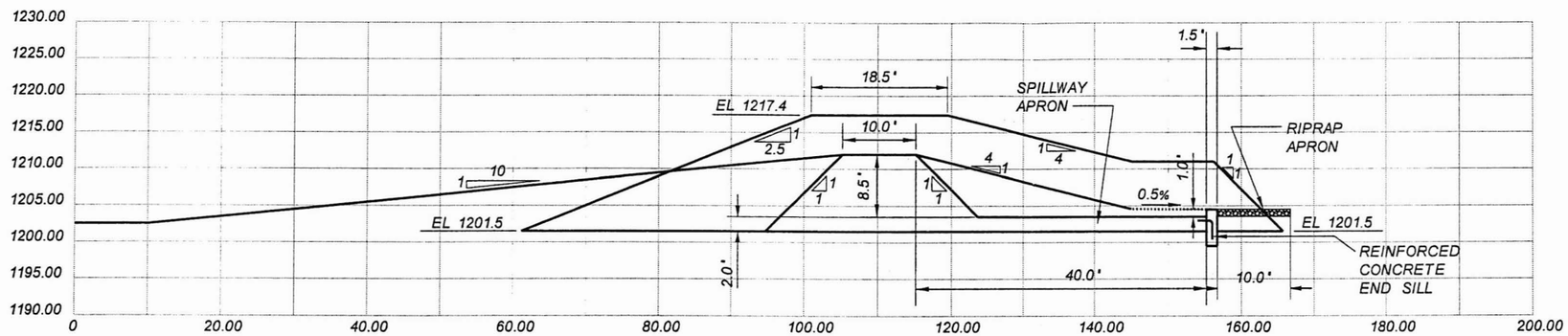
Scale in Feet



SECTION B / F1
EMERGENCY SPILLWAY
LEFT ABUTMENT

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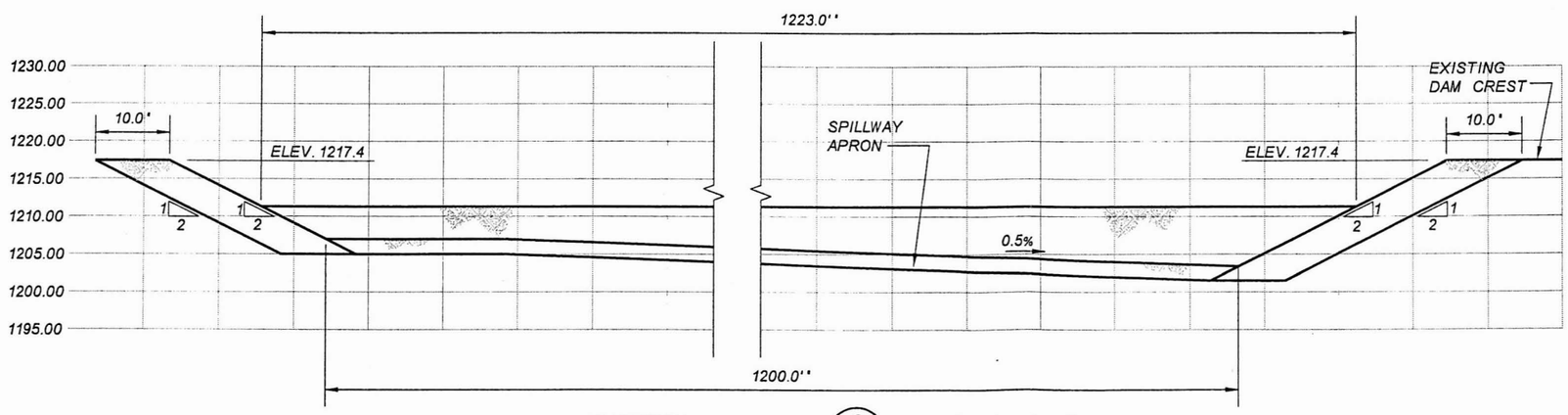
Scale in Feet



ELEVATION C / F1
EMERGENCY SPILLWAY
ABUTMENT TO ABUTMENT

5 0 5 10
Scale in Feet

ITEM NO.	ITEM DESCRIPTION	QUANTITY

TWO WORKING DAYS BEFORE YOU DIG, CALL
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BLUE STAKE

ADWR APPROVAL

NO.	REVISION	BY	DATE
A	ADWR REVIEW SUBMITTAL	TER	7-04

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

WHITE TANKS FRS NO 3
REMEDIATION DESIGN - PHASE 1
PCN 470.04.30, FCD CONTRACT NO. 2004C017

PRELIMINARY NOT FOR CONSTRUCTION

	BY	DATE
DESIGNED	TER	7-04
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URS
7720 NORTH 16TH STREET
SUITE 100
PHOENIX, AZ 85020

DRAWING NO. FIGURE 2

EMERGENCY SPILLWAY CROSS SECTIONS

SHEET OF

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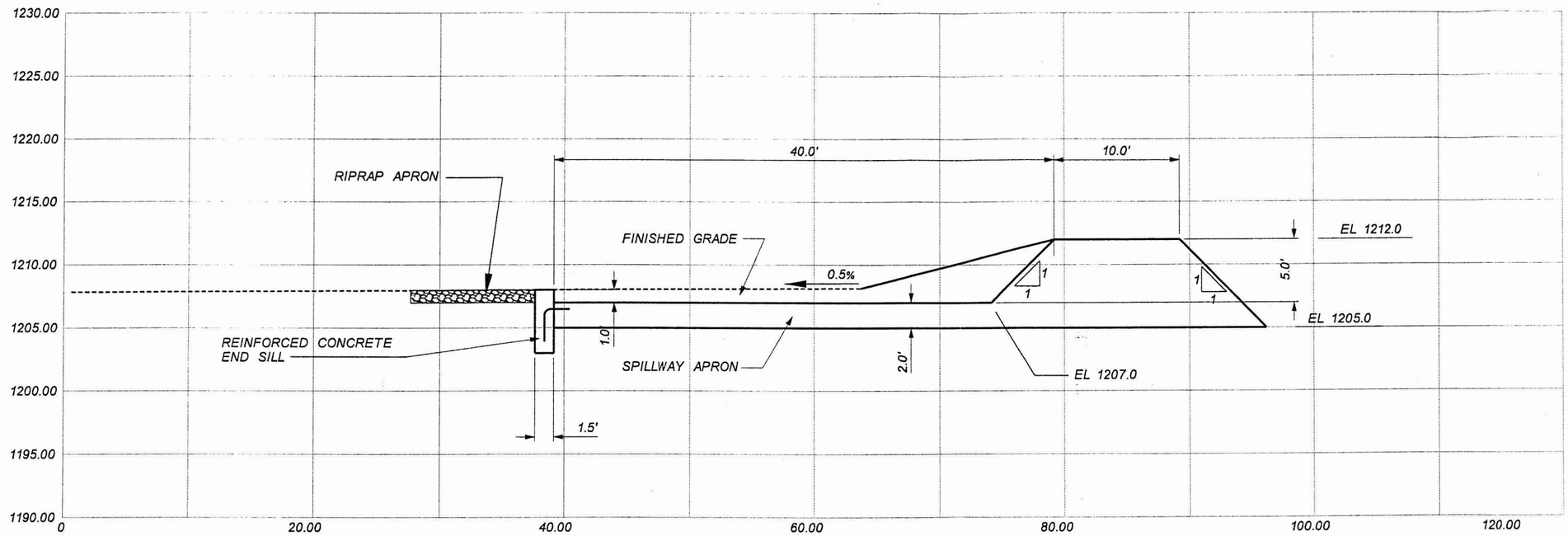

SECTION D
EMERGENCY SPILLWAY F1

5 0 5 10
Scale in Feet

ITEM NO.	ITEM DESCRIPTION	QUANTITY

TWO WORKING DAYS BEFORE YOU DIG, CALL
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

WHITE TANKS FRS NO 3
REMEDIATION DESIGN - PHASE 1
PCN 470.04.30, FCD CONTRACT NO. 2004C017

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	DRAWN	MSJ	7-04
	CHECKED		

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7720 NORTH 16TH STREET
SUITE 100
PHOENIX, AZ 85020

DRAWING NO. FIGURE 3
EMERGENCY SPILLWAY CROSS SECTION
SHEET OF

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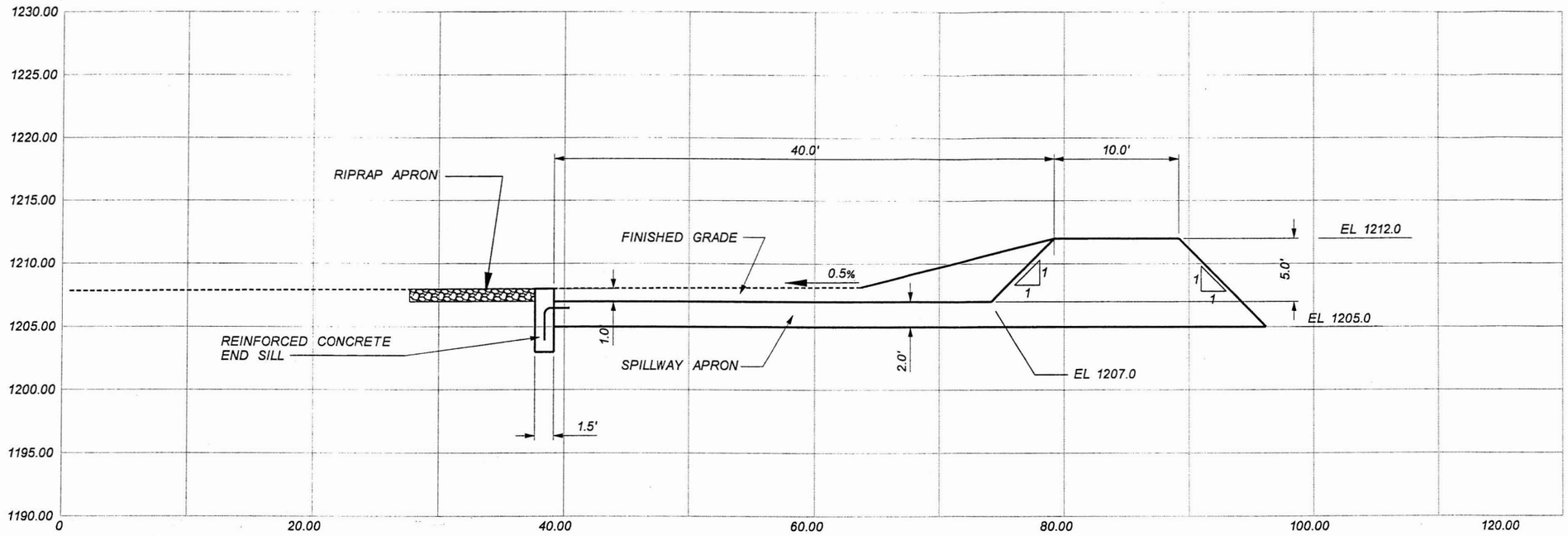

SECTION D
EMERGENCY SPILLWAY F1

5 0 5 10
Scale in Feet

ITEM NO.	ITEM DESCRIPTION	QUANTITY

TWO WORKING DAYS BEFORE YOU DIG, CALL
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BLUE STAKE

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

WHITE TANKS FRS NO 3
REMEDIATION DESIGN - PHASE 1
PCN 470.04.30, FCD CONTRACT NO. 2004C017

PRELIMINARY NOT FOR CONSTRUCTION

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DESIGNED	TER	7-04
DRAWN	MSJ	7-04
CHECKED		

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7720 NORTH 16TH STREET
SUITE 100
PHOENIX, AZ 85020

DRAWING NO. FIGURE 3
EMERGENCY SPILLWAY CROSS SECTION
SHEET OF

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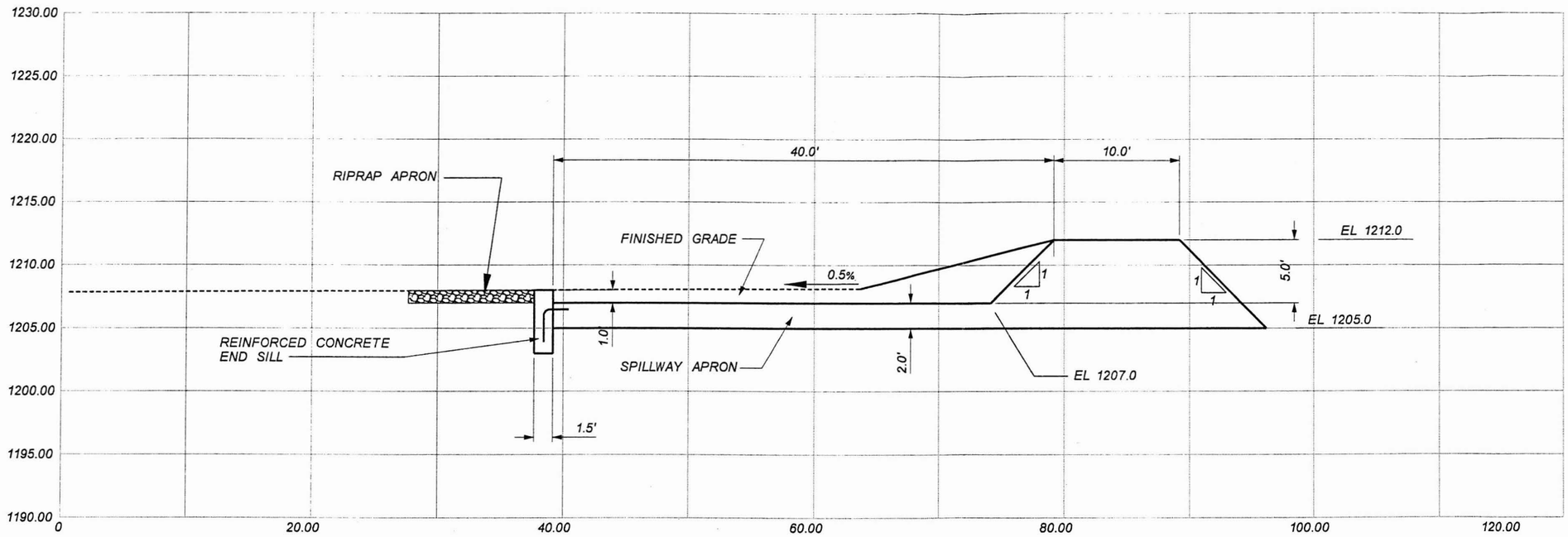

SECTION D
EMERGENCY SPILLWAY F1

5 0 5 10
Scale in Feet

ITEM NO.	ITEM DESCRIPTION	QUANTITY

TWO WORKING DAYS BEFORE YOU DIG, CALL
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BLUE STAKE

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

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PCN 470.04.30, FCD CONTRACT NO. 2004C017

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	TER	7-04
	DRAWN	MSJ	7-04
	CHECKED		

URS 7720 NORTH 16TH STREET SUITE 100 PHOENIX, AZ 85020

DRAWING NO. FIGURE 3 | EMERGENCY SPILLWAY CROSS SECTION | SHEET OF

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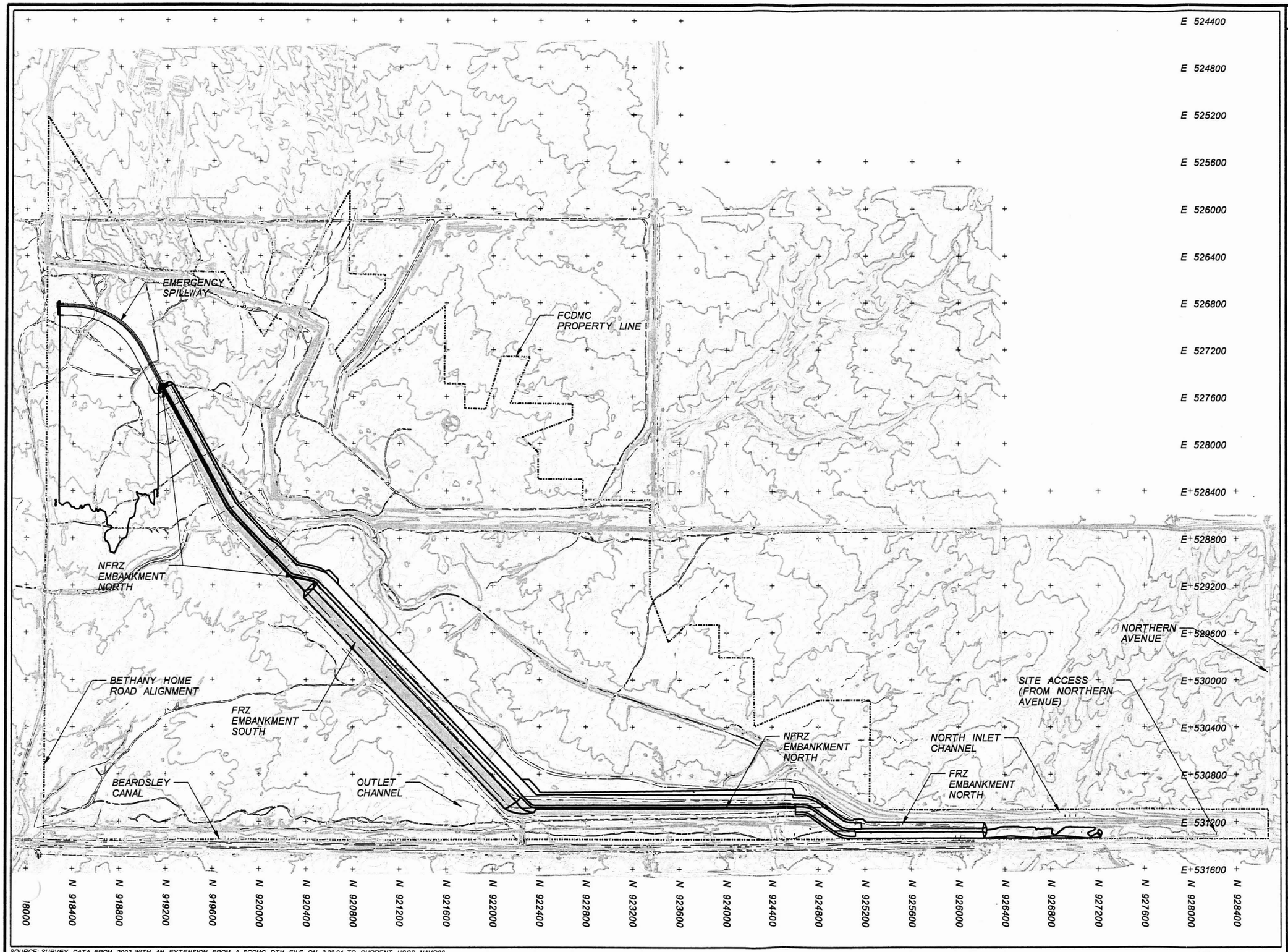

SOURCE: SURVEY DATA FROM 2003 WITH AN EXTENSION FROM A FCDMC DTM FILE ON 3.22.04 TO CURRENT USGS NAVD88

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XREFS: FCDMC TOPO.DGN, DAM MONUMENTS.DGN, NEW CREST ALIGNMENT.DGN, 52604_TOPO.DGN, BORROW SOURCE.DGN, WHITETANKS3, WOFUS.DGN, PL-FCD.DGN

200 0 200 400
Scale in Feet
ONE FOOT CONTOURS

ITEM NO.	ITEM DESCRIPTION	QUANTITY

TWO WORKING DAYS BEFORE YOU DIG, CALL
263-1100
BLUE STAKE

ADWR APPROVAL

NO.	REVISION	BY	DATE
A	ADWR REVIEW SUBMITTAL	TER	7-04

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

WHITE TANKS FRS NO 3
REMEDIATION DESIGN - PHASE 1
PCN 470.04.30, FCD CONTRACT NO. 2004C017

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SUITE 100
PHOENIX, AZ 85020

DRAWING NO. FIGURE 4

SITE PLAN

SHEET O

APPENDIX B
CALCULATION PACKAGES

(1)

Calculation Package 3

URS

EXHIBIT 4.7-2

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title: **ESTABLISHMENT OF ELEVATION-SPILLWAY DISCHARGE RATING CURVE FOR A BROAD-CRESTED WEIR**

Total Number of Pages (including cover sheet): _____

Total Number of Computer Runs: _____

Prepared by: Hammad Hussain Date: 06/21/04

Checked by: _____ Date: _____

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

Remarks/Conclusions/Results:

See Page 5.

Calculation Approved by: [signature] 7/23/04
Project Manager/Date

Revision No.:	Description of Revision:	Approved by:

Project Manager/Date

ESTABLISHMENT OF ELEVATION-SPILLWAY DISCHARGE RATING CURVE FOR A BROAD-CRESTED WEIR

(WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3)
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

The purpose of this calculation package is to present the calculations involved in developing the elevation-discharge rating curve for a broad-crested weir at the White Tank FRS No. 3 project.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

The broad-crested weir was evaluated as a replacement to the current emergency spillway at the White Tank FRS No. 3 project. The elevation-discharge rating curve for a broad-crested weir was established using the following relationship as expressed in *Handbook of Hydraulics by King, H.W. and Barter, E.F, 1963* (See page 11):

$$Q = C * L * H^{1.5}$$

Where

Q = Spillway Discharge (cfs)

C = Broad-Crested Weir Spillway Coefficient

L = Crest Length (ft)

H = Head Above the Spillway (ft)

Spillway Coefficient (C)

Experiments on broad crested weir has indicated that for heads from 0.5 ft to 1.5 ft, the spillway crest coefficient (C) becomes more uniform, and for heads from 1.5 ft and above, the spillway crest coefficient as given by the different experiments is nearly constant and equals approximately 2.63 (See page 11). Table 5-3 of *Handbook of Hydraulics by King H.W and Barter, E.F, 1963* also indicates the spillway coefficient to be equal to 2.64 for heads equal to 1.5 ft or above when the breadth of crest of weir is equal to 10 ft (See page 12). For this a particular analysis, the head above spillway varied between 1 and 7 ft. URS decided to use a spillway coefficient of 2.64 to develop the elevation-discharge rating curve.

Spillway Crest Length (L)

It should be noted that the proposed broad crested weir has a curvature with a radius of 700 ft (See Figure on page 13). The spillway crest length (L) was estimated using the following relationship:

$$L = 100*\Delta/D$$

where

L = Length of the spillway crest (ft)

Δ = Central angle of the curve (angle of curvature)

D = Degree of curvature (degrees)

The central angle of the curve was estimated using AutoCAD and found to be equal to 62 degree. The degree of curvature (D) was estimated using the following relationship:

$$D = 5729.28 /R$$

where

R = Radius of the Curve (700 ft)

The degree of curvature was found to be equal to 8.18 degree. The length of curve was estimated to be equal to 760 ft. The Point of Curvature (PC) was equal to 1+00 stations and Point of Tangency PT was estimated to be equal to 3+68 station (See Figure on page 11). The total length of the spillway was found to be equal to:

$$760 + 100 + 368 = 1228 \text{ ft}$$

URS therefore decided to use a length of spillway crest equal to 1200 ft in developing the elevation-spillway discharge curve.

Head Above the Spillway (H)

The spillway crest was set at an elevation of 1212.0 ft (NAVD 88.0). The preliminary reservoir routing indicated the embankment height to be equal to 1218.25 ft. Therefore, the elevation-discharge rating curve was estimated between 1213 ft and 1220 ft (between 1 and 7 ft). The emergency spillway cross section is provided on Page 14.

RESULTS

The elevation-spillway discharge-rating curve for a 10-ft broad-crested weir also include the infiltration amounts in addition to the discharges released through the emergency spillway. It should be noted that infiltration amounts were estimated for the future condition and interim condition separately. Interim condition refers to the existing condition with no sediment pool. Future condition refers to the scenario with a 100-year sediment accumulated in the reservoir.

The elevation-spillway discharge rating curve for the interim condition is provided in Table 1 (See page 5). All the formulas involved in establishing the rating curve provided in Table 1 are provided on page 6. For the interim condition, the discharges will be released through the emergency spillway and infiltration only. The procedure related to the estimation of the infiltration rates for the interim condition is provided in a separate calculation package.

The elevation-spillway discharge rating curve for the future condition (principal spillway closed) is provided in Table 2 (See page 7). All the formulas involved in establishing the rating curve provided in Table 2 are provided on page 8. For the future condition (principal spillway closed), the discharges will be released through the emergency spillway and infiltration (for future condition). The procedure related to the estimation of the infiltration rates for the future condition is provided in a separate calculation package.

The elevation-spillway discharge rating curve for the future condition (principal spillway open) is provided in Table 3 (See page 9). All the formulas involved in establishing the rating curve provided in Table 3 are provided on page 10. For the future condition (principal spillway open), the discharges will be released through the emergency spillway, infiltration (for future condition) and a 48-inch principal spillway. The procedure related to the estimation of the capacity of the principal spillway and infiltration rates for the future condition are provided in a separate calculation package.

(It should be noted that the reservoir upstream of the White tank FRS No. 3 Spillway gets narrower at the south end of the spillway. URS determined the conveyance effects in the reservoir upstream of the White Tank FRS No. 3 Spillway in a separate calculation package and found out that the water surface elevation in the reservoir drops by 0.25 ft as it travels from North end of reservoir to the South end. The calculations indicated that the water surface elevation drops by approximately 0.25 ft at the North end of the spillway and approximately by zero ft at South end of the spillway. Therefore, URS decided to lower the actual head available at the broad crested weir by 0.125 ft (average of maximum and minimum drop).

	A	B	C	D	E	F	G
69	**TABLE 1**						
70	**ELEVATION-DISCHARGE CURVE FOR BROAD-CRESTED WEIR**						
71	**INTERIM CONDITION**						
72							
73	**Reservoir Elevation (NAVD 88)**	**Conveyance Effects**	**Effective Head For Discharge Calculation**	**'C' Coefficient**	**Flow rate, 'Q'**	**Infiltration Amount**	**Total Discharge**
74	**(feet)**	**(ft)**	**(ft)**		**(cfs)**	**(cfs)**	**(cfs)**
75	**1212.0**	0.000	1212.00	-	0	85.95	86
76	1213.0	0.125	1212.88	2.64	2593	92.00	2685
77	1214.0	0.125	1213.88	2.64	8134	97.00	8231
78	1215.0	0.125	1214.88	2.64	15443	102.00	15545
79	1216.0	0.125	1215.88	2.64	24165	107.00	24272
80	1217.0	0.125	1216.88	2.64	34099	113.00	34212
81	1218.0	0.125	1217.88	2.64	45113	119.00	45232
82	1219.0	0.125	1218.88	2.64	57108	125.00	57233
83	1220.0	0.125	1219.88	2.64	70010	132.00	70142

	A	B	C	D	E	F	G
69	**TABLE 1**						
70	**ELEVATION-DISCHARGE CURVE FOR BROAD-CRESTED WEIR**						
71	**INTERIM CONDITION**						
72							
73	**Reservoir Elevation (NAVD 88)**	**Conveyance Effects**	**Effective Head For Discharge Calculation**	**'C' Coefficient**	**Flow rate, 'Q'**	**Infiltration Amount**	**Total Discharge**
74	**(feet)**	**(ft)**	**(ft)**		**(cfs)**	**(cfs)**	**(cfs)**
75	**1212**	0	=A75-B75	-	0	85.95	=SUM(E75:F75)
76	=(A75+1)	0.125	=A76-B76	2.64	=D76*$D$54*((C76-K	92	=SUM(E76:F76)
77	=(A76+1)	0.125	=A77-B77	2.64	=D77*$D$54*((C77-K	97	=SUM(E77:F77)
78	=(A77+1)	0.125	=A78-B78	2.64	=D78*$D$54*((C78-K	102	=SUM(E78:F78)
79	=(A78+1)	0.125	=A79-B79	2.64	=D79*$D$54*((C79-K	107	=SUM(E79:F79)
80	=(A79+1)	0.125	=A80-B80	2.64	=D80*$D$54*((C80-K	113	=SUM(E80:F80)
81	=(A80+1)	0.125	=A81-B81	2.64	=D81*$D$54*((C81-K	119	=SUM(E81:F81)
82	=(A81+1)	0.125	=A82-B82	2.64	=D82*$D$54*((C82-K	125	=SUM(E82:F82)
83	=(A82+1)	0.125	=A83-B83	2.64	=D83*$D$54*((C83-K	132	=SUM(E83:F83)

	A	B	C	D	E	F	G
49	TABLE 2						
50	ELEVATION-DISCHARGE CURVE FOR BROAD-CRESTED WEIR						
51	FUTURE - PRINCIPAL SPILLWAY CLOSED						
52							
53							
54	Effective Spillway Width			1200	ft		
55	Broad-crested weir rating curve (10-ft wide crest)						
56							
57	Reservoir Elevation (NAVD 88)	Conveyance Effects	Effective Head For Discharge Calculation	'C' Coefficient	Flow rate, 'Q'	Infiltration Amount	Total Discharge
58	(feet)	(ft)	(ft)		(cfs)	(cfs)	(cfs)
59	**1212.0**	0.000	1212.00	-	0	72.7	73
60	1213.0	0.125	1212.88	2.64	2593	78.96	2672
61	1214.0	0.125	1213.88	2.64	8134	84.41	8218
62	1215.0	0.125	1214.88	2.64	15443	89.86	15533
63	1216.0	0.125	1215.88	2.64	24165	96.02	24261
64	1217.0	0.125	1216.88	2.64	34099	102.14	34202
65	1218.0	0.125	1217.88	2.64	45113	108.43	45221
66	1219.0	0.125	1218.88	2.64	57108	114.54	57222
67	1220.0	0.125	1219.88	2.64	70010	121.34	70131
68							
69							

	A	B	C	D	E	F	G
49	TABLE 2						
50	ELEVATION-DISCHARGE CURVE FOR BROAD-CRESTED WEIR						
51	FUTURE - PRINCIPAL SPILLWAY CLOSED						
52							
53							
54	Effective Spillway Width			1200	ft		
55	Broad-crested w						
56							
57	Reservoir Elevation (NAVD 88)	Conveyance Effects	Effective Head For Discharge Calculation	'C' Coefficient	Flow rate, 'Q'	Infiltration Amount	Total Discharge
58	(feet)	(ft)	(ft)		(cfs)	(cfs)	(cfs)
59	1212	0	=A59-B59	-	0	72.7	=SUM(E59:F59)
60	=(A59+1)	0.125	=A60-B60	2.64	=D60*$D$54*((C60-$K$40)^1.5)	78.96	=SUM(E60:F60)
61	=(A60+1)	0.125	=A61-B61	2.64	=D61*$D$54*((C61-$K$40)^1.5)	84.412	=SUM(E61:F61)
62	=(A61+1)	0.125	=A62-B62	2.64	=D62*$D$54*((C62-$K$40)^1.5)	89.861	=SUM(E62:F62)
63	=(A62+1)	0.125	=A63-B63	2.64	=D63*$D$54*((C63-$K$40)^1.5)	96.018	=SUM(E63:F63)
64	=(A63+1)	0.125	=A64-B64	2.64	=D64*$D$54*((C64-$K$40)^1.5)	102.143	=SUM(E64:F64)
65	=(A64+1)	0.125	=A65-B65	2.64	=D65*$D$54*((C65-$K$40)^1.5)	108.43	=SUM(E65:F65)
66	=(A65+1)	0.125	=A66-B66	2.64	=D66*$D$54*((C66-$K$40)^1.5)	114.544	=SUM(E66:F66)
67	=(A66+1)	0.125	=A67-B67	2.64	=D67*$D$54*((C67-$K$40)^1.5)	121.344	=SUM(E67:F67)
68							
69							

	H	I	J	K	L	M	N	O	P
49		TABLE 3							
50		ELEVATION-DISCHARGE CURVE FOR BROAD-CRESTED WEIR							
51		FUTURE - PRINCIPAL SPILLWAY OPEN							
52									
53									
54		Effective Spillway Width			1200	ft			
55		Broad-crested weir rating curve (10-ft wide crest)							
56									
57		Reservoir Elevation (NAVD 88)	Conveyance Effects	Effective Head For Discharge Calculation	'C' Coefficient	Flow rate, 'Q'	Infiltration Amount	Principal Spillway Discharge	Total Discharge
58		(feet)	(ft)	(ft)		(cfs)	(cfs)	(cfs)	(cfs)
59		**1212.0**	0.0	1212.00	-	0	72.7	216	289
60		1213.0	0.125	1212.875	2.64	2593	78.96	222	2894
61		1214.0	0.125	1213.875	2.64	8134	84.41	228	8446
62		1215.0	0.125	1214.875	2.64	15443	89.86	233	15766
63		1216.0	0.125	1215.875	2.64	24165	96.02	239	24500
64		1217.0	0.125	1216.875	2.64	34099	102.14	244	34446
65		1218.0	0.125	1217.875	2.64	45113	108.43	250	45471
66		1219.0	0.125	1218.875	2.64	57108	114.54	255	57477
67		1220.0	0.125	1219.875	2.64	70010	121.34	260	70391
68									
69									

	H	I	J	K	L	M	N	O	P
49		TABLE 3							
50		ELEVATION-DISCHARGE CURVE FOR BROAD-CRESTED WEIR							
51		FUTURE - PRINCIPAL SPILLWAY OPEN							
52									
53									
54		Effective Spillway Width			1200	ft			
55		Broad-crested w							
56									
57		Reservoir Elevation (NAVD 88)	Conveyance Effects	Effective Head For Discharge Calculation		Flow rate, 'Q'	Infiltration Amount	Principal Spillway Discharge	Total Discharge
58		(feet)	(ft)	(ft)	'C' Coefficient	(cfs)	(cfs)	(cfs)	(cfs)
59		1212	0	=I59-J59	-	0	72.7	216	=SUM(M59:O59)
60		=(I59+1)	0.125	=I60-J60	2.64	=L60*$L$54*((K60-$K$40)^1.5)	78.96	222	=SUM(M60:O60)
61		=(I60+1)	0.125	=I61-J61	2.64	=L61*$L$54*((K61-$K$40)^1.5)	84.412	228	=SUM(M61:O61)
62		=(I61+1)	0.125	=I62-J62	2.64	=L62*$L$54*((K62-$K$40)^1.5)	89.861	233	=SUM(M62:O62)
63		=(I62+1)	0.125	=I63-J63	2.64	=L63*$L$54*((K63-$K$40)^1.5)	96.018	239	=SUM(M63:O63)
64		=(I63+1)	0.125	=I64-J64	2.64	=L64*$L$54*((K64-$K$40)^1.5)	102.143	244	=SUM(M64:O64)
65		=(I64+1)	0.125	=I65-J65	2.64	=L65*$L$54*((K65-$K$40)^1.5)	108.43	250	=SUM(M65:O65)
66		=(I65+1)	0.125	=I66-J66	2.64	=L66*$L$54*((K66-$K$40)^1.5)	114.544	255	=SUM(M66:O66)
67		=(I66+1)	0.125	=I67-J67	2.64	=L67*$L$54*((K67-$K$40)^1.5)	121.344	260	=SUM(M67:O67)
68									
69									

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crest is likely to become dulled or rusted, or it may be damaged by floating ice and debris. Under such conditions it may be advisable to use a weir with a thicker crest. It is often convenient to use an existing weir or overflow dam for measuring discharges. Weirs of various dimensions and shapes are used in hydraulic structures. When designing such structures it is important to be able to estimate approximately the discharges over these weirs (p. 2-15).

The amount of water which will pass over a weir, not sharp-crested, depends to a large extent upon its sectional form and the shape of its crest, and it is necessary to resort to experiment to determine the discharge over any particular shape. Inasmuch as the number of shapes of weirs is unlimited, it is not to be expected that experimental data are or ever will be available for them all. There are available, however, the results of several series of experiments on weirs of different cross sections which furnish much valuable information for determining discharges over weirs of the same or similar shapes.

The available experiments are not extensive enough for a comprehensive study of the effect of velocity of approach on weirs not sharp-crested. The coefficients given in this chapter probably apply more accurately where the velocity of approach is not high. From a consideration of sharp-crested weirs it appears that discharges, for high velocities of approach, will be somewhat greater than is given by formula (5-10).

Since experimental conditions will seldom be duplicated in practice, it is probable that errors may result from the general use of the coefficients given in this chapter. Extreme accuracy, however, is not always necessary in design, where uncertainty as to the exact quantity of water to be provided for may exist.

The problem of establishing a fixed relation between head and discharge, for weirs not sharp-crested, is complicated by the fact that the nappe may assume a variety of forms in passing over the weir. For each modification of nappe form, there is a corresponding change in the relation between head and discharge. The effect of this condition is more noticeable for low heads.

The nappe may undergo several of these modifications in succession as the head is varied. The successive forms that appear with an increasing stage may differ from those pertaining to similar stages with a decreasing head. The head at which the changes of nappe form occur varies with the rate of

change of head, whether increasing or decreasing, and with other conditions.

Among weirs of irregular section there is a large class for which, from the nature of their section, the nappe can assume only one form unless drowned. Such weirs, it is suggested, may, if properly calibrated, equal or exceed the usefulness of the thin-edged weir for purposes of stream gaging, because of their stability of section and because the thin-edged weir is not free from modification of nappe form for low heads.

Broad-crested Weirs. A weir approximately rectangular in cross section is termed a broad-crested weir. Unless otherwise noted, it will be assumed to have vertical faces, a plane level

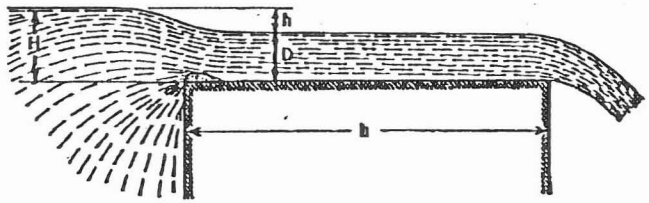

FIG. 5-6. Broad-crested weir.

crest, and sharp right-angled corners. Figure 6-6 represents a broad-crested weir of breadth b. The head H should be measured at least $2.5H$ upstream from the weir. Because of the sharp upstream edge, contraction of the nappe occurs. Surface contraction begins at a point slightly upstream from the weir.

The discharge over broad-crested weirs is usually expressed by the equation

$$Q = CLH^{3/2} \tag{5-10}$$

Experiments on broad-crested weirs have been performed by Blackwell, Bazin, Woodburn, the U.S. Deep Waterways Board, and the U.S. Geological Survey. These experiments cover a wide range of conditions as to head, breadth, and height of weir. Considerable discrepancy exists in the results of the different experimenters, especially for heads below 0.5 ft. For heads from 0.5 to about 1.5 ft the coefficient becomes more uniform, and for heads from 1.5 ft to that at which the nappe becomes detached from the crest, the coefficient as given by the different experiments is nearly constant and equals approximately 2.63.

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Table 5-3. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs

Measured head in feet, H	Breadth of crest of weir in feet										
	0.50	0.75	1.00	1.50	2.00	2.50	3.00	4.00	5.00	10.00	15.00
0.2	2.80	2.75	2.69	2.62	2.54	2.48	2.44	2.38	2.34	2.49	2.68
0.4	2.92	2.80	2.72	2.64	2.61	2.60	2.58	2.54	2.50	2.68	2.70
0.6	3.08	2.89	2.75	2.64	2.61	2.60	2.68	2.69	2.70	2.70	2.70
0.8	3.30	3.04	2.85	2.68	2.60	2.60	2.67	2.68	2.68	2.69	2.64
1.0	3.32	3.14	2.98	2.76	2.66	2.64	2.66	2.67	2.68	2.68	2.63
1.2	3.32	3.20	3.08	2.88	2.70	2.65	2.64	2.67	2.66	2.69	2.64
1.4	3.32	3.26	3.20	2.92	2.77	2.68	2.64	2.66	2.65	2.67	2.64
1.6	3.32	3.29	3.28	3.07	2.89	2.75	2.68	2.66	2.65	2.64	2.63
1.8	3.32	3.32	3.31	3.07	2.88	2.74	2.68	2.66	2.65	2.64	2.63
2.0	3.32	3.31	3.30	3.03	2.85	2.76	2.72	2.68	2.65	2.64	2.63
2.5	3.32	3.32	3.31	3.28	3.07	2.89	2.81	2.72	2.67	2.64	2.63
3.0	3.32	3.32	3.32	3.32	3.20	3.05	2.92	2.73	2.68	2.64	2.63
3.5	3.32	3.32	3.32	3.32	3.32	3.19	2.97	2.76	2.68	2.64	2.63
4.0	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.70	2.64	2.63
4.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.74	2.64	2.63
5.0	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.64	2.63
5.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.64	2.63

Table 5-4. Values of C in the Formula $Q = CLH^{3/2}$ for Models of Broad-crested Weirs with Rounded Upstream Corner

Name of experimenter	Radius of curve in feet	Breadth of weir in feet, B	Height of weir in feet, P	Head in feet, H									
				0.4	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Basin	0.33	2.52	2.46	3.03	2.97	2.93	3.01	3.04					
Basin	0.33	2.58	2.46	2.70	2.89	2.87	2.89	2.92					
U. S. Deep Waterways	0.33	2.62	2.57	....	2.77	2.80	2.83	2.92	3.00	3.08	3.17	3.34	3.50
U. S. Deep Waterways	0.33	2.56	2.56	....	....	2.83	2.83	2.83	2.82	2.82	2.82	2.82	2.81

Table 5-5. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs with Crests Inclined Slightly Downward

(a)

Crest	Energy head = H_e								
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6
Level	2.78	2.79	2.80	2.81	2.82	2.83	2.85	2.85	2.85
Slope = 0.004	2.95	2.94	2.93	2.92	2.91	2.90	2.88	2.87	2.87
Slope = 0.026	3.07	3.06	3.05	3.04	3.03	3.02	3.00	2.99	

(b)

Slope of crest	Length of weir in feet	Head in feet, H						
		0.1	0.2	0.3	0.4	0.5	0.6	0.7
12 to 1	3.0	2.58	2.57	2.57	2.60	2.64	2.81	2.70
18 to 1	3.0	2.91	2.92	2.53	2.60	2.80	2.74	2.62
18 to 1	10.0	2.52	2.68	2.73	2.80	2.90	2.80	2.68

Table 5-6. Values of C in the Formula $Q = CLH^{3/2}$ for Weirs of Triangular Cross Section with Vertical Upstream Face and Sloping Downstream Face

Slope of downstream face	Height of weir in feet, P	Head in feet, H										
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5
Hor.-Vert.												
1 to 1	2.46	3.88	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
2 to 1	2.46	3.48	3.48	3.49	3.49	3.50	3.50	3.50	3.50	3.51	3.51	
2 to 1	1.64	3.56	3.47	3.47	3.51	3.54	3.57	3.58	3.58	3.59	3.57	
3 to 1	1.64	....	2.90	3.11	3.22	3.26	3.33	3.37	3.40	3.40	3.41	3.41
5 to 1	2.46	....	3.08	3.06	3.05	3.05	3.07	3.09	3.12	3.13	3.13	3.13
10 to 1	2.46	....	2.82	2.83	2.84	2.86	2.89	2.90	2.91	2.91	2.92	2.93

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SOURCE: SURVEY DATA FROM 2003 WITH AN EXTENSION FROM A FCDMC DTM FILE ON 3.22.04 TO CURRENT USGS NAVD88

P:\FCDMC\23443698 White Tanks\Calcs\SpillwayPlan.dgn

XREFS: 52604,TOPO.DGN, PL-FCD.DGN

ITEM NO.	ITEM DESCRIPTION	QUANTITY

13

N

50 0 50 100
Scale in Feet

TWO WORKING DAYS BEFORE YOU DIG, CALL
263-1100
BLUE STAKE

ADWR APPROVAL

NO.	REVISION	BY	DATE
B	60% DESIGN SUBMITTAL	TER	6-04
A	30% DESIGN SUBMITTAL	TER	4-04

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

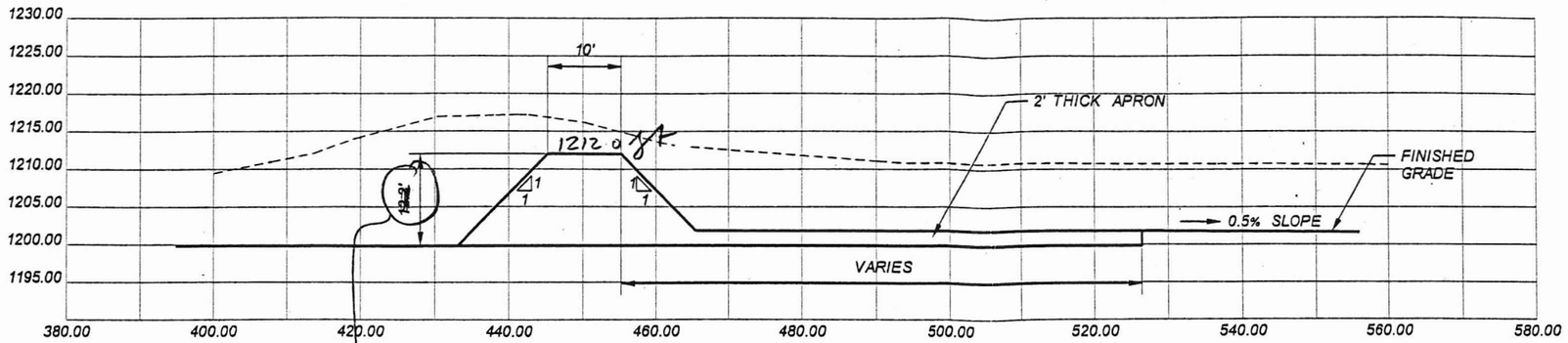
WHITE TANKS FRS NO. 3
REMEDIATION DESIGN - PHASE 2
PCN 470.04.30, FCD CONTRACT NO. 2004CO17

PRELIMINARY NOT FOR CONSTRUCTION

	BY	DATE
DESIGNED	TER	6-04
DRAWN	MSJ	6-04
CHECKED	RM	6-04

URS
7720 NORTH 16TH STREET
SUITE 100
PHOENIX, AZ 85020

DRAWING NO. | EMERGENCY SPILLWAY PLAN | SHEET C



ELEVATION — A
EMERGENCY SPILLWAY — 41

5 0 5 10
Scale in Feet

(varie b/w 6 to 9 ft)

ITEM NO.	ITEM DESCRIPTION	QUANTITY

(14)

TWO WORKING DAYS BEFORE YOU DIG, CALL
263-1100
BLUE STAKE

ADWR APPROVAL

NO.	REVISION	BY	DATE
A	60% DESIGN SUBMITTAL	TER	6-04

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

WHITE TANKS FRS NO. 3
REMEDIATION DESIGN - PHASE 2
PCN 470.04.30, FCD CONTRACT NO. 2004C017

PRELIMINARY NOT FOR CONSTRUCTION

	BY	DATE
DESIGNED	TER	6-04
DRAWN	MSJ	6-04
CHECKED	RM	6-04

URS
7720 NORTH 16TH STREET
SUITE 100
PHOENIX, AZ 85020

DRAWING NO. XS16

EMERGENCY SPILLWAY SECTIONS AND DETAILS

SHEET 41 OF 43

P:\FCDMC\23443698 White Tanks\CADD\P2\REV A\WT3_XS16-P2-REVA.dgn

Calculation Package 16

URS **EXHIBIT 4.7-2**

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title: **DETERMINATION OF ANTECEDENT RESERVOIR CONDITION (ARC) FOR RESERVOIR ROUTING PURPOSES BASED ON ADWR CRITERIA**

Total Number of Pages (including cover sheet): _____

Total Number of Computer Runs: _____

Prepared by: Hammad Hussain Date: 07/27/04

Checked by: Todd Ringsmuth Date: 7-28-04

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

Remarks/Conclusions/Results:

See Page 3.

Calculation Approved by: Todd Ringsmuth 7-28-04
Project Manager/Date

Revision No.:	Description of Revision:	Approved by:

Project Manager/Date

DETERMINATION OF ANTECEDENT RESERVOIR CONDITION (ARC) FOR RESERVOIR ROUTING PURPOSES BASED ON ADWR CRITERIA

(WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3)
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

The aim of this calculation package is to determine the ANTECEDENT RESERVOIR CONDITION (ARC) to be able to route the PMF hydrographs based on ADWR's design criteria.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

The ADWR design criteria are developed from "Draft Guidelines: Emergency Spillway Capacity, Reservoir Routing, and Freeboard Requirements" (ADWR, 1994) (Please See Page 8). The design criteria states that the ARC for PMF flood hydrographs will be determined based on routing results of 100-year 24-hour hydrograph. The ADWR criteria requires that the ARC for the reservoir routing purposes can be set at the invert of the lowest outlet if 85 percent of smaller of either 1) the reservoir volume at the spillway crest elevation or 2) the total runoff volume during the 100-year 24-hour storm can be drained within 10 days.

In order to evaluate the above criteria, first, the 100-year 24-hour hydrograph was routed with the ARC set at the invert of the lowest outlet or at elevation of 1193.0 ft (NAVD 88) with the gated outlet considered to be closed. The only discharges that were allowed to be released were through the emergency spillway and infiltration. The peak reservoir elevation was found to be equal to be 1208.90 ft (See Page 15).

Next step was to route the 100-year 24-hr hydrograph with:

1) ARC set a 1208.90 ft,
2) No new inflows coming into the reservoir and
3) Gated outlet of 48 inch was considered to be open.

The calculations related to development of the rating curve for an emergency spillway, estimation of the infiltration amounts and the capacity of the gated outlet are provided in separate calculation packages.

RESULTS

Based on the reservoir routing of 100-year 24-hr results, it was found that 97% of the reservoir volume could be drained by the end of 10th day (See Pages 36-37).

Given that ADWR criteria was met, 6-hr Local and 72-hr General PMF hydrographs for interim condition were decided to be routed with ARC set at invert level of the lowest outlet or at elevation of 1193.0 ft (NAVD 88).

Reservoir routing results (i.e. peak inflows, peak outflows, storage volume and the maximum reservoir stage) are summarized in Tables 1 & 2 (See Page 4).

TABLE 1
RESERVOIR ROUTING RESULTS
(BASED ON ADWR CRITERION ONLY)

Storm Event	Inflow to White Tank FRS No.3		Outflow from White Tank FRS No.3		
	Precipitation (inches)	Peak Inflow (cfs)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (ft)
100-yr 24-hr *1	3.85	9,600	1193.0	71.2	1208.9

TABLE 2
RESERVOIR ROUTING RESULTS
(BASED ON ADWR CRITERION ONLY)

Storm Event	Inflow to White Tank FRS No.3		Outflow from White Tank FRS No.3		
	Precipitation (inches)	Peak Inflow (cfs)	Antecedent Reservoir Condition (ARC) (ft)	Starting Reservoir Storage (ac-ft)	Reservoir Storage at End of 10th day (ac-ft)
100-yr 24-hr *2	3.85	0.0	1208.9	2293.0	58.0

Notes:

1) The first 100-year 24-hr hydrograph was routed to determine the peak reservoir elevation which was used as ARC to route the second 100-year 24-hr hydrograph with an assumption that no new inflows are coming in.

2) The second 100-year 24-hr hydrograph was routed to determine the storage at the end of 10th day and to determine whether 85 % of the storage have been drained.

(5)

ARIZONA DEPARTMENT OF WATER RESOURCES
OFFICE OF WATER ENGINEERING
Dam Safety and Flood Mitigation

PMF Studies for Evaluation of Spillway Adequacy
General Guidelines

Revised March 2004

Inflow design floods (IDFs) for jurisdictional dams in Arizona are almost always some percentage, up to and including 100 percent, of the probable maximum flood (PMF). Percentages of the PMF are calculated by reducing the ordinates of the PMF flood hydrograph(s). Therefore, IDF studies almost always begin with an assessment of the PMF.

All PMF studies submitted for evaluation of the spillway adequacy of existing or proposed jurisdictional dams should satisfy the following general requirements.

Watershed Hydrology

- 6-hour local and 72-hour general storm probable maximum precipitation (PMP) depths should be calculated using procedures described in Hydrometeorological Report No. 49 (HMR 49).

- Time-distribution for the 6-hour local PMP should be calculated using procedures described in HMR 49. The hypothetical storm used in the HEC-1 Program (i.e. the 'PH' Record) is not acceptable.

- HMR 49 does not include guidance for the time-distribution for the 72-hour general storm PMP. The worksheets used to develop the general storm provide the distribution by day and by 6-hour period for the largest day. The Department has previously approved use of the following distribution:

  1st Day: Second Largest Day uniformly distributed

  2nd day: Largest Day sequenced as follows:

  A. Third largest 6-hr period uniformly distributed
  B. Second largest 6-hr period uniformly distributed
  C. Largest 6-hr period uniformly distributed
  D. Fourth largest 6-hr period uniformly distributed

  3rd day: Smallest Day uniformly distributed

- Site-specific PMP depths and distributions may be accepted if independently reviewed by a qualified third-party meteorologist at the dam owner's expense.

- The potential for rainfall coupled with snowmelt should be considered where applicable.

- Rainfall-runoff analyses should be performed following an appropriate industry-recognized methodology. Examples of acceptable methodologies include:

    - USBR Flood Hydrology Manual
    - ADOT Highway Drainage Design Manual
    - USACE Flood Runoff Analysis – EM 1110-2-1417
    - Drainage Design Manual for Maricopa County, Arizona, Hydrology
    - NRCS National Engineering Handbook – Part 630 Hydrology

  The selected methodology should be clearly identified including a statement of justification explaining why it is the most appropriate method for the watershed being considered. If the selected methodology is not one of those included in the list above, then upon request a copy of the reference should be provided along with the study.

- The rainfall-runoff model should be "verified" using one or more of the following:

    - Known reservoir or streamflow data during one or more severe storms on the watershed or nearby similar watershed(s);
    - 100-year discharge by flood frequency analysis on the watershed or nearby similar watershed(s);
    - 100-year discharge by indirect method(s).

  The ADOT and Maricopa County drainage design manuals provide procedures for verification by indirect methods. Watershed characteristics that may explain differences between the model results and those predicted by indirect methods should be discussed and examined.

- The verified rainfall-runoff model should be modified to account for increased rates of runoff during the PMF (i.e. decreased losses and shortened lag time or time of concentration).

- Other dams within the contributing watershed should generally not be assumed to fail during floods equal to or smaller than their own IDF, even if they have inadequate spillway capacities.

- Other dams within the contributing watershed should be assessed for the level of flood attenuation they provide during the PMF. If expected to be significant they should be included in the analysis.

- Watershed conditions used for estimation of the PMF should include foreseeable future (e.g. 10 years) changes in land-use.

- Deliverables accompanying the study should at a minimum include:

    - Total and excess rainfall hyetographs and discharge hydrographs for major sub-basins;
    - Inflow hydrographs for all reservoirs;
    - One or more channel cross-sections showing maximum water surfaces for major routing reaches

Documentation accompanying the study should at a minimum include:

- Local and general PMP computation sheets;
- Topographic mapping of watershed including types/sources, scales, and dates;
- Drainage area boundaries including the study area boundary, major sub-basin boundaries, and concentration points;
- Channel cross-sections for routing reaches including sources.
- Soils maps;
- Land-use maps;
- Copy of references used for selecting specific basin parameters (i.e. infiltration rates, curve numbers, runoff roughness coefficients, etc.) if not included in the selected standard methodology;
- Watershed work maps including sub-basin boundaries and concentration points, time-of concentration or lag flow paths, and hydrograph routing paths;
- Verification procedures and results;
- Copies of representative hand-calculations;
- Hard and electronic copies of all input and output computer files;
- Discussion of error or warning messages included in computer output;
- Comparison of results with those from previous studies including a discussion of differences.

Reservoir Routing

- All spillway and outlet elevation-discharge relationships should be calculated using appropriate industry-recognized design guidelines such as:

  - Hydraulics of Broad-Crested Spillways (SCS TR-39, 1968)
  - Hydraulic Design of the Box-Inlet Drop Spillway (SCS AH-301, 1966)
  - Hydraulic Design of Spillways (USACE EM 1110-2-1603, 1990)
  - Hydraulic Design of Reservoir Outlet Works (USACE EM 1110-2-1602, 1980)
  - Discharge Coefficients for Irregular Overfall Spillways (USBR EM No. 9, 1952)
  - Design of Small Dams, 3rd Ed. (USBR, 1987)
  - Handbook of Hydraulics, 7th Ed. (Brater et al., 1996)
  - Etc.

- Discharges through all spillways and outlets should be calculated and summed at one-foot intervals.

- Often, a weir equation is used to calculate the rating curve for an emergency spillway. In general, the weir coefficient varies with weir geometry (i.e. crest width, slope of upstream face, height of crest above the approach channel, etc.). It also varies with overflow depth and thus is usually not constant for the range of discharges. Also, in order for the weir equation to be applicable for the full range of discharges, the channel flow downstream of the weir must be supercritical. If a weir equation is used, the choice of discharge coefficient must be documented with reference(s) or calculations and supercritical flow downstream of the weir must be shown for the range of discharges.

- Energy losses in long, shallow spillway approach channels should be evaluated. The spillway discharge relationship should be related to the reservoir water surface elevation, which may be higher than that immediately upstream of the weir.

- Channel spillways without a clearly defined control section should be analyzed using a step backwater analysis.

- Flood routings for permanent storage reservoirs will normally be required to begin with reservoir storage at the spillway crest elevation. Flood routings for single-purpose flood control dams may be allowed to begin with the reservoir elevation at the invert of the lowest outlet work if 85 percent of the smaller of either (1) the reservoir volume at the spillway crest elevation or (2) the total runoff volume during the 100-year 24-hour storm can be drained within 10 days.

- Level-pool routing procedures are generally acceptable for most flood routings. For very long, narrow reservoirs dynamic-wave routing procedures should be used.

- The inflow design flood should be that resulting from either the six-hour local storm PMP or seventy-two-hour general storm PMP, whichever results in a higher routed maximum reservoir water surface elevation.

- Deliverables accompanying the study should at a minimum include:

    - Elevation-storage relationship for all reservoirs routed via level-pool procedures;
    - Elevation-discharge relationships for all spillways and outlets and combined relationship for all dams;
    - Stage and discharge hydrographs for all reservoirs routed via level-pool procedures;
    - Maximum water surface elevation profile for all reservoirs routed via dynamic-wave procedures.
    - For dams predicted to be overtopped during the IDF:
        - i) Maximum depth and duration of overtopping during the IDF;
        - ii) Maximum percentage of the PMF during which the dam is not predicted to overtop.

- Documentation accompanying the study should at a minimum include:

    - Topographic mapping of the dam and reservoir including types/sources, scales, and dates;
    - Centerline profile of spillway starting upstream of the approach channel and terminating downstream of the stilling basin, if present;
    - One or more spillway cross-sections, as applicable;
    - Reservoir cross-sections used in dynamic-wave routing;
    - Centerline profile of outlet works showing conduit dimensions and entrance/exit conditions;
    - Copies of any design tables, charts, or nomographs used for predicting the hydraulic performance of spillway or outlet works;
    - Copies of representative hand calculations;
    - Hard and electronic copies of all input and output computer files;
    - Discussion of error or warning messages included in computer output;
    - Comparison of results with those from previous studies including a discussion of differences.

100-yr 24-hr Routing
(Gated outlet closed)

```
******************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY******************

JOB TR-20 WT100YR                          PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROUTING
TITLE     100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spillway
 4 DIMHYD                .0556                                          WT3
 8          0.0          .03          .10          .19          .31
 8          .47          .66          .82          .93          .99
 8          1.0          .99          .93          .82          .66
 8          .47          .31          .03          .00          .00
 9 ENDTBL
 5 RAINFL 2               .1000                                        TYPE II
 8          .0000        .0010        .0020        .0030        .0041
 8          .0051        .0062        .0072        .0083        .0094
 8          .0105        .0116        .0127        .0138        .0150
 8          .0161        .0173        .0184        .0196        .0208
 8          .0220        .0232        .0244        .0257        .0269
 8          .0281        .0294        .0306        .0319        .0332
 8          .0345        .0358        .0371        .0384        .0398
 8          .0411        .0425        .0439        .0452        .0466
 8          .0480        .0494        .0508        .0523        .0538
 8          .0553        .0568        .0583        .0598        .0614
 8          .0630        .0646        .0662        .0679        .0696
 8          .0712        .0730        .0747        .0764        .0782
 8          .0800        .0818        .0836        .0855        .0874
 8          .0892        .0912        .0931        .0950        .0970
 8          .0990        .1010        .1030        .1051        .1072
 8          .1093        .1114        .1135        .1156        .1178
 8          .1200        .1222        .1246        .1270        .1296
 8          .1322        .1350        .1379        .1408        .1438
 8          .1470        .1502        .1534        .1566        .1598
 8          .1630        .1663        .1697        .1733        .1771
 8          .1810        .1851        .1895        .1941        .1989
 8          .2040        .2094        .2152        .2214        .2280
 8          .2350        .2427        .2513        .2609        .2715
 8          .2830        .3068        .3544        .4308        .5679
 8          .6630        .6820        .6986        .7130        .7252
 8          .7350        .7434        .7514        .7588        .7656
 8          .7720        .7780        .7836        .7890        .7942
 8          .7990        .8036        .8080        .8122        .8162
 8          .8200        .8237        .8273        .8308        .8342
 8          .8376        .8409        .8442        .8474        .8505
 8          .8535        .8565        .8594        .8622        .8649
 8          .8676        .8702        .8728        .8753        .8777
 8          .8800        .8823        .8845        .8868        .8890
 8          .8912        .8934        .8955        .8976        .8997
 8          .9018        .9038        .9058        .9078        .9097
 8          .9117        .9136        .9155        .9173        .9192
 8          .9210        .9228        .9245        .9263        .9280
 8          .9297        .9313        .9330        .9346        .9362
 8          .9377        .9393        .9408        .9423        .9438
 8          .9452        .9466        .9480        .9493        .9507
 8          .9520        .9533        .9546        .9559        .9572
 8          .9584        .9597        .9610        .9622        .9635
 8          .9647        .9660        .9672        .9685        .9697
 8          .9709        .9722        .9734        .9746        .9758
 8          .9770        .9782        .9794        .9806        .9818
 8          .9829        .9841        .9853        .9864        .9876
```

Note: 1) First, 100-yr, 24-hr hydrograph was routed with ARC set at ~~lowest~~ invert of lowest outlet i.e 1193.0 ft

2) The gated outlet was closed

3) Peak reservoir elevation was determined i.e 1208.90 ft ~~and was~~.

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8          .9887       .9899       .9910       .9922       .9933
 8          .9944       .9956       .9967       .9978       .9989
 8          1.000       1.000       1.000       1.000       1.000
 9 ENDTBL
 2 XSECTN   005         1.0         8.77                                    BOSSCS#5
 8                      0.          0.0         0.0
 8                      0.35        5.          5.56
 8                      1.03        50.         30.95
 8                      1.39        100.        52.16
 8                      1.94        200.        88.72
 8                      2.63        400.        148.61
 8                      3.51        800.        260.63
 8                      4.62        1600.       459.66
 8                      6.04        3200.       929.36
 8                      7.38        6400.       1811.51
 8                      8.77        12800.      3374.20
 8                      10.17       25600.      6398.87
 8                      11.89       51200.      10982.51
 9 ENDTBL
 2 XSECTN   010         1.0         10.41                                   BOSSCS#4
 8                      0.          0.0         0.0
 8                      0.86        5.          4.39
 8                      2.01        50.         24.22
 8                      2.58        100.        40.12
 8                      3.46        200.        80.99
 8                      4.14        400.        129.44
 8                      5.16        800.        214.74
 8                      6.39        1600.       441.84
 8                      7.80        3200.       980.75
 8                      9.16        6400.       1891.44
 8                      10.41       12800.      3516.14
 8                      11.75       25600.      6548.98
 8                      13.26       51200.      11081.19
 9 ENDTBL
 2 XSECTN   020         1.0         7.3                                     REACHC
 8                      0.          0.0         0.0
 8                      1.01        100.        57.78
 8                      1.49        200.        86.81
 8                      1.88        300.        110.25
 8                      2.49        500.        149.47
 8                      3.68        1000.       226.31
 8                      5.40        2000.       346.26
 8                      7.85        4000.       533.39
 8                      9.64        6000.       688.07
 8                      11.16       8000.       838.10
 8                      12.46       10000.      985.31
 8                      13.61       12000.      1122.03
 8                      14.56       14000.      1236.94
 8                      15.43       16000.      1345.18
 8                      16.31       18000.      1456.68
 9 ENDTBL
 2 XSECTN   025         1.0         7.3                                     REACHB
 8                      0.          0.0         0.0
 8                      0.63        100.        80.89
 8                      0.93        200.        120.32
 8                      1.17        300.        151.77
```

**********80-80 LIST OF INPUT DATA (CONTINUED)**********

```
8                       1.56        500.        203.28
8                       2.30        1000.       302.00
8                       3.38        2000.       449.24
8                       4.97        4000.       673.73
8                       6.23        6000.       855.96
8                       7.31        8000.       1016.35
8                       8.24        10000.      1158.51
8                       9.09        12000.      1293.31
8                       9.90        14000.      1425.57
8                       10.64       16000.      1549.17
8                       11.36       18000.      1673.11
9 ENDTBL
2 XSECTN    030         1.0         9.45                                BOSSCS#6
8                       0.          0.0         0.0
8                       0.77        5.          4.67
8                       1.54        50.         32.06
8                       1.78        100.        56.64
8                       2.10        200.        100.59
8                       2.50        400.        179.97
8                       3.01        800.        320.25
8                       3.63        1600.       589.66
8                       4.35        3200.       1110.72
8                       5.21        6400.       2084.48
8                       6.03        12800.      4119.83
8                       6.99        25600.      6856.75
8                       8.28        51200.      11085.87
9 ENDTBL
2 XSECTN    045         1.0         4.87                                REACHA
8                       0.          0.0         0.0
8                       0.60        100.        85.69
8                       0.90        200.        127.94
8                       1.13        300.        161.93
8                       1.52        500.        217.27
8                       2.25        1000.       324.03
8                       3.31        2000.       483.02
8                       4.87        4000.       722.17
8                       6.09        6000.       914.99
8                       7.15        8000.       1084.61
8                       8.05        10000.      1234.17
8                       8.87        12000.      1373.80
8                       9.64        14000.      1507.84
8                       10.34       16000.      1633.45
8                       11.00       18000.      1753.12
9 ENDTBL
2 XSECTN    060         1.0         4.7                                 2CP6CP7
8                       0.          0.0         0.0
8                       2.36        100.        45.12
8                       2.88        200.        83.75
8                       3.18        300.        114.33
8                       3.64        500.        172.72
8                       4.42        1000.       289.04
8                       5.40        2000.       470.72
8                       6.87        4000.       782.74
8                       7.91        6000.       1020.12
8                       8.79        8000.       1231.25
8                       9.60        10000.      1435.05
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8                        10.26       12000.      1618.34
 8                        10.94       14000.      1812.58
 8                        11.47       16000.      1983.46
 8                        11.96       18000.      2150.12
 9 ENDTBL
 2 XSECTN   067           1.0         8.77                                    BOSSCS#5
 8                        0.          0.0         0.0
 8                        0.35        5.          5.56
 8                        1.03        50.         30.95
 8                        1.39        100.        52.16
 8                        1.94        200.        88.72
 8                        2.63        400.        148.61
 8                        3.51        800.        260.63
 8                        4.62        1600.       459.66
 8                        6.04        3200.       929.36
 8                        7.38        6400.       1811.51
 8                        8.77        12800.      3374.20
 8                        10.17       25600.      6398.87
 8                        11.89       51200.      10982.51
 9 ENDTBL
 3 STRUCT      01                                                             95/11/6
 8                        1178.0      0.00        0.0
 8                        1188.0      2.71        44.8
 8                        1193.0      7.29        129.0
 8                        1199.2      26.75       500.0
 8                        1202.0      38.68       845.55
 8                        1204.0      48.00       1176.28
 8                        1206.0      56.80       1575.25
 8                        1208.0      66.40       2044.97
 8                        1210.0      77.10       2593.40
 8                        1212.0      85.95       3218.00
 8                        1213.0      2685.00     3556.67
 8                        1214.0      8231.00     3916.02
 8                        1215.0      15545.0     4294.13
 8                        1216.0      24272.0     4692.68
 8                        1217.0      34212.0     5113.19
 8                        1218.0      45232.0     5556.01
 8                        1219.0      57233.0     6021.50
 8                        1220.0      70142.0     6509.75
 9 ENDTBL
 6 RUNOFF 1 001         1 2.46        87.2        0.85        1 1
 6 REACH  3 005   1     7 9100.                               1           BOSS#6
 6 REACH  3 010   7     2 9100.                               1           BOSS#4
 6 RUNOFF 1 002         3 2.38        79.9        0.73        1 1
 6 ADDHYD 4 012   2 3 1                                       1 1
 6 DIVERT 6 012   1 4 7 4100.         1.00        200.        1 1         OLIVE
 6 REACH  3 020   4     7 3332.                               1           REACH C
 6 REACH  3 025   7     5 1950.                               1           REACH B
 6 RUNOFF 1 003         6 3.94        87.2        0.88        1 1
 6 REACH  3 030   6     7 8865.                               1           BOSS#6
 6 REACH  3 005   7     1 8865.                               1           BOSS#5
 6 REACH  3 025   1     7 1950.                               1           REACH B
 6 RUNOFF 1 004         1 2.06        77.3        0.79        1 1
 6 ADDHYD 4 034   7 1 2                                       1 1
 6 ADDHYD 4 035   5 2 3                                       1 1
 6 DIVERT 6 035   3 4 7 11000.         1.00        199.        1 1         NORTHERN
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)*********************

 6 REACH  3 045   4   5 4200.                                1           REACH A
 6 RUNOFF 1 006       2 1.47        87.7        0.47        1 1
 6 REACH  3 060   2   3 7540.                                1           CP6CP7
 6 REACH  3 067   3   4 5140.                                1           BOSS#5
 6 ADDHYD 4 064   5 4 3                                      1 1
 6 RUNOFF 1 005       6 4.78        78.8        0.78        1 1
 6 RUNOFF 1 007       7 3.48        81.7        1.01        1 1
 6 ADDHYD 4 075   6 7 1                                      1 1
 6 ADDHYD 4 076   1 3 2                                      1 1     1
 6 RESVOR 2    01 2   1 1193.0                                1 1     1
   ENDATA
 7 LIST                 1.0                     1.
 7 INCREM 6             0.70
 7 COMPUT 7 001      01 0.          3.85        1.0         2 1  01  01
   ENDCMP 1
 7 COMPUT 7 001      01 0.          3.85        1.0         2 2  02  01
   ENDCMP 1
   ENDJOB 2

*********************************END OF 80-80 LIST*******************************
```

```
TR20 ------------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
13:52:40                    PASS   2   JOB NO.   1                        PAGE  21

    14.00 CFS       412     316     275     233     204     188     173     158
    19.60 CFS       143     127     120     118     114     111     109      45
    25.20 CFS       .00

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                  1.62 WATERSHED INCHES;    5009 CFS-HRS;     413.9 ACRE-FEET.

 *** WARNING - MAIN TIME INCREMENT (  .700) IS GREATER THAN 50% OF THE
               TIME OF CONCENTRATION (  .78) FOR SUBWATERSHED XSECTION   5.
               THIS WILL REDUCE THE COMPUTED PEAK BY ABOUT  37.9%.          ***


OPERATION RUNOFF    XSECTION   7

    PEAK TIME(HRS)             PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
       12.59                        2998.2                        (RUNOFF)

                    HYDROGRAPH POINTS FOR   ALTERNATE = 2,   STORM = 1
     HRS      MAIN TIME INCREMENT =  .700 hr,      DRAINAGE AREA =   3.48 SQ.MI.
     7.70 CFS         0       1      13      32      62     131     634    2998
    13.30 CFS       531     339     253     218     185     159     146     135
    18.90 CFS       123     111      98      92      90      87      85      83
    24.50 CFS     52.32     .00

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                  2.07 WATERSHED INCHES;    4660 CFS-HRS;     385.1 ACRE-FEET.

 *** WARNING - MAIN TIME INCREMENT (  .700) IS GREATER THAN 50% OF THE
               TIME OF CONCENTRATION ( 1.01) FOR SUBWATERSHED XSECTION   7.
               THIS WILL REDUCE THE COMPUTED PEAK BY ABOUT   7.4%.          ***


OPERATION ADDHYD    XSECTION  75

    PEAK TIME(HRS)             PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
       12.57                        5846.3                        (NULL)

                    HYDROGRAPH POINTS FOR   ALTERNATE = 2,   STORM = 1
     HRS      MAIN TIME INCREMENT =  .700 hr,      DRAINAGE AREA =   8.26 SQ.MI.
     7.70 CFS         0       1      14      52     119     275    1765    5841
    13.30 CFS      1135     751     569     493     418     363     335     308
    18.90 CFS       281     253     225     212     207     202     195     192
    24.50 CFS     97.28     .00

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                  1.88 WATERSHED INCHES;   10012 CFS-HRS;     827.4 ACRE-FEET.


OPERATION ADDHYD    XSECTION  76

    PEAK TIME(HRS)             PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
       12.61                        9652.1                        (NULL)
       14.01                        4911.1                        (NULL)
```

```
TR20 ------------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
13:52:40                    PASS   2   JOB NO.   1                        PAGE  22
```

HYDROGRAPH POINTS FOR ALTERNATE = 2, STORM = 1

MAIN TIME INCREMENT = .700 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
6.30 CFS	0	2	8	24	62	148	294	602
11.90 CFS	3168	9652	3391	4911	3512	2376	1666	1274
17.50 CFS	1063	923	821	738	660	609	576	547
23.10 CFS	526	511	348	173	127	61	25	10
28.70 CFS	3.75	1.39	.50	.18				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.16 WATERSHED INCHES; 28641 CFS-HRS; 2366.9 ACRE-FEET.

--- XSECTION 76, ALTERNATE 2, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

*** MESSAGE - STRUCTURE 1, USER ENTERED STARTING ELEVATION (1193.0 FEET) CAN ADD .118 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

*** MESSAGE - RESERVOIR ROUTING, STRUCTURE 1, TRUNCATED AT 400 POINTS WITH 1065.46 AC-FT (.08 WATERSHED INCHES) FLOOD STORAGE REMAINING IN RESERVOIR AT ELEV 1203.33 ***

outflow Hydrographs.

OPERATION RESVOR STRUCTURE 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.56	71.2	1208.90

*** WARNING - STRUCTURE 1, HYDROGRAPH VOLUME TRUNCATED AT 45 CFS RESVOR (63. % OF MAX. HYDROGRAPH COORDINATE) MAIN TIME INCREMENT TOO SMALL. ***

HYDROGRAPH POINTS FOR ALTERNATE = 2, STORM = 1

MAIN TIME INCREMENT = .700 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
4.90 CFS	7.29	7.27	7.24	7.23	7.22	7.25	7.36	7.65
10.50 CFS	8.30	9.63	15.31	31.98	43.78	49.93	55.24	58.77
16.10 CFS	61.08	62.75	64.06	65.15	66.11	66.93	67.64	68.28
21.70 CFS	68.87	69.42	69.95	70.46	70.86	71.08	71.17	71.19
27.30 CFS	71.16	71.10	71.03	70.95	70.87	70.79	70.71	70.63
32.90 CFS	70.55	70.47	70.39	70.31	70.23	70.16	70.08	70.00
38.50 CFS	69.92	69.84	69.76	69.68	69.60	69.52	69.45	69.37
44.10 CFS	69.29	69.21	69.13	69.06	68.98	68.90	68.82	68.74
49.70 CFS	68.67	68.59	68.51	68.43	68.36	68.28	68.20	68.13
55.30 CFS	68.05	67.97	67.90	67.82	67.74	67.67	67.59	67.51
60.90 CFS	67.44	67.36	67.29	67.21	67.13	67.06	66.98	66.91
66.50 CFS	66.83	66.76	66.68	66.61	66.53	66.46	66.38	66.30
72.10 CFS	66.22	66.14	66.07	65.99	65.91	65.83	65.75	65.68
77.70 CFS	65.60	65.52	65.44	65.37	65.29	65.21	65.14	65.06
83.30 CFS	64.98	64.91	64.83	64.75	64.68	64.60	64.52	64.45
88.90 CFS	64.37	64.29	64.22	64.14	64.07	63.99	63.92	63.84
94.50 CFS	63.76	63.69	63.61	63.54	63.46	63.39	63.31	63.24
100.10 CFS	63.16	63.09	63.01	62.94	62.87	62.79	62.72	62.64
105.70 CFS	62.57	62.50	62.42	62.35	62.27	62.20	62.13	62.05
111.30 CFS	61.98	61.91	61.83	61.76	61.69	61.61	61.54	61.47

Elevation Corresponding to Peak Discharge

$Q_1 = 66.40$ cfs , $E_1 = 1208.0$ ft

$Q_2 = 71.2$ cfs $E2 = ?$

$Q_3 = 77.1$ cfs $E3 = 1210.0$ ft

$$E2 = 1208.0 + \frac{(71.2 - 66.40)}{(77.1 - 66.40)} * (1210 - 1208)$$

$$E2 = 1208 + \frac{(4.8)}{(10.7)} * (2) = \boxed{1208.90 \text{ ft}}$$

116.90 CFS	61.40	61.32	61.25	61.18	61.11	61.03	60.96	60.89
122.50 CFS	60.82	60.75	60.68	60.60	60.53	60.46	60.39	60.32
128.10 CFS	60.25	60.17	60.10	60.03	59.96	59.89	59.82	59.75
133.70 CFS	59.68	59.61	59.54	59.47	59.40	59.33	59.26	59.19
139.30 CFS	59.12	59.05	58.98	58.91	58.84	58.77	58.70	58.63
144.90 CFS	58.56	58.49	58.42	58.35	58.28	58.22	58.15	58.08
150.50 CFS	58.01	57.94	57.87	57.80	57.74	57.67	57.60	57.53
156.10 CFS	57.46	57.40	57.33	57.26	57.19	57.12	57.06	56.99
161.70 CFS	56.92	56.85	56.79	56.71	56.64	56.57	56.50	56.43
167.30 CFS	56.35	56.28	56.21	56.14	56.07	56.00	55.92	55.85
172.90 CFS	55.78	55.71	55.64	55.57	55.50	55.43	55.36	55.29
178.50 CFS	55.21	55.14	55.07	55.00	54.93	54.86	54.79	54.72
184.10 CFS	54.65	54.58	54.51	54.45	54.38	54.31	54.24	54.17
189.70 CFS	54.10	54.03	53.96	53.89	53.82	53.75	53.69	53.62
195.30 CFS	53.55	53.48	53.41	53.34	53.28	53.21	53.14	53.07
200.90 CFS	53.01	52.94	52.87	52.80	52.74	52.67	52.60	52.53
206.50 CFS	52.47	52.40	52.33	52.27	52.20	52.13	52.07	52.00
212.10 CFS	51.93	51.87	51.80	51.74	51.67	51.60	51.54	51.47
217.70 CFS	51.41	51.34	51.28	51.21	51.15	51.08	51.01	50.95
223.30 CFS	50.88	50.82	50.76	50.69	50.63	50.56	50.50	50.43
228.90 CFS	50.37	50.30	50.24	50.18	50.11	50.05	49.98	49.92
234.50 CFS	49.86	49.79	49.73	49.67	49.60	49.54	49.48	49.41
240.10 CFS	49.35	49.29	49.22	49.16	49.10	49.04	48.97	48.91
245.70 CFS	48.85	48.79	48.72	48.66	48.60	48.54	48.48	48.41
251.30 CFS	48.35	48.29	48.23	48.17	48.11	48.05	47.98	47.90
256.90 CFS	47.82	47.75	47.67	47.59	47.51	47.44	47.36	47.28
262.50 CFS	47.20	47.13	47.05	46.97	46.90	46.82	46.74	46.67
268.10 CFS	46.59	46.52	46.44	46.36	46.29	46.21	46.14	46.06
273.70 CFS	45.99	45.91	45.84	45.76	45.69	45.62	45.54	45.47
279.30 CFS	45.39	45.32	45.24	45.17	45.10	45.02	44.95	44.88

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
1.19 WATERSHED INCHES; 15838 CFS-HRS; 1308.9 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 2, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 2

100-yr, 24-hr Routing
(Gated outlet open and started with Reservoir Full)

```
*****************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

JOB TR-20 WT100YR                          PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROUTING
TITLE     100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spillway
 4 DIMHYD                .0556                                          WT3
 8          0.0          .03          .10          .19          .31
 8          .47          .66          .82          .93          .99
 8          1.0          .99          .93          .82          .66
 8          .47          .31          .03          .00          .00
 9 ENDTBL
 5 RAINFL 2               .1000                                        TYPE II
 8          .0000        .0010        .0020        .0030        .0041
 8          .0051        .0062        .0072        .0083        .0094
 8          .0105        .0116        .0127        .0138        .0150
 8          .0161        .0173        .0184        .0196        .0208
 8          .0220        .0232        .0244        .0257        .0269
 8          .0281        .0294        .0306        .0319        .0332
 8          .0345        .0358        .0371        .0384        .0398
 8          .0411        .0425        .0439        .0452        .0466
 8          .0480        .0494        .0508        .0523        .0538
 8          .0553        .0568        .0583        .0598        .0614
 8          .0630        .0646        .0662        .0679        .0696
 8          .0712        .0730        .0747        .0764        .0782
 8          .0800        .0818        .0836        .0855        .0874
 8          .0892        .0912        .0931        .0950        .0970
 8          .0990        .1010        .1030        .1051        .1072
 8          .1093        .1114        .1135        .1156        .1178
 8          .1200        .1222        .1246        .1270        .1296
 8          .1322        .1350        .1379        .1408        .1438
 8          .1470        .1502        .1534        .1566        .1598
 8          .1630        .1663        .1697        .1733        .1771
 8          .1810        .1851        .1895        .1941        .1989
 8          .2040        .2094        .2152        .2214        .2280
 8          .2350        .2427        .2513        .2609        .2715
 8          .2830        .3068        .3544        .4308        .5679
 8          .6630        .6820        .6986        .7130        .7252
 8          .7350        .7434        .7514        .7588        .7656
 8          .7720        .7780        .7836        .7890        .7942
 8          .7990        .8036        .8080        .8122        .8162
 8          .8200        .8237        .8273        .8308        .8342
 8          .8376        .8409        .8442        .8474        .8505
 8          .8535        .8565        .8594        .8622        .8649
 8          .8676        .8702        .8728        .8753        .8777
 8          .8800        .8823        .8845        .8868        .8890
 8          .8912        .8934        .8955        .8976        .8997
 8          .9018        .9038        .9058        .9078        .9097
 8          .9117        .9136        .9155        .9173        .9192
 8          .9210        .9228        .9245        .9263        .9280
 8          .9297        .9313        .9330        .9346        .9362
 8          .9377        .9393        .9408        .9423        .9438
 8          .9452        .9466        .9480        .9493        .9507
 8          .9520        .9533        .9546        .9559        .9572
 8          .9584        .9597        .9610        .9622        .9635
 8          .9647        .9660        .9672        .9685        .9697
 8          .9709        .9722        .9734        .9746        .9758
 8          .9770        .9782        .9794        .9806        .9818
 8          .9829        .9841        .9853        .9864        .9876
```

1) 100-yr 24-hr hydrograph was routed with ARC set at 1204.16 ft, the peak elevation of 100-yr 24-hr hydrograph.
2) Gated outlet was supposed to be open.
3) No new inflows were supposed to be flowing in.
4) % volume drained after 10-days were determined.

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8          .9887       .9899       .9910       .9922       .9933
 8          .9944       .9956       .9967       .9978       .9989
 8          1.000       1.000       1.000       1.000       1.000
 9 ENDTBL
 2 XSECTN   005         1.0         8.77                                    BOSSCS#5
 8                      0.          0.0         0.0
 8                      0.35        5.          5.56
 8                      1.03        50.         30.95
 8                      1.39        100.        52.16
 8                      1.94        200.        88.72
 8                      2.63        400.        148.61
 8                      3.51        800.        260.63
 8                      4.62        1600.       459.66
 8                      6.04        3200.       929.36
 8                      7.38        6400.       1811.51
 8                      8.77        12800.      3374.20
 8                      10.17       25600.      6398.87
 8                      11.89       51200.      10982.51
 9 ENDTBL
 2 XSECTN   010         1.0         10.41                                   BOSSCS#4
 8                      0.          0.0         0.0
 8                      0.86        5.          4.39
 8                      2.01        50.         24.22
 8                      2.58        100.        40.12
 8                      3.46        200.        80.99
 8                      4.14        400.        129.44
 8                      5.16        800.        214.74
 8                      6.39        1600.       441.84
 8                      7.80        3200.       980.75
 8                      9.16        6400.       1891.44
 8                      10.41       12800.      3516.14
 8                      11.75       25600.      6548.98
 8                      13.26       51200.      11081.19
 9 ENDTBL
 2 XSECTN   020         1.0         7.3                                     REACHC
 8                      0.          0.0         0.0
 8                      1.01        100.        57.78
 8                      1.49        200.        86.81
 8                      1.88        300.        110.25
 8                      2.49        500.        149.47
 8                      3.68        1000.       226.31
 8                      5.40        2000.       346.26
 8                      7.85        4000.       533.39
 8                      9.64        6000.       688.07
 8                      11.16       8000.       838.10
 8                      12.46       10000.      985.31
 8                      13.61       12000.      1122.03
 8                      14.56       14000.      1236.94
 8                      15.43       16000.      1345.18
 8                      16.31       18000.      1456.68
 9 ENDTBL
 2 XSECTN   025         1.0         7.3                                     REACHB
 8                      0.          0.0         0.0
 8                      0.63        100.        80.89
 8                      0.93        200.        120.32
 8                      1.17        300.        151.77
```

**********80-80 LIST OF INPUT DATA (CONTINUED)**********

```
 8                      1.56        500.        203.28
 8                      2.30        1000.       302.00
 8                      3.38        2000.       449.24
 8                      4.97        4000.       673.73
 8                      6.23        6000.       855.96
 8                      7.31        8000.       1016.35
 8                      8.24        10000.      1158.51
 8                      9.09        12000.      1293.31
 8                      9.90        14000.      1425.57
 8                      10.64       16000.      1549.17
 8                      11.36       18000.      1673.11
 9 ENDTBL
 2 XSECTN    030        1.0         9.45                                BOSSCS#6
 8                      0.          0.0         0.0
 8                      0.77        5.          4.67
 8                      1.54        50.         32.06
 8                      1.78        100.        56.64
 8                      2.10        200.        100.59
 8                      2.50        400.        179.97
 8                      3.01        800.        320.25
 8                      3.63        1600.       589.66
 8                      4.35        3200.       1110.72
 8                      5.21        6400.       2084.48
 8                      6.03        12800.      4119.83
 8                      6.99        25600.      6856.75
 8                      8.28        51200.      11085.87
 9 ENDTBL
 2 XSECTN    045        1.0         4.87                                REACHA
 8                      0.          0.0         0.0
 8                      0.60        100.        85.69
 8                      0.90        200.        127.94
 8                      1.13        300.        161.93
 8                      1.52        500.        217.27
 8                      2.25        1000.       324.03
 8                      3.31        2000.       483.02
 8                      4.87        4000.       722.17
 8                      6.09        6000.       914.99
 8                      7.15        8000.       1084.61
 8                      8.05        10000.      1234.17
 8                      8.87        12000.      1373.80
 8                      9.64        14000.      1507.84
 8                      10.34       16000.      1633.45
 8                      11.00       18000.      1753.12
 9 ENDTBL
 2 XSECTN    060        1.0         4.7                                 2CP6CP7
 8                      0.          0.0         0.0
 8                      2.36        100.        45.12
 8                      2.88        200.        83.75
 8                      3.18        300.        114.33
 8                      3.64        500.        172.72
 8                      4.42        1000.       289.04
 8                      5.40        2000.       470.72
 8                      6.87        4000.       782.74
 8                      7.91        6000.       1020.12
 8                      8.79        8000.       1231.25
 8                      9.60        10000.      1435.05
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)*********************

 8                        10.26       12000.      1618.34
 8                        10.94       14000.      1812.58
 8                        11.47       16000.      1983.46
 8                        11.96       18000.      2150.12
 9 ENDTBL
 2 XSECTN   067           1.0         8.77                                    BOSSCS#5
 8                        0.          0.0         0.0
 8                        0.35        5.          5.56
 8                        1.03        50.         30.95
 8                        1.39        100.        52.16
 8                        1.94        200.        88.72
 8                        2.63        400.        148.61
 8                        3.51        800.        260.63
 8                        4.62        1600.       459.66
 8                        6.04        3200.       929.36
 8                        7.38        6400.       1811.51
 8                        8.77        12800.      3374.20
 8                        10.17       25600.      6398.87
 8                        11.89       51200.      10982.51
 9 ENDTBL
 3 STRUCT      01                                                             95/11/6
 8                        1178.0      0.0         0.
 8                        1188.0      0.02        44.8
 8                        1196.8      87.0        300.
 8                        1199.2      120.0       500.
 8                        1202.0      166.0       845.55
 8                        1204.0      196.00      1176.28
 8                        1206.0      224.0       1575.25
 8                        1208.0      250.0       2044.97
 8                        1210.0      275.0       2593.40
 8                        1212.0      299.00      3218.00
 8                        1213.0      2905.00     3556.67
 8                        1214.0      8457.00     3916.02
 8                        1215.0      15778.0     4294.13
 8                        1216.0      24512.0     4692.68
 8                        1217.0      34458.0     5113.19
 8                        1218.0      45483.0     5556.01
 8                        1219.0      57490.0     6021.50
 8                        1220.0      70405.0     6509.75
 9 ENDTBL
 6 RUNOFF 1 001       1 2.46          87.2        0.85        1 1
 6 REACH  3 005   1   7 9100.                                 1           BOSS#6
 6 REACH  3 010   7   2 9100.                                 1           BOSS#4
 6 RUNOFF 1 002       3 2.38          79.9        0.73        1 1
 6 ADDHYD 4 012   2 3 1                                       1 1
 6 DIVERT 6 012   1 4 7 4100.         1.00        200.        1 1         OLIVE
 6 REACH  3 020   4   7 3332.                                 1           REACH C
 6 REACH  3 025   7   5 1950.                                 1           REACH B
 6 RUNOFF 1 003       6 3.94          87.2        0.88        1 1
 6 REACH  3 030   6   7 8865.                                 1           BOSS#6
 6 REACH  3 005   7   1 8865.                                 1           BOSS#5
 6 REACH  3 025   1   7 1950.                                 1           REACH B
 6 RUNOFF 1 004       1 2.06          77.3        0.79        1 1
 6 ADDHYD 4 034   7 1 2                                       1 1
 6 ADDHYD 4 035   5 2 3                                       1 1
 6 DIVERT 6 035   3 4 7 11000.        1.00        199.        1 1         NORTHERN
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 6 REACH  3 045   4   5 4200.                                1           REACH A
 6 RUNOFF 1 006       2 1.47        87.7        0.47        1 1
 6 REACH  3 060   2   3 7540.                                1           CP6CP7
 6 REACH  3 067   3   4 5140.                                1           BOSS#5
 6 ADDHYD 4 064   5 4 3                                      1 1
 6 RUNOFF 1 005       6 4.78        78.8        0.78        1 1
 6 RUNOFF 1 007       7 3.48        81.7        1.01        1 1
 6 ADDHYD 4 075   6 7 1                                      1 1
 6 ADDHYD 4 076   1 3 2                                      1 1     1
 6 RESVOR 2    01 2   1 1208.90                              1 1     1
   ENDATA
 7 LIST                 1.0                     1.
 7 INCREM 6             0.70
 7 COMPUT 7 001      01 0.          0.01        1.0         2 1  01  01
   ENDCMP 1
 7 COMPUT 7 001      01 0.          0.01        1.0         2 2  02  01
   ENDCMP 1
   ENDJOB 2

*******************************END OF 80-80 LIST******************************
```

```
TR20 ------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
16:11:27                    PASS   1   JOB NO.   1                      PAGE   1

            COMPUTED DIMHYD PEAK RATE FACTOR =  664.607
```

```
TR20 ------------------------------------------------------------------- SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
16:11:27                    PASS   1   JOB NO.   1                      PAGE   2


EXECUTIVE CONTROL  LIST           1.          0.          1.

          LISTING OF CURRENT DATA


                      COMPUTED TIME INCREMENT
DIMHYD                          .0556

                   .0000       .0300       .1000       .1900       .3100
                   .4700       .6600       .8200       .9300       .9900
                  1.0000       .9900       .9300       .8200       .6600
                   .4700       .3100       .0300       .0000       .0000
ENDTBL

   COMPUTED PEAK RATE FACTOR =  664.607
```

	TABLE NO.	TIME INCREMENT				
RAINFL	1	.1000				
		.0000	.0017	.0035	.0052	.0070
		.0087	.0105	.0122	.0139	.0157
		.0174	.0192	.0210	.0227	.0245
		.0262	.0280	.0297	.0315	.0332
		.0350	.0368	.0386	.0404	.0423
		.0442	.0461	.0480	.0500	.0520
		.0540	.0561	.0582	.0603	.0625
		.0647	.0669	.0691	.0714	.0737
		.0760	.0784	.0807	.0831	.0855
		.0878	.0902	.0926	.0951	.0975
		.1000	.1024	.1049	.1073	.1098
		.1123	.1148	.1174	.1199	.1225
		.1250	.1276	.1303	.1332	.1361
		.1391	.1423	.1456	.1489	.1524
		.1560	.1597	.1633	.1671	.1708
		.1746	.1784	.1823	.1861	.1901
		.1940	.1982	.2027	.2077	.2132
		.2190	.2252	.2318	.2388	.2462
		.2540	.2623	.2714	.2812	.2917
		.3030	.3194	.3454	.3878	.4632
		.5150	.5322	.5476	.5612	.5730
		.5830	.5919	.6003	.6083	.6159
		.6230	.6298	.6365	.6430	.6493
		.6555	.6615	.6674	.6731	.6786
		.6840	.6892	.6944	.6995	.7044
		.7092	.7140	.7186	.7232	.7276
		.7320	.7362	.7404	.7444	.7484
		.7523	.7560	.7596	.7632	.7667
		.7700	.7733	.7766	.7798	.7830
		.7862	.7894	.7926	.7958	.7989
		.8020	.8051	.8082	.8112	.8142
		.8173	.8202	.8232	.8262	.8291
		.8320	.8349	.8378	.8406	.8434
		.8462	.8490	.8518	.8546	.8573
		.8600	.8627	.8654	.8680	.8706
		.8733	.8758	.8784	.8810	.8835
		.8860	.8885	.8910	.8934	.8958
		.8982	.9006	.9030	.9054	.9077
		.9100	.9123	.9146	.9168	.9190
		.9212	.9234	.9256	.9278	.9299
		.9320	.9341	.9362	.9382	.9402
		.9423	.9442	.9462	.9482	.9501
		.9520	.9539	.9558	.9576	.9594
		.9613	.9630	.9648	.9666	.9683
		.9700	.9717	.9734	.9750	.9766
		.9783	.9798	.9814	.9830	.9845
		.9860	.9875	.9890	.9904	.9918
		.9933	.9946	.9960	.9974	.9987
		1.0000	1.0000	1.0000	1.0000	1.0000

ENDTBL

STANDARD CONTROL INSTRUCTIONS

```
RUNOFF        1       1      2.4600     87.2000       .85001 1 0 0 0 1
REACH         5   1   7   9100.0000       .0000       .00001 0 0 0 0 1
REACH        10   7   2   9100.0000       .0000       .00001 0 0 0 0 1
RUNOFF        2       3      2.3800     79.9000       .73001 1 0 0 0 1
ADDHYD       12   2 3 1                                     1 1 0 0 0 1
DIVERT       12   1 4 7   4100.0000      1.0000    200.00001 1 0 0 0 1
REACH        20   4   7   3332.0000       .0000       .00001 0 0 0 0 1
REACH        25   7   5   1950.0000       .0000       .00001 0 0 0 0 1
RUNOFF        3       6      3.9400     87.2000       .88001 1 0 0 0 1
REACH        30   6   7   8865.0000       .0000       .00001 0 0 0 0 1
REACH         5   7   1   8865.0000       .0000       .00001 0 0 0 0 1
REACH        25   1   7   1950.0000       .0000       .00001 0 0 0 0 1
RUNOFF        4       1      2.0600     77.3000       .79001 1 0 0 0 1
ADDHYD       34   7 1 2                                     1 1 0 0 0 1
ADDHYD       35   5 2 3                                     1 1 0 0 0 1
DIVERT       35   3 4 7  11000.0000      1.0000    199.00001 1 0 0 0 1
REACH        45   4   5   4200.0000       .0000       .00001 0 0 0 0 1
RUNOFF        6       2      1.4700     87.7000       .47001 1 0 0 0 1
REACH        60   2   3   7540.0000       .0000       .00001 0 0 0 0 1
REACH        67   3   4   5140.0000       .0000       .00001 0 0 0 0 1
ADDHYD       64   5 4 3                                     1 1 0 0 0 1
RUNOFF        5       6      4.7800     78.8000       .78001 1 0 0 0 1
RUNOFF        7       7      3.4800     81.7000      1.01001 1 0 0 0 1
ADDHYD       75   6 7 1                                     1 1 0 0 0 1
ADDHYD       76   1 3 2                                     1 1 0 0 1 1
RESVOR          1 2   1   1208.9000                         1 1 0 0 1 1
ENDATA
```

END OF LISTING

```
TR20 ------------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
16:11:27                    PASS   1   JOB NO.   1                        PAGE   5


EXECUTIVE CONTROL  INCREM    MAIN TIME INCREMENT =   .700 HOURS


EXECUTIVE CONTROL  COMPUT    FROM XSECTION   1  TO STRUCTURE  1
    STARTING TIME =   .00       RAIN DEPTH =   .01       RAIN DURATION =  1.00
    ANT. RUNOFF COND. = 1       MAIN TIME INCREMENT =   .700 HOURS
    ALTERNATE NO. = 1           STORM NO. = 1            RAIN TABLE NO. = 2


OPERATION RUNOFF    XSECTION   1

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION   5

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  10

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   2

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  12

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.
```

```
OPERATION DIVERT    XSECTION  12
                    OUTPUT #1 HYDROGRAPH

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


            OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION  200)

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                      1 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  20

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  25

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   3

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  30

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.
```

```
TR20 ------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
16:11:27                    PASS   1   JOB NO.   1                      PAGE   7


OPERATION REACH     XSECTION   5

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  25

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   4

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  34

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  35

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION DIVERT    XSECTION  35
                    OUTPUT #1 HYDROGRAPH

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.
```

```
          OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION  199)

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                     1 CFS-HRS;         .0 ACRE-FEET.


OPERATION REACH     XSECTION  45

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                   .00 WATERSHED INCHES;       0 CFS-HRS;         .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   6

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                   .00 WATERSHED INCHES;       1 CFS-HRS;         .0 ACRE-FEET.


OPERATION REACH     XSECTION  60

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                   .00 WATERSHED INCHES;       0 CFS-HRS;         .0 ACRE-FEET.


OPERATION REACH     XSECTION  67

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                   .00 WATERSHED INCHES;       0 CFS-HRS;         .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  64

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                   .00 WATERSHED INCHES;       1 CFS-HRS;         .0 ACRE-FEET.
```

```
OPERATION RUNOFF    XSECTION   5

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION RUNOFF    XSECTION   7

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION ADDHYD    XSECTION  75

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION ADDHYD    XSECTION  76

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

 *** MESSAGE - STRUCTURE  1, USER ENTERED STARTING ELEVATION ( 1208.9 FEET) CAN
               ADD  2.089 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

OPERATION RESVOR    STRUCTURE  1

    PEAK TIME(HRS)            PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
       23.80                        261.3                        1208.90

                    HYDROGRAPH POINTS FOR   ALTERNATE = 1,   STORM = 1
     HRS      MAIN TIME INCREMENT =  .700 hr,      DRAINAGE AREA =  20.57 SQ.MI.
    23.80 CFS      261      261      260      259      259      258      257      256
    29.40 CFS      256      255      254      254      253      252      252      251
    35.00 CFS      250      250      249      248      247      247      246      245
    40.60 CFS      244      243      243      242      241      240      240      239
    46.20 CFS      238      237      237      236      235      234      234      233
    51.80 CFS      232      231      231      230      229      228      228      227
    57.40 CFS      226      225      225      224      223      222      221      220
```

63.00 CFS	219	219	218	217	216	215	214	213
68.60 CFS	212	212	211	210	209	208	207	207
74.20 CFS	206	205	204	203	202	202	201	200
79.80 CFS	199	198	197	197	196	195	194	193
85.40 CFS	192	191	190	189	188	187	186	185
91.00 CFS	184	183	182	181	180	179	178	177
96.60 CFS	176	175	175	174	173	172	171	170
102.20 CFS	169	168	167	166	165	164	163	162
107.80 CFS	160	159	158	157	156	154	153	152
113.40 CFS	151	150	148	147	146	145	144	143
119.00 CFS	142	141	140	139	137	136	135	134
124.60 CFS	133	132	131	130	129	128	127	126
130.20 CFS	125	124	123	122	122	121	120	118
135.80 CFS	117	116	115	114	113	112	111	110
141.40 CFS	109	108	107	106	105	104	103	102
147.00 CFS	101	100	99	98	97	96	95	94
152.60 CFS	93.33	92.44	91.57	90.70	89.83	88.98	88.13	87.30
158.20 CFS	85.91	84.23	82.58	80.97	79.39	77.84	76.32	74.83
163.80 CFS	73.37	71.94	70.53	69.16	67.81	66.48	65.18	63.91
169.40 CFS	62.66	61.44	60.24	59.06	57.91	56.78	55.67	54.58
175.00 CFS	53.52	52.47	51.45	50.44	49.46	48.49	47.55	46.62
180.60 CFS	45.71	44.82	43.94	43.08	42.24	41.42	40.61	39.82
186.20 CFS	39.04	38.28	37.53	36.80	36.08	35.37	34.68	34.01
191.80 CFS	33.34	32.69	32.05	31.43	30.81	30.21	29.62	29.04
197.40 CFS	28.48	27.92	27.37	26.84	26.32	25.80	25.30	24.80
203.00 CFS	24.32	23.85	23.38	22.92	22.48	22.04	21.61	21.18
208.60 CFS	20.77	20.37	19.97	19.58	19.20	18.82	18.45	18.09
214.20 CFS	17.74	17.39	17.05	16.72	16.39	16.07	15.76	15.45
219.80 CFS	15.15	14.86	14.57	14.28	14.00	13.73	13.46	13.20
225.40 CFS	12.94	12.69	12.44	12.20	11.96	11.73	11.50	11.27
231.00 CFS	11.05	10.84	10.62	10.42	10.21	10.01	9.82	9.63
236.60 CFS	9.44	9.25	9.07	8.90	8.72	8.55	8.39	8.22
242.20 CFS	8.06	7.90	7.75	7.60	7.45	7.30	7.16	7.02
247.80 CFS	6.88	6.75	6.62	6.49	6.36	6.24	6.12	6.00
253.40 CFS	5.88	5.77	5.65	5.54	5.43	5.33	5.22	5.12
259.00 CFS	5.02	4.92	4.83	4.73	4.64	4.55	4.46	4.37
264.60 CFS	4.29	4.21	4.12	4.04	3.96	3.89	3.81	3.74
270.20 CFS	3.66	3.59	3.52	3.45	3.39	3.32	3.25	3.19
275.80 CFS	3.13	3.07	3.01	2.95	2.89	2.83	2.78	2.73
281.40 CFS	2.67	2.62	2.57	2.52	2.47	2.42	2.37	2.33
287.00 CFS	2.28	2.24	2.19	2.15	2.11	2.07	2.03	1.99
292.60 CFS	1.95	1.91	1.87	1.84	1.80	1.77	1.73	1.70
298.20 CFS	1.66	1.63	1.60	1.57	1.54	1.51	1.48	1.45

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.04 WATERSHED INCHES; 27138 CFS-HRS; 2242.6 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 1, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

```
TR20 ------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
16:11:27                    PASS   2   JOB NO.   1                      PAGE  11


EXECUTIVE CONTROL  ENDCMP    COMPUTATIONS COMPLETED FOR PASS   1


EXECUTIVE CONTROL  COMPUT    FROM XSECTION   1  TO STRUCTURE  1
    STARTING TIME =   .00       RAIN DEPTH =   .01        RAIN DURATION =  1.00
    ANT. RUNOFF COND. = 2       MAIN TIME INCREMENT =   .700 HOURS
    ALTERNATE NO. = 2           STORM NO. = 1             RAIN TABLE NO. = 2


OPERATION RUNOFF    XSECTION   1

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  2.04 WATERSHED INCHES;       1 CFS-HRS;    2242.6 ACRE-FEET.


OPERATION REACH     XSECTION   5

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  10

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   2

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                   .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  12

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***
```

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    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION DIVERT    XSECTION  12
                    OUTPUT #1 HYDROGRAPH

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

            OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION  200)

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                      1 CFS-HRS;        .0 ACRE-FEET.

OPERATION REACH     XSECTION  20

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.

OPERATION REACH     XSECTION  25

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.

OPERATION RUNOFF    XSECTION   3

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION REACH     XSECTION  30

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***
```

```
   RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.

OPERATION REACH     XSECTION   5

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                 ***

   RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.

OPERATION REACH     XSECTION  25

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                 ***

   RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.

OPERATION RUNOFF    XSECTION   4

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                 ***

   RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION ADDHYD    XSECTION  34

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                 ***

   RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION ADDHYD    XSECTION  35

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                 ***

   RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

OPERATION DIVERT    XSECTION  35
                    OUTPUT #1 HYDROGRAPH

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                 ***
```

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```
    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


            OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION  199)

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                     1 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  45

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   6

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  60

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION REACH     XSECTION  67

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =    .00 CFS)
                  .00 WATERSHED INCHES;       0 CFS-HRS;        .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  64

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***
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```
TR20 ------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST
16:11:27                    PASS   2   JOB NO.   1                      PAGE  15


    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   5

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION RUNOFF    XSECTION   7

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  75

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.


OPERATION ADDHYD    XSECTION  76

 *** MESSAGE - HYDROGRAPH CONTAINS NO FLOW                                  ***

    RUNOFF ABOVE BASEFLOW  (BASEFLOW =     .00 CFS)
                    .00 WATERSHED INCHES;       1 CFS-HRS;        .0 ACRE-FEET.

 *** MESSAGE - STRUCTURE  1, USER ENTERED STARTING ELEVATION ( 1208.9 FEET) CAN
               ADD  2.089 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***


OPERATION RESVOR    STRUCTURE  1

    PEAK TIME(HRS)              PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
       23.80                          261.3                        1208.90

                    HYDROGRAPH POINTS FOR   ALTERNATE = 2,   STORM = 1
     HRS       MAIN TIME INCREMENT =  .700 hr,      DRAINAGE AREA =  20.57 SQ.MI.
   23.80 CFS       261      261      260      259      259      258      257      256
   29.40 CFS       256      255      254      254      253      252      252      251
   35.00 CFS       250      250      249      248      247      247      246      245
   40.60 CFS       244      243      243      242      241      240      240      239
```

Storage corresponding to Peak Discharge 261.3 cfs

$Q_1 = 250$ cfs $S1 = 2045$ acft

$Q_2 = 261.3$ cfs $S2 = ?$

$Q_3 = 275$ cfs $S3 = 2594$ acft

$$S_2 = 2045 + \frac{(261.3-250)}{(275-250)} * (2594-2045)$$

$$S_2 = 2045 + \left(\frac{11.3}{25}\right)(549) = 2293 \text{ acft}$$

46.20 CFS	238	237	237	236	235	234	234	233
51.80 CFS	232	231	231	230	229	228	228	227
57.40 CFS	226	225	225	224	223	222	221	220
63.00 CFS	219	219	218	217	216	215	214	213
68.60 CFS	212	212	211	210	209	208	207	207
74.20 CFS	206	205	204	203	202	202	201	200
79.80 CFS	199	198	197	197	196	195	194	193
85.40 CFS	192	191	190	189	188	187	186	185
91.00 CFS	184	183	182	181	180	179	178	177
96.60 CFS	176	175	175	174	173	172	171	170
102.20 CFS	169	168	167	166	165	164	163	162
107.80 CFS	160	159	158	157	156	154	153	152
113.40 CFS	151	150	148	147	146	145	144	143
119.00 CFS	142	141	140	139	137	136	135	134
124.60 CFS	133	132	131	130	129	128	127	126
130.20 CFS	125	124	123	122	122	121	120	118
135.80 CFS	117	116	115	114	113	112	111	110
141.40 CFS	109	108	107	106	105	104	103	102
147.00 CFS	101	100	99	98	97	96	95	94
152.60 CFS	93.33	92.44	91.57	90.70	89.83	88.98	88.13	87.30
158.20 CFS	85.91	84.23	82.58	80.97	79.39	77.84	76.32	74.83
163.80 CFS	73.37	71.94	70.53	69.16	67.81	66.48	65.18	63.91
169.40 CFS	62.66	61.44	60.24	59.06	57.91	56.78	55.67	54.58
175.00 CFS	53.52	52.47	51.45	50.44	49.46	48.49	47.55	46.62
180.60 CFS	45.71	44.82	43.94	43.08	42.24	41.42	40.61	39.82
186.20 CFS	39.04	38.28	37.53	36.80	36.08	35.37	34.68	34.01
191.80 CFS	33.34	32.69	32.05	31.43	30.81	30.21	29.62	29.04
197.40 CFS	28.48	27.92	27.37	26.84	26.32	25.80	25.30	24.80
203.00 CFS	24.32	23.85	23.38	22.92	22.48	22.04	21.61	21.18
208.60 CFS	20.77	20.37	19.97	19.58	19.20	18.82	18.45	18.09
214.20 CFS	17.74	17.39	17.05	16.72	16.39	16.07	15.76	15.45
219.80 CFS	15.15	14.86	14.57	14.28	14.00	13.73	13.46	13.20
225.40 CFS	12.94	12.69	12.44	12.20	11.96	11.73	11.50	11.27
231.00 CFS	11.05	10.84	10.62	10.42	10.21	10.01	9.82	9.63
236.60 CFS	9.44	9.25	9.07	8.90	8.72	8.55	8.39	8.22
242.20 CFS	8.06	7.90	7.75	7.60	7.45	7.30	7.16	7.02
247.80 CFS	6.88	6.75	6.62	6.49	6.36	6.24	6.12	6.00
253.40 CFS	5.88	5.77	5.65	5.54	5.43	5.33	5.22	5.12
259.00 CFS	5.02	4.92	4.83	4.73	4.64	4.55	4.46	4.37
264.60 CFS	4.29	4.21	4.12	4.04	3.96	3.89	3.81	3.74
270.20 CFS	3.66	3.59	3.52	3.45	3.39	3.32	3.25	3.19
275.80 CFS	3.13	3.07	3.01	2.95	2.89	2.83	2.78	2.73
281.40 CFS	2.67	2.62	2.57	2.52	2.47	2.42	2.37	2.33
287.00 CFS	2.28	2.24	2.19	2.15	2.11	2.07	2.03	1.99
292.60 CFS	1.95	1.91	1.87	1.84	1.80	1.77	1.73	1.70
298.20 CFS	1.66	1.63	1.60	1.57	1.54	1.51	1.48	1.45

Discharge at end of 10th day

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.04 WATERSHED INCHES; 27138 CFS-HRS; 2242.6 ACRE-FEET.

Reservior storage at end of 10th day

$Q_1 = 0.02$ cfs $S1 = 44.8$ acft

$Q_2 = 4.37$ cfs $S2 = ?$

$Q_3 = 87.0$ cfs $S3 = 300$ acft

$$S2 = 44.8 + \frac{(4.37 - 0.02)}{(87 - 0.02)} * (300 - 44.8)$$

$S2 = 58$ acft

% volume drained in 10 days $= \left(\frac{2293 - 58}{2293}\right) * 100 = 97\%$

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--- STRUCTURE 1, ALTERNATE 2, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 2

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

RAINFALL OF .01 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 2, ARC 1
MAIN TIME INCREMENT .700 HOURS

ALTERNATE 1 STORM 1

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION 1	RUNOFF	2.46	.00	---	.00	0	.0
XSECTION 5	REACH	2.46	.00	---	.00	0	.0
XSECTION 10	REACH	2.46	.00	---	.00	0	.0
XSECTION 2	RUNOFF	2.38	.00	---	.00	0	.0
XSECTION 12	ADDHYD	4.84	.00	---	.00	0	.0
XSECTION 12	DIVERT	4.84	.00	---	.00	0	.0
XSECTION 200	DIVERT	.00	.00	---	.00	0	********
XSECTION 20	REACH	4.84	.00	---	.00	0	.0
XSECTION 25	REACH	4.84	.00	---	.00	0	.0
XSECTION 3	RUNOFF	3.94	.00	---	.00	0	.0
XSECTION 30	REACH	3.94	.00	---	.00	0	.0
XSECTION 5	REACH	3.94	.00	---	.00	0	.0
XSECTION 25	REACH	3.94	.00	---	.00	0	.0
XSECTION 4	RUNOFF	2.06	.00	---	.00	0	.0
XSECTION 34	ADDHYD	6.00	.00	---	.00	0	.0
XSECTION 35	ADDHYD	10.84	.00	---	.00	0	.0
XSECTION 35	DIVERT	10.84	.00	---	.00	0	.0
XSECTION 199	DIVERT	.00	.00	---	.00	0	********
XSECTION 45	REACH	10.84	.00	---	.00	0	.0
XSECTION 6	RUNOFF	1.47	.00	---	.00	0	.0
XSECTION 60	REACH	1.47	.00	---	.00	0	.0
XSECTION 67	REACH	1.47	.00	---	.00	0	.0
XSECTION 64	ADDHYD	12.31	.00	---	.00	0	.0
XSECTION 5	RUNOFF	4.78	.00	---	.00	0	.0
XSECTION 7	RUNOFF	3.48	.00	---	.00	0	.0
XSECTION 75	ADDHYD	8.26	.00	---	.00	0	.0
XSECTION 76	ADDHYD	20.57	.00	---	.00	0	.0
STRUCTURE 1	RESVOR	20.57	2.04	1208.90	23.80	261	12.7

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
RAINTABLE NUMBER 2, ARC 2							
ALTERNATE 2 STORM 1							
XSECTION 1	RUNOFF	2.46	2.04	---	.00	0	.0
XSECTION 5	REACH	2.46	.00	---	.00	0	.0
XSECTION 10	REACH	2.46	.00	---	.00	0	.0
XSECTION 2	RUNOFF	2.38	.00	---	.00	0	.0
XSECTION 12	ADDHYD	4.84	.00	---	.00	0	.0
XSECTION 12	DIVERT	4.84	.00	---	.00	0	.0
XSECTION 200	DIVERT	.00	.00	---	.00	0	********
XSECTION 20	REACH	4.84	.00	---	.00	0	.0
XSECTION 25	REACH	4.84	.00	---	.00	0	.0
XSECTION 3	RUNOFF	3.94	.00	---	.00	0	.0
XSECTION 30	REACH	3.94	.00	---	.00	0	.0
XSECTION 5	REACH	3.94	.00	---	.00	0	.0
XSECTION 25	REACH	3.94	.00	---	.00	0	.0
XSECTION 4	RUNOFF	2.06	.00	---	.00	0	.0
XSECTION 34	ADDHYD	6.00	.00	---	.00	0	.0
XSECTION 35	ADDHYD	10.84	.00	---	.00	0	.0
XSECTION 35	DIVERT	10.84	.00	---	.00	0	.0
XSECTION 199	DIVERT	.00	.00	---	.00	0	********
XSECTION 45	REACH	10.84	.00	---	.00	0	.0
XSECTION 6	RUNOFF	1.47	.00	---	.00	0	.0
XSECTION 60	REACH	1.47	.00	---	.00	0	.0
XSECTION 67	REACH	1.47	.00	---	.00	0	.0
XSECTION 64	ADDHYD	12.31	.00	---	.00	0	.0
XSECTION 5	RUNOFF	4.78	.00	---	.00	0	.0
XSECTION 7	RUNOFF	3.48	.00	---	.00	0	.0

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 2 STORM 1							
XSECTION 75	ADDHYD	8.26	.00	---	.00	0	.0
XSECTION 76	ADDHYD	20.57	.00	---	.00	0	.0
STRUCTURE 1	RESVOR	20.57	2.04	1208.90	23.80	261	12.7

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SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.
QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;
LENGTH FACTOR - VALUE k* GREATER THAN 1.0;
ATT-KIN COEFF - VALUE C GREATER THAN 0.667.

			HYDROGRAPH INFORMATION				ROUTING PARAMETERS				
		FLOOD	INFLOW		OUTFLOW		Q-A EQ.			PEAK	ATT-
XSEC ID	REACH LENGTH (FT)	PLAIN LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	COEFF (X)	POWER (M)	LENGTH FACTOR (k*)	RATIO Q/I (Q*)	KIN COEFF (C)
BASEFLOW IS .0 CFS											
ALTERNATE 1 STORM 1											
5	9100		0	.0	0	.0	.000	.00	.000	.000	.00
10	9100		0	.0	0	.0	.000	.00	.000	.000	.00
20	3332		0	.0	0	.0	.000	.00	.000	.000	.00
25	1950		0	.0	0	.0	.000	.00	.000	.000	.00
30	8865		0	.0	0	.0	.000	.00	.000	.000	.00
5	8865		0	.0	0	.0	.000	.00	.000	.000	.00
25	1950		0	.0	0	.0	.000	.00	.000	.000	.00
45	4200		0	.0	0	.0	.000	.00	.000	.000	.00
60	7540		0	.0	0	.0	.000	.00	.000	.000	.00
67	5140		0	.0	0	.0	.000	.00	.000	.000	.00
ALTERNATE 2 STORM 1											
5	9100		0	.0	0	.0	.000	.00	.000	.000	.00
10	9100		0	.0	0	.0	.000	.00	.000	.000	.00
20	3332		0	.0	0	.0	.000	.00	.000	.000	.00
25	1950		0	.0	0	.0	.000	.00	.000	.000	.00
30	8865		0	.0	0	.0	.000	.00	.000	.000	.00
5	8865		0	.0	0	.0	.000	.00	.000	.000	.00
25	1950		0	.0	0	.0	.000	.00	.000	.000	.00
45	4200		0	.0	0	.0	.000	.00	.000	.000	.00
60	7540		0	.0	0	.0	.000	.00	.000	.000	.00
67	5140		0	.0	0	.0	.000	.00	.000	.000	.00

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
STRUCTURE 1		20.57	
ALTERNATE	1		261
ALTERNATE	2		261
XSECTION 1		2.46	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 2		2.38	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 3		3.94	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 4		2.06	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 5		4.78	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 6		1.47	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 7		3.48	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 10		2.46	
ALTERNATE	1		0
ALTERNATE	2		0
XSECTION 12		4.84	
ALTERNATE	1		0
ALTERNATE	2		0

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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
XSECTION 20	4.84	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 25	3.94	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 30	3.94	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 34	6.00	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 35	10.84	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 45	10.84	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 60	1.47	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 64	12.31	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 67	1.47	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 75	8.26	
ALTERNATE 1		0
ALTERNATE 2		0

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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
XSECTION 76	20.57	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 199	.00	
ALTERNATE 1		0
ALTERNATE 2		0
XSECTION 200	.00	
ALTERNATE 1		0
ALTERNATE 2		0

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```
TR20 ------------------------------------------------------------------ SCS -
WT100YR   WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS, NU ROU VERSION
07/27/**  100-yr, 24-hr, Type II Dist, 100-yr Sediment Storage, 800'Spil2.04TEST


END OF  1 JOBS IN THIS RUN


                    SCS  TR-20,  VERSION 2.04TEST
                          WT100YR   FILES

     INPUT  = 100INN.DAT                              , GIVEN DATA FILE
     OUTPUT = 100OUTTT.OUT                            , DATED 07/27/**,16:11:27

              FILES GENERATED - DATED 07/27/**,16:11:27

    FILE 111.TRD CONTAINS READHD INFORMATION


          TOTAL NUMBER OF WARNINGS =   0,  MESSAGES =  56

                       JOB ENDED AT 16:11:27
                  *** TR-20 RUN COMPLETED ***
```

(1)

Calculation Package 17

URS **EXHIBIT 4.7-2**

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title:

RESERVOIR ROUTING OF 6-HR LOCAL AND 72-HR GENERAL PMF HYDROGRAPHS FOR INTERIM PRINCIPAL SPILLWAY CONDITION (ADWR CRITERIA)

Total Number of Pages (including cover sheet):

Total Number of Computer Runs:

Prepared by: Hammad Hussain Date: 07/22/04

Checked by: Todd Ringsmuth Date: 7/22/04

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

Remarks/Conclusions/Results:

See Page 3.

Routing 15.8 for 72 hr (need reference)
Slight change to Table 1
Same 4 warnings as other calcs — not a problem — conservative results

Calculation Approved by: 7/27/04
Project Manager/Date

Revision No.:	Description of Revision:	Approved by:
1	Revised Table 1.	7-28-04

Project Manager/Date

RESERVOIR ROUTING OF 6-HR LOCAL AND 72-HR GENERAL PMF HYDROGRAPHS FOR INTERIM PRINCIPAL SPILLWAY CONDITION (ADWR CRITERIA)

(WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3)
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

This particular calculation package addresses the reservoir routing results for the **Interim Condition** based on ADWR criteria.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

INTERIM CONDITION

The Interim Condition represents the time period following construction of the facilities included in the Remediation Project and the installation of the downstream conveyance channel. Since this time period is anticipated to be short (less than 10 years), it is assumed that no additional sediment has accumulated in the reservoir. The principal spillway is closed and does not convey flow out of the reservoir. Under this condition the only outflow from the reservoir occurs through infiltration and flow through the emergency spillway. The detailed calculations involved in estimating the infiltration rates for the Interim condition are provided in a separate calculation package

Given that the Interim Condition was assumed a short period following construction of the dam and prior to construction of a dedicated downstream conveyance, the routing for the Interim Condition was performed based on the current topographic condition in the reservoir (i.e., no additional sediment). Therefore, the Antecedent Reservoir Condition (ARC) for initial reservoir routing is the invert elevation of the proposed gated outlet or at elevation 1193.0 ft (NAVD 88). The reservoir routing for the Interim Condition was carried out for 6-hr Local and 72-hr General Probable Maximum Flood (PMF) hydrographs based on ADWR criteria. The ADWR criteria for the interim condition is explained as follows.

ADWR Routing Criteria: For the Interim Condition, the ARC for the routing of the 6-hr Local and 72-hr General PMF hydrographs will be based on the water surface elevation equal to the invert of the lowest outlet or at elevation 1193.0 ft (NAVD 88). This ARC was selected after verifying that a single 48-inch outlet pipe could draw down 85 percent of the peak storage volume at the end of 10th day following the peak of 100-year 24-hour storm.

ROUTING RESULTS

ADWR Routing: The ARC for the routing of the 6-hour Local and 72-hr General PMF hydrographs was set at the invert elevation of the proposed gated outlet, or elevation 1,193 ft (NAVD 88). The reservoir routing results i.e. ARC, peak inflows, peak outflows, and the maximum reservoir elevation for the 6-hour Local and 72-hr General PMF hydrographs for Interim Condition based on ADWR criteria are provided in Table 1 (Please See Page 4).

The input file and the detailed output results of TR-20 modeling for reservoir routing of 6-hour Local and 72-hr General PMF hydrographs for ADWR criteria are attached at the end of this calculation package.

TABLE 1
RESERVOIR ROUTING RESULTS
(BASED ON ADWR CRITERION ONLY)

(INTERIM CONDITON)

Storm Event	Inflow to White Tank FRS No.3		Outflow from White Tank FRS No.3		
	Precipitation (inches)	Peak Inflow (cfs)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (ft)
6-hr Local	12.70	68,291	1193.0	21,921	1215.7
72-hr General	15.80	32,764	1193.0	21,911	1215.7

6-hr Local PMF (ADWR)
Input and output Results.

```
*****************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

JOB TR-20 WT3PMP6   ECON                PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE     6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT
 5 RAINFL 1            0.1                                          6HRLOCAL
 8          .0000      .003       .006       .009       .013
 8          .016       .020       .025       .030       .035
 8          .039       .046       .052       .058       .065
 8          .071       .080       .090       .099       .109
 8          .118       .283       .449       .567       .622
 8          .669       .701       .732       .756       .780
 8          .795       .809       .824       .838       .852
 8          .866       .876       .885       .894       .904
 8          .913       .920       .926       .932       .939
 8          .945       .950       .954       .959       .964
 8          .969       .972       .976       .980       .984
 8          .988       .991       .993       .995       .998
 8          1.         1.         1.         1.         1.
 9 ENDTBL
 5 RAINFL 2            .1                                           6HR GEN
 8          .000       .005       .013       .020       .028
 8          .038       .045       .053       .060       .070
 8          .080       .085       .095       .108       .120
 8          .138       .150       .165       .190       .210
 8          .238       .280       .350       .440       .550
 8          .590       .620       .645       .668       .685
 8          .700       .720       .735       .753       .765
 8          .775       .790       .800       .810       .820
 8          .835       .843       .850       .863       .870
 8          .880       .890       .898       .908       .915
 8          .925       .930       .940       .945       .955
 8          .963       .970       .978       .985       .990
 8          1.00       1.00       1.00       1.00       1.00
 9 ENDTBL
 5 RAINFL 3            0.1                                          12HRGEN
 8          .000       .003       .007       .010       .013
 8          .016       .019       .022       .025       .028
 8          .031       .034       .037       .040       .043
 8          .045       .050       .054       .058       .062
 8          .066       .071       .075       .080       .085
 8          .089       .095       .101       .107       .112
 8          .118       .125       .132       .139       .146
 8          .153       .162       .171       .180       .189
 8          .198       .211       .224       .237       .250
 8          .264       .300       .345       .391       .436
 8          .491       .536       .564       .586       .607
 8          .629       .643       .657       .672       .686
 8          .700       .711       .721       .732       .742
 8          .753       .761       .769       .778       .786
 8          .795       .802       .809       .817       .824
 8          .832       .837       .843       .848       .854
 8          .859       .865       .870       .875       .881
 8          .886       .891       .895       .900       .905
 8          .909       .913       .917       .921       .925
 8          .929       .933       .936       .940       .944
 8          .948       .951       .954       .957       .960
 8          .963       .966       .969       .971       .974
```

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 8          .977        .980        .982        .984        .986
 8          .989        .991        .993        .995        .998
 8          1.000      01.000       1.000       1.000       1.00
 9 ENDTBL
 5 RAINFL 4             0.1                                          18HRGEN
 8          .000        .001        .002        .003        .004
 8          .005        .005        .006        .007        .008
 8          .009        .012        .014        .017        .020
 8          .023        .025        .028        .031        .033
 8          .036        .040        .044        .049        .053
 8          .057        .061        .065        .070        .074
 8          .078        .084        .090        .096        .102
 8          .108        .114        .120        .126        .132
 8          .138        .146        .154        .162        .170
 8          .179        .187        .195        .203        .211
 8          .220        .238        .256        .275        .293
 8          .311        .330        .348        .367        .385
 8          .403        .430        .457        .484        .511
 8          .538        .557        .577        .597        .616
 8          .636        .653        .670        .687        .704
 8          .721        .734        .746        .759        .771
 8          .784        .792        .801        .810        .818
 8          .827        .832        .838        .843        .848
 8          .853        .856        .859        .862        .864
 8          .867        .870        .872        .875        .878
 8          .880        .882        .885        .887        .889
 8          .891        .893        .895        .897        .899
 8          .901        .903        .905        .907        .909
 8          .911        .912        .914        .916        .917
 8          .919        .920        .922        .924        .925
 8          .927        .929        .930        .932        .934
 8          .935        .937        .938        .940        .941
 8          .943        .945        .946        .948        .949
 8          .951        .952        .953        .955        .956
 8          .957        .959        .960        .961        .963
 8          .964        .965        .967        .968        .970
 8          .971        .972        .974        .975        .976
 8          .978        .979        .980        .982        .983
 8          .984        .985        .986        .988        .989
 8          .990        .991        .992        .993        .994
 8          .995        .996        .997        .998        .999
 8          1.000       1.000       1.000       1.000       1.000
 9 ENDTBL
 5 RAINFL 5             0.1                                          24HRGEN
 8          0.000       0.000       0.001       0.001       0.002
 8          0.002       0.002       0.003       0.003       0.003
 8          0.004       0.005       0.007       0.009       0.010
 8          0.012       0.013       0.015       0.016       0.018
 8          0.019       0.022       0.024       0.027       0.030
 8          0.032       0.035       0.037       0.040       0.042
 8          0.045       0.048       0.051       0.055       0.058
 8          0.061       0.064       0.068       0.071       0.074
 8          0.078       0.082       0.087       0.091       0.096
 8          0.100       0.104       0.109       0.113       0.118
 8          0.122       0.127       0.132       0.137       0.142
 8          0.147       0.151       0.156       0.161       0.166
```

**********80-80 LIST OF INPUT DATA (CONTINUED)**********

```
8          0.171      0.177      0.184      0.191      0.198
8          0.205      0.214      0.224      0.233      0.242
8          0.252      0.265      0.278      0.291      0.303
8          0.316      0.334      0.351      0.368      0.386
8          0.403      0.425      0.447      0.468      0.490
8          0.512      0.527      0.543      0.558      0.574
8          0.589      0.603      0.617      0.631      0.645
8          0.659      0.671      0.684      0.696      0.709
8          0.721      0.731      0.741      0.751      0.761
8          0.771      0.779      0.786      0.793      0.800
8          0.808      0.814      0.820      0.825      0.831
8          0.837      0.840      0.843      0.847      0.850
8          0.853      0.855      0.857      0.859      0.861
8          0.864      0.866      0.868      0.870      0.872
8          0.874      0.876      0.878      0.880      0.881
8          0.883      0.885      0.886      0.888      0.890
8          0.891      0.893      0.895      0.896      0.898
8          0.899      0.901      0.902      0.904      0.905
8          0.907      0.908      0.909      0.910      0.912
8          0.913      0.914      0.915      0.916      0.917
8          0.919      0.920      0.921      0.922      0.923
8          0.924      0.926      0.927      0.928      0.929
8          0.930      0.932      0.933      0.935      0.936
8          0.938      0.940      0.941      0.943      0.944
8          0.946      0.947      0.947      0.948      0.949
8          0.950      0.950      0.951      0.952      0.953
8          0.953      0.955      0.956      0.957      0.958
8          0.959      0.960      0.961      0.962      0.963
8          0.964      0.965      0.966      0.967      0.968
8          0.969      0.970      0.971      0.972      0.973
8          0.974      0.975      0.976      0.977      0.978
8          0.979      0.980      0.981      0.982      0.983
8          0.984      0.985      0.986      0.987      0.988
8          0.988      0.989      0.990      0.991      0.991
8          0.992      0.993      0.994      0.995      0.995
8          0.996      0.997      0.998      0.998      0.999
8          1.000      1.000      1.000      1.000      1.000
9 ENDTBL
5 RAINFL 6            .25                                          48HRGEN
8          0.0000     0.0015     0.0029     0.0044     0.0058
8          0.0073     0.0088     0.0102     0.0117     0.0131
8          0.0146     0.0160     0.0175     0.0190     0.0204
8          0.0219     0.0233     0.0248     0.0263     0.0277
8          0.0292     0.0306     0.0321     0.0335     0.0350
8          0.0365     0.0379     0.0394     0.0408     0.0423
8          0.0438     0.0452     0.0467     0.0481     0.0496
8          0.0510     0.0525     0.0542     0.0558     0.0575
8          0.0592     0.0608     0.0625     0.0642     0.0658
8          0.0692     0.0725     0.0758     0.0792     0.0825
8          0.0858     0.0892     0.0925     0.0975     0.1025
8          0.1075     0.1125     0.1175     0.1225     0.1275
8          0.1325     0.1442     0.1560     0.1677     0.1794
8          0.1985     0.2176     0.2366     0.2557     0.3239
8          0.3921     0.4603     0.5285     0.5520     0.5754
8          0.5989     0.6224     0.6356     0.6488     0.6620
8          0.6752     0.6862     0.6972     0.7082     0.7192
```

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8          0.7267     0.7342     0.7417     0.7492     0.7558
8          0.7625     0.7692     0.7758     0.7825     0.7892
8          0.7958     0.8025     0.8083     0.8142     0.8200
8          0.8258     0.8308     0.8358     0.8408     0.8458
8          0.8508     0.8558     0.8608     0.8658     0.8683
8          0.8708     0.8733     0.8758     0.8783     0.8808
8          0.8833     0.8858     0.8875     0.8892     0.8908
8          0.8925     0.8942     0.8958     0.8975     0.8992
8          0.9008     0.9025     0.9042     0.9058     0.9075
8          0.9092     0.9108     0.9125     0.9140     0.9154
8          0.9169     0.9183     0.9198     0.9213     0.9227
8          0.9242     0.9256     0.9271     0.9285     0.9300
8          0.9315     0.9329     0.9344     0.9358     0.9373
8          0.9388     0.9402     0.9417     0.9431     0.9446
8          0.9460     0.9475     0.9490     0.9504     0.9519
8          0.9533     0.9548     0.9563     0.9577     0.9592
8          0.9606     0.9621     0.9635     0.9650     0.9665
8          0.9679     0.9694     0.9708     0.9723     0.9737
8          0.9752     0.9767     0.9781     0.9796     0.9810
8          0.9825     0.9840     0.9854     0.9869     0.9883
8          0.9898     0.9912     0.9927     0.9942     0.9956
8          0.9971     0.9985     1.0000     1.0000     1.0
9 ENDTBL
5 RAINFL 7            .25                                          72HRGEN
8          0.0000     0.0005     0.0009     0.0014     0.0019
8          0.0025     0.0032     0.0038     0.0044     0.0051
8          0.0057     0.0063     0.0070     0.0076     0.0082
8          0.0089     0.0095     0.0103     0.0111     0.0119
8          0.0127     0.0134     0.0142     0.0150     0.0158
8          0.0171     0.0184     0.0196     0.0209     0.0222
8          0.0234     0.0247     0.0259     0.0272     0.0285
8          0.0297     0.0310     0.0323     0.0335     0.0348
8          0.0361     0.0375     0.0389     0.0403     0.0418
8          0.0432     0.0446     0.0460     0.0475     0.0489
8          0.0503     0.0517     0.0532     0.0546     0.0560
8          0.0574     0.0589     0.0604     0.0620     0.0636
8          0.0652     0.0668     0.0684     0.0699     0.0715
8          0.0731     0.0747     0.0763     0.0778     0.0797
8          0.0816     0.0835     0.0854     0.0877     0.0899
8          0.0921     0.0943     0.0968     0.0994     0.1019
8          0.1044     0.1073     0.1101     0.1130     0.1158
8          0.1193     0.1228     0.1263     0.1297     0.1335
8          0.1373     0.1411     0.1449     0.1491     0.1532
8          0.1573     0.1614     0.1725     0.1837     0.1948
8          0.2059     0.2241     0.2422     0.2603     0.2784
8          0.3431     0.4078     0.4726     0.5373     0.5596
8          0.5819     0.6042     0.6265     0.6390     0.6515
8          0.6641     0.6766     0.6870     0.6975     0.7079
8          0.7184     0.7255     0.7326     0.7397     0.7468
8          0.7535     0.7601     0.7668     0.7734     0.7794
8          0.7854     0.7915     0.7975     0.8030     0.8085
8          0.8141     0.8196     0.8247     0.8297     0.8348
8          0.8399     0.8443     0.8487     0.8532     0.8576
8          0.8598     0.8620     0.8642     0.8665     0.8685
8          0.8706     0.8726     0.8747     0.8766     0.8785
8          0.8804     0.8823     0.8840     0.8858     0.8875
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8          0.8892      0.8908      0.8924      0.8940      0.8956
 8          0.8972      0.8987      0.9003      0.9019      0.9035
 8          0.9051      0.9066      0.9082      0.9098      0.9114
 8          0.9130      0.9146      0.9160      0.9174      0.9188
 8          0.9203      0.9217      0.9231      0.9245      0.9259
 8          0.9274      0.9288      0.9302      0.9316      0.9329
 8          0.9342      0.9354      0.9367      0.9380      0.9392
 8          0.9405      0.9418      0.9430      0.9443      0.9456
 8          0.9468      0.9481      0.9494      0.9506      0.9519
 8          0.9530      0.9541      0.9552      0.9563      0.9574
 8          0.9585      0.9597      0.9608      0.9619      0.9630
 8          0.9641      0.9652      0.9661      0.9671      0.9680
 8          0.9690      0.9699      0.9709      0.9718      0.9728
 8          0.9736      0.9744      0.9752      0.9759      0.9767
 8          0.9775      0.9783      0.9791      0.9797      0.9804
 8          0.9810      0.9816      0.9823      0.9829      0.9835
 8          0.9842      0.9847      0.9851      0.9856      0.9861
 8          0.9866      0.9870      0.9875      0.9880      0.9884
 8          0.9889      0.9894      0.9899      0.9902      0.9905
 8          0.9908      0.9911      0.9915      0.9918      0.9921
 8          0.9924      0.9927      0.9930      0.9934      0.9937
 8          0.9940      0.9943      0.9946      0.9949      0.9953
 8          0.9956      0.9959      0.9962      0.9965      0.9968
 8          0.9972      0.9975      0.9978      0.9981      0.9984
 8          0.9987      0.9989      0.9991      0.9992      0.9994
 8          0.9995      0.9997      0.9998      1.0000      1.0000
 9 ENDTBL
 5 RAINFL 8     1        2.4                                          10-DAY
 8          .0000       .0024       .0048       .0073       .0097
 8          .0121       .0148       .0174       .0201       .0228
 8          .0254       .0284       .0314       .0344       .0374
 8          .0404       .0437       .0471       .0505       .0539
 8          .0572       .0612       .0651       .0690       .0729
 8          .0768       .0815       .0862       .0909       .0955
 8          .1002       .1061       .1120       .1179       .1238
 8          .1297       .1377       .1458       .1538       .1618
 8          .1699       .1832       .1966       .2099       .2232
 8          .2366       .2548       .2778       .3093       .3614
 8          1.092       1.174       1.213       1.240       1.260
 8          1.276       1.286       1.296       1.306       1.316
 8          1.326       1.333       1.340       1.347       1.354
 8          1.360       1.365       1.371       1.376       1.381
 8          1.386       1.391       1.395       1.399       1.403
 8          1.408       1.411       1.415       1.418       1.422
 8          1.426       1.429       1.432       1.435       1.438
 8          1.442       1.444       1.447       1.450       1.453
 8          1.456       1.458       1.461       1.463       1.466
 8          1.468       1.471       1.473       1.475       1.477
 8          1.48        1.48        1.48        1.48        1.48
 9 ENDTBL
 4 DIMHYD               .0556                                           WT3
 8          0.0         .03         .10         .19         .31
 8          .47         .66         .82         .93         .99
 8          1.0         .99         .93         .82         .66
 8          .47         .31         .03         .00         .00
 9 ENDTBL
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 2 XSECTN   005         1.0         8.77                                BOSSCS#5
 8                      0.          0.0         0.0
 8                      0.35        5.          5.56
 8                      1.03        50.         30.95
 8                      1.39        100.        52.16
 8                      1.94        200.        88.72
 8                      2.63        400.        148.61
 8                      3.51        800.        260.63
 8                      4.62        1600.       459.66
 8                      6.04        3200.       929.36
 8                      7.38        6400.       1811.51
 8                      8.77        12800.      3374.20
 8                      10.17       25600.      6398.87
 8                      11.89       51200.      10982.51
 9 ENDTBL
 2 XSECTN   010         1.0         8.94                                BOSSCS#4
 8                      0.          0.0         0.0
 8                      0.91        5.          4.95
 8                      2.03        50.         24.80
 8                      2.63        100.        41.32
 8                      3.34        200.        74.14
 8                      4.15        400.        130.28
 8                      5.23        800.        223.37
 8                      6.41        1600.       447.51
 8                      7.65        3200.       898.64
 8                      8.94        6400.       1690.88
 8                      10.29       12800.      3331.95
 8                      11.64       25600.      6185.81
 8                      13.14       51200.      10661.04
 9 ENDTBL
 2 XSECTN   020         1.0         7.3                                 REACHC
 8                      0.          0.0         0.0
 8                      1.01        100.        57.78
 8                      1.49        200.        86.81
 8                      1.88        300.        110.25
 8                      2.49        500.        149.47
 8                      3.68        1000.       226.31
 8                      5.40        2000.       346.26
 8                      7.85        4000.       533.39
 8                      9.64        6000.       688.07
 8                      11.16       8000.       838.10
 8                      12.46       10000.      985.31
 8                      13.61       12000.      1122.03
 8                      14.56       14000.      1236.94
 8                      15.43       16000.      1345.18
 8                      16.31       18000.      1456.68
 9 ENDTBL
 2 XSECTN   025         1.0         7.3                                 REACHB
 8                      0.          0.0         0.0
 8                      0.63        100.        80.89
 8                      0.93        200.        120.32
 8                      1.17        300.        151.77
 8                      1.56        500.        203.28
 8                      2.30        1000.       302.00
 8                      3.38        2000.       449.24
 8                      4.97        4000.       673.73
```

```
8                       6.23        6000.       855.96
8                       7.31        8000.       1016.35
8                       8.24        10000.      1158.51
8                       9.09        12000.      1293.31
8                       9.90        14000.      1425.57
8                       10.64       16000.      1549.17
8                       11.36       18000.      1673.11
9 ENDTBL
2 XSECTN    030         1.0         9.45                                BOSSCS#6
8                       0.          0.0         0.0
8                       0.77        5.          4.67
8                       1.54        50.         32.06
8                       1.78        100.        56.64
8                       2.10        200.        100.59
8                       2.50        400.        179.97
8                       3.01        800.        320.25
8                       3.63        1600.       589.66
8                       4.35        3200.       1110.72
8                       5.21        6400.       2084.48
8                       6.03        12800.      4119.83
8                       6.99        25600.      6856.75
8                       8.28        51200.      11085.87
9 ENDTBL
2 XSECTN    045         1.0         4.87                                REACHA
8                       0.          0.0         0.0
8                       0.60        100.        85.69
8                       0.90        200.        127.94
8                       1.13        300.        161.93
8                       1.52        500.        217.27
8                       2.25        1000.       324.03
8                       3.31        2000.       483.02
8                       4.87        4000.       722.17
8                       6.09        6000.       914.99
8                       7.15        8000.       1084.61
8                       8.05        10000.      1234.17
8                       8.87        12000.      1373.80
8                       9.64        14000.      1507.84
8                       10.34       16000.      1633.45
8                       11.00       18000.      1753.12
9 ENDTBL
2 XSECTN    060         1.0         4.7                                 2CP6CP7
8                       0.          0.0         0.0
8                       2.36        100.        45.12
8                       2.88        200.        83.75
8                       3.18        300.        114.33
8                       3.64        500.        172.72
8                       4.42        1000.       289.04
8                       5.40        2000.       470.72
8                       6.87        4000.       782.74
8                       7.91        6000.       1020.12
8                       8.79        8000.       1231.25
8                       9.60        10000.      1435.05
8                       10.26       12000.      1618.34
8                       10.94       14000.      1812.58
8                       11.47       16000.      1983.46
8                       11.96       18000.      2150.12
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 9 ENDTBL
 2 XSECTN   067          1.0         8.77                                BOSSCS#5
 8                       0.          0.0         0.0
 8                       0.35        5.          5.56
 8                       1.03        50.         30.95
 8                       1.39        100.        52.16
 8                       1.94        200.        88.72
 8                       2.63        400.        148.61
 8                       3.51        800.        260.63
 8                       4.62        1600.       459.66
 8                       6.04        3200.       929.36
 8                       7.38        6400.       1811.51
 8                       8.77        12800.      3374.20
 8                       10.17       25600.      6398.87
 8                       11.89       51200.      10982.51
 9 ENDTBL
 3 STRUCT       01                                                          95/11/6
 8                       1178.0      0.00        0.0
 8                       1188.0      2.71        44.8
 8                       1193.0      7.29        129.0
 8                       1199.2      26.75       500.0
 8                       1202.0      38.68       845.55
 8                       1204.0      48.00       1176.28
 8                       1206.0      56.80       1575.25
 8                       1208.0      66.40       2044.97
 8                       1210.0      77.10       2593.40
 8                       1212.0      85.95       3218.00
 8                       1213.0      2685.00     3556.67
 8                       1214.0      8231.00     3916.02
 8                       1215.0      15545.0     4294.13
 8                       1216.0      24272.0     4692.68
 8                       1217.0      34212.0     5113.19
 8                       1218.0      45232.0     5556.01
 8                       1219.0      57233.0     6021.50
 8                       1220.0      70142.0     6509.75
 9 ENDTBL
 6 RUNOFF 1 001        1 2.46        87.2        0.85        1 1
 6 REACH  3 005   1    7 9100.                               1           BOSS#6
 6 REACH  3 010   7    2 9100.                               1           BOSS#4
 6 RUNOFF 1 002        3 2.38        79.9        0.73        1 1
 6 ADDHYD 4 012   2 3 1                                      1 1
 6 DIVERT 6 012   1 4 7 4100.        1.00        200.        1 1         OLIVE
 6 REACH  3 020   4    7 3332.                               1           REACH C
 6 REACH  3 025   7    5 1950.                               1           REACH B
 6 RUNOFF 1 003        6 3.94        87.2        0.88        1 1
 6 REACH  3 030   6    7 8865.                               1           BOSS#6
 6 REACH  3 005   7    1 8865.                               1           BOSS#5
 6 REACH  3 025   1    7 1950.                               1           REACH B
 6 RUNOFF 1 004        1 2.06        77.3        0.79        1 1
 6 ADDHYD 4 034   7 1 2                                      1 1
 6 ADDHYD 4 035   5 2 3                                      1 1
 6 DIVERT 6 035   3 4 7 11000.       1.00        199.        1 1         NORTHERN
 6 REACH  3 045   4    5 4200.                               1           REACH A
 6 RUNOFF 1 006        2 1.47        87.7        0.47        1 1
 6 REACH  3 060   2    3 7540.                               1           CP6CP7
 6 REACH  3 067   3    4 5140.                               1           BOSS#5
```

Infiltration per calc package 5 JJE signed by 5/19/04 for Phoenix w/ Hussein 7/27/04

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 6 ADDHYD 4 064    5 4 3                                          1 1
 6 RUNOFF 1 005        6 4.78        78.8         0.78           1 1
 6 RUNOFF 1 007        7 3.48        81.7         1.01           1 1
 6 ADDHYD 4 075    6 7 1                                          1 1
 6 ADDHYD 4 076    1 3 2                                          1 1      1
 6 RESVOR 2     01 2   1 193.0                                    1 1      1
 ENDATA
 7 LIST                  1.0                        1.
 7 INCREM 6              0.05
 7 COMPUT 7 001       01 0.          12.7         1.0          1 2  01  01
   ENDCMP 1
   ENDJOB 2

*******************************END OF 80-80 LIST*******************************
```

RUNOFF OPTION USED WITH RAINTABLE NO. 8, RUNOFF CURVE NO. = 100.

COMPUTED DIMHYD PEAK RATE FACTOR = 664.607

```
EXECUTIVE CONTROL  LIST          1.          0.          1.

          LISTING OF CURRENT DATA


                     COMPUTED TIME INCREMENT
DIMHYD                        .0556

                  .0000       .0300       .1000       .1900       .3100
                  .4700       .6600       .8200       .9300       .9900
                 1.0000       .9900       .9300       .8200       .6600
                  .4700       .3100       .0300       .0000       .0000
ENDTBL

   COMPUTED PEAK RATE FACTOR =  664.607
```

```
      TABLE NO.        TIME INCREMENT
RAINFL    1                   .1000

                  .0000       .0030       .0060       .0090       .0130
                  .0160       .0200       .0250       .0300       .0350
                  .0390       .0460       .0520       .0580       .0650
                  .0710       .0800       .0900       .0990       .1090
                  .1180       .2830       .4490       .5670       .6220
                  .6690       .7010       .7320       .7560       .7800
                  .7950       .8090       .8240       .8380       .8520
                  .8660       .8760       .8850       .8940       .9040
                  .9130       .9200       .9260       .9320       .9390
                  .9450       .9500       .9540       .9590       .9640
                  .9690       .9720       .9760       .9800       .9840
                  .9880       .9910       .9930       .9950       .9980
                 1.0000      1.0000      1.0000      1.0000      1.0000
ENDTBL
```

STANDARD CONTROL INSTRUCTIONS

```
RUNOFF      1       1      2.4600     87.2000      .85001 1 0 0 0 1
REACH       5   1   7   9100.0000       .0000      .00001 0 0 0 0 1
REACH      10   7   2   9100.0000       .0000      .00001 0 0 0 0 1
RUNOFF      2       3      2.3800     79.9000      .73001 1 0 0 0 1
ADDHYD     12   2 3 1                                   1 1 0 0 0 1
DIVERT     12   1 4 7   4100.0000      1.0000   200.00001 1 0 0 0 1
REACH      20   4   7   3332.0000       .0000      .00001 0 0 0 0 1
REACH      25   7   5   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      3       6      3.9400     87.2000      .88001 1 0 0 0 1
REACH      30   6   7   8865.0000       .0000      .00001 0 0 0 0 1
REACH       5   7   1   8865.0000       .0000      .00001 0 0 0 0 1
REACH      25   1   7   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      4       1      2.0600     77.3000      .79001 1 0 0 0 1
ADDHYD     34   7 1 2                                   1 1 0 0 0 1
ADDHYD     35   5 2 3                                   1 1 0 0 0 1
DIVERT     35   3 4 7  11000.0000      1.0000   199.00001 1 0 0 0 1
REACH      45   4   5   4200.0000       .0000      .00001 0 0 0 0 1
RUNOFF      6       2      1.4700     87.7000      .47001 1 0 0 0 1
REACH      60   2   3   7540.0000       .0000      .00001 0 0 0 0 1
REACH      67   3   4   5140.0000       .0000      .00001 0 0 0 0 1
ADDHYD     64   5 4 3                                   1 1 0 0 0 1
RUNOFF      5       6      4.7800     78.8000      .78001 1 0 0 0 1
RUNOFF      7       7      3.4800     81.7000     1.01001 1 0 0 0 1
ADDHYD     75   6 7 1                                   1 1 0 0 0 1
ADDHYD     76   1 3 2                                   1 1 0 0 1 1
RESVOR        1 2   1   1193.0000                       1 1 0 0 1 1
ENDATA
```

END OF LISTING

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .050 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 12.70 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .050 HOURS
ALTERNATE NO. = 1 STORM NO. = 1 RAIN TABLE NO. = 1

OPERATION RUNOFF XSECTION 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET) (RUNOFF)
2.71	17873.0	

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.46 SQ.MI.

HRS								
.75 CFS	.38	1.15	2.73	5.54	9.95	16.43	25.70	38.37
1.15 CFS	55	75	99	128	160	196	235	276
1.55 CFS	318	362	409	458	510	566	625	688
1.95 CFS	753	830	978	1279	1794	2595	3743	5287
2.35 CFS	7187	9294	11447	13473	15219	16590	17491	17866
2.75 CFS	17674	16919	15643	13899	11960	10148	8586	7352
3.15 CFS	6416	5736	5217	4765	4374	4049	3771	3525
3.55 CFS	3312	3138	2995	2873	2772	2690	2613	2530
3.95 CFS	2439	2343	2247	2154	2065	1978	1896	1819
4.35 CFS	1749	1687	1631	1574	1516	1458	1400	1342
4.75 CFS	1287	1239	1196	1160	1128	1098	1069	1038
5.15 CFS	1007	976	947	922	901	882	867	852
5.55 CFS	837	819	800	781	762	742	721	700
5.95 CFS	676	646	612	576	539	500	458	413
6.35 CFS	367	322	278	234	191	147	106	68
6.75 CFS	37.92	17.14	5.12	.74	.04			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.32	10200.1	8.21

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION REACH XSECTION 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.96	7060.0	9.08

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	16995.9	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.38 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.67	15.34	25.03	38.19
1.45 CFS	55	75	99	128	161	198	240	286
1.85 CFS	336	390	445	523	689	1033	1648	2632
2.25 CFS	4059	5924	8106	10407	12610	14524	15972	16813
2.65 CFS	16970	16435	15174	13412	11508	9715	8223	7053
3.05 CFS	6203	5583	5079	4636	4253	3923	3631	3372
3.45 CFS	3155	2982	2842	2733	2654	2597	2536	2461
3.85 CFS	2371	2271	2170	2073	1981	1896	1820	1752
4.25 CFS	1694	1642	1588	1530	1468	1405	1343	1286
4.65 CFS	1236	1194	1158	1126	1094	1061	1028	995
5.05 CFS	962	932	906	886	869	852	836	819
5.45 CFS	801	781	762	746	733	721	708	691
5.85 CFS	668	636	601	565	530	495	459	422
6.25 CFS	383	341	298	252	204	155	108	65
6.65 CFS	33.37	12.75	2.82	.21				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.12 WATERSHED INCHES; 15550 CFS-HRS; 1285.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	17248.4	(NULL)
3.81	9386.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.68	15.37	25.12	38.38
1.45 CFS	55	76	101	130	164	203	246	295
1.85 CFS	349	407	468	552	726	1078	1702	2698
2.25 CFS	4138	6017	8214	10533	12754	14690	16164	17035
2.65 CFS	17234	16756	15574	13921	12165	10563	9314	8436
3.05 CFS	7930	7699	7624	7638	7731	7880	8056	8240
3.45 CFS	8433	8628	8811	8978	9131	9262	9350	9385
3.85 CFS	9371	9316	9230	9123	8998	8860	8713	8560
4.25 CFS	8404	8243	8072	7889	7696	7497	7295	7095
4.65 CFS	6900	6711	6528	6348	6169	5990	5812	5635

5.05 CFS	5461	5291	5129	4974	4825	4679	4537	4397
5.45 CFS	4259	4123	3991	3865	3745	3630	3517	3404
5.85 CFS	3287	3165	3043	2923	2807	2695	2585	2475
6.25 CFS	2367	2259	2152	2045	1937	1831	1727	1631
6.65 CFS	1547	1475	1416	1364	1316	1269	1223	1177
7.05 CFS	1132	1087	1043	999	956	913	871	830
7.45 CFS	790	751	714	678	642	609	576	545
7.85 CFS	516	487	460	434	409	386	363	342
8.25 CFS	322	303	285	268	252	236	222	208
8.65 CFS	195	183	172	161	151	141	132	124
9.05 CFS	116	109	102	95	89	83	78	73
9.45 CFS	67.78	63.31	59.13	55.22	51.55	48.12	44.91	41.90
9.85 CFS	39.10	36.47	34.01	31.72	29.57	27.57	25.70	23.95
10.25 CFS	22.32	20.79	19.37	18.04	16.81	15.65	14.57	13.57
10.65 CFS	12.63	11.76	10.94	10.18	9.47	8.81	8.20	7.63
11.05 CFS	7.10	6.60	6.14	5.71	5.30	4.93	4.58	4.26
11.45 CFS	3.96	3.68	3.42	3.18	2.95	2.74	2.55	2.37
11.85 CFS	2.20	2.04	1.89	1.76	1.63	1.51	1.40	1.30
12.25 CFS	1.21	1.12	1.04	.97	.90	.83	.77	.71
12.65 CFS	.66	.61	.57	.53	.49			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.62 WATERSHED INCHES; 33163 CFS-HRS; 2740.6 ACRE-FEET.

OPERATION DIVERT XSECTION 12
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.25	4100.0 *	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.68	15.37	25.12	38.38
1.45 CFS	55	76	101	130	164	203	246	295
1.85 CFS	349	407	468	552	726	1078	1702	2698
2.25 CFS	4100	4100	4100	4100	4100	4100	4100	4100
2.65 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.05 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.45 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.85 CFS	4100	4100	4100	4100	4100	4100	4100	4100
4.25 CFS	4100	4100	4100	4100	4100	4100	4100	4100
4.65 CFS	4100	4100	4100	4100	4100	4100	4100	4100
5.05 CFS	4100	4100	4100	4100	4100	4100	4100	4100
5.45 CFS	4100	4100	3991	3865	3745	3630	3517	3404
5.85 CFS	3287	3165	3043	2923	2807	2695	2585	2475
6.25 CFS	2367	2259	2152	2045	1937	1831	1727	1631
6.65 CFS	1547	1475	1416	1364	1316	1269	1223	1177
7.05 CFS	1132	1087	1043	999	956	913	871	830

7.45 CFS	790	751	714	678	642	609	576	545
7.85 CFS	516	487	460	434	409	386	363	342
8.25 CFS	322	303	285	268	252	236	222	208
8.65 CFS	195	183	172	161	151	141	132	124
9.05 CFS	116	109	102	95	89	83	78	73
9.45 CFS	67.78	63.31	59.13	55.22	51.55	48.12	44.91	41.90
9.85 CFS	39.10	36.47	34.01	31.72	29.57	27.57	25.70	23.95
10.25 CFS	22.32	20.79	19.37	18.04	16.81	15.65	14.57	13.57
10.65 CFS	12.63	11.76	10.94	10.18	9.47	8.81	8.20	7.63
11.05 CFS	7.10	6.60	6.14	5.71	5.30	4.93	4.58	4.26
11.45 CFS	3.96	3.68	3.42	3.18	2.95	2.74	2.55	2.37
11.85 CFS	2.20	2.04	1.89	1.76	1.63	1.51	1.40	1.30
12.25 CFS	1.21	1.12	1.04	.97	.90	.83	.77	.71
12.65 CFS	.66	.61	.57	.53	.49			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18666 CFS-HRS; 1542.6 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 200)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	13148.4	(DIVERT)
3.81	5286.1	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
2.20 CFS	0	38	1917	4114	6433	8654	10590	12064
2.60 CFS	12935	13134	12656	11474	9821	8065	6463	5214
3.00 CFS	4336	3830	3599	3524	3538	3631	3780	3956
3.40 CFS	4140	4333	4528	4711	4878	5031	5162	5250
3.80 CFS	5285	5271	5216	5130	5023	4898	4760	4613
4.20 CFS	4460	4304	4143	3972	3789	3596	3397	3195
4.60 CFS	2995	2800	2611	2428	2248	2069	1890	1712
5.00 CFS	1535	1361	1191	1029	874	725	579	437
5.40 CFS	297	159	23	0				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14497 CFS-HRS; 1198.0 ACRE-FEET.

OPERATION REACH XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.35	4100.0 *	7.94

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18674 CFS-HRS; 1543.2 ACRE-FEET.

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.40	4100.0 *	5.03

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18671 CFS-HRS; 1543.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.73	28008.6	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 3.94 SQ.MI.

HRS								
.70 CFS	.11	.53	1.63	3.91	7.97	14.38	23.74	37.26
1.10 CFS	56	80	110	147	190	239	295	355
1.50 CFS	419	485	555	629	707	789	876	970
1.90 CFS	1070	1172	1291	1520	1978	2754	3947	5645
2.30 CFS	7914	10709	13856	17125	20269	23051	25326	26959
2.70 CFS	27856	27941	27181	25638	23334	20446	17522	14870
3.10 CFS	12659	10940	9640	8690	7921	7256	6690	6220
3.50 CFS	5813	5453	5146	4895	4684	4501	4348	4218
3.90 CFS	4089	3952	3806	3656	3508	3364	3224	3089
4.30 CFS	2960	2840	2733	2639	2550	2461	2371	2280
4.70 CFS	2188	2099	2016	1942	1879	1824	1775	1729
5.10 CFS	1682	1634	1585	1537	1492	1455	1423	1396
5.50 CFS	1372	1350	1324	1294	1262	1230	1197	1163
5.90 CFS	1128	1091	1048	998	943	885	823	756
6.30 CFS	686	612	539	468	398	331	264	199
6.70 CFS	138	85	45	18	5	0		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 30

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.40	16237.6	6.29

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
4.00	11557.4	8.50

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
4.06	11552.0	8.90

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.68	13580.0	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.06 SQ.MI.

HRS								
1.20 CFS	.32	.94	2.20	4.53	8.43	14.25	22.34	33.25
1.60 CFS	48	65	87	114	145	180	219	260
2.00 CFS	305	403	622	1013	1651	2596	3893	5471
2.40 CFS	7211	8963	10567	11924	12911	13469	13552	13136
2.80 CFS	12289	10903	9457	8031	6802	5872	5130	4648
3.20 CFS	4233	3871	3547	3287	3055	2849	2670	2532
3.60 CFS	2417	2323	2247	2197	2140	2073	1998	1916
4.00 CFS	1834	1756	1682	1611	1545	1485	1430	1385
4.40 CFS	1339	1292	1243	1192	1143	1095	1051	1014
4.80 CFS	980	952	925	899	874	848	822	796
5.20 CFS	773	754	738	723	709	697	684	668
5.60 CFS	652	638	624	611	596	581	561	535
6.00 CFS	506	477	447	416	384	349	313	276
6.40 CFS	239	203	165	126	89	55	29	12
6.80 CFS	2.44	.16						

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
9.75 WATERSHED INCHES; 12960 CFS-HRS; 1071.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 34

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	13913.0	(NULL)
3.98	13359.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 6.00 SQ.MI.

HRS								
1.20 CFS	.32	.94	2.20	4.54	8.47	14.37	22.62	33.79

1.60 CFS	49	67	90	118	151	190	233	279
2.00 CFS	331	437	665	1068	1719	2680	3994	5593
2.40 CFS	7355	9131	10763	12150	13171	13769	13900	13547
2.80 CFS	12787	11520	10239	9034	8094	7531	7235	7282
3.20 CFS	7472	7784	8186	8690	9239	9807	10376	10937
3.60 CFS	11459	11929	12340	12699	12977	13175	13298	13353
4.00 CFS	13354	13307	13219	13096	12942	12763	12562	12350
4.40 CFS	12118	11870	11608	11334	11053	10768	10482	10199
4.80 CFS	9918	9642	9367	9094	8823	8555	8290	8028
5.20 CFS	7773	7527	7288	7056	6829	6609	6394	6181
5.60 CFS	5974	5774	5582	5394	5212	5034	4857	4679
6.00 CFS	4504	4334	4169	4009	3851	3697	3545	3398
6.40 CFS	3255	3116	2979	2846	2718	2596	2485	2385
6.80 CFS	2295	2215	2138	2062	1988	1916	1844	1773
7.20 CFS	1702	1633	1564	1495	1428	1362	1297	1234
7.60 CFS	1172	1112	1054	998	945	893	844	796
8.00 CFS	751	708	667	628	591	555	522	490
8.40 CFS	460	432	405	380	356	334	312	292
8.80 CFS	274	256	239	224	209	195	182	170
9.20 CFS	159	148	139	129	120	112	105	98
9.60 CFS	90.94	84.72	78.91	73.48	68.41	63.69	59.27	55.16
10.00 CFS	51.32	47.74	44.40	41.29	38.39	35.69	33.17	30.83
10.40 CFS	28.65	26.62	24.73	22.97	21.34	19.81	18.40	17.08
10.80 CFS	15.86	14.72	13.66	12.68	11.76	10.91	10.12	9.39
11.20 CFS	8.71	8.08	7.49	6.95	6.44	5.97	5.53	5.13
11.60 CFS	4.75	4.40	4.08	3.78	3.50	3.24	3.00	2.78
12.00 CFS	2.58	2.38	2.21	2.04	1.89	1.75	1.62	1.50
12.40 CFS	1.39	1.28	1.19	1.10	1.02	.94	.87	.80
12.80 CFS	.74	.69	.63	.58	.54	.50		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.63 WATERSHED INCHES; 41173 CFS-HRS; 3402.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 35

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	17992.4	(NULL)
3.98	17459.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
1.15 CFS	.13	.58	1.78	4.30	8.98	16.87	28.87	45.91
1.55 CFS	69	99	137	183	238	302	377	461
1.95 CFS	554	656	817	1111	1616	2456	3763	5660
2.35 CFS	8149	10567	12747	14606	16117	17202	17834	17983
2.75 CFS	17639	16883	15618	14338	13133	12193	11631	11335
3.15 CFS	11382	11572	11884	12286	12790	13339	13907	14476
3.55 CFS	15037	15559	16029	16440	16799	17077	17275	17398
3.95 CFS	17453	17454	17407	17319	17196	17042	16863	16662
4.35 CFS	16450	16218	15970	15708	15434	15153	14868	14582

4.75 CFS	14299	14018	13742	13467	13194	12923	12655	12390
5.15 CFS	12128	11873	11627	11388	11156	10929	10709	10494
5.55 CFS	10281	10074	9839	9576	9296	9008	8722	8434
5.95 CFS	8142	7851	7562	7278	6998	6725	6456	6193
6.35 CFS	5935	5683	5435	5191	4950	4714	4487	4272
6.75 CFS	4077	3900	3743	3600	3466	3338	3215	3094
7.15 CFS	2976	2860	2745	2631	2519	2408	2299	2192
7.55 CFS	2087	1985	1886	1790	1697	1608	1522	1439
7.95 CFS	1360	1285	1212	1143	1078	1015	956	899
8.35 CFS	846	795	747	701	658	618	579	543
8.75 CFS	509	477	447	418	392	366	343	321
9.15 CFS	300	280	262	245	228	213	199	186
9.55 CFS	173	162	151	141	131	122	114	106
9.95 CFS	98.98	92.21	85.89	79.99	74.48	69.34	64.54	60.07
10.35 CFS	55.90	52.01	48.39	45.01	41.87	38.94	36.21	33.66
10.75 CFS	31.29	29.09	27.04	25.13	23.35	21.69	20.15	18.72
11.15 CFS	17.39	16.15	15.00	13.92	12.93	12.00	11.14	10.34
11.55 CFS	9.59	8.90	8.26	7.66	7.11	6.60	6.12	5.68
11.95 CFS	5.26	4.88	4.52	4.19	3.89	3.60	3.34	3.09
12.35 CFS	2.87	2.66	2.46	2.28	2.11	1.96	1.81	1.68
12.75 CFS	1.55	1.44	1.33	1.23	1.14	1.05	.97	.90
13.15 CFS	.83	.77	.71	.65	.61	.56	.51	.47

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.55 WATERSHED INCHES; 59845 CFS-HRS; 4945.6 ACRE-FEET.

OPERATION DIVERT XSECTION 35
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.45	11000.0 *	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
1.15 CFS	.13	.58	1.78	4.30	8.98	16.87	28.87	45.91
1.55 CFS	69	99	137	183	238	302	377	461
1.95 CFS	554	656	817	1111	1616	2456	3763	5660
2.35 CFS	8149	10567	11000	11000	11000	11000	11000	11000
2.75 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.15 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.55 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.95 CFS	11000	11000	11000	11000	11000	11000	11000	11000
4.35 CFS	11000	11000	11000	11000	11000	11000	11000	11000
4.75 CFS	11000	11000	11000	11000	11000	11000	11000	11000
5.15 CFS	11000	11000	11000	11000	11000	10929	10709	10494
5.55 CFS	10281	10074	9839	9576	9296	9008	8722	8434
5.95 CFS	8142	7851	7562	7278	6998	6725	6456	6193
6.35 CFS	5935	5683	5435	5191	4950	4714	4487	4272

6.75 CFS	4077	3900	3743	3600	3466	3338	3215	3094
7.15 CFS	2976	2860	2745	2631	2519	2408	2299	2192
7.55 CFS	2087	1985	1886	1790	1697	1608	1522	1439
7.95 CFS	1360	1285	1212	1143	1078	1015	956	899
8.35 CFS	846	795	747	701	658	618	579	543
8.75 CFS	509	477	447	418	392	366	343	321
9.15 CFS	300	280	262	245	228	213	199	186
9.55 CFS	173	162	151	141	131	122	114	106
9.95 CFS	98.98	92.21	85.89	79.99	74.48	69.34	64.54	60.07
10.35 CFS	55.90	52.01	48.39	45.01	41.87	38.94	36.21	33.66
10.75 CFS	31.29	29.09	27.04	25.13	23.35	21.69	20.15	18.72
11.15 CFS	17.39	16.15	15.00	13.92	12.93	12.00	11.14	10.34
11.55 CFS	9.59	8.90	8.26	7.66	7.11	6.60	6.12	5.68
11.95 CFS	5.26	4.88	4.52	4.19	3.89	3.60	3.34	3.09
12.35 CFS	2.87	2.66	2.46	2.28	2.11	1.96	1.81	1.68
12.75 CFS	1.55	1.44	1.33	1.23	1.14	1.05	.97	.90
13.15 CFS	.83	.77	.71	.65	.61	.56	.51	.47

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.98 WATERSHED INCHES; 48844 CFS-HRS; 4036.5 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 199)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	6992.4	(DIVERT)
3.98	6459.3	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
2.40 CFS	0	1747	3606	5117	6202	6834	6983	6639
2.80 CFS	5883	4618	3338	2133	1193	631	335	382
3.20 CFS	572	884	1286	1790	2339	2907	3476	4037
3.60 CFS	4559	5029	5440	5799	6077	6275	6398	6453
4.00 CFS	6454	6407	6319	6196	6042	5863	5662	5450
4.40 CFS	5218	4970	4708	4434	4153	3868	3582	3299
4.80 CFS	3018	2742	2467	2194	1923	1655	1390	1128
5.20 CFS	873	627	388	156	0			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11001 CFS-HRS; 909.1 ACRE-FEET.

OPERATION REACH XSECTION 45

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.60	11000.0 *	8.46 .

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.98 WATERSHED INCHES; 48837 CFS-HRS; 4035.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.44	14477.1	(RUNOFF)
5.09	565.7	(RUNOFF)
5.57	467.7	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 1.47 SQ.MI.

HRS	.49	1.79	4.72	10.27	19.17	31.25	46.11	63.69
.70 CFS								
1.10 CFS	84	107	133	161	189	217	246	272
1.50 CFS	296	320	348	382	424	473	525	578
1.90 CFS	629	673	751	1016	1675	2951	4958	7479
2.30 CFS	10139	12487	14048	14453	13548	11805	9813	7930
2.70 CFS	6413	5301	4595	4109	3719	3397	3144	2908
3.10 CFS	2660	2416	2203	2019	1869	1766	1716	1699
3.50 CFS	1689	1673	1643	1594	1528	1446	1355	1265
3.90 CFS	1188	1135	1109	1100	1091	1070	1033	980
4.30 CFS	915	851	800	767	752	748	744	734
4.70 CFS	711	676	634	596	571	559	559	563
5.10 CFS	565	559	539	512	488	468	456	454
5.50 CFS	460	467	466	456	437	410	376	342
5.90 CFS	311	289	278	271	262	243	211	166
6.30 CFS	116	68	32	10	1	0		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION REACH XSECTION 60

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.65	11037.3	9.94

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION REACH XSECTION 67

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.98	7397.2	7.60

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 64

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.98	18393.8	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 12.31 SQ.MI.

HRS								
1.00 CFS	.28	.72	1.60	3.11	5.54	9.19	14.51	22.08
1.40 CFS	33	47	67	92	124	163	210	265
1.80 CFS	330	405	491	588	696	816	970	1207
2.20 CFS	1588	2212	3205	4714	6841	9347	11203	12592
2.60 CFS	13786	14881	15877	16738	17427	17925	18235	18378
3.00 CFS	18383	18283	18103	17867	17594	17296	16984	16665
3.40 CFS	16344	16027	15718	15420	15137	14873	14630	14407
3.80 CFS	14203	14018	13849	13692	13546	13409	13280	13159
4.20 CFS	13045	12940	12844	12756	12674	12599	12527	12459
4.60 CFS	12392	12329	12268	12212	12160	12112	12068	12026
5.00 CFS	11986	11947	11910	11874	11840	11809	11781	11755
5.40 CFS	11731	11675	11531	11344	11135	10918	10685	10430
5.80 CFS	10158	9872	9581	9285	8984	8680	8375	8071
6.20 CFS	7771	7475	7184	6898	6617	6340	6066	5795
6.60 CFS	5526	5260	5000	4750	4516	4299	4102	3922
7.00 CFS	3757	3603	3459	3320	3188	3059	2933	2810
7.40 CFS	2690	2571	2456	2342	2231	2123	2019	1917
7.80 CFS	1819	1724	1633	1545	1461	1380	1303	1230
8.20 CFS	1159	1093	1029	969	912	857	806	757
8.60 CFS	711	667	626	587	551	516	484	453
9.00 CFS	424	397	371	347	325	304	284	265
9.40 CFS	248	232	216	202	188	176	164	153
9.80 CFS	143	133	124	116	108	100	94	87
10.20 CFS	81.15	75.56	70.35	65.49	60.95	56.72	52.78	49.10
10.60 CFS	45.68	42.49	39.51	36.74	34.17	31.76	29.52	27.44
11.00 CFS	25.50	23.70	22.02	20.46	19.00	17.65	16.40	15.23
11.40 CFS	14.14	13.13	12.19	11.31	10.50	9.74	9.04	8.39
11.80 CFS	7.78	7.22	6.70	6.21	5.76	5.34	4.95	4.59
12.20 CFS	4.26	3.95	3.66	3.39	3.14	2.91	2.70	2.50
12.60 CFS	2.32	2.14	1.99	1.84	1.70	1.58	1.46	1.35
13.00 CFS	1.25	1.15	1.07	.99	.91	.84	.78	.72
13.40 CFS	.67	.61	.57	.52	.48			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.48 WATERSHED INCHES; 59391 CFS-HRS; 4908.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.67	32338.6	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.78 SQ.MI.

HRS								
1.10 CFS	.35	1.23	3.30	7.30	14.19	25.19	41.59	63.91
1.50 CFS	93	129	173	226	289	361	444	535
1.90 CFS	634	737	869	1142	1708	2714	4325	6694
2.30 CFS	9866	13685	17849	21989	25760	28874	31081	32214
2.70 CFS	32167	30967	28567	25291	21793	18489	15718	13544
3.10 CFS	11939	10771	9814	8968	8240	7625	7085	6605
3.50 CFS	6203	5882	5620	5407	5246	5124	4988	4829
3.90 CFS	4648	4454	4262	4079	3905	3741	3591	3453
4.30 CFS	3329	3225	3117	3005	2887	2768	2653	2541
4.70 CFS	2441	2356	2280	2217	2154	2093	2032	1970
5.10 CFS	1909	1848	1797	1756	1718	1685	1653	1624
5.50 CFS	1591	1553	1517	1484	1454	1423	1390	1353
5.90 CFS	1303	1240	1173	1104	1034	961	886	805
6.30 CFS	722	637	550	463	372	282	195	118
6.70 CFS	60.08	22.99	4.65	.29				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
9.96 WATERSHED INCHES; 30716 CFS-HRS; 2538.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.83	21194.2	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 3.48 SQ.MI.

HRS								
1.00 CFS	.19	.70	1.87	4.06	7.63	13.12	21.11	32.24
1.40 CFS	47	66	88	115	147	185	228	276
1.80 CFS	330	390	456	526	613	762	1034	1484
2.20 CFS	2161	3116	4397	6018	7955	10115	12368	14560
2.60 CFS	16553	18252	19605	20564	21097	21158	20717	19797
3.00 CFS	18426	16619	14575	12598	10822	9364	8214	7356
3.40 CFS	6708	6164	5698	5314	4987	4694	4434	4215
3.80 CFS	4027	3858	3706	3582	3469	3358	3243	3124
4.20 CFS	3003	2884	2765	2649	2537	2431	2335	2251
4.60 CFS	2177	2104	2032	1957	1882	1806	1734	1669
5.00 CFS	1613	1566	1525	1486	1449	1410	1370	1328
5.40 CFS	1288	1254	1227	1204	1184	1165	1144	1117
5.80 CFS	1087	1055	1022	988	954	920	884	843
6.20 CFS	795	743	686	625	562	497	435	375
6.60 CFS	320	267	216	168	123	81	47	23
7.00 CFS	7.37	1.46	.17					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.35 WATERSHED INCHES; 23254 CFS-HRS; 1921.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 75

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.72	51863.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 8.26 SQ.MI.

HRS								
1.00 CFS	.19	.78	2.22	5.28	10.93	20.42	35.29	57.43
1.40 CFS	89	130	181	244	320	411	517	638
1.80 CFS	774	925	1090	1263	1482	1904	2742	4198
2.20 CFS	6486	9810	14263	19702	25804	32104	38127	43435
2.60 CFS	47634	50466	51771	51531	49664	46449	42510	38287
3.00 CFS	34144	30163	26514	23368	20636	18333	16454	14981
3.40 CFS	13793	12769	11901	11196	10607	10101	9680	9339
3.80 CFS	9015	8687	8354	8036	7732	7437	7148	6866
4.20 CFS	6594	6337	6094	5874	5654	5436	5222	5019
4.60 CFS	4829	4645	4473	4313	4162	4023	3887	3762
5.00 CFS	3645	3536	3434	3335	3245	3165	3087	3012
5.40 CFS	2941	2878	2817	2757	2701	2649	2597	2540
5.80 CFS	2477	2408	2325	2229	2127	2024	1918	1804
6.20 CFS	1681	1548	1408	1262	1112	960	807	657
6.60 CFS	515	385	276	191	127	81	47	23
7.00 CFS	7.37	1.46	.17					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.12 WATERSHED INCHES; 53970 CFS-HRS; 4460.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 76 6-hr local Inflow

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.74	68291.0	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
1.00 CFS	.46	1.50	3.81	8.39	16.46	29.61	49.80	79.52
1.40 CFS	121	177	248	336	444	574	726	903
1.80 CFS	1104	1330	1580	1851	2178	2720	3712	5404
2.20 CFS	8074	12021	17468	24416	32645	41451	49331	56027
2.60 CFS	61419	65347	67649	68269	67091	64374	60745	56664
3.00 CFS	52527	48446	44617	41236	38230	35629	33438	31646
3.40 CFS	30137	28797	27619	26615	25744	24974	24309	23745
3.80 CFS	23218	22705	22202	21728	21278	20847	20429	20024
4.20 CFS	19639	19277	18938	18630	18328	18035	17749	17477
4.60 CFS	17221	16974	16741	16525	16322	16136	15955	15788
5.00 CFS	15631	15484	15344	15209	15085	14974	14868	14768
5.40 CFS	14672	14553	14349	14101	13835	13567	13282	12970
5.80 CFS	12634	12280	11906	11513	11111	10704	10293	9875
6.20 CFS	9452	9023	8592	8160	7729	7300	6873	6452
6.60 CFS	6040	5645	5277	4941	4643	4380	4148	3945
7.00 CFS	3764	3605	3459	3320	3188	3059	2933	2810
7.40 CFS	2690	2571	2456	2342	2231	2123	2019	1917
7.80 CFS	1819	1724	1633	1545	1461	1380	1303	1230
8.20 CFS	1159	1093	1029	969	912	857	806	757

8.60 CFS	711	667	626	587	551	516	484	453
9.00 CFS	424	397	371	347	325	304	284	265
9.40 CFS	248	232	216	202	188	176	164	153
9.80 CFS	143	133	124	116	108	100	94	87
10.20 CFS	81.15	75.56	70.35	65.49	60.95	56.72	52.78	49.10
10.60 CFS	45.68	42.49	39.51	36.74	34.17	31.76	29.52	27.44
11.00 CFS	25.50	23.70	22.02	20.46	19.00	17.65	16.40	15.23
11.40 CFS	14.14	13.13	12.19	11.31	10.50	9.74	9.04	8.39
11.80 CFS	7.78	7.22	6.70	6.21	5.76	5.34	4.95	4.59
12.20 CFS	4.26	3.95	3.66	3.39	3.14	2.91	2.70	2.50
12.60 CFS	2.32	2.14	1.99	1.84	1.70	1.58	1.46	1.35
13.00 CFS	1.25	1.15	1.07	.99	.91	.84	.78	.72
13.40 CFS	.67	.61	.57	.52	.48			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.54 WATERSHED INCHES; 113361 CFS-HRS; 9368.2 ACRE-FEET.

--- XSECTION 76, ALTERNATE 1, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

*** MESSAGE - STRUCTURE 1, USER ENTERED STARTING ELEVATION (1193.0 FEET) CAN ADD .118 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

*** MESSAGE - RESERVOIR ROUTING, STRUCTURE 1, TRUNCATED AT 400 POINTS WITH 3172.68 AC-FT (.24 WATERSHED INCHES) FLOOD STORAGE REMAINING IN RESERVOIR AT ELEV. 1211.85. ***

outflow 6h-local hydrograph (ADWR)

OPERATION RESVOR STRUCTURE 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.93	21920.6	1215.73

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
.70 CFS	7.29	7.29	7.29	7.29	7.28	7.28	7.28	7.28
1.10 CFS	7.28	7.28	7.28	7.28	7.29	7.30	7.32	7.35
1.50 CFS	7.40	7.46	7.54	7.65	7.79	7.96	8.18	8.44
1.90 CFS	8.76	9.13	9.56	10.09	10.78	11.77	13.23	15.40
2.30 CFS	18.59	23.13	28.43	33.71	39.91	46.04	51.81	57.53
2.70 CFS	63	69	74	79	83	86	1780	3903
3.10 CFS	6537	8922	11290	13260	14896	16341	17601	18628
3.50 CFS	19457	20120	20645	21053	21364	21594	21758	21862
3.90 CFS	21913	21918	21882	21811	21709	21581	21429	21259
4.30 CFS	21072	20874	20667	20452	20230	20004	19774	19542
4.70 CFS	19310	19078	18848	18622	18399	18180	17966	17758
5.10 CFS	17555	17357	17166	16981	16803	16631	16466	16305
5.50 CFS	16145	15978	15804	15622	15445	15266	15077	14876
5.90 CFS	14662	14435	14195	13942	13678	13401	13114	12816
6.30 CFS	12508	12190	11864	11530	11188	10840	10487	10130
6.70 CFS	9771	9413	9058	8708	8367	8073	7813	7557
7.10 CFS	7309	7066	6831	6602	6379	6162	5951	5746

7.50 CFS	5546	5352	5162	4978	4798	4623	4453	4287
7.90 CFS	4126	3969	3817	3669	3525	3385	3250	3119
8.30 CFS	2991	2868	2749	2659	2602	2545	2489	2433
8.70 CFS	2377	2322	2267	2213	2159	2106	2054	2003
9.10 CFS	1953	1903	1854	1806	1759	1712	1667	1622
9.50 CFS	1579	1536	1494	1453	1413	1374	1336	1298
9.90 CFS	1262	1226	1191	1157	1124	1092	1060	1030
10.30 CFS	1000	971	943	915	888	862	837	812
10.70 CFS	788	764	742	719	698	677	657	637
11.10 CFS	618	599	581	564	546	530	514	498
11.50 CFS	483	468	454	440	427	414	401	389
11.90 CFS	377	365	354	343	333	322	312	303
12.30 CFS	294	284	276	267	259	251	243	236
12.70 CFS	228	221	214	208	201	195	189	183
13.10 CFS	178	172	167	161	156	152	147	142
13.50 CFS	138	134	129	125	122	118	114	111
13.90 CFS	107	104	101	97	94	91	89	86
14.30 CFS	85.94	85.94	85.93	85.93	85.92	85.92	85.91	85.91
14.70 CFS	85.90	85.90	85.89	85.89	85.88	85.88	85.87	85.87
15.10 CFS	85.86	85.86	85.85	85.85	85.84	85.84	85.83	85.83
15.50 CFS	85.82	85.82	85.81	85.81	85.80	85.80	85.79	85.79
15.90 CFS	85.78	85.78	85.77	85.77	85.76	85.76	85.75	85.75
16.30 CFS	85.74	85.74	85.73	85.73	85.72	85.72	85.71	85.71
16.70 CFS	85.70	85.70	85.69	85.69	85.68	85.68	85.67	85.67
17.10 CFS	85.66	85.66	85.65	85.65	85.64	85.64	85.63	85.63
17.50 CFS	85.62	85.62	85.61	85.61	85.60	85.60	85.59	85.59
17.90 CFS	85.58	85.58	85.57	85.57	85.56	85.56	85.55	85.55
18.30 CFS	85.54	85.54	85.53	85.53	85.52	85.52	85.51	85.51
18.70 CFS	85.50	85.50	85.49	85.49	85.48	85.48	85.47	85.47
19.10 CFS	85.46	85.46	85.45	85.45	85.44	85.44	85.43	85.43
19.50 CFS	85.42	85.42	85.41	85.41	85.40	85.40	85.39	85.39
19.90 CFS	85.38	85.38	85.37	85.37	85.36	85.36	85.35	85.35
20.30 CFS	85.34	85.34	85.33	85.33	85.32	85.32	85.31	85.31

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.76 WATERSHED INCHES; 76521 CFS-HRS; 6323.7 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 1, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

RAINFALL OF 12.70 inches AND 6.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 1, ARC 2
MAIN TIME INCREMENT .050 HOURS

ALTERNATE 1 STORM 1

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION 1	RUNOFF	2.46	11.09	---	2.71	17873	7265.4
XSECTION 5	REACH	2.46	11.09	8.21	3.32	10200	4146.3
XSECTION 10	REACH	2.46	11.09	9.08	3.96	7060	2869.9
XSECTION 2	RUNOFF	2.38	10.12	---	2.64	16996	7141.2
XSECTION 12	ADDHYD	4.84	10.62	---	2.64	17248	3563.6
XSECTION 12	DIVERT	4.84	5.98	---	2.25F	4100F	847.1
XSECTION 200	DIVERT	.00	5.98	---	2.64	13148	********
XSECTION 20	REACH	4.84	5.98	7.94	3.35F	4100F	847.1
XSECTION 25	REACH	4.84	5.98	5.03	3.40F	4100F	847.1
XSECTION 3	RUNOFF	3.94	11.10	---	2.73	28009	7108.9
XSECTION 30	REACH	3.94	11.10	6.29	3.40	16238	4121.3
XSECTION 5	REACH	3.94	11.10	8.50	4.00	11557	2933.2
XSECTION 25	REACH	3.94	11.10	8.90	4.06	11552	2932.0
XSECTION 4	RUNOFF	2.06	9.75	---	2.68	13580	6592.2
XSECTION 34	ADDHYD	6.00	10.63	---	2.69	13913	2318.8
XSECTION 35	ADDHYD	10.84	8.55	---	2.69	17992	1659.8
XSECTION 35	DIVERT	10.84	6.98	---	2.45F	11000F	1014.8
XSECTION 199	DIVERT	.00	6.98	---	2.69	6992	********
XSECTION 45	REACH	10.84	6.98	8.46	3.60F	11000F	1014.8
XSECTION 6	RUNOFF	1.47	11.12	---	2.44	14477	9848.3
XSECTION 60	REACH	1.47	11.12	9.94	2.65	11037	7508.2
XSECTION 67	REACH	1.47	11.12	7.60	2.98	7397	5032.0
XSECTION 64	ADDHYD	12.31	7.48	---	2.98	18394	1494.2
XSECTION 5	RUNOFF	4.78	9.96	---	2.67	32339	6765.5
XSECTION 7	RUNOFF	3.48	10.35	---	2.83	21194	6090.2
XSECTION 75	ADDHYD	8.26	10.12	---	2.72	51863	6278.8
XSECTION 76	ADDHYD	20.57	8.54	---	2.74	68291	3319.9
STRUCTURE 1	RESVOR	20.57	5.76	1215.73	3.93	21921	1065.7

SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.
QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;
LENGTH FACTOR - VALUE k* GREATER THAN 1.0;
ATT-KIN COEFF - VALUE C GREATER THAN 0.667.

			HYDROGRAPH INFORMATION				ROUTING PARAMETERS				
		FLOOD	INFLOW		OUTFLOW		Q-A EQ.			PEAK	ATT-
XSEC ID	REACH LENGTH (FT)	PLAIN LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	COEFF (X)	POWER (M)	LENGTH FACTOR (k*)	RATIO Q/I (Q*)	KIN COEFF (C)
BASEFLOW IS .0 CFS											
ALTERNATE 1 STORM 1											
5	9100		17866	2.7	10182	3.3	1.77	1.09	.634	.570	.08
10	9100		10182	3.3	7060	4.0	2.37	1.06	.361	.693	.08
20	3332		4100	2.3	4100	3.3	.14	1.63	.003	1.000	.50
25	1950		4100	3.3	4100	3.4	.052	1.73	.001	1.000	.65
30	8865		27941	2.8	16238	3.4	.95	1.15	.638	.581	.08
5	8865		16238	3.4	11557	4.0	1.76	1.09	.334	.712	.08
25	1950		11557	4.0	11551	4.1	.062	1.70	.002	.999	.84?
45	4200		11000	2.5	11000	3.6	.049	1.72	.003	1.000	.47
60	7540		14453	2.5	11037	2.7	.28	1.44	.236	.764	.24
67	5140		11037	2.7	7386	3.0	1.78	1.09	.367	.669	.13

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
STRUCTURE 1	20.57	
ALTERNATE 1		21921
XSECTION 1	2.46	
ALTERNATE 1		17873
XSECTION 2	2.38	
ALTERNATE 1		16996
XSECTION 3	3.94	
ALTERNATE 1		28009
XSECTION 4	2.06	
ALTERNATE 1		13580
XSECTION 5	4.78	
ALTERNATE 1		32339
XSECTION 6	1.47	
ALTERNATE 1		14477
XSECTION 7	3.48	
ALTERNATE 1		21194
XSECTION 10	2.46	
ALTERNATE 1		7060
XSECTION 12	4.84	
ALTERNATE 1		4100
XSECTION 20	4.84	
ALTERNATE 1		4100
XSECTION 25	3.94	
ALTERNATE 1		11552
XSECTION 30	3.94	
ALTERNATE 1		16238
XSECTION 34	6.00	

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
XSECTION 34	6.00	
ALTERNATE 1		13913
XSECTION 35	10.84	
ALTERNATE 1		11000
XSECTION 45	10.84	
ALTERNATE 1		11000
XSECTION 60	1.47	
ALTERNATE 1		11037
XSECTION 64	12.31	
ALTERNATE 1		18394
XSECTION 67	1.47	
ALTERNATE 1		7397
XSECTION 75	8.26	
ALTERNATE 1		51863
XSECTION 76	20.57	
ALTERNATE 1		68291
XSECTION 199	.00	
ALTERNATE 1		6992
XSECTION 200	.00	
ALTERNATE 1		13148

ECON2 DATA FILE

```
ECON2
TITLE        WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE         6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT
FLOW-FREQ    -1         21921.                                        ALT  1   1
FLOW-FREQ     1         17873.                                        ALT  1   2
FLOW-FREQ     2         16996.                                        ALT  1   3
FLOW-FREQ     3         28009.                                        ALT  1   4
FLOW-FREQ     4         13580.                                        ALT  1   5
FLOW-FREQ     5         32339.                                        ALT  1   6
FLOW-FREQ     6         14477.                                        ALT  1   7
FLOW-FREQ     7         21194.                                        ALT  1   8
FLOW-FREQ    10          7060.                                        ALT  1   9
FLOW-FREQ    12          4100.                                        ALT  1  10
FLOW-FREQ    20          4100.                                        ALT  1  11
FLOW-FREQ    25         11552.                                        ALT  1  12
FLOW-FREQ    30         16238.                                        ALT  1  13
FLOW-FREQ    34         13913.                                        ALT  1  14
FLOW-FREQ    35         11000.                                        ALT  1  15
FLOW-FREQ    45         11000.                                        ALT  1  16
FLOW-FREQ    60         11037.                                        ALT  1  17
FLOW-FREQ    64         18394.                                        ALT  1  18
FLOW-FREQ    67          7397.                                        ALT  1  19
FLOW-FREQ    75         51863.                                        ALT  1  20
FLOW-FREQ    76         68291.                                        ALT  1  21
FLOW-FREQ   199          6992.                                        ALT  1  22
FLOW-FREQ   200         13148.                                        ALT  1  23
```

```
TR20 ------------------------------------------------------------------------ SCS -
WT3PMP6       WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS      VERSION
07/21/**       6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT      2.04TEST


END OF  1 JOBS IN THIS RUN


                    SCS  TR-20,  VERSION 2.04TEST
                          WT3PMP6   FILES

     INPUT  = 6LADWR.DAT                                , GIVEN DATA FILE
     OUTPUT = 6LOUT.OUT                                 , DATED 07/21/**,16:20:24

              FILES GENERATED - DATED 07/21/**,16:20:24

    FILE LLL.TEC CONTAINS ECON2 INFORMATION

    FILE LLL.TRD CONTAINS READHD INFORMATION


          TOTAL NUMBER OF WARNINGS =   0,  MESSAGES =   2

                       JOB ENDED AT 16:20:24
                   *** TR-20 RUN COMPLETED ***
```

72-hr General PMF Hydrograph (ADWR)

```
*****************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

JOB TR-20 WT3PMP72  ECON                PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE     72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED
 5 RAINFL 1             0.1                                          6HRLOCAL
 8          .0000       .003        .006        .009        .013
 8          .016        .020        .025        .030        .035
 8          .039        .046        .052        .058        .065
 8          .071        .080        .090        .099        .109
 8          .118        .283        .449        .567        .622
 8          .669        .701        .732        .756        .780
 8          .795        .809        .824        .838        .852
 8          .866        .876        .885        .894        .904
 8          .913        .920        .926        .932        .939
 8          .945        .950        .954        .959        .964
 8          .969        .972        .976        .980        .984
 8          .988        .991        .993        .995        .998
 8          1.          1.          1.          1.          1.
 9 ENDTBL
 5 RAINFL 2             .1                                           6HR GEN
 8          .000        .005        .013        .020        .028
 8          .038        .045        .053        .060        .070
 8          .080        .085        .095        .108        .120
 8          .138        .150        .165        .190        .210
 8          .238        .280        .350        .440        .550
 8          .590        .620        .645        .668        .685
 8          .700        .720        .735        .753        .765
 8          .775        .790        .800        .810        .820
 8          .835        .843        .850        .863        .870
 8          .880        .890        .898        .908        .915
 8          .925        .930        .940        .945        .955
 8          .963        .970        .978        .985        .990
 8          1.00        1.00        1.00        1.00        1.00
 9 ENDTBL
 5 RAINFL 3             0.1                                          12HRGEN
 8          .000        .003        .007        .010        .013
 8          .016        .019        .022        .025        .028
 8          .031        .034        .037        .040        .043
 8          .045        .050        .054        .058        .062
 8          .066        .071        .075        .080        .085
 8          .089        .095        .101        .107        .112
 8          .118        .125        .132        .139        .146
 8          .153        .162        .171        .180        .189
 8          .198        .211        .224        .237        .250
 8          .264        .300        .345        .391        .436
 8          .491        .536        .564        .586        .607
 8          .629        .643        .657        .672        .686
 8          .700        .711        .721        .732        .742
 8          .753        .761        .769        .778        .786
 8          .795        .802        .809        .817        .824
 8          .832        .837        .843        .848        .854
 8          .859        .865        .870        .875        .881
 8          .886        .891        .895        .900        .905
 8          .909        .913        .917        .921        .925
 8          .929        .933        .936        .940        .944
 8          .948        .951        .954        .957        .960
 8          .963        .966        .969        .971        .974
```

Input & output Results.

```
 8          .977        .980        .982        .984        .986
 8          .989        .991        .993        .995        .998
 8          1.000      01.000       1.000       1.000       1.00
 9 ENDTBL
 5 RAINFL 4             0.1                                                18HRGEN
 8          .000        .001        .002        .003        .004
 8          .005        .005        .006        .007        .008
 8          .009        .012        .014        .017        .020
 8          .023        .025        .028        .031        .033
 8          .036        .040        .044        .049        .053
 8          .057        .061        .065        .070        .074
 8          .078        .084        .090        .096        .102
 8          .108        .114        .120        .126        .132
 8          .138        .146        .154        .162        .170
 8          .179        .187        .195        .203        .211
 8          .220        .238        .256        .275        .293
 8          .311        .330        .348        .367        .385
 8          .403        .430        .457        .484        .511
 8          .538        .557        .577        .597        .616
 8          .636        .653        .670        .687        .704
 8          .721        .734        .746        .759        .771
 8          .784        .792        .801        .810        .818
 8          .827        .832        .838        .843        .848
 8          .853        .856        .859        .862        .864
 8          .867        .870        .872        .875        .878
 8          .880        .882        .885        .887        .889
 8          .891        .893        .895        .897        .899
 8          .901        .903        .905        .907        .909
 8          .911        .912        .914        .916        .917
 8          .919        .920        .922        .924        .925
 8          .927        .929        .930        .932        .934
 8          .935        .937        .938        .940        .941
 8          .943        .945        .946        .948        .949
 8          .951        .952        .953        .955        .956
 8          .957        .959        .960        .961        .963
 8          .964        .965        .967        .968        .970
 8          .971        .972        .974        .975        .976
 8          .978        .979        .980        .982        .983
 8          .984        .985        .986        .988        .989
 8          .990        .991        .992        .993        .994
 8          .995        .996        .997        .998        .999
 8          1.000       1.000       1.000       1.000       1.000
 9 ENDTBL
 5 RAINFL 5             0.1                                                24HRGEN
 8          0.000       0.000       0.001       0.001       0.002
 8          0.002       0.002       0.003       0.003       0.003
 8          0.004       0.005       0.007       0.009       0.010
 8          0.012       0.013       0.015       0.016       0.018
 8          0.019       0.022       0.024       0.027       0.030
 8          0.032       0.035       0.037       0.040       0.042
 8          0.045       0.048       0.051       0.055       0.058
 8          0.061       0.064       0.068       0.071       0.074
 8          0.078       0.082       0.087       0.091       0.096
 8          0.100       0.104       0.109       0.113       0.118
 8          0.122       0.127       0.132       0.137       0.142
 8          0.147       0.151       0.156       0.161       0.166
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8          0.171      0.177      0.184      0.191      0.198
8          0.205      0.214      0.224      0.233      0.242
8          0.252      0.265      0.278      0.291      0.303
8          0.316      0.334      0.351      0.368      0.386
8          0.403      0.425      0.447      0.468      0.490
8          0.512      0.527      0.543      0.558      0.574
8          0.589      0.603      0.617      0.631      0.645
8          0.659      0.671      0.684      0.696      0.709
8          0.721      0.731      0.741      0.751      0.761
8          0.771      0.779      0.786      0.793      0.800
8          0.808      0.814      0.820      0.825      0.831
8          0.837      0.840      0.843      0.847      0.850
8          0.853      0.855      0.857      0.859      0.861
8          0.864      0.866      0.868      0.870      0.872
8          0.874      0.876      0.878      0.880      0.881
8          0.883      0.885      0.886      0.888      0.890
8          0.891      0.893      0.895      0.896      0.898
8          0.899      0.901      0.902      0.904      0.905
8          0.907      0.908      0.909      0.910      0.912
8          0.913      0.914      0.915      0.916      0.917
8          0.919      0.920      0.921      0.922      0.923
8          0.924      0.926      0.927      0.928      0.929
8          0.930      0.932      0.933      0.935      0.936
8          0.938      0.940      0.941      0.943      0.944
8          0.946      0.947      0.947      0.948      0.949
8          0.950      0.950      0.951      0.952      0.953
8          0.953      0.955      0.956      0.957      0.958
8          0.959      0.960      0.961      0.962      0.963
8          0.964      0.965      0.966      0.967      0.968
8          0.969      0.970      0.971      0.972      0.973
8          0.974      0.975      0.976      0.977      0.978
8          0.979      0.980      0.981      0.982      0.983
8          0.984      0.985      0.986      0.987      0.988
8          0.988      0.989      0.990      0.991      0.991
8          0.992      0.993      0.994      0.995      0.995
8          0.996      0.997      0.998      0.998      0.999
8          1.000      1.000      1.000      1.000      1.000
9  ENDTBL
5 RAINFL 6            .25                                          48HRGEN
8          0.0000     0.0015     0.0029     0.0044     0.0058
8          0.0073     0.0088     0.0102     0.0117     0.0131
8          0.0146     0.0160     0.0175     0.0190     0.0204
8          0.0219     0.0233     0.0248     0.0263     0.0277
8          0.0292     0.0306     0.0321     0.0335     0.0350
8          0.0365     0.0379     0.0394     0.0408     0.0423
8          0.0438     0.0452     0.0467     0.0481     0.0496
8          0.0510     0.0525     0.0542     0.0558     0.0575
8          0.0592     0.0608     0.0625     0.0642     0.0658
8          0.0692     0.0725     0.0758     0.0792     0.0825
8          0.0858     0.0892     0.0925     0.0975     0.1025
8          0.1075     0.1125     0.1175     0.1225     0.1275
8          0.1325     0.1442     0.1560     0.1677     0.1794
8          0.1985     0.2176     0.2366     0.2557     0.3239
8          0.3921     0.4603     0.5285     0.5520     0.5754
8          0.5989     0.6224     0.6356     0.6488     0.6620
8          0.6752     0.6862     0.6972     0.7082     0.7192
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8          0.7267     0.7342     0.7417     0.7492     0.7558
8          0.7625     0.7692     0.7758     0.7825     0.7892
8          0.7958     0.8025     0.8083     0.8142     0.8200
8          0.8258     0.8308     0.8358     0.8408     0.8458
8          0.8508     0.8558     0.8608     0.8658     0.8683
8          0.8708     0.8733     0.8758     0.8783     0.8808
8          0.8833     0.8858     0.8875     0.8892     0.8908
8          0.8925     0.8942     0.8958     0.8975     0.8992
8          0.9008     0.9025     0.9042     0.9058     0.9075
8          0.9092     0.9108     0.9125     0.9140     0.9154
8          0.9169     0.9183     0.9198     0.9213     0.9227
8          0.9242     0.9256     0.9271     0.9285     0.9300
8          0.9315     0.9329     0.9344     0.9358     0.9373
8          0.9388     0.9402     0.9417     0.9431     0.9446
8          0.9460     0.9475     0.9490     0.9504     0.9519
8          0.9533     0.9548     0.9563     0.9577     0.9592
8          0.9606     0.9621     0.9635     0.9650     0.9665
8          0.9679     0.9694     0.9708     0.9723     0.9737
8          0.9752     0.9767     0.9781     0.9796     0.9810
8          0.9825     0.9840     0.9854     0.9869     0.9883
8          0.9898     0.9912     0.9927     0.9942     0.9956
8          0.9971     0.9985     1.0000     1.0000     1.0
9 ENDTBL
5 RAINFL 7            .25                                          72HRGEN
8          0.0000     0.0005     0.0009     0.0014     0.0019
8          0.0025     0.0032     0.0038     0.0044     0.0051
8          0.0057     0.0063     0.0070     0.0076     0.0082
8          0.0089     0.0095     0.0103     0.0111     0.0119
8          0.0127     0.0134     0.0142     0.0150     0.0158
8          0.0171     0.0184     0.0196     0.0209     0.0222
8          0.0234     0.0247     0.0259     0.0272     0.0285
8          0.0297     0.0310     0.0323     0.0335     0.0348
8          0.0361     0.0375     0.0389     0.0403     0.0418
8          0.0432     0.0446     0.0460     0.0475     0.0489
8          0.0503     0.0517     0.0532     0.0546     0.0560
8          0.0574     0.0589     0.0604     0.0620     0.0636
8          0.0652     0.0668     0.0684     0.0699     0.0715
8          0.0731     0.0747     0.0763     0.0778     0.0797
8          0.0816     0.0835     0.0854     0.0877     0.0899
8          0.0921     0.0943     0.0968     0.0994     0.1019
8          0.1044     0.1073     0.1101     0.1130     0.1158
8          0.1193     0.1228     0.1263     0.1297     0.1335
8          0.1373     0.1411     0.1449     0.1491     0.1532
8          0.1573     0.1614     0.1725     0.1837     0.1948
8          0.2059     0.2241     0.2422     0.2603     0.2784
8          0.3431     0.4078     0.4726     0.5373     0.5596
8          0.5819     0.6042     0.6265     0.6390     0.6515
8          0.6641     0.6766     0.6870     0.6975     0.7079
8          0.7184     0.7255     0.7326     0.7397     0.7468
8          0.7535     0.7601     0.7668     0.7734     0.7794
8          0.7854     0.7915     0.7975     0.8030     0.8085
8          0.8141     0.8196     0.8247     0.8297     0.8348
8          0.8399     0.8443     0.8487     0.8532     0.8576
8          0.8598     0.8620     0.8642     0.8665     0.8685
8          0.8706     0.8726     0.8747     0.8766     0.8785
8          0.8804     0.8823     0.8840     0.8858     0.8875
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8          0.8892      0.8908      0.8924      0.8940      0.8956
8          0.8972      0.8987      0.9003      0.9019      0.9035
8          0.9051      0.9066      0.9082      0.9098      0.9114
8          0.9130      0.9146      0.9160      0.9174      0.9188
8          0.9203      0.9217      0.9231      0.9245      0.9259
8          0.9274      0.9288      0.9302      0.9316      0.9329
8          0.9342      0.9354      0.9367      0.9380      0.9392
8          0.9405      0.9418      0.9430      0.9443      0.9456
8          0.9468      0.9481      0.9494      0.9506      0.9519
8          0.9530      0.9541      0.9552      0.9563      0.9574
8          0.9585      0.9597      0.9608      0.9619      0.9630
8          0.9641      0.9652      0.9661      0.9671      0.9680
8          0.9690      0.9699      0.9709      0.9718      0.9728
8          0.9736      0.9744      0.9752      0.9759      0.9767
8          0.9775      0.9783      0.9791      0.9797      0.9804
8          0.9810      0.9816      0.9823      0.9829      0.9835
8          0.9842      0.9847      0.9851      0.9856      0.9861
8          0.9866      0.9870      0.9875      0.9880      0.9884
8          0.9889      0.9894      0.9899      0.9902      0.9905
8          0.9908      0.9911      0.9915      0.9918      0.9921
8          0.9924      0.9927      0.9930      0.9934      0.9937
8          0.9940      0.9943      0.9946      0.9949      0.9953
8          0.9956      0.9959      0.9962      0.9965      0.9968
8          0.9972      0.9975      0.9978      0.9981      0.9984
8          0.9987      0.9989      0.9991      0.9992      0.9994
8          0.9995      0.9997      0.9998      1.0000      1.0000
9 ENDTBL
5 RAINFL 8     1       2.4                                          10-DAY
8          .0000       .0024       .0048       .0073       .0097
8          .0121       .0148       .0174       .0201       .0228
8          .0254       .0284       .0314       .0344       .0374
8          .0404       .0437       .0471       .0505       .0539
8          .0572       .0612       .0651       .0690       .0729
8          .0768       .0815       .0862       .0909       .0955
8          .1002       .1061       .1120       .1179       .1238
8          .1297       .1377       .1458       .1538       .1618
8          .1699       .1832       .1966       .2099       .2232
8          .2366       .2548       .2778       .3093       .3614
8          1.092       1.174       1.213       1.240       1.260
8          1.276       1.286       1.296       1.306       1.316
8          1.326       1.333       1.340       1.347       1.354
8          1.360       1.365       1.371       1.376       1.381
8          1.386       1.391       1.395       1.399       1.403
8          1.408       1.411       1.415       1.418       1.422
8          1.426       1.429       1.432       1.435       1.438
8          1.442       1.444       1.447       1.450       1.453
8          1.456       1.458       1.461       1.463       1.466
8          1.468       1.471       1.473       1.475       1.477
8          1.48        1.48        1.48        1.48        1.48
9 ENDTBL
4 DIMHYD               .0556                                          WT3
8          0.0         .03         .10         .19         .31
8          .47         .66         .82         .93         .99
8          1.0         .99         .93         .82         .66
8          .47         .31         .03         .00         .00
9 ENDTBL
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 2 XSECTN   005         1.0         8.77                                BOSSCS#5
 8                      0.          0.0         0.0
 8                      0.35        5.          5.56
 8                      1.03        50.         30.95
 8                      1.39        100.        52.16
 8                      1.94        200.        88.72
 8                      2.63        400.        148.61
 8                      3.51        800.        260.63
 8                      4.62        1600.       459.66
 8                      6.04        3200.       929.36
 8                      7.38        6400.       1811.51
 8                      8.77        12800.      3374.20
 8                      10.17       25600.      6398.87
 8                      11.89       51200.      10982.51
 9 ENDTBL
 2 XSECTN   010         1.0         8.94                                BOSSCS#4
 8                      0.          0.0         0.0
 8                      0.91        5.          4.95
 8                      2.03        50.         24.80
 8                      2.63        100.        41.32
 8                      3.34        200.        74.14
 8                      4.15        400.        130.28
 8                      5.23        800.        223.37
 8                      6.41        1600.       447.51
 8                      7.65        3200.       898.64
 8                      8.94        6400.       1690.88
 8                      10.29       12800.      3331.95
 8                      11.64       25600.      6185.81
 8                      13.14       51200.      10661.04
 9 ENDTBL
 2 XSECTN   020         1.0         7.3                                 REACHC
 8                      0.          0.0         0.0
 8                      1.01        100.        57.78
 8                      1.49        200.        86.81
 8                      1.88        300.        110.25
 8                      2.49        500.        149.47
 8                      3.68        1000.       226.31
 8                      5.40        2000.       346.26
 8                      7.85        4000.       533.39
 8                      9.64        6000.       688.07
 8                      11.16       8000.       838.10
 8                      12.46       10000.      985.31
 8                      13.61       12000.      1122.03
 8                      14.56       14000.      1236.94
 8                      15.43       16000.      1345.18
 8                      16.31       18000.      1456.68
 9 ENDTBL
 2 XSECTN   025         1.0         7.3                                 REACHB
 8                      0.          0.0         0.0
 8                      0.63        100.        80.89
 8                      0.93        200.        120.32
 8                      1.17        300.        151.77
 8                      1.56        500.        203.28
 8                      2.30        1000.       302.00
 8                      3.38        2000.       449.24
 8                      4.97        4000.       673.73
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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8                      6.23        6000.       855.96
 8                      7.31        8000.       1016.35
 8                      8.24        10000.      1158.51
 8                      9.09        12000.      1293.31
 8                      9.90        14000.      1425.57
 8                      10.64       16000.      1549.17
 8                      11.36       18000.      1673.11
 9 ENDTBL
 2 XSECTN    030        1.0         9.45                                BOSSCS#6
 8                      0.          0.0         0.0
 8                      0.77        5.          4.67
 8                      1.54        50.         32.06
 8                      1.78        100.        56.64
 8                      2.10        200.        100.59
 8                      2.50        400.        179.97
 8                      3.01        800.        320.25
 8                      3.63        1600.       589.66
 8                      4.35        3200.       1110.72
 8                      5.21        6400.       2084.48
 8                      6.03        12800.      4119.83
 8                      6.99        25600.      6856.75
 8                      8.28        51200.      11085.87
 9 ENDTBL
 2 XSECTN    045        1.0         4.87                                REACHA
 8                      0.          0.0         0.0
 8                      0.60        100.        85.69
 8                      0.90        200.        127.94
 8                      1.13        300.        161.93
 8                      1.52        500.        217.27
 8                      2.25        1000.       324.03
 8                      3.31        2000.       483.02
 8                      4.87        4000.       722.17
 8                      6.09        6000.       914.99
 8                      7.15        8000.       1084.61
 8                      8.05        10000.      1234.17
 8                      8.87        12000.      1373.80
 8                      9.64        14000.      1507.84
 8                      10.34       16000.      1633.45
 8                      11.00       18000.      1753.12
 9 ENDTBL
 2 XSECTN    060        1.0         4.7                                 2CP6CP7
 8                      0.          0.0         0.0
 8                      2.36        100.        45.12
 8                      2.88        200.        83.75
 8                      3.18        300.        114.33
 8                      3.64        500.        172.72
 8                      4.42        1000.       289.04
 8                      5.40        2000.       470.72
 8                      6.87        4000.       782.74
 8                      7.91        6000.       1020.12
 8                      8.79        8000.       1231.25
 8                      9.60        10000.      1435.05
 8                      10.26       12000.      1618.34
 8                      10.94       14000.      1812.58
 8                      11.47       16000.      1983.46
 8                      11.96       18000.      2150.12
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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 9 ENDTBL
 2 XSECTN   067          1.0         8.77                                BOSSCS#5
 8                       0.          0.0         0.0
 8                       0.35        5.          5.56
 8                       1.03        50.         30.95
 8                       1.39        100.        52.16
 8                       1.94        200.        88.72
 8                       2.63        400.        148.61
 8                       3.51        800.        260.63
 8                       4.62        1600.       459.66
 8                       6.04        3200.       929.36
 8                       7.38        6400.       1811.51
 8                       8.77        12800.      3374.20
 8                       10.17       25600.      6398.87
 8                       11.89       51200.      10982.51
 9 ENDTBL
 3 STRUCT       01                                                          95/11/6
 8                       1178.0      0.00        0.0
 8                       1188.0      2.71        44.8
 8                       1193.0      7.29        129.0
 8                       1199.2      26.75       500.0
 8                       1202.0      38.68       845.55
 8                       1204.0      48.00       1176.28
 8                       1206.0      56.80       1575.25
 8                       1208.0      66.40       2044.97
 8                       1210.0      77.10       2593.40
 8                       1212.0      85.95       3218.00
 8                       1213.0      2685.00     3556.67
 8                       1214.0      8231.00     3916.02
 8                       1215.0      15545.0     4294.13
 8                       1216.0      24272.0     4692.68
 8                       1217.0      34212.0     5113.19
 8                       1218.0      45232.0     5556.01
 8                       1219.0      57233.0     6021.50
 8                       1220.0      70142.0     6509.75
 9 ENDTBL
 6 RUNOFF 1 001        1 2.46        87.2        0.85        1 1
 6 REACH  3 005   1    7 9100.                               1           BOSS#6
 6 REACH  3 010   7    2 9100.                               1           BOSS#4
 6 RUNOFF 1 002        3 2.38        79.9        0.73        1 1
 6 ADDHYD 4 012   2 3 1                                      1 1
 6 DIVERT 6 012   1 4 7 4100.        1.00        200.        1 1         OLIVE
 6 REACH  3 020   4    7 3332.                               1           REACH C
 6 REACH  3 025   7    5 1950.                               1           REACH B
 6 RUNOFF 1 003        6 3.94        87.2        0.88        1 1
 6 REACH  3 030   6    7 8865.                               1           BOSS#6
 6 REACH  3 005   7    1 8865.                               1           BOSS#5
 6 REACH  3 025   1    7 1950.                               1           REACH B
 6 RUNOFF 1 004        1 2.06        77.3        0.79        1 1
 6 ADDHYD 4 034   7 1 2                                      1 1
 6 ADDHYD 4 035   5 2 3                                      1 1
 6 DIVERT 6 035   3 4 7 11000.       1.00        199.        1 1         NORTHERN
 6 REACH  3 045   4    5 4200.                               1           REACH A
 6 RUNOFF 1 006        2 1.47        87.7        0.47        1 1
 6 REACH  3 060   2    3 7540.                               1           CP6CP7
 6 REACH  3 067   3    4 5140.                               1           BOSS#5
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 6 ADDHYD 4 064   5 4 3                                          1 1
 6 RUNOFF 1 005       6 4.78        78.8        0.78             1 1
 6 RUNOFF 1 007       7 3.48        81.7        1.01             1 1
 6 ADDHYD 4 075   6 7 1                                          1 1
 6 ADDHYD 4 076   1 3 2                                          1 1     1
 6 RESVOR 2    01 2   1 1193.0                                   1 1     1
   ENDATA
 7 LIST                 1.0                     1.
 7 INCREM 6             0.20
 7 COMPUT 7 001      01 0.          15.8        1.0              7 2  01  07
   ENDCMP 1
   ENDJOB 2

*********************************END OF 80-80 LIST*********************************
```

RUNOFF OPTION USED WITH RAINTABLE NO. 8, RUNOFF CURVE NO. = 100.

COMPUTED DIMHYD PEAK RATE FACTOR = 664.607

```
EXECUTIVE CONTROL  LIST          1.          0.          1.

          LISTING OF CURRENT DATA


                     COMPUTED TIME INCREMENT
DIMHYD                        .0556

                  .0000       .0300       .1000       .1900       .3100
                  .4700       .6600       .8200       .9300       .9900
                 1.0000       .9900       .9300       .8200       .6600
                  .4700       .3100       .0300       .0000       .0000
ENDTBL

   COMPUTED PEAK RATE FACTOR =  664.607
```

TABLE NO.		TIME INCREMENT				
RAINFL	1	.1000				
		.0000	.0030	.0060	.0090	.0130
		.0160	.0200	.0250	.0300	.0350
		.0390	.0460	.0520	.0580	.0650
		.0710	.0800	.0900	.0990	.1090
		.1180	.2830	.4490	.5670	.6220
		.6690	.7010	.7320	.7560	.7800
		.7950	.8090	.8240	.8380	.8520
		.8660	.8760	.8850	.8940	.9040
		.9130	.9200	.9260	.9320	.9390
		.9450	.9500	.9540	.9590	.9640
		.9690	.9720	.9760	.9800	.9840
		.9880	.9910	.9930	.9950	.9980
		1.0000	1.0000	1.0000	1.0000	1.0000

ENDTBL

STANDARD CONTROL INSTRUCTIONS

```
RUNOFF      1       1      2.4600     87.2000      .85001 1 0 0 0 1
REACH       5   1   7   9100.0000       .0000      .00001 0 0 0 0 1
REACH      10   7   2   9100.0000       .0000      .00001 0 0 0 0 1
RUNOFF      2       3      2.3800     79.9000      .73001 1 0 0 0 1
ADDHYD     12   2 3 1                                   1 1 0 0 0 1
DIVERT     12   1 4 7   4100.0000      1.0000   200.00001 1 0 0 0 1
REACH      20   4   7   3332.0000       .0000      .00001 0 0 0 0 1
REACH      25   7   5   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      3       6      3.9400     87.2000      .88001 1 0 0 0 1
REACH      30   6   7   8865.0000       .0000      .00001 0 0 0 0 1
REACH       5   7   1   8865.0000       .0000      .00001 0 0 0 0 1
REACH      25   1   7   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      4       1      2.0600     77.3000      .79001 1 0 0 0 1
ADDHYD     34   7 1 2                                   1 1 0 0 0 1
ADDHYD     35   5 2 3                                   1 1 0 0 0 1
DIVERT     35   3 4 7  11000.0000      1.0000   199.00001 1 0 0 0 1
REACH      45   4   5   4200.0000       .0000      .00001 0 0 0 0 1
RUNOFF      6       2      1.4700     87.7000      .47001 1 0 0 0 1
REACH      60   2   3   7540.0000       .0000      .00001 0 0 0 0 1
REACH      67   3   4   5140.0000       .0000      .00001 0 0 0 0 1
ADDHYD     64   5 4 3                                   1 1 0 0 0 1
RUNOFF      5       6      4.7800     78.8000      .78001 1 0 0 0 1
RUNOFF      7       7      3.4800     81.7000     1.01001 1 0 0 0 1
ADDHYD     75   6 7 1                                   1 1 0 0 0 1
ADDHYD     76   1 3 2                                   1 1 0 0 1 1
RESVOR        1 2   1   1193.0000                       1 1 0 0 1 1
ENDATA
```

END OF LISTING

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .200 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 15.80 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .200 HOURS
ALTERNATE NO. = 1 STORM NO. = 7 RAIN TABLE NO. = 7

OPERATION RUNOFF XSECTION 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.01	6290.9	(RUNOFF)
37.14	222.8	(RUNOFF)
42.48	160.6	(RUNOFF)
43.88	160.6	(RUNOFF)
45.39	144.8	(RUNOFF)
46.63	144.8	(RUNOFF)
48.53	128.1	(RUNOFF)
49.25	128.1	(RUNOFF)
50.01	128.2	(RUNOFF)
50.78	128.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.46 SQ.MI.

HRS								
6.80 CFS	.23	.99	2.60	4.92	7.41	9.80	12.16	14.48
8.40 CFS	16.85	19.25	21.48	23.29	25.31	27.59	29.55	31.06
10.00 CFS	32.94	35.51	38.49	41.46	44.22	46.72	49.35	51.53
11.60 CFS	52.88	53.84	55.72	58.23	60.26	61.25	61.85	63.48
13.20 CFS	65.94	67.81	68.54	68.83	70.26	73.02	76.35	79.85
14.80 CFS	83.14	86.13	88.09	89.48	90.66	91.14	91.12	92.08
16.40 CFS	94	97	98	98	100	105	113	121
18.00 CFS	124	127	135	144	151	152	154	162
19.60 CFS	172	180	184	186	193	204	212	215
21.20 CFS	220	234	253	270	275	277	284	296
22.80 CFS	306	311	315	325	337	345	350	394
24.40 CFS	545	760	926	983	1033	1205	1437	1616
26.00 CFS	1680	1996	3130	4708	5958	6290	6037	5038
27.60 CFS	3598	2474	2209	2138	1905	1567	1316	1248
29.20 CFS	1233	1182	1109	1057	1041	1019	937	822
30.80 CFS	735	709	707	696	681	669	665	660
32.40 CFS	643	621	606	604	601	587	568	556
34.00 CFS	554	552	540	522	510	507	504	489
35.60 CFS	465	448	444	429	373	294	237	222
37.20 CFS	223	219	212	207	206	205	202	197
38.80 CFS	192	190	189	185	179	176	174	172
40.40 CFS	167	164	161	161	161	160	158	156
42.00 CFS	157	159	160	160	159	157	156	158
43.60 CFS	160	161	161	159	154	147	142	142

45.20 CFS	144	145	144	141	141	141	143	145
46.80 CFS	144	142	140	137	134	130	127	126
48.40 CFS	128	128	126	127	128	128	126	127
50.00 CFS	128	127	126	127	128	127	125	122
51.60 CFS	117	112	110	110	110	111	112	114
53.20 CFS	115	113	111	110	110	109	104	99
54.80 CFS	95.92	95.49	95.53	95.31	95.58	95.24	95.48	94.73
56.40 CFS	91.62	86.71	81.65	79.19	77.09	76.07	77.39	79.64
58.00 CFS	80.28	78.85	74.36	69.21	65.85	64.21	62.73	63.19
59.60 CFS	64.51	63.90	62.57	63.01	60.90	54.36	47.42	46.33
61.20 CFS	48.46	49.63	48.07	46.12	46.28	47.66	47.31	45.89
62.80 CFS	46.76	48.96	48.66	43.81	36.83	31.65	30.19	30.89
64.40 CFS	32.94	34.37	33.62	31.35	30.17	30.15	30.41	31.81
66.00 CFS	33.98	34.30	32.52	30.50	30.15	30.18	30.92	32.95
67.60 CFS	34.48	33.68	31.30	30.16	30.15	30.33	31.78	33.88
69.20 CFS	34.35	32.60	30.51	30.15	30.11	29.43	26.91	23.19
70.80 CFS	19.16	16.26	15.21	14.96	15.26	14.90	15.12	14.45
72.40 CFS	11.29	6.32	1.19	.00				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22681 CFS-HRS; 1874.3 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.54	4816.3	6.72
42.76	160.0	1.72
44.25	159.6	1.72
46.94	143.7	1.63
51.01	127.5	1.54
53.42	113.7	1.47
63.33	48.1	1.00
66.47	32.9	.77
68.00	32.7	.77
69.50	32.6	.77

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22692 CFS-HRS; 1875.3 ACRE-FEET.

OPERATION REACH XSECTION 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.12	3932.3	7.95
44.51	159.4	3.05
68.36	32.2	1.59
69.88	32.1	1.58

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22690 CFS-HRS; 1875.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.97	5804.6	(RUNOFF)
27.91	2083.0	(RUNOFF)
32.95	574.5	(RUNOFF)
33.97	527.8	(RUNOFF)
34.96	482.6	(RUNOFF)
35.91	425.5	(RUNOFF)
37.12	212.6	(RUNOFF)
41.10	153.0	(RUNOFF)
42.43	153.0	(RUNOFF)
43.72	153.1	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.38 SQ.MI.

HRS								
9.40 CFS	.14	.63	1.68	3.16	4.81	6.60	8.47	10.27
11.00 CFS	12.14	14.12	15.84	17.19	18.61	20.39	22.36	23.92
12.60 CFS	24.94	26.12	27.84	29.82	31.23	32.00	32.96	34.62
14.20 CFS	36.86	39.25	41.70	44.25	46.40	47.92	49.37	50.69
15.80 CFS	51.39	51.89	53.40	55.71	57.36	58.57	59.27	60.59
17.40 CFS	65.67	72.65	76.93	78.70	82.05	89.12	96.33	99.53
19.00 CFS	101	104	111	119	125	127	129	138
20.60 CFS	147	152	155	161	174	192	201	204
22.20 CFS	207	216	228	235	239	244	255	267
23.80 CFS	272	274	324	491	691	792	812	882
25.40 CFS	1076	1303	1422	1470	1892	3231	4839	5662
27.00 CFS	5799	5531	4259	2748	2071	2073	1988	1688
28.60 CFS	1339	1182	1177	1158	1092	1019	987	985
30.20 CFS	955	852	729	672	672	669	656	639
31.80 CFS	630	630	624	603	580	573	574	569
33.40 CFS	551	532	526	528	524	508	489	481
35.00 CFS	482	479	457	432	422	423	401	330
36.60 CFS	249	212	211	212	207	199	196	196
38.20 CFS	195	191	185	181	181	180	174	169
39.80 CFS	167	166	162	158	155	153	153	153
41.40 CFS	152	150	148	150	152	153	153	151
43.00 CFS	149	149	152	153	153	153	151	145
44.60 CFS	137	134	136	138	138	136	134	134
46.20 CFS	135	138	139	137	134	133	130	126
47.80 CFS	122	120	121	123	122	120	121	123
49.40 CFS	121	120	122	123	120	120	123	122
51.00 CFS	120	119	115	109	106	105	105	105
52.60 CFS	106	108	110	109	107	105	105	105
54.20 CFS	103	98	93	91	91	91	91	91
55.80 CFS	91.23	91.13	90.16	86.63	80.12	76.62	75.20	72.57

57.40 CFS	72.39	75.00	76.69	76.65	74.70	68.97	64.00	62.46
59.00 CFS	60.92	59.14	61.17	62.23	60.18	59.29	60.96	57.31
60.60 CFS	48.43	43.26	44.74	47.42	47.41	45.10	43.32	44.67
62.20 CFS	46.36	44.37	43.36	45.53	47.73	46.08	39.71	32.21
63.80 CFS	28.79	28.81	29.70	32.36	33.49	31.36	29.05	28.80
65.40 CFS	28.79	29.11	31.05	33.35	32.66	29.83	28.80	28.80
67.00 CFS	28.82	29.71	32.40	33.52	31.37	29.04	28.80	28.80
68.60 CFS	29.10	31.02	33.34	32.68	29.88	28.80	28.80	28.77
70.20 CFS	27.82	24.66	20.68	17.06	14.62	14.36	14.56	14.23
71.80 CFS	14.45	14.35	13.29	9.79	3.54	.17		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.26 WATERSHED INCHES; 20363 CFS-HRS; 1682.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.15	7758.9	(NULL)
28.05	5991.2	(NULL)
42.16	319.5	(NULL)
43.60	313.0	(NULL)
45.17	294.5	(NULL)
46.50	285.0	(NULL)
48.33	261.8	(NULL)
49.13	256.0	(NULL)
49.92	252.4	(NULL)
50.66	250.9	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
7.60 CFS	.31	.76	1.47	2.44	3.66	5.08	6.68	8.43
9.20 CFS	10.32	12.37	14.83	17.89	21.39	25.05	28.81	32.69
10.80 CFS	36.59	40.66	44.94	49.03	52.79	56.64	60.79	64.98
12.40 CFS	68.67	71.80	75.05	78.77	82.60	85.76	88.29	91.01
14.00 CFS	94	98	102	106	110	114	118	122
15.60 CFS	125	128	131	135	139	142	145	147
17.20 CFS	150	156	165	171	175	181	192	202
18.80 CFS	210	215	223	235	249	260	266	275
20.40 CFS	289	304	314	323	335	355	379	395
22.00 CFS	406	418	436	457	473	486	500	520
23.60 CFS	540	553	564	622	797	1008	1131	1193
25.20 CFS	1323	1589	1892	2095	2242	2778	4235	5976
26.80 CFS	7013	7503	7727	7011	6032	5765	5982	5910
28.40 CFS	5496	4966	4590	4337	4052	3727	3415	3168
30.00 CFS	2974	2775	2526	2277	2110	2006	1905	1801
31.60 CFS	1705	1627	1568	1510	1446	1387	1348	1322
33.20 CFS	1292	1252	1214	1191	1177	1158	1128	1097
34.80 CFS	1077	1067	1052	1020	984	965	955	921
36.40 CFS	838	745	693	671	644	609	573	543
38.00 CFS	519	497	475	454	437	426	414	400

39.60 CFS	388	380	373	364	355	347	341	337
41.20 CFS	334	330	324	320	319	319	318	316
42.80 CFS	313	310	310	313	313	313	312	310
44.40 CFS	304	297	293	294	294	293	288	285
46.00 CFS	284	283	285	285	282	279	278	274
47.60 CFS	270	265	262	261	262	258	255	255
49.20 CFS	256	252	250	252	252	249	249	251
50.80 CFS	250	248	246	243	236	232	231	230
52.40 CFS	228	226	227	227	226	222	220	220
54.00 CFS	220	217	211	205	203	201	200	198
55.60 CFS	196	194	193	191	186	179	174	172
57.20 CFS	167	165	165	165	163	159	153	147
58.80 CFS	144	141	137	137	137	133	130	130
60.40 CFS	126	116	110	110	110	108	104	100
62.00 CFS	99.93	100.12	96.80	94.73	96.04	97.46	95.17	88.45
63.60 CFS	80.75	76.90	75.87	75.11	75.80	74.97	71.19	67.60
65.20 CFS	66.31	65.31	64.63	65.66	67.17	65.92	62.83	61.76
66.80 CFS	61.70	61.52	62.12	64.50	65.36	63.16	60.98	60.96
68.40 CFS	61.01	61.18	62.91	65.00	64.23	61.54	60.71	60.90
70.00 CFS	60.84	59.75	56.38	52.13	48.04	44.79	43.32	41.96
71.60 CFS	39.92	38.46	36.84	34.42	29.76	22.49	18.03	16.46
73.20 CFS	14.61	12.59	10.60	8.78	7.18	5.80	4.65	3.70
74.80 CFS	2.93	2.30	1.80	1.41	1.09	.85	.65	.50
76.40 CFS	.38							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.78 WATERSHED INCHES; 43053 CFS-HRS; 3557.9 ACRE-FEET.

OPERATION DIVERT XSECTION 12
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	(DIVERT)
42.16	319.5	(DIVERT)
43.60	313.0	(DIVERT)
45.17	294.5	(DIVERT)
46.50	285.0	(DIVERT)
48.33	261.8	(DIVERT)
49.13	256.0	(DIVERT)
49.92	252.4	(DIVERT)
50.66	250.9	(DIVERT)
52.97	227.5	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
7.60 CFS	.31	.76	1.47	2.44	3.66	5.08	6.68	8.43
9.20 CFS	10.32	12.37	14.83	17.89	21.39	25.05	28.81	32.69
10.80 CFS	36.59	40.66	44.94	49.03	52.79	56.64	60.79	64.98

12.40 CFS	68.67	71.80	75.05	78.77	82.60	85.76	88.29	91.01
14.00 CFS	94	98	102	106	110	114	118	122
15.60 CFS	125	128	131	135	139	142	145	147
17.20 CFS	150	156	165	171	175	181	192	202
18.80 CFS	210	215	223	235	249	260	266	275
20.40 CFS	289	304	314	323	335	355	379	395
22.00 CFS	406	418	436	457	473	486	500	520
23.60 CFS	540	553	564	622	797	1008	1131	1193
25.20 CFS	1323	1589	1892	2095	2242	2778	4100	4100
26.80 CFS	4100	4100	4100	4100	4100	4100	4100	4100
28.40 CFS	4100	4100	4100	4100	4052	3727	3415	3168
30.00 CFS	2974	2775	2526	2277	2110	2006	1905	1801
31.60 CFS	1705	1627	1568	1510	1446	1387	1348	1322
33.20 CFS	1292	1252	1214	1191	1177	1158	1128	1097
34.80 CFS	1077	1067	1052	1020	984	965	955	921
36.40 CFS	838	745	693	671	644	609	573	543
38.00 CFS	519	497	475	454	437	426	414	400
39.60 CFS	388	380	373	364	355	347	341	337
41.20 CFS	334	330	324	320	319	319	318	316
42.80 CFS	313	310	310	313	313	313	312	310
44.40 CFS	304	297	293	294	294	293	288	285
46.00 CFS	284	283	285	285	282	279	278	274
47.60 CFS	270	265	262	261	262	258	255	255
49.20 CFS	256	252	250	252	252	249	249	251
50.80 CFS	250	248	246	243	236	232	231	230
52.40 CFS	228	226	227	227	226	222	220	220
54.00 CFS	220	217	211	205	203	201	200	198
55.60 CFS	196	194	193	191	186	179	174	172
57.20 CFS	167	165	165	165	163	159	153	147
58.80 CFS	144	141	137	137	137	133	130	130
60.40 CFS	126	116	110	110	110	108	104	100
62.00 CFS	99.93	100.12	96.80	94.73	96.04	97.46	95.17	88.45
63.60 CFS	80.75	76.90	75.87	75.11	75.80	74.97	71.19	67.60
65.20 CFS	66.31	65.31	64.63	65.66	67.17	65.92	62.83	61.76
66.80 CFS	61.70	61.52	62.12	64.50	65.36	63.16	60.98	60.96
68.40 CFS	61.01	61.18	62.91	65.00	64.23	61.54	60.71	60.90
70.00 CFS	60.84	59.75	56.38	52.13	48.04	44.79	43.32	41.96
71.60 CFS	39.92	38.46	36.84	34.42	29.76	22.49	18.03	16.46
73.20 CFS	14.61	12.59	10.60	8.78	7.18	5.80	4.65	3.70
74.80 CFS	2.93	2.30	1.80	1.41	1.09	.85	.65	.50
76.40 CFS	.38							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 200)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.15	3658.9	(DIVERT)
28.05	1891.2	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
26.20 CFS	0	135	1876	2913	3403	3627	2911	1932
27.80 CFS	1665	1882	1810	1396	866	490	237	0

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5055 CFS-HRS; 417.7 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 20. ***

OPERATION REACH XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	7.94
42.16	319.5	1.94
43.60	313.0	1.92
45.17	294.5	1.86
46.50	285.0	1.82
48.33	261.8	1.73
49.13	256.0	1.71
49.92	252.4	1.69
50.66	250.9	1.69
52.97	227.5	1.60

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 25. ***

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	5.03
42.16	319.5	1.21
43.60	313.0	1.20
45.17	294.5	1.16
46.50	285.0	1.13
48.33	261.8	1.08
49.13	256.0	1.06
49.92	252.4	1.06
50.66	250.9	1.05
52.97	227.5	1.00

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.03	10040.5	(RUNOFF)
37.12	356.5	(RUNOFF)
41.10	257.2	(RUNOFF)
42.50	257.2	(RUNOFF)
43.87	257.2	(RUNOFF)
45.40	231.7	(RUNOFF)
46.65	231.7	(RUNOFF)
48.55	205.0	(RUNOFF)
50.03	205.0	(RUNOFF)
50.79	205.1	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 3.94 SQ.MI.

HRS								
6.80 CFS	.34	1.45	3.89	7.54	11.53	15.39	19.17	22.84
8.40 CFS	26.59	30.43	34.07	37.14	40.32	43.87	47.03	49.53
10.00 CFS	52.51	56.50	61.23	65.95	70.39	74.49	78.70	82.25
11.60 CFS	85	86	89	93	96	98	99	101
13.20 CFS	105	108	110	110	112	117	122	127
14.80 CFS	133	138	141	143	145	146	146	147
16.40 CFS	151	154	157	158	159	167	180	192
18.00 CFS	198	203	215	230	241	244	247	258
19.60 CFS	274	287	294	297	308	325	339	345
21.20 CFS	353	373	403	429	440	443	454	472
22.80 CFS	489	497	504	519	538	551	558	621
24.40 CFS	852	1184	1469	1571	1659	1902	2263	2558
26.00 CFS	2703	3170	4869	7282	9355	10029	9667	8221
27.60 CFS	5995	4199	3538	3445	3081	2567	2137	2004
29.20 CFS	1977	1901	1788	1701	1668	1637	1511	1335
30.80 CFS	1187	1138	1132	1117	1093	1073	1065	1058

32.40 CFS	1033	998	973	967	963	942	912	892
34.00 CFS	887	884	867	840	818	812	807	785
35.60 CFS	748	719	710	688	605	485	388	355
37.20 CFS	356	351	341	332	329	328	323	316
38.80 CFS	308	305	303	296	288	282	279	275
40.40 CFS	269	263	259	257	257	256	254	251
42.00 CFS	251	254	257	257	255	251	251	253
43.60 CFS	256	257	257	255	248	237	228	227
45.20 CFS	230	232	230	226	225	226	229	232
46.80 CFS	231	227	224	220	215	208	203	203
48.40 CFS	204	205	203	203	205	205	203	203
50.00 CFS	205	204	202	204	205	203	200	195
51.60 CFS	188	180	177	177	177	177	179	183
53.20 CFS	184	181	178	177	177	175	168	160
54.80 CFS	154	153	153	153	153	153	153	152
56.40 CFS	147	140	132	127	124	122	124	127
58.00 CFS	129	127	120	112	106	103	101	101
59.60 CFS	103	102	101	101	98	88	77	74
61.20 CFS	77.10	79.45	77.17	74.29	74.14	76.15	75.93	73.85
62.80 CFS	74.62	77.92	78.02	70.90	60.16	51.49	48.30	49.34
64.40 CFS	52.39	54.88	54.13	50.67	48.42	48.28	48.64	50.74
66.00 CFS	54.08	54.91	52.48	49.07	48.29	48.36	49.44	52.43
67.60 CFS	54.81	53.98	50.67	48.40	48.29	48.68	50.71	53.91
69.20 CFS	54.79	52.53	49.19	48.29	48.24	47.24	43.47	37.73
70.80 CFS	31.21	26.55	24.54	23.82	24.43	24.09	23.99	23.32
72.40 CFS	18.27	11.03	2.94	.12				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 36347 CFS-HRS; 3003.7 ACRE-FEET.

OPERATION REACH XSECTION 30

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.78	7435.3	5.34
42.91	256.8	2.21
44.45	255.5	2.21
47.13	230.4	2.16
50.38	204.6	2.11
51.21	204.2	2.11
53.62	182.4	2.04
63.53	77.1	1.67
66.69	52.7	1.55
68.22	52.2	1.55

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36355 CFS-HRS; 3004.3 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.39	6138.2	7.27
44.55	255.5	2.13
68.57	51.6	1.04
70.11	51.4	1.04

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36353 CFS-HRS; 3004.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 25. ***

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.39	6138.2	6.30
44.55	255.5	1.06
68.57	51.6	.32
70.11	51.4	.32

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36353 CFS-HRS; 3004.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.01	4861.6	(RUNOFF)
32.92	492.2	(RUNOFF)
33.95	452.3	(RUNOFF)
37.13	182.2	(RUNOFF)
42.46	131.5	(RUNOFF)
43.75	131.5	(RUNOFF)
45.36	118.9	(RUNOFF)
46.60	118.9	(RUNOFF)
49.22	105.4	(RUNOFF)
49.98	105.4	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.06 SQ.MI.

HRS								
10.60 CFS	.44	1.24	2.48	3.94	5.36	6.65	7.89	9.27
12.20 CFS	10.74	12.07	13.16	14.21	15.50	16.98	18.25	19.14
13.80 CFS	19.98	21.24	22.86	24.65	26.54	28.44	30.17	31.57
15.40 CFS	32.82	33.98	34.79	35.41	36.53	38.22	39.73	40.82
17.00 CFS	41.60	42.73	45.98	50.80	54.70	56.41	58.79	63.74
18.60 CFS	69.28	72.69	73.87	76.25	81.12	87.59	92.71	94.71

20.20 CFS	97	103	110	115	117	122	132	145
21.80 CFS	154	158	160	167	176	183	187	191
23.40 CFS	200	209	215	217	251	368	521	625
25.00 CFS	653	705	846	1029	1155	1197	1491	2480
26.60 CFS	3780	4657	4861	4677	3805	2608	1849	1768
28.20 CFS	1709	1489	1203	1026	1006	993	945	883
29.80 CFS	847	843	822	746	646	583	575	573
31.40 CFS	564	550	541	540	536	520	501	492
33.00 CFS	492	489	475	459	451	452	450	438
34.60 CFS	423	414	414	411	396	375	363	363
36.20 CFS	348	295	227	186	181	182	178	172
37.80 CFS	168	168	167	165	160	156	156	154
39.40 CFS	150	146	144	143	140	136	133	132
41.00 CFS	131	131	131	129	128	128	131	131
42.60 CFS	131	130	128	128	130	131	131	131
44.20 CFS	130	125	119	116	116	118	119	117
45.80 CFS	115	115	116	118	119	118	116	114
47.40 CFS	112	109	106	104	104	105	105	103
49.00 CFS	104	105	104	103	104	105	104	103
50.60 CFS	105	105	104	102	100	95	91	91
52.20 CFS	90.63	90.64	90.88	92.26	94.14	94.12	92.10	90.69
53.80 CFS	90.67	90.60	89.19	84.94	80.60	78.49	78.43	78.29
55.40 CFS	78.35	78.44	78.27	78.37	77.50	74.80	70.18	66.39
57.00 CFS	64.88	62.84	62.23	63.93	65.76	65.92	64.49	60.24
58.60 CFS	55.90	53.70	52.67	51.12	52.17	53.31	52.22	51.16
60.20 CFS	51.85	49.69	43.38	38.08	38.11	40.32	40.86	39.10
61.80 CFS	37.54	38.17	39.57	38.58	37.50	38.68	40.75	39.92
63.40 CFS	35.14	28.96	25.22	24.80	25.52	27.45	28.54	27.35
65.00 CFS	25.23	24.76	24.76	24.95	26.35	28.23	28.22	26.27
66.60 CFS	24.86	24.76	24.78	25.42	27.43	28.56	27.40	25.33
68.20 CFS	24.77	24.77	25.00	26.37	28.27	28.27	26.22	24.84
69.80 CFS	24.77	24.73	24.01	21.69	18.44	15.17	12.99	12.36
71.40 CFS	12.40	12.44	12.29	12.40	11.54	8.86	4.23	.50
73.00 CFS	.00							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.87 WATERSHED INCHES; 17108 CFS-HRS; 1413.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 34

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	7273.8	(NULL)
28.25	7762.8	(NULL)
43.54	389.7	(NULL)
45.15	371.8	(NULL)
50.68	311.1	(NULL)
61.10	145.4	(NULL)
62.94	122.6	(NULL)
65.94	84.5	(NULL)
67.56	80.3	(NULL)
69.07	79.5	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 6.00 SQ.MI.

HRS								
7.80 CFS	.43	1.07	2.10	3.54	5.35	7.50	9.93	12.62
9.40 CFS	15.50	18.51	21.60	24.76	27.97	31.23	34.74	38.74
11.00 CFS	43.30	48.23	53.28	58.30	63.39	68.64	73.89	78.81
12.60 CFS	83	88	92	97	101	105	109	113
14.20 CFS	117	122	126	130	135	139	144	148
15.80 CFS	153	157	162	167	171	175	178	182
17.40 CFS	188	195	201	206	211	221	232	241
19.00 CFS	248	257	270	284	297	307	317	332
20.60 CFS	349	362	374	388	408	430	450	464
22.20 CFS	479	499	523	545	562	581	604	627
23.80 CFS	646	662	709	839	1006	1125	1186	1298
25.40 CFS	1529	1820	2063	2234	2680	3842	5325	6410
27.00 CFS	6933	7265	7120	6765	6830	7417	7751	7627
28.60 CFS	7224	6815	6489	6116	5675	5217	4808	4463
30.20 CFS	4134	3782	3440	3168	2974	2800	2627	2463
31.80 CFS	2320	2201	2095	1991	1896	1823	1769	1717
33.40 CFS	1660	1606	1565	1536	1506	1468	1430	1400
35.00 CFS	1380	1358	1324	1285	1257	1240	1208	1136
36.60 CFS	1049	988	960	929	884	832	783	741
38.20 CFS	701	664	629	600	577	557	536	517
39.80 CFS	502	490	477	465	454	444	437	430
41.40 CFS	424	416	409	406	404	401	397	393
43.00 CFS	390	388	389	390	388	388	386	381
44.60 CFS	375	371	371	372	370	365	361	358
46.20 CFS	357	356	355	352	349	347	344	340
47.80 CFS	336	333	331	331	328	324	321	321
49.40 CFS	318	315	314	314	312	310	311	311
51.00 CFS	309	307	304	299	295	294	293	290
52.60 CFS	288	286	286	283	279	276	275	275
54.20 CFS	272	267	262	259	258	256	253	250
55.80 CFS	247	245	242	237	230	225	222	218
57.40 CFS	215	213	212	208	204	197	191	187
59.00 CFS	184	180	179	177	172	168	166	162
60.60 CFS	154	147	145	145	143	137	133	130
62.20 CFS	129	126	123	122	123	120	114	108
63.80 CFS	103	102	101	101	99	95	90	87

65.40 CFS	85.71	84.27	84.05	84.42	83.09	80.13	78.18	77.89
67.00 CFS	77.76	78.06	79.59	80.22	78.63	76.40	75.99	76.26
68.60 CFS	76.59	77.80	79.41	79.08	76.85	75.58	75.84	76.07
70.20 CFS	75.37	72.85	69.30	65.63	62.78	60.98	59.24	56.97
71.80 CFS	54.23	51.74	48.46	43.59	37.07	31.66	29.39	27.21
73.40 CFS	24.42	21.29	18.17	15.25	12.65	10.38	8.44	6.82
75.00 CFS	5.48	4.38	3.48	2.76	2.18	1.72	1.35	1.05
76.60 CFS	.82	.64	.50					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.81 WATERSHED INCHES; 53461 CFS-HRS; 4418.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 35

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	11373.8	(NULL)
28.25	11862.8	(NULL)
43.56	702.7	(NULL)
45.16	666.3	(NULL)
46.41	641.0	(NULL)
49.91	566.9	(NULL)
50.66	562.0	(NULL)
52.91	513.5	(NULL)
61.13	255.8	(NULL)
62.96	220.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
7.60 CFS	.44	1.19	2.53	4.54	7.19	10.43	14.18	18.37
9.20 CFS	22.93	27.87	33.34	39.49	46.16	53.02	60.04	67.44
10.80 CFS	75	84	93	102	111	120	129	139
12.40 CFS	147	155	163	171	180	187	193	200
14.00 CFS	207	215	224	232	241	249	257	265
15.60 CFS	274	281	288	296	306	313	320	325
17.20 CFS	332	344	360	372	380	393	413	434
18.80 CFS	450	463	481	505	533	557	573	592
20.40 CFS	621	652	677	697	723	763	809	845
22.00 CFS	870	897	936	980	1018	1048	1081	1124
23.60 CFS	1167	1199	1226	1331	1636	2013	2256	2378
25.20 CFS	2621	3118	3712	4157	4477	5458	7942	9425
26.80 CFS	10510	11033	11365	11220	10865	10930	11517	11851
28.40 CFS	11727	11324	10915	10589	10169	9402	8633	7976
30.00 CFS	7438	6909	6308	5718	5278	4980	4704	4429
31.60 CFS	4168	3947	3769	3605	3436	3284	3171	3091
33.20 CFS	3009	2912	2820	2756	2713	2664	2596	2527
34.80 CFS	2477	2447	2410	2344	2269	2221	2195	2129
36.40 CFS	1974	1794	1681	1631	1573	1493	1405	1326
38.00 CFS	1260	1199	1140	1083	1037	1003	971	936
39.60 CFS	905	882	863	841	820	801	786	774
41.20 CFS	764	753	740	729	724	723	719	714

42.80 CFS	707	700	699	702	703	701	700	696
44.40 CFS	685	672	664	665	666	663	654	646
46.00 CFS	642	640	641	640	634	628	624	618
47.60 CFS	610	601	595	592	592	586	579	577
49.20 CFS	576	570	565	566	566	561	559	562
50.80 CFS	561	557	554	547	536	528	525	522
52.40 CFS	518	514	513	513	509	501	497	496
54.00 CFS	494	490	478	467	462	459	455	451
55.60 CFS	446	442	438	432	423	409	399	394
57.20 CFS	385	380	379	377	371	363	350	337
58.80 CFS	331	325	318	316	313	305	298	297
60.40 CFS	288	269	256	255	255	251	241	233
62.00 CFS	230	229	223	217	218	220	216	203
63.60 CFS	188	180	178	177	177	174	166	158
65.20 CFS	154	151	149	150	152	149	143	140
66.80 CFS	140	139	140	144	146	142	137	137
68.40 CFS	137	138	141	144	143	138	136	137
70.00 CFS	137	135	129	121	114	108	104	101
71.60 CFS	96.90	92.69	88.57	82.87	73.36	59.56	49.69	45.85
73.20 CFS	41.82	37.01	31.89	26.95	22.43	18.45	15.03	12.14
74.80 CFS	9.75	7.78	6.18	4.89	3.85	3.03	2.37	1.85
76.40 CFS	1.44	1.12	.87	.67	.52	.40		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.07 WATERSHED INCHES; 91445 CFS-HRS; 7557.0 ACRE-FEET.

OPERATION DIVERT XSECTION 35
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11000.0 *	(DIVERT)
28.00	11000.0 *	(DIVERT)
43.56	702.7	(DIVERT)
45.16	666.3	(DIVERT)
46.41	641.0	(DIVERT)
49.91	566.9	(DIVERT)
50.66	562.0	(DIVERT)
52.91	513.5	(DIVERT)
61.13	255.8	(DIVERT)
62.96	220.1	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 10.84 SQ.MI.

7.60 CFS	.44	1.19	2.53	4.54	7.19	10.43	14.18	18.37
9.20 CFS	22.93	27.87	33.34	39.49	46.16	53.02	60.04	67.44
10.80 CFS	75	84	93	102	111	120	129	139
12.40 CFS	147	155	163	171	180	187	193	200
14.00 CFS	207	215	224	232	241	249	257	265

15.60 CFS	274	281	288	296	306	313	320	325
17.20 CFS	332	344	360	372	380	393	413	434
18.80 CFS	450	463	481	505	533	557	573	592
20.40 CFS	621	652	677	697	723	763	809	845
22.00 CFS	870	897	936	980	1018	1048	1081	1124
23.60 CFS	1167	1199	1226	1331	1636	2013	2256	2378
25.20 CFS	2621	3118	3712	4157	4477	5458	7942	9425
26.80 CFS	10510	11000	11000	11000	10865	10930	11000	11000
28.40 CFS	11000	11000	10915	10589	10169	9402	8633	7976
30.00 CFS	7438	6909	6308	5718	5278	4980	4704	4429
31.60 CFS	4168	3947	3769	3605	3436	3284	3171	3091
33.20 CFS	3009	2912	2820	2756	2713	2664	2596	2527
34.80 CFS	2477	2447	2410	2344	2269	2221	2195	2129
36.40 CFS	1974	1794	1681	1631	1573	1493	1405	1326
38.00 CFS	1260	1199	1140	1083	1037	1003	971	936
39.60 CFS	905	882	863	841	820	801	786	774
41.20 CFS	764	753	740	729	724	723	719	714
42.80 CFS	707	700	699	702	703	701	700	696
44.40 CFS	685	672	664	665	666	663	654	646
46.00 CFS	642	640	641	640	634	628	624	618
47.60 CFS	610	601	595	592	592	586	579	577
49.20 CFS	576	570	565	566	566	561	559	562
50.80 CFS	561	557	554	547	536	528	525	522
52.40 CFS	518	514	513	513	509	501	497	496
54.00 CFS	494	490	478	467	462	459	455	451
55.60 CFS	446	442	438	432	423	409	399	394
57.20 CFS	385	380	379	377	371	363	350	337
58.80 CFS	331	325	318	316	313	305	298	297
60.40 CFS	288	269	256	255	255	251	241	233
62.00 CFS	230	229	223	217	218	220	216	203
63.60 CFS	188	180	178	177	177	174	166	158
65.20 CFS	154	151	149	150	152	149	143	140
66.80 CFS	140	139	140	144	146	142	137	137
68.40 CFS	137	138	141	144	143	138	136	137
70.00 CFS	137	135	129	121	114	108	104	101
71.60 CFS	96.90	92.69	88.57	82.87	73.36	59.56	49.69	45.85
73.20 CFS	41.82	37.01	31.89	26.95	22.43	18.45	15.03	12.14
74.80 CFS	9.75	7.78	6.18	4.89	3.85	3.03	2.37	1.85
76.40 CFS	1.44	1.12	.87	.67	.52	.40		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.99 WATERSHED INCHES; 90850 CFS-HRS; 7507.8 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 199)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	373.8	(DIVERT)
28.25	862.8	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = .00 SQ.MI.

26.80 CFS	0	33	365	220	0	0	517	851
28.40 CFS	727	324	0					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
595 CFS-HRS; 49.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 45. ***

OPERATION REACH XSECTION 45

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11000.0 *	8.46
28.00	11000.0 *	8.46
43.56	702.7	1.82
45.16	666.3	1.76
46.41	641.0	1.73
49.91	566.9	1.62
50.66	562.0	1.61
52.91	513.5	1.54
61.13	255.8	1.03
62.96	220.1	.95

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.99 WATERSHED INCHES; 90850 CFS-HRS; 7507.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
21.84	167.4	(RUNOFF)
26.91	3876.1	(RUNOFF)
27.90	1343.4	(RUNOFF)
28.90	752.9	(RUNOFF)
30.90	425.2	(RUNOFF)
31.90	399.8	(RUNOFF)
32.90	363.9	(RUNOFF)
33.90	334.0	(RUNOFF)
34.94	306.1	(RUNOFF)
35.88	267.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 1.47 SQ.MI.

6.60 CFS	.30	1.29	2.91	4.65	6.19	7.39	9.02	10.41
8.20 CFS	11.55	13.39	14.79	15.46	16.67	18.57	19.60	19.88
9.80 CFS	21.35	23.15	24.75	27.00	28.43	29.62	31.63	33.39
11.40 CFS	33.22	33.89	34.93	36.91	38.61	38.11	38.59	39.51

13.00 CFS	41.48	43.13	42.35	42.67	43.49	45.46	47.91	49.32
14.60 CFS	52.03	53.78	54.61	55.40	56.16	56.67	55.66	56.24
16.20 CFS	58.78	59.66	60.31	60.86	60.06	62.65	72.28	75.36
17.80 CFS	76.15	77.01	82.04	91.96	92.94	92.70	93.65	97.87
19.40 CFS	107	112	112	111	117	128	129	131
21.00 CFS	133	140	160	166	167	167	171	183
22.60 CFS	187	188	190	196	208	210	209	212
24.20 CFS	307	524	588	593	597	703	936	1001
25.80 CFS	1008	1023	1718	3306	3746	3784	3805	3173
27.40 CFS	1696	1323	1325	1325	1177	831	745	748
29.00 CFS	749	714	640	625	624	623	575	454
30.60 CFS	424	424	424	418	403	397	398	398
32.20 CFS	386	364	359	362	363	352	334	330
33.80 CFS	333	333	324	308	302	303	305	295
35.40 CFS	270	264	267	267	230	152	132	132
37.00 CFS	134	133	123	124	123	122	122	116
38.60 CFS	114	114	114	111	105	106	105	102
40.20 CFS	100	97	96	96	96	96	95	92
41.80 CFS	93.41	95.91	96.01	96.01	95.65	92.75	92.58	95.64
43.40 CFS	96.02	96.03	96.03	95.97	92.86	85.84	84.03	84.16
45.00 CFS	86.47	88.07	84.94	84.04	84.04	84.07	85.63	88.28
46.60 CFS	85.71	84.05	84.02	82.47	78.95	77.69	74.74	74.58
48.20 CFS	77.68	77.20	74.07	75.48	77.98	76.49	73.81	76.40
49.80 CFS	77.96	75.63	73.98	77.17	77.71	74.75	74.53	74.61
51.40 CFS	67.84	66.06	66.06	66.06	66.06	66.07	66.42	69.39
53.00 CFS	69.62	66.38	66.07	66.07	66.07	66.06	63.00	56.65
54.60 CFS	58.04	56.76	56.53	58.22	55.78	58.03	56.77	56.53
56.20 CFS	56.68	49.83	48.06	47.94	45.62	43.90	47.17	48.06
57.80 CFS	48.06	48.02	44.98	38.67	39.99	38.64	36.14	37.60
59.40 CFS	40.33	37.73	36.19	38.46	38.60	30.97	26.10	27.45
61.00 CFS	29.96	30.04	29.21	26.10	27.45	29.92	28.47	25.74
62.60 CFS	28.37	30.04	29.98	26.87	19.78	18.02	18.03	18.06
64.20 CFS	19.62	22.31	19.70	18.02	18.03	18.03	18.02	18.39
65.80 CFS	21.31	21.47	18.41	18.03	18.03	18.03	18.06	19.62
67.40 CFS	22.27	19.68	18.03	18.03	18.03	18.03	18.38	21.33
69.00 CFS	21.48	18.40	18.03	18.03	18.03	18.01	16.44	12.92
70.60 CFS	11.66	8.70	8.53	10.07	7.77	10.00	8.69	8.50
72.20 CFS	8.50	1.80	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.39 WATERSHED INCHES; 13656 CFS-HRS; 1128.5 ACRE-FEET.

OPERATION REACH XSECTION 60

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.40	3596.1	6.57
42.89	95.7	2.26
44.31	96.1	2.27
45.60	87.1	2.05
46.86	86.7	2.05
48.73	77.1	1.82
49.48	76.8	1.81
50.23	76.9	1.81
50.98	76.9	1.82
53.39	68.7	1.62

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.36 WATERSHED INCHES; 13620 CFS-HRS; 1125.6 ACRE-FEET.

OPERATION REACH XSECTION 67

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.76	3220.8	6.05
43.15	95.5	1.36
44.56	95.6	1.36
47.18	85.9	1.29
49.73	76.5	1.22
50.49	76.3	1.22
51.23	76.4	1.22
53.67	67.9	1.16
58.55	47.6	.99
60.71	38.3	.85

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.37 WATERSHED INCHES; 13631 CFS-HRS; 1126.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 64

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.80	14144.0	(NULL)
43.51	797.1	(NULL)
46.36	726.5	(NULL)
49.85	642.6	(NULL)
50.64	638.2	(NULL)
62.95	248.2	(NULL)
65.97	170.2	(NULL)
67.55	164.1	(NULL)
69.05	163.0	(NULL)
69.84	156.4	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 12.31 SQ.MI.

HRS								
7.40 CFS	.46	1.40	3.10	5.61	8.86	12.86	17.48	22.57
9.00 CFS	28.20	34.22	40.45	47.15	54.66	62.64	70.59	78.72
10.60 CFS	87	97	107	118	128	139	149	160
12.20 CFS	171	180	189	198	207	217	225	232
13.80 CFS	240	248	257	266	275	285	295	304
15.40 CFS	314	324	333	342	351	361	369	376
17.00 CFS	383	390	403	419	432	443	459	482
18.60 CFS	506	525	542	564	592	622	648	669
20.20 CFS	692	725	759	787	811	842	885	935
21.80 CFS	975	1007	1042	1088	1138	1180	1215	1254
23.40 CFS	1301	1348	1385	1417	1528	1838	2218	2483
25.00 CFS	2674	2998	3563	4209	4713	5128	6210	8777
26.60 CFS	10324	11598	12607	13205	13709	13950	14144	13935
28.20 CFS	13517	13146	12866	12555	11994	11368	10446	9570
29.80 CFS	8836	8228	7645	7004	6387	5920	5575	5250
31.40 CFS	4934	4645	4403	4208	4030	3852	3693	3574
33.00 CFS	3483	3391	3288	3191	3121	3070	3013	2940
34.60 CFS	2866	2812	2775	2731	2659	2580	2528	2493
36.20 CFS	2417	2254	2070	1946	1869	1781	1676	1571
37.80 CFS	1480	1404	1336	1272	1211	1163	1126	1091
39.40 CFS	1054	1022	997	975	951	929	908	891
41.00 CFS	877	865	852	838	826	821	819	814
42.60 CFS	809	802	795	794	797	797	795	795
44.20 CFS	791	780	767	759	758	757	751	741
45.80 CFS	733	728	726	726	725	719	714	710
47.40 CFS	704	695	686	678	674	672	664	656
49.00 CFS	654	653	646	641	643	642	637	635
50.60 CFS	638	637	632	630	623	611	603	599
52.20 CFS	594	588	583	581	580	576	568	565
53.80 CFS	563	562	556	545	534	528	523	517
55.40 CFS	511	505	500	495	490	480	466	456
57.00 CFS	449	439	431	429	425	419	411	397
58.60 CFS	385	378	370	361	358	354	344	338
60.20 CFS	336	326	308	294	291	289	283	272
61.80 CFS	263	260	258	251	246	247	248	243
63.40 CFS	231	217	209	205	201	199	195	186
65.00 CFS	178	174	171	168	169	170	167	162
66.60 CFS	160	159	159	159	163	164	160	157
68.20 CFS	157	157	157	159	163	162	157	156
69.80 CFS	156	156	154	148	140	132	124	120
71.40 CFS	115	109	104	99	93	83	69	59
73.00 CFS	53.25	47.22	40.69	34.30	28.48	23.39	19.04	15.39
74.60 CFS	12.36	9.88	7.86	6.22	4.91	3.87	3.03	2.37
76.20 CFS	1.85	1.44	1.12	.87	.67	.52	.40	

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.15 WATERSHED INCHES; 104481 CFS-HRS; 8634.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11470.2	(RUNOFF)
32.95	1148.8	(RUNOFF)
33.95	1055.1	(RUNOFF)
35.90	851.1	(RUNOFF)
37.13	424.7	(RUNOFF)
41.10	306.3	(RUNOFF)
42.46	306.5	(RUNOFF)
43.79	306.5	(RUNOFF)
45.35	277.2	(RUNOFF)
46.60	277.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.78 SQ.MI.

HRS								
9.80	CFS	.17	.88	2.64	5.48	8.88	12.34	15.87	19.61
11.40	CFS	23.07	25.98	28.79	32.15	35.85	39.03	41.43	43.75
13.00	CFS	46.94	50.62	53.59	55.52	57.42	60.45	64.54	69.10
14.60	CFS	73.78	78.50	82.82	86.04	88.94	91.63	93.34	94.60
16.20	CFS	97	101	105	108	109	112	120	133
17.80	CFS	142	146	152	164	178	186	189	194
19.40	CFS	207	223	235	239	244	259	277	288
21.00	CFS	294	305	329	361	384	391	397	413
22.60	CFS	435	452	459	470	490	512	525	534
24.20	CFS	623	905	1277	1520	1577	1689	2044	2490
25.80	CFS	2775	2885	3634	5974	9027	11023	11470	11007
27.40	CFS	8865	5998	4286	4139	3998	3467	2789	2389
29.00	CFS	2351	2319	2204	2061	1978	1970	1922	1736
30.60	CFS	1497	1356	1343	1337	1315	1284	1263	1261
32.20	CFS	1250	1213	1168	1146	1149	1141	1108	1070
33.80	CFS	1053	1055	1048	1021	986	965	965	959
35.40	CFS	922	872	846	847	811	683	524	431
37.00	CFS	423	424	415	401	393	392	390	384
38.60	CFS	372	364	363	360	350	340	335	332
40.20	CFS	326	318	311	307	306	306	305	301
41.80	CFS	298	299	304	306	306	303	298	298
43.40	CFS	303	306	306	306	303	292	278	269
45.00	CFS	271	276	277	273	269	268	270	275
46.60	CFS	277	274	269	267	261	254	246	241
48.20	CFS	241	245	244	240	242	246	243	241
49.80	CFS	243	246	242	241	244	245	241	238
51.40	CFS	232	220	212	211	211	211	212	215
53.00	CFS	219	219	214	211	211	211	208	198
54.60	CFS	187	183	183	182	183	183	182	183
56.20	CFS	181	174	163	154	151	146	145	149
57.80	CFS	153	154	150	140	130	125	123	119
59.40	CFS	122	124	122	119	121	116	101	88
61.00	CFS	88.84	94.09	95.16	90.93	87.21	88.97	92.51	89.79

62.60 CFS	87.29	90.19	94.81	92.54	81.45	67.19	58.59	57.70
64.20 CFS	59.20	64.01	66.64	63.72	58.85	57.68	57.68	58.25
65.80 CFS	61.55	65.97	65.73	60.86	57.69	57.69	57.73	59.33
67.40 CFS	64.01	66.55	63.67	58.85	57.70	57.69	58.22	61.50
69.00 CFS	66.00	65.84	60.87	57.79	57.70	57.62	55.95	50.37
70.60 CFS	42.70	35.08	30.08	28.71	28.96	29.05	28.72	29.10
72.20 CFS	27.20	20.64	9.19	.81	.00			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.10 WATERSHED INCHES; 40399 CFS-HRS; 3338.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.12	8392.6	(RUNOFF)
42.60	224.5	(RUNOFF)
43.91	224.8	(RUNOFF)
45.48	201.9	(RUNOFF)
46.73	201.9	(RUNOFF)
48.62	178.6	(RUNOFF)
49.41	178.6	(RUNOFF)
50.13	178.5	(RUNOFF)
50.87	178.7	(RUNOFF)
53.23	159.9	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 3.48 SQ.MI.

HRS								
8.80 CFS	.24	.95	2.29	4.33	6.65	9.00	11.37	13.93
10.40 CFS	16.73	19.73	22.74	25.72	28.67	31.47	33.95	36.07
12.00 CFS	38.28	41.00	43.70	45.92	47.72	49.59	52.14	54.64
13.60 CFS	56.59	58.06	59.73	62.40	65.81	69.63	73.54	77.11
15.20 CFS	80.23	82.71	84.69	86.26	87.33	88.70	90.88	93.63
16.80 CFS	96	98	99	104	111	120	126	131
18.40 CFS	138	147	156	161	165	171	181	192
20.00 CFS	200	205	212	222	233	242	249	262
21.60 CFS	281	301	316	322	330	342	356	367
23.20 CFS	374	385	399	412	421	463	591	813
24.80 CFS	1044	1197	1285	1448	1698	1953	2149	2524
26.40 CFS	3559	5276	7060	8232	8309	7435	5884	4292
28.00 CFS	3293	2991	2765	2398	2026	1783	1719	1673
29.60 CFS	1591	1509	1459	1428	1348	1221	1092	1007
31.20 CFS	986	976	959	941	930	922	906	882
32.80 CFS	858	845	839	827	806	786	775	771
34.40 CFS	761	742	722	711	705	691	666	640
36.00 CFS	624	606	554	464	373	321	310	308
37.60 CFS	301	294	288	287	284	278	272	268
39.20 CFS	265	261	255	249	245	242	237	232
40.80 CFS	228	225	225	224	223	220	220	221
42.40 CFS	223	224	223	221	220	220	223	225
44.00 CFS	225	223	218	211	203	199	200	202

45.60 CFS	202	200	197	198	200	202	202	200
47.20 CFS	197	194	190	184	180	178	178	179
48.80 CFS	178	178	178	179	178	178	178	178
50.40 CFS	178	178	179	178	176	172	167	161
52.00 CFS	156	155	155	155	156	159	160	159
53.60 CFS	157	155	155	153	149	143	137	134
55.20 CFS	134	134	134	134	134	133	130	124
56.80 CFS	118	113	109	108	108	110	112	111
58.40 CFS	107	101	95	91	89	89	89	90
60.00 CFS	89.06	88.07	85.84	80.03	71.88	66.46	66.43	68.48
61.60 CFS	68.33	66.16	65.30	65.78	66.19	65.53	65.34	66.92
63.20 CFS	68.11	64.03	56.32	48.50	43.31	42.97	44.89	46.96
64.80 CFS	47.39	45.74	43.20	42.27	42.48	43.85	46.20	47.42
66.40 CFS	46.73	44.40	42.46	42.33	43.03	44.98	47.00	47.28
68.00 CFS	45.63	43.22	42.31	42.54	43.90	46.13	47.33	46.71
69.60 CFS	44.40	42.49	42.21	41.55	39.07	35.00	29.68	24.77
71.20 CFS	22.38	21.11	21.09	21.33	20.80	20.64	17.41	11.87
72.80 CFS	5.89	1.17	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.52 WATERSHED INCHES; 30362 CFS-HRS; 2509.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 75

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.06	19796.8	(NULL)
42.53	530.7	(NULL)
43.89	531.3	(NULL)
45.39	478.8	(NULL)
46.63	478.9	(NULL)
48.48	423.6	(NULL)
49.23	423.9	(NULL)
49.99	424.1	(NULL)
50.76	424.0	(NULL)
53.13	379.5	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 8.26 SQ.MI.

HRS								
8.80 CFS	.24	.95	2.29	4.33	6.66	9.17	12.25	16.57
10.40 CFS	22.21	28.61	35.07	41.59	48.28	54.54	59.93	64.86
12.00 CFS	70	77	83	87	91	97	103	108
13.60 CFS	112	115	120	127	135	143	152	160
15.20 CFS	166	172	176	180	182	186	192	199
16.80 CFS	204	207	211	224	244	262	273	283
18.40 CFS	302	325	342	350	359	378	404	427
20.00 CFS	439	449	471	499	522	536	553	591
21.60 CFS	642	685	706	719	743	777	808	826
23.20 CFS	844	876	911	937	955	1087	1496	2090
24.80 CFS	2564	2774	2975	3492	4188	4728	5034	6158
26.40 CFS	9533	14303	18083	19702	19317	16300	11881	8578

28.00 CFS	7432	6988	6231	5187	4415	4134	4038	3877
29.60 CFS	3652	3487	3429	3350	3084	2718	2448	2350
31.20 CFS	2323	2291	2243	2205	2190	2172	2119	2049
32.80 CFS	2004	1994	1981	1936	1876	1839	1830	1819
34.40 CFS	1782	1728	1687	1675	1664	1613	1538	1486
36.00 CFS	1471	1416	1238	989	804	744	734	723
37.60 CFS	703	686	680	677	668	651	636	631
39.20 CFS	625	611	594	584	577	567	555	542
40.80 CFS	534	531	531	529	524	518	519	525
42.40 CFS	530	530	526	519	518	524	529	531
44.00 CFS	531	526	510	489	473	470	476	479
45.60 CFS	475	468	466	467	474	479	476	470
47.20 CFS	464	455	443	430	421	419	423	423
48.80 CFS	419	420	424	422	419	421	424	421
50.40 CFS	419	422	424	420	415	404	387	373
52.00 CFS	367	366	366	367	371	378	379	374
53.60 CFS	368	366	366	361	347	330	320	317
55.20 CFS	316	316	316	316	316	314	304	287
56.80 CFS	273	264	256	253	257	263	266	261
58.40 CFS	247	230	220	213	208	210	213	211
60.00 CFS	208	209	201	181	160	155	161	164
61.60 CFS	159	153	154	158	156	153	156	162
63.20 CFS	161	145	124	107	101	102	109	114
64.80 CFS	111	105	101	100	101	105	112	113
66.40 CFS	108	102	100	100	102	109	114	111
68.00 CFS	104	101	100	101	105	112	113	108
69.60 CFS	102	100	100	97	89	78	65	55
71.20 CFS	51.09	50.07	50.14	50.05	49.90	47.84	38.06	21.05
72.80 CFS	6.70	1.17	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.27 WATERSHED INCHES; 70760 CFS-HRS; 5847.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 76 Inflow Hydrograph

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.12	32763.8	(NULL)
42.29	1343.9	(NULL)
43.78	1326.6	(NULL)
45.23	1232.4	(NULL)
46.56	1204.1	(NULL)
48.34	1095.7	(NULL)
49.15	1077.2	(NULL)
49.95	1066.8	(NULL)
50.71	1061.7	(NULL)
53.03	958.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 20.57 SQ.MI.

7.40 CFS	.46	1.40	3.10	5.61	8.86	12.86	17.52	22.81

9.00 CFS	29	37	45	54	64	75	87	101
10.60 CFS	116	132	148	166	183	199	214	230
12.20 CFS	247	263	276	289	304	319	333	344
13.80 CFS	355	368	384	401	418	437	455	471
15.40 CFS	486	501	513	524	537	553	567	580
17.00 CFS	589	601	627	663	694	716	742	784
18.60 CFS	831	867	892	924	970	1027	1075	1108
20.20 CFS	1141	1196	1258	1308	1347	1395	1476	1577
21.80 CFS	1660	1713	1761	1831	1915	1987	2041	2098
23.40 CFS	2177	2260	2322	2372	2615	3334	4308	5047
25.00 CFS	5448	5972	7055	8397	9441	10163	12368	18311
26.60 CFS	24627	29682	32309	32521	30010	25831	22722	21367
28.20 CFS	20505	19377	18053	16970	16128	15406	14323	13222
29.80 CFS	12323	11657	10995	10088	9105	8368	7925	7573
31.40 CFS	7226	6888	6608	6398	6202	5971	5742	5578
33.00 CFS	5477	5372	5223	5067	4960	4901	4832	4721
34.60 CFS	4594	4499	4451	4395	4271	4118	4014	3963
36.20 CFS	3833	3492	3059	2751	2613	2515	2399	2274
37.80 CFS	2167	2084	2013	1939	1862	1800	1757	1716
39.40 CFS	1665	1616	1581	1552	1519	1484	1450	1425
41.00 CFS	1408	1395	1382	1362	1344	1340	1344	1343
42.60 CFS	1339	1328	1314	1312	1320	1326	1327	1326
44.20 CFS	1318	1291	1256	1232	1227	1232	1230	1216
45.80 CFS	1201	1194	1193	1201	1204	1195	1183	1174
47.40 CFS	1158	1138	1116	1098	1093	1095	1087	1075
49.00 CFS	1074	1077	1068	1060	1064	1066	1057	1054
50.60 CFS	1060	1061	1052	1044	1027	998	976	966
52.20 CFS	960	954	950	952	958	955	942	933
53.80 CFS	930	927	918	891	864	848	839	833
55.40 CFS	827	821	817	812	804	785	754	729
57.00 CFS	713	694	684	686	688	684	672	644
58.60 CFS	616	598	584	569	568	567	556	546
60.20 CFS	545	527	488	455	447	450	446	431
61.80 CFS	416	415	417	407	399	402	410	404
63.40 CFS	377	341	316	306	303	308	308	297
65.00 CFS	283	275	271	269	274	282	281	270
66.60 CFS	262	259	259	261	272	278	271	261
68.20 CFS	258	257	258	265	275	275	265	258
69.80 CFS	257	256	252	237	218	196	179	171
71.40 CFS	165	159	154	149	141	121	90	65
73.00 CFS	54.41	47.22	40.69	34.30	28.48	23.39	19.04	15.39
74.60 CFS	12.36	9.88	7.86	6.22	4.91	3.87	3.03	2.37
76.20 CFS	1.85	1.44	1.12	.87	.67	.52	.40	

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.20 WATERSHED INCHES; 175222 CFS-HRS; 14480.4 ACRE-FEET.

--- XSECTION 76, ALTERNATE 1, STORM 7, HYDROGRAPH ADDED TO READHD FILE ---

*** MESSAGE - STRUCTURE 1, USER ENTERED STARTING ELEVATION (1193.0 FEET) CAN ADD .118 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

*** MESSAGE - RESERVOIR ROUTING, STRUCTURE 1, TRUNCATED AT 400 POINTS WITH 3135.18 AC-FT (.24 WATERSHED INCHES) FLOOD STORAGE REMAINING IN RESERVOIR AT ELEV. 1211.73. ***

OPERATION RESVOR STRUCTURE 1 72-hr General outflow Hydrograph.

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.94	21910.7	1215.73
69.19	272.9	1212.07

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
6.40 CFS	7.29	7.28	7.28	7.27	7.26	7.26	7.25	7.25
8.00 CFS	7.24	7.24	7.25	7.26	7.27	7.28	7.31	7.33
9.60 CFS	7.37	7.42	7.47	7.53	7.61	7.70	7.80	7.91
11.20 CFS	8.04	8.18	8.34	8.51	8.70	8.90	9.11	9.34
12.80 CFS	9.58	9.82	10.09	10.36	10.64	10.94	11.24	11.56
14.40 CFS	11.89	12.23	12.59	12.97	13.36	13.76	14.18	14.60
16.00 CFS	15.04	15.49	15.95	16.42	16.90	17.39	17.89	18.41
17.60 CFS	18.95	19.52	20.12	20.73	21.38	22.06	22.77	23.52
19.20 CFS	24.28	25.08	25.93	26.79	27.40	28.03	28.68	29.36
20.80 CFS	30.08	30.82	31.58	32.38	33.23	34.14	35.08	36.05
22.40 CFS	37.06	38.10	39.10	40.02	40.96	41.94	42.95	44.00
24.00 CFS	45.07	46.21	47.58	49.04	50.73	52.63	54.69	57.02
25.60 CFS	60	63	66	70	74	80	381	5241
27.20 CFS	12078	17571	20743	21826	21893	21600	21091	20363
28.80 CFS	19489	18588	17723	16847	15905	15005	14174	13389
30.40 CFS	12604	11775	10938	10168	9501	8922	8408	8001
32.00 CFS	7662	7354	7067	6793	6537	6308	6108	5925
33.60 CFS	5749	5582	5435	5306	5186	5067	4949	4842
35.20 CFS	4747	4653	4550	4440	4338	4239	4108	3920
36.80 CFS	3690	3462	3259	3078	2910	2754	2646	2575
38.40 CFS	2504	2432	2360	2291	2225	2161	2099	2039
40.00 CFS	1983	1929	1878	1829	1783	1739	1699	1662
41.60 CFS	1627	1594	1564	1538	1515	1494	1475	1456
43.20 CFS	1439	1425	1413	1402	1393	1385	1375	1363
44.80 CFS	1349	1335	1322	1311	1301	1290	1279	1269
46.40 CFS	1260	1253	1247	1240	1233	1225	1216	1205
48.00 CFS	1193	1182	1171	1162	1152	1143	1135	1127
49.60 CFS	1120	1113	1107	1102	1096	1092	1088	1084
51.20 CFS	1080	1075	1067	1058	1047	1037	1028	1019
52.80 CFS	1011	1004	998	992	986	979	973	967
54.40 CFS	960	950	939	927	916	906	896	887
56.00 CFS	879	870	861	850	837	823	809	795
57.60 CFS	782	770	760	750	739	726	712	698
59.20 CFS	683	670	657	646	635	624	613	601

60.80 CFS	585	569	555	542	530	517	505	494
62.40 CFS	485	475	466	459	453	445	435	422
64.00 CFS	409	396	386	376	368	358	349	340
65.60 CFS	331	324	319	314	310	304	299	294
67.20 CFS	290	287	286	285	282	280	277	275
68.80 CFS	273	273	273	273	271	270	268	266
70.40 CFS	264	259	253	245	237	229	221	213
72.00 CFS	206	198	190	180	168	155	143	131
73.60 CFS	120	109	99	90	86	86	86	86
75.20 CFS	85.87	85.85	85.83	85.81	85.79	85.77	85.75	85.73
76.80 CFS	85.71	85.69	85.67	85.65	85.63	85.61	85.59	85.57
78.40 CFS	85.55	85.53	85.51	85.49	85.47	85.45	85.43	85.41
80.00 CFS	85.39	85.37	85.35	85.33	85.31	85.29	85.27	85.25
81.60 CFS	85.23	85.21	85.19	85.17	85.15	85.13	85.11	85.10
83.20 CFS	85.08	85.06	85.04	85.02	85.00	84.98	84.96	84.94
84.80 CFS	84.92	84.90	84.88	84.86	84.84	84.82	84.80	84.78

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.46 WATERSHED INCHES; 138915 CFS-HRS; 11479.9 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 1, STORM 7, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

RAINFALL OF 15.80 inches AND 72.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 7, ARC 2
MAIN TIME INCREMENT .200 HOURS

ALTERNATE 1 STORM 7

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION 1	RUNOFF	2.46	14.29	---	27.01	6291	2557.3
XSECTION 5	REACH	2.46	14.29	6.72	27.54	4816	1957.7
XSECTION 10	REACH	2.46	14.29	7.95	28.12	3932	1598.4
XSECTION 2	RUNOFF	2.38	13.26	---	26.97	5805	2439.1
XSECTION 12	ADDHYD	4.84	13.78	---	27.15	7759	1603.1
XSECTION 12	DIVERT	4.84	12.16	---	26.40F	4100F	847.1
XSECTION 200	DIVERT	.00	12.16	---	27.15	3659	********
XSECTION 20	REACH	4.84	12.16	7.94	26.40F	4100F	847.1
XSECTION 25	REACH	4.84	12.16	5.03	26.40F	4100F	847.1
XSECTION 3	RUNOFF	3.94	14.29	---	27.03	10041	2548.5
XSECTION 30	REACH	3.94	14.30	5.34	27.78	7435	1887.1
XSECTION 5	REACH	3.94	14.30	7.27	28.39	6138	1557.9
XSECTION 25	REACH	3.94	14.30	6.30	28.39	6138	1557.9
XSECTION 4	RUNOFF	2.06	12.87	---	27.01	4862	2360.2
XSECTION 34	ADDHYD	6.00	13.81	---	28.25	7763	1293.8
XSECTION 35	ADDHYD	10.84	13.07	---	28.25	11863	1094.4
XSECTION 35	DIVERT	10.84	12.99	---	27.00F	11000F	1014.8
XSECTION 199	DIVERT	.00	12.99	---	28.25	863	********
XSECTION 45	REACH	10.84	12.99	8.46	27.00F	11000F	1014.8
XSECTION 6	RUNOFF	1.47	14.39	---	26.91	3876	2636.7
XSECTION 60	REACH	1.47	14.36	6.57	27.40	3596	2446.3
XSECTION 67	REACH	1.47	14.37	6.05	27.76	3221	2191.2
XSECTION 64	ADDHYD	12.31	13.15	---	27.80	14144	1149.0
XSECTION 5	RUNOFF	4.78	13.10	---	27.00	11470	2399.6
XSECTION 7	RUNOFF	3.48	13.52	---	27.12	8393	2411.8
XSECTION 75	ADDHYD	8.26	13.27	---	27.06	19797	2396.7
XSECTION 76	ADDHYD	20.57	13.20	---	27.12	32764	1592.8
STRUCTURE 1	RESVOR	20.57	10.46	1215.73	27.94	21911	1065.2

SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.
QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;
LENGTH FACTOR - VALUE k* GREATER THAN 1.0;
ATT-KIN COEFF - VALUE C GREATER THAN 0.667.

			HYDROGRAPH INFORMATION				ROUTING PARAMETERS				
		FLOOD	INFLOW		OUTFLOW		Q-A EQ.			PEAK	ATT-
XSEC	REACH	PLAIN							LENGTH	RATIO	KIN
ID	LENGTH	LENGTH	PEAK	TIME	PEAK	TIME	COEFF	POWER	FACTOR	Q/I	COEFF
	(FT)	(FT)	(CFS)	(HR)	(CFS)	(HR)	(X)	(M)	(k*)	(Q*)	(C)
BASEFLOW IS .0 CFS											
ALTERNATE 1 STORM 7											
5	9100		6290	27.0	4800	27.6	1.95	1.08	.175	.763	.26
10	9100		4800	27.6	3922	28.2	2.17	1.07	.126	.817	.27
20	3332		4100	26.4	4100	26.4	.14	1.63	.001	1.000	1.00?
25	1950		4100	26.4	4100	26.4	.052	1.73	.000	1.000	1.00?
30	8865		10029	27.0	7433	27.8	1.57	1.08	.193	.741	.24
5	8865		7433	27.8	6138	28.4	1.91	1.08	.119	.826	.27
25	1950		6138	28.4	6138	28.4	.056	1.72	.001	1.000	1.00?
45	4200		11000	27.0	11000	27.0	.049	1.72	.001	1.000	1.00?
60	7540		3805	27.0	3596	27.4	.48	1.36	.054	.945	.49
67	5140		3596	27.4	3214	27.8	1.59	1.11	.085	.894	.42

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 7
STRUCTURE 1	20.57	
ALTERNATE 1		21911
XSECTION 1	2.46	
ALTERNATE 1		6291
XSECTION 2	2.38	
ALTERNATE 1		5805
XSECTION 3	3.94	
ALTERNATE 1		10041
XSECTION 4	2.06	
ALTERNATE 1		4862
XSECTION 5	4.78	
ALTERNATE 1		11470
XSECTION 6	1.47	
ALTERNATE 1		3876
XSECTION 7	3.48	
ALTERNATE 1		8393
XSECTION 10	2.46	
ALTERNATE 1		3932
XSECTION 12	4.84	
ALTERNATE 1		4100
XSECTION 20	4.84	
ALTERNATE 1		4100
XSECTION 25	3.94	
ALTERNATE 1		6138
XSECTION 30	3.94	
ALTERNATE 1		7435
XSECTION 34	6.00	

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 7
XSECTION 34	6.00	
ALTERNATE 1		7763
XSECTION 35	10.84	
ALTERNATE 1		11000
XSECTION 45	10.84	
ALTERNATE 1		11000
XSECTION 60	1.47	
ALTERNATE 1		3596
XSECTION 64	12.31	
ALTERNATE 1		14144
XSECTION 67	1.47	
ALTERNATE 1		3221
XSECTION 75	8.26	
ALTERNATE 1		19797
XSECTION 76	20.57	
ALTERNATE 1		32764
XSECTION 199	.00	
ALTERNATE 1		863
XSECTION 200	.00	
ALTERNATE 1		3659

ECON2 DATA FILE

```
ECON2
TITLE        WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE        72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED
FLOW-FREQ    -1         21911.                                        ALT  1   1
FLOW-FREQ     1          6291.                                        ALT  1   2
FLOW-FREQ     2          5805.                                        ALT  1   3
FLOW-FREQ     3         10041.                                        ALT  1   4
FLOW-FREQ     4          4862.                                        ALT  1   5
FLOW-FREQ     5         11470.                                        ALT  1   6
FLOW-FREQ     6          3876.                                        ALT  1   7
FLOW-FREQ     7          8393.                                        ALT  1   8
FLOW-FREQ    10          3932.                                        ALT  1   9
FLOW-FREQ    12          4100.                                        ALT  1  10
FLOW-FREQ    20          4100.                                        ALT  1  11
FLOW-FREQ    25          6138.                                        ALT  1  12
FLOW-FREQ    30          7435.                                        ALT  1  13
FLOW-FREQ    34          7763.                                        ALT  1  14
FLOW-FREQ    35         11000.                                        ALT  1  15
FLOW-FREQ    45         11000.                                        ALT  1  16
FLOW-FREQ    60          3596.                                        ALT  1  17
FLOW-FREQ    64         14144.                                        ALT  1  18
FLOW-FREQ    67          3221.                                        ALT  1  19
FLOW-FREQ    75         19797.                                        ALT  1  20
FLOW-FREQ    76         32764.                                        ALT  1  21
FLOW-FREQ   199           863.                                        ALT  1  22
FLOW-FREQ   200          3659.                                        ALT  1  23
```

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TR20 ------------------------------------------------------------------------ SCS -
WT3PMP72     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS      VERSION
07/21/**     72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED      2.04TEST


END OF  1 JOBS IN THIS RUN


                    SCS  TR-20,  VERSION 2.04TEST
                          WT3PMP72  FILES

     INPUT  = WT3PMP72.DAT                          , GIVEN DATA FILE
     OUTPUT = 72OUTT.OUT                            , DATED 07/21/**,17:26:13

              FILES GENERATED - DATED 07/21/**,17:26:13

    FILE LLL.TEC CONTAINS ECON2 INFORMATION

    FILE LLL.TRD CONTAINS READHD INFORMATION


          TOTAL NUMBER OF WARNINGS =   4,  MESSAGES =   2

                       JOB ENDED AT 17:26:13
                  *** TR-20 RUN COMPLETED ***
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URS

Calculation Package 18

EXHIBIT 4.7-2

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title:

RESERVOIR ROUTING OF 6-HR LOCAL AND 72-HR GENERAL PMF HYDROGRAPHS FOR FUTURE CONDITION WITH A CLOSED PRINCIPAL SPILLWAY (ADWR CRITERIA)

Total Number of Pages (including cover sheet):

Total Number of Computer Runs:

Prepared by: Hammad Hussain Date: 07/22/04

Checked by: Todd Ringsmuth Date: 7/22/04

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

the 72 hr results has 4 warnings - all for no attenuation in routing. This is OK as result is conservative.

Remarks/Conclusions/Results:

See Page 3.

Please confirm that RUNOFF/REACH/ADDHYD CARDS are the same as earlier checked calcs

Please confirm 72-hr PMP is 15.8 in/hrs (need reference to earlier calc)

slight change to results - see Table 1

Calculation Approved by: 7/27/04

Project Manager/Date

Revision No.:	Description of Revision:	Approved by:
1	Revised Table 1.	Todd Ringsmuth 7/28/04

RESERVOIR ROUTING OF 6-HR LOCAL AND 72-HR GENERAL PMF HYDROGRAPHS FOR FUTURE CONDITION WITH A CLOSED PRINCIPAL SPILLWAY (ADWR CRITERIA)

(WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3)
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

This particular calculation package addresses the reservoir routing results for the ***Future Condition*** with a ***Closed Principal Spillway*** based on ADWR criteria.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

FUTRE CONDITION (Principal Spillway Closed)

The Future Condition (Principal Spillway Closed) represents the condition where construction of the downstream conveyance channel does not occur and the principal spillway remains closed. It is assumed that the 100-year sediment volume (500 ac-ft) has accumulated in the reservoir. Under this condition outflow from the reservoir occurs through infiltration, and flow through the emergency spillway.

The reservoir routing for the Future Condition with a Closed Principal Spillway was carried out for 6-hr Local and 72-hr General Probable Maximum Flood (PMF) hydrographs based on ADWR criteria. The ADWR criteria for the Future Condition with a closed principal spillway is explained as follows.

ADWR Routing Criteria: Given the assumption that the during the Future Condition (Principal Spillway Closed), the 100-year sediment volume (500 ac-ft) has accumulated in the reservoir, the ARC for the routing of the 6-hr Local and 72-hr General PMF hydrographs based on ADWR criteria will be set at the 100-year sediment pool level or at elevation 1199.2 ft (NAVD 88).

antecedent reservoir cond.tion

RESULTS

ADWR Routing: The ARC for the routing of the 6-hour Local and 72-hr General PMF hydrographs was set at the 100-year sediment pool level or at elevation 1199.2 ft (NAVD 88). The reservoir routing results i.e. ARC, peak inflows, peak outflows, and the maximum reservoir elevation for the 6-hour Local and 72-hr General PMF hydrographs for Future Condition (Principal Spillway Closed) based on ADWR criteria are provided in Table 1 (Please See page 4).

The input file and the detailed output results of TR-20 modeling for reservoir routing of 6-hour Local and 72-hr General PMF hydrographs for ADWR criteria are attached at the end of this calculation package.

TABLE 1
RESERVOIR ROUTING RESULTS
(BASED ON ADWR CRITERION ONLY)

(FUTURE CONDITON – PRINCIPAL SPILLWAY CLOSED)

Storm Event	Inflow to White Tank FRS No.3		Outflow from White Tank FRS No.3		
	Precipitation (inches)	Peak Inflow (cfs)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (ft)
6-hr Local	12.70	68,291	1199.2	23,720	1215.9
72-hr General	15.80	32,764	1199.2	23,435	1215.9

```
******************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY******************

JOB TR-20 WT3PMP6   ECON                PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE     6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT
 5 RAINFL 1            0.1                                          6HRLOCAL
 8          .0000      .003       .006       .009       .013
 8          .016       .020       .025       .030       .035
 8          .039       .046       .052       .058       .065
 8          .071       .080       .090       .099       .109
 8          .118       .283       .449       .567       .622
 8          .669       .701       .732       .756       .780
 8          .795       .809       .824       .838       .852
 8          .866       .876       .885       .894       .904
 8          .913       .920       .926       .932       .939
 8          .945       .950       .954       .959       .964
 8          .969       .972       .976       .980       .984
 8          .988       .991       .993       .995       .998
 8          1.         1.         1.         1.         1.
 9 ENDTBL
 5 RAINFL 2            .1                                           6HR GEN
 8          .000       .005       .013       .020       .028
 8          .038       .045       .053       .060       .070
 8          .080       .085       .095       .108       .120
 8          .138       .150       .165       .190       .210
 8          .238       .280       .350       .440       .550
 8          .590       .620       .645       .668       .685
 8          .700       .720       .735       .753       .765
 8          .775       .790       .800       .810       .820
 8          .835       .843       .850       .863       .870
 8          .880       .890       .898       .908       .915
 8          .925       .930       .940       .945       .955
 8          .963       .970       .978       .985       .990
 8          1.00       1.00       1.00       1.00       1.00
 9 ENDTBL
 5 RAINFL 3            0.1                                          12HRGEN
 8          .000       .003       .007       .010       .013
 8          .016       .019       .022       .025       .028
 8          .031       .034       .037       .040       .043
 8          .045       .050       .054       .058       .062
 8          .066       .071       .075       .080       .085
 8          .089       .095       .101       .107       .112
 8          .118       .125       .132       .139       .146
 8          .153       .162       .171       .180       .189
 8          .198       .211       .224       .237       .250
 8          .264       .300       .345       .391       .436
 8          .491       .536       .564       .586       .607
 8          .629       .643       .657       .672       .686
 8          .700       .711       .721       .732       .742
 8          .753       .761       .769       .778       .786
 8          .795       .802       .809       .817       .824
 8          .832       .837       .843       .848       .854
 8          .859       .865       .870       .875       .881
 8          .886       .891       .895       .900       .905
 8          .909       .913       .917       .921       .925
 8          .929       .933       .936       .940       .944
 8          .948       .951       .954       .957       .960
 8          .963       .966       .969       .971       .974
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12x5 = 60 ordinates

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8          .977       .980       .982       .984       .986
8          .989       .991       .993       .995       .998
8          1.000     01.000      1.000      1.000      1.00
9 ENDTBL
5 RAINFL 4            0.1                                                  18HRGEN
8          .000       .001       .002       .003       .004
8          .005       .005       .006       .007       .008
8          .009       .012       .014       .017       .020
8          .023       .025       .028       .031       .033
8          .036       .040       .044       .049       .053
8          .057       .061       .065       .070       .074
8          .078       .084       .090       .096       .102
8          .108       .114       .120       .126       .132
8          .138       .146       .154       .162       .170
8          .179       .187       .195       .203       .211
8          .220       .238       .256       .275       .293
8          .311       .330       .348       .367       .385
8          .403       .430       .457       .484       .511
8          .538       .557       .577       .597       .616
8          .636       .653       .670       .687       .704
8          .721       .734       .746       .759       .771
8          .784       .792       .801       .810       .818
8          .827       .832       .838       .843       .848
8          .853       .856       .859       .862       .864
8          .867       .870       .872       .875       .878
8          .880       .882       .885       .887       .889
8          .891       .893       .895       .897       .899
8          .901       .903       .905       .907       .909
8          .911       .912       .914       .916       .917
8          .919       .920       .922       .924       .925
8          .927       .929       .930       .932       .934
8          .935       .937       .938       .940       .941
8          .943       .945       .946       .948       .949
8          .951       .952       .953       .955       .956
8          .957       .959       .960       .961       .963
8          .964       .965       .967       .968       .970
8          .971       .972       .974       .975       .976
8          .978       .979       .980       .982       .983
8          .984       .985       .986       .988       .989
8          .990       .991       .992       .993       .994
8          .995       .996       .997       .998       .999
8          1.000      1.000      1.000      1.000      1.000
9 ENDTBL
5 RAINFL 5            0.1                                                  24HRGEN
8          0.000      0.000      0.001      0.001      0.002
8          0.002      0.002      0.003      0.003      0.003
8          0.004      0.005      0.007      0.009      0.010
8          0.012      0.013      0.015      0.016      0.018
8          0.019      0.022      0.024      0.027      0.030
8          0.032      0.035      0.037      0.040      0.042
8          0.045      0.048      0.051      0.055      0.058
8          0.061      0.064      0.068      0.071      0.074
8          0.078      0.082      0.087      0.091      0.096
8          0.100      0.104      0.109      0.113      0.118
8          0.122      0.127      0.132      0.137      0.142
8          0.147      0.151      0.156      0.161      0.166
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8          0.171      0.177      0.184      0.191      0.198
8          0.205      0.214      0.224      0.233      0.242
8          0.252      0.265      0.278      0.291      0.303
8          0.316      0.334      0.351      0.368      0.386
8          0.403      0.425      0.447      0.468      0.490
8          0.512      0.527      0.543      0.558      0.574
8          0.589      0.603      0.617      0.631      0.645
8          0.659      0.671      0.684      0.696      0.709
8          0.721      0.731      0.741      0.751      0.761
8          0.771      0.779      0.786      0.793      0.800
8          0.808      0.814      0.820      0.825      0.831
8          0.837      0.840      0.843      0.847      0.850
8          0.853      0.855      0.857      0.859      0.861
8          0.864      0.866      0.868      0.870      0.872
8          0.874      0.876      0.878      0.880      0.881
8          0.883      0.885      0.886      0.888      0.890
8          0.891      0.893      0.895      0.896      0.898
8          0.899      0.901      0.902      0.904      0.905
8          0.907      0.908      0.909      0.910      0.912
8          0.913      0.914      0.915      0.916      0.917
8          0.919      0.920      0.921      0.922      0.923
8          0.924      0.926      0.927      0.928      0.929
8          0.930      0.932      0.933      0.935      0.936
8          0.938      0.940      0.941      0.943      0.944
8          0.946      0.947      0.947      0.948      0.949
8          0.950      0.950      0.951      0.952      0.953
8          0.953      0.955      0.956      0.957      0.958
8          0.959      0.960      0.961      0.962      0.963
8          0.964      0.965      0.966      0.967      0.968
8          0.969      0.970      0.971      0.972      0.973
8          0.974      0.975      0.976      0.977      0.978
8          0.979      0.980      0.981      0.982      0.983
8          0.984      0.985      0.986      0.987      0.988
8          0.988      0.989      0.990      0.991      0.991
8          0.992      0.993      0.994      0.995      0.995
8          0.996      0.997      0.998      0.998      0.999
8          1.000      1.000      1.000      1.000      1.000
9 ENDTBL
5 RAINFL 6            .25                                          48HRGEN
8          0.0000     0.0015     0.0029     0.0044     0.0058
8          0.0073     0.0088     0.0102     0.0117     0.0131
8          0.0146     0.0160     0.0175     0.0190     0.0204
8          0.0219     0.0233     0.0248     0.0263     0.0277
8          0.0292     0.0306     0.0321     0.0335     0.0350
8          0.0365     0.0379     0.0394     0.0408     0.0423
8          0.0438     0.0452     0.0467     0.0481     0.0496
8          0.0510     0.0525     0.0542     0.0558     0.0575
8          0.0592     0.0608     0.0625     0.0642     0.0658
8          0.0692     0.0725     0.0758     0.0792     0.0825
8          0.0858     0.0892     0.0925     0.0975     0.1025
8          0.1075     0.1125     0.1175     0.1225     0.1275
8          0.1325     0.1442     0.1560     0.1677     0.1794
8          0.1985     0.2176     0.2366     0.2557     0.3239
8          0.3921     0.4603     0.5285     0.5520     0.5754
8          0.5989     0.6224     0.6356     0.6488     0.6620
8          0.6752     0.6862     0.6972     0.7082     0.7192
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8          0.7267     0.7342     0.7417     0.7492     0.7558
8          0.7625     0.7692     0.7758     0.7825     0.7892
8          0.7958     0.8025     0.8083     0.8142     0.8200
8          0.8258     0.8308     0.8358     0.8408     0.8458
8          0.8508     0.8558     0.8608     0.8658     0.8683
8          0.8708     0.8733     0.8758     0.8783     0.8808
8          0.8833     0.8858     0.8875     0.8892     0.8908
8          0.8925     0.8942     0.8958     0.8975     0.8992
8          0.9008     0.9025     0.9042     0.9058     0.9075
8          0.9092     0.9108     0.9125     0.9140     0.9154
8          0.9169     0.9183     0.9198     0.9213     0.9227
8          0.9242     0.9256     0.9271     0.9285     0.9300
8          0.9315     0.9329     0.9344     0.9358     0.9373
8          0.9388     0.9402     0.9417     0.9431     0.9446
8          0.9460     0.9475     0.9490     0.9504     0.9519
8          0.9533     0.9548     0.9563     0.9577     0.9592
8          0.9606     0.9621     0.9635     0.9650     0.9665
8          0.9679     0.9694     0.9708     0.9723     0.9737
8          0.9752     0.9767     0.9781     0.9796     0.9810
8          0.9825     0.9840     0.9854     0.9869     0.9883
8          0.9898     0.9912     0.9927     0.9942     0.9956
8          0.9971     0.9985     1.0000     1.0000     1.0
9 ENDTBL
5 RAINFL 7            .25                                          72HRGEN
8          0.0000     0.0005     0.0009     0.0014     0.0019
8          0.0025     0.0032     0.0038     0.0044     0.0051
8          0.0057     0.0063     0.0070     0.0076     0.0082
8          0.0089     0.0095     0.0103     0.0111     0.0119
8          0.0127     0.0134     0.0142     0.0150     0.0158
8          0.0171     0.0184     0.0196     0.0209     0.0222
8          0.0234     0.0247     0.0259     0.0272     0.0285
8          0.0297     0.0310     0.0323     0.0335     0.0348
8          0.0361     0.0375     0.0389     0.0403     0.0418
8          0.0432     0.0446     0.0460     0.0475     0.0489
8          0.0503     0.0517     0.0532     0.0546     0.0560
8          0.0574     0.0589     0.0604     0.0620     0.0636
8          0.0652     0.0668     0.0684     0.0699     0.0715
8          0.0731     0.0747     0.0763     0.0778     0.0797
8          0.0816     0.0835     0.0854     0.0877     0.0899
8          0.0921     0.0943     0.0968     0.0994     0.1019
8          0.1044     0.1073     0.1101     0.1130     0.1158
8          0.1193     0.1228     0.1263     0.1297     0.1335
8          0.1373     0.1411     0.1449     0.1491     0.1532
8          0.1573     0.1614     0.1725     0.1837     0.1948
8          0.2059     0.2241     0.2422     0.2603     0.2784
8          0.3431     0.4078     0.4726     0.5373     0.5596
8          0.5819     0.6042     0.6265     0.6390     0.6515
8          0.6641     0.6766     0.6870     0.6975     0.7079
8          0.7184     0.7255     0.7326     0.7397     0.7468
8          0.7535     0.7601     0.7668     0.7734     0.7794
8          0.7854     0.7915     0.7975     0.8030     0.8085
8          0.8141     0.8196     0.8247     0.8297     0.8348
8          0.8399     0.8443     0.8487     0.8532     0.8576
8          0.8598     0.8620     0.8642     0.8665     0.8685
8          0.8706     0.8726     0.8747     0.8766     0.8785
8          0.8804     0.8823     0.8840     0.8858     0.8875
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58 x 5 x .25

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8          0.8892     0.8908     0.8924     0.8940     0.8956
8          0.8972     0.8987     0.9003     0.9019     0.9035
8          0.9051     0.9066     0.9082     0.9098     0.9114
8          0.9130     0.9146     0.9160     0.9174     0.9188
8          0.9203     0.9217     0.9231     0.9245     0.9259
8          0.9274     0.9288     0.9302     0.9316     0.9329
8          0.9342     0.9354     0.9367     0.9380     0.9392
8          0.9405     0.9418     0.9430     0.9443     0.9456
8          0.9468     0.9481     0.9494     0.9506     0.9519
8          0.9530     0.9541     0.9552     0.9563     0.9574
8          0.9585     0.9597     0.9608     0.9619     0.9630
8          0.9641     0.9652     0.9661     0.9671     0.9680
8          0.9690     0.9699     0.9709     0.9718     0.9728
8          0.9736     0.9744     0.9752     0.9759     0.9767
8          0.9775     0.9783     0.9791     0.9797     0.9804
8          0.9810     0.9816     0.9823     0.9829     0.9835
8          0.9842     0.9847     0.9851     0.9856     0.9861
8          0.9866     0.9870     0.9875     0.9880     0.9884
8          0.9889     0.9894     0.9899     0.9902     0.9905
8          0.9908     0.9911     0.9915     0.9918     0.9921
8          0.9924     0.9927     0.9930     0.9934     0.9937
8          0.9940     0.9943     0.9946     0.9949     0.9953
8          0.9956     0.9959     0.9962     0.9965     0.9968
8          0.9972     0.9975     0.9978     0.9981     0.9984
8          0.9987     0.9989     0.9991     0.9992     0.9994
8          0.9995     0.9997     0.9998     1.0000     1.0000
9 ENDTBL
5 RAINFL 8     1      2.4                                          10-DAY
8          .0000      .0024      .0048      .0073      .0097
8          .0121      .0148      .0174      .0201      .0228
8          .0254      .0284      .0314      .0344      .0374
8          .0404      .0437      .0471      .0505      .0539
8          .0572      .0612      .0651      .0690      .0729
8          .0768      .0815      .0862      .0909      .0955
8          .1002      .1061      .1120      .1179      .1238
8          .1297      .1377      .1458      .1538      .1618
8          .1699      .1832      .1966      .2099      .2232
8          .2366      .2548      .2778      .3093      .3614
8          1.092      1.174      1.213      1.240      1.260
8          1.276      1.286      1.296      1.306      1.316
8          1.326      1.333      1.340      1.347      1.354
8          1.360      1.365      1.371      1.376      1.381
8          1.386      1.391      1.395      1.399      1.403
8          1.408      1.411      1.415      1.418      1.422
8          1.426      1.429      1.432      1.435      1.438
8          1.442      1.444      1.447      1.450      1.453
8          1.456      1.458      1.461      1.463      1.466
8          1.468      1.471      1.473      1.475      1.477
8          1.48       1.48       1.48       1.48       1.48
9 ENDTBL
4 DIMHYD              .0556                                         WT3
8          0.0        .03        .10        .19        .31
8          .47        .66        .82        .93        .99
8          1.0        .99        .93        .82        .66
8          .47        .31        .03        .00        .00
9 ENDTBL
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 2 XSECTN   005         1.0         8.77                                BOSSCS#5
 8                      0.          0.0         0.0
 8                      0.35        5.          5.56
 8                      1.03        50.         30.95
 8                      1.39        100.        52.16
 8                      1.94        200.        88.72
 8                      2.63        400.        148.61
 8                      3.51        800.        260.63
 8                      4.62        1600.       459.66
 8                      6.04        3200.       929.36
 8                      7.38        6400.       1811.51
 8                      8.77        12800.      3374.20
 8                      10.17       25600.      6398.87
 8                      11.89       51200.      10982.51
 9 ENDTBL
 2 XSECTN   010         1.0         8.94                                BOSSCS#4
 8                      0.          0.0         0.0
 8                      0.91        5.          4.95
 8                      2.03        50.         24.80
 8                      2.63        100.        41.32
 8                      3.34        200.        74.14
 8                      4.15        400.        130.28
 8                      5.23        800.        223.37
 8                      6.41        1600.       447.51
 8                      7.65        3200.       898.64
 8                      8.94        6400.       1690.88
 8                      10.29       12800.      3331.95
 8                      11.64       25600.      6185.81
 8                      13.14       51200.      10661.04
 9 ENDTBL
 2 XSECTN   020         1.0         7.3                                 REACHC
 8                      0.          0.0         0.0
 8                      1.01        100.        57.78
 8                      1.49        200.        86.81
 8                      1.88        300.        110.25
 8                      2.49        500.        149.47
 8                      3.68        1000.       226.31
 8                      5.40        2000.       346.26
 8                      7.85        4000.       533.39
 8                      9.64        6000.       688.07
 8                      11.16       8000.       838.10
 8                      12.46       10000.      985.31
 8                      13.61       12000.      1122.03
 8                      14.56       14000.      1236.94
 8                      15.43       16000.      1345.18
 8                      16.31       18000.      1456.68
 9 ENDTBL
 2 XSECTN   025         1.0         7.3                                 REACHB
 8                      0.          0.0         0.0
 8                      0.63        100.        80.89
 8                      0.93        200.        120.32
 8                      1.17        300.        151.77
 8                      1.56        500.        203.28
 8                      2.30        1000.       302.00
 8                      3.38        2000.       449.24
 8                      4.97        4000.       673.73
```

```
8                       6.23        6000.       855.96
8                       7.31        8000.       1016.35
8                       8.24        10000.      1158.51
8                       9.09        12000.      1293.31
8                       9.90        14000.      1425.57
8                       10.64       16000.      1549.17
8                       11.36       18000.      1673.11
9 ENDTBL
2 XSECTN    030         1.0         9.45                                BOSSCS#6
8                       0.          0.0         0.0
8                       0.77        5.          4.67
8                       1.54        50.         32.06
8                       1.78        100.        56.64
8                       2.10        200.        100.59
8                       2.50        400.        179.97
8                       3.01        800.        320.25
8                       3.63        1600.       589.66
8                       4.35        3200.       1110.72
8                       5.21        6400.       2084.48
8                       6.03        12800.      4119.83
8                       6.99        25600.      6856.75
8                       8.28        51200.      11085.87
9 ENDTBL
2 XSECTN    045         1.0         4.87                                REACHA
8                       0.          0.0         0.0
8                       0.60        100.        85.69
8                       0.90        200.        127.94
8                       1.13        300.        161.93
8                       1.52        500.        217.27
8                       2.25        1000.       324.03
8                       3.31        2000.       483.02
8                       4.87        4000.       722.17
8                       6.09        6000.       914.99
8                       7.15        8000.       1084.61
8                       8.05        10000.      1234.17
8                       8.87        12000.      1373.80
8                       9.64        14000.      1507.84
8                       10.34       16000.      1633.45
8                       11.00       18000.      1753.12
9 ENDTBL
2 XSECTN    060         1.0         4.7                                 2CP6CP7
8                       0.          0.0         0.0
8                       2.36        100.        45.12
8                       2.88        200.        83.75
8                       3.18        300.        114.33
8                       3.64        500.        172.72
8                       4.42        1000.       289.04
8                       5.40        2000.       470.72
8                       6.87        4000.       782.74
8                       7.91        6000.       1020.12
8                       8.79        8000.       1231.25
8                       9.60        10000.      1435.05
8                       10.26       12000.      1618.34
8                       10.94       14000.      1812.58
8                       11.47       16000.      1983.46
8                       11.96       18000.      2150.12
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 9 ENDTBL
 2 XSECTN   067          1.0          8.77                                  BOSSCS#5
 8                       0.           0.0          0.0
 8                       0.35         5.           5.56
 8                       1.03         50.          30.95
 8                       1.39         100.         52.16
 8                       1.94         200.         88.72
 8                       2.63         400.         148.61
 8                       3.51         800.         260.63
 8                       4.62         1600.        459.66
 8                       6.04         3200.        929.36
 8                       7.38         6400.        1811.51
 8                       8.77         12800.       3374.20
 8                       10.17        25600.       6398.87
 8                       11.89        51200.       10982.51
 9 ENDTBL
 3 STRUCT       01                                                            95/11/6
 8                       1178.0       0.0          0.
 8                       1188.0       0.02         44.8
 8                       1196.8       0.13         300.
 8                       1199.2       0.21         500.
 8                       1202.0       16.00        845.55
 8                       1204.0       28.000       1176.28
 8                       1206.0       39.00        1575.25
 8                       1208.0       50.00        2044.97
 8                       1210.0       63.00        2593.40
 8                       1212.0       73.000       3218.00
 8                       1213.0       2672.00      3556.67
 8                       1214.0       8218.00      3916.02
 8                       1215.0       15533.0      4294.13
 8                       1216.0       24261.0      4692.68
 8                       1217.0       34202.0      5113.19
 8                       1218.0       45221.0      5556.01
 8                       1219.0       57222.0      6021.50
 8                       1220.0       70131.0      6509.75
 9 ENDTBL
 6 RUNOFF 1 001        1 2.46         87.2         0.85         1 1
 6 REACH  3 005   1    7 9100.                                   1            BOSS#6
 6 REACH  3 010   7    2 9100.                                   1            BOSS#4
 6 RUNOFF 1 002        3 2.38         79.9         0.73         1 1
 6 ADDHYD 4 012   2 3 1                                          1 1
 6 DIVERT 6 012   1 4 7 4100.         1.00         200.         1 1          OLIVE
 6 REACH  3 020   4    7 3332.                                   1            REACH C
 6 REACH  3 025   7    5 1950.                                   1            REACH B
 6 RUNOFF 1 003        6 3.94         87.2         0.88         1 1
 6 REACH  3 030   6    7 8865.                                   1            BOSS#6
 6 REACH  3 005   7    1 8865.                                   1            BOSS#5
 6 REACH  3 025   1    7 1950.                                   1            REACH B
 6 RUNOFF 1 004        1 2.06         77.3         0.79         1 1
 6 ADDHYD 4 034   7 1 2                                          1 1
 6 ADDHYD 4 035   5 2 3                                          1 1
 6 DIVERT 6 035   3 4 7 11000.        1.00         199.         1 1          NORTHERN
 6 REACH  3 045   4    5 4200.                                   1            REACH A
 6 RUNOFF 1 006        2 1.47         87.7         0.47         1 1
 6 REACH  3 060   2    3 7540.                                   1            CP6CP7
 6 REACH  3 067   3    4 5140.                                   1            BOSS#5
```

OK

no prior. spvy ✓

Assume these are the same as for other calcs

agrees w/my earlier calc checks

includes spillway + infiltration per p 7 calc pkg 3 signed by Greg Gilmore 3/23/04

"Establishment of Flow-Spillway Discharge..."

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 6 ADDHYD 4 064    5 4 3                                          1 1
 6 RUNOFF 1 005        6 4.78         78.8         0.78          1 1
 6 RUNOFF 1 007        7 3.48         81.7         1.01          1 1
 6 ADDHYD 4 075    6 7 1                                          1 1
 6 ADDHYD 4 076    1 3 2                                          1 1      1
 6 RESVOR 2     01 2   1 1199.2                                   1 1      1
 ENDATA
 7 LIST                  1.0                          1.
 7 INCREM 6              0.05
 7 COMPUT 7 001       01 6.          12.7            1.0          1 2  01  01
   ENDCMP 1
   ENDJOB 2

*******************************END OF 80-80 LIST*******************************
```

✓ rain

✓ 6 Hr Local

Area

12 min

RUNOFF OPTION USED WITH RAINTABLE NO. 8, RUNOFF CURVE NO. = 100.

COMPUTED DIMHYD PEAK RATE FACTOR = 664.607

```
EXECUTIVE CONTROL  LIST          1.          0.          1.

          LISTING OF CURRENT DATA


                      COMPUTED TIME INCREMENT
DIMHYD                         .0556

                   .0000       .0300       .1000       .1900       .3100
                   .4700       .6600       .8200       .9300       .9900
                  1.0000       .9900       .9300       .8200       .6600
                   .4700       .3100       .0300       .0000       .0000
ENDTBL

   COMPUTED PEAK RATE FACTOR =  664.607
```

	TABLE NO.	TIME INCREMENT				
RAINFL	1	.1000				
		.0000	.0030	.0060	.0090	.0130
		.0160	.0200	.0250	.0300	.0350
		.0390	.0460	.0520	.0580	.0650
		.0710	.0800	.0900	.0990	.1090
		.1180	.2830	.4490	.5670	.6220
		.6690	.7010	.7320	.7560	.7800
		.7950	.8090	.8240	.8380	.8520
		.8660	.8760	.8850	.8940	.9040
		.9130	.9200	.9260	.9320	.9390
		.9450	.9500	.9540	.9590	.9640
		.9690	.9720	.9760	.9800	.9840
		.9880	.9910	.9930	.9950	.9980
		1.0000	1.0000	1.0000	1.0000	1.0000

ENDTBL

STANDARD CONTROL INSTRUCTIONS

```
RUNOFF        1       1       2.4600     87.2000       .85001 1 0 0 0 1
REACH         5   1   7    9100.0000       .0000       .00001 0 0 0 0 1
REACH        10   7   2    9100.0000       .0000       .00001 0 0 0 0 1
RUNOFF        2       3       2.3800     79.9000       .73001 1 0 0 0 1
ADDHYD       12   2 3 1                                     1 1 0 0 0 1
DIVERT       12   1 4 7    4100.0000      1.0000    200.00001 1 0 0 0 1
REACH        20   4   7    3332.0000       .0000       .00001 0 0 0 0 1
REACH        25   7   5    1950.0000       .0000       .00001 0 0 0 0 1
RUNOFF        3       6       3.9400     87.2000       .88001 1 0 0 0 1
REACH        30   6   7    8865.0000       .0000       .00001 0 0 0 0 1
REACH         5   7   1    8865.0000       .0000       .00001 0 0 0 0 1
REACH        25   1   7    1950.0000       .0000       .00001 0 0 0 0 1
RUNOFF        4       1       2.0600     77.3000       .79001 1 0 0 0 1
ADDHYD       34   7 1 2                                     1 1 0 0 0 1
ADDHYD       35   5 2 3                                     1 1 0 0 0 1
DIVERT       35   3 4 7   11000.0000      1.0000    199.00001 1 0 0 0 1
REACH        45   4   5    4200.0000       .0000       .00001 0 0 0 0 1
RUNOFF        6       2       1.4700     87.7000       .47001 1 0 0 0 1
REACH        60   2   3    7540.0000       .0000       .00001 0 0 0 0 1
REACH        67   3   4    5140.0000       .0000       .00001 0 0 0 0 1
ADDHYD       64   5 4 3                                     1 1 0 0 0 1
RUNOFF        5       6       4.7800     78.8000       .78001 1 0 0 0 1
RUNOFF        7       7       3.4800     81.7000      1.01001 1 0 0 0 1
ADDHYD       75   6 7 1                                     1 1 0 0 0 1
ADDHYD       76   1 3 2                                     1 1 0 0 1 1
RESVOR          1 2   1    1199.2000                        1 1 0 0 1 1
ENDATA
```

END OF LISTING

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .050 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 12.70 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .050 HOURS
ALTERNATE NO. = 1 STORM NO. = 1 RAIN TABLE NO. = 1

OPERATION RUNOFF XSECTION 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.71	17873.0	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.46 SQ.MI.

HRS								
.75 CFS	.38	1.15	2.73	5.54	9.95	16.43	25.70	38.37
1.15 CFS	55	75	99	128	160	196	235	276
1.55 CFS	318	362	409	458	510	566	625	688
1.95 CFS	753	830	978	1279	1794	2595	3743	5287
2.35 CFS	7187	9294	11447	13473	15219	16590	17491	17866
2.75 CFS	17674	16919	15643	13899	11960	10148	8586	7352
3.15 CFS	6416	5736	5217	4765	4374	4049	3771	3525
3.55 CFS	3312	3138	2995	2873	2772	2690	2613	2530
3.95 CFS	2439	2343	2247	2154	2065	1978	1896	1819
4.35 CFS	1749	1687	1631	1574	1516	1458	1400	1342
4.75 CFS	1287	1239	1196	1160	1128	1098	1069	1038
5.15 CFS	1007	976	947	922	901	882	867	852
5.55 CFS	837	819	800	781	762	742	721	700
5.95 CFS	676	646	612	576	539	500	458	413
6.35 CFS	367	322	278	234	191	147	106	68
6.75 CFS	37.92	17.14	5.12	.74	.04			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.32	10200.1	8.21

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION REACH XSECTION 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.96	7060.0	9.08

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	16995.9	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.38 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.67	15.34	25.03	38.19
1.45 CFS	55	75	99	128	161	198	240	286
1.85 CFS	336	390	445	523	689	1033	1648	2632
2.25 CFS	4059	5924	8106	10407	12610	14524	15972	16813
2.65 CFS	16970	16435	15174	13412	11508	9715	8223	7053
3.05 CFS	6203	5583	5079	4636	4253	3923	3631	3372
3.45 CFS	3155	2982	2842	2733	2654	2597	2536	2461
3.85 CFS	2371	2271	2170	2073	1981	1896	1820	1752
4.25 CFS	1694	1642	1588	1530	1468	1405	1343	1286
4.65 CFS	1236	1194	1158	1126	1094	1061	1028	995
5.05 CFS	962	932	906	886	869	852	836	819
5.45 CFS	801	781	762	746	733	721	708	691
5.85 CFS	668	636	601	565	530	495	459	422
6.25 CFS	383	341	298	252	204	155	108	65
6.65 CFS	33.37	12.75	2.82	.21				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.12 WATERSHED INCHES; 15550 CFS-HRS; 1285.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	17248.4	(NULL)
3.81	9386.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.68	15.37	25.12	38.38
1.45 CFS	55	76	101	130	164	203	246	295
1.85 CFS	349	407	468	552	726	1078	1702	2698
2.25 CFS	4138	6017	8214	10533	12754	14690	16164	17035
2.65 CFS	17234	16756	15574	13921	12165	10563	9314	8436
3.05 CFS	7930	7699	7624	7638	7731	7880	8056	8240
3.45 CFS	8433	8628	8811	8978	9131	9262	9350	9385
3.85 CFS	9371	9316	9230	9123	8998	8860	8713	8560
4.25 CFS	8404	8243	8072	7889	7696	7497	7295	7095
4.65 CFS	6900	6711	6528	6348	6169	5990	5812	5635

5.05 CFS	5461	5291	5129	4974	4825	4679	4537	4397
5.45 CFS	4259	4123	3991	3865	3745	3630	3517	3404
5.85 CFS	3287	3165	3043	2923	2807	2695	2585	2475
6.25 CFS	2367	2259	2152	2045	1937	1831	1727	1631
6.65 CFS	1547	1475	1416	1364	1316	1269	1223	1177
7.05 CFS	1132	1087	1043	999	956	913	871	830
7.45 CFS	790	751	714	678	642	609	576	545
7.85 CFS	516	487	460	434	409	386	363	342
8.25 CFS	322	303	285	268	252	236	222	208
8.65 CFS	195	183	172	161	151	141	132	124
9.05 CFS	116	109	102	95	89	83	78	73
9.45 CFS	67.78	63.31	59.13	55.22	51.55	48.12	44.91	41.90
9.85 CFS	39.10	36.47	34.01	31.72	29.57	27.57	25.70	23.95
10.25 CFS	22.32	20.79	19.37	18.04	16.81	15.65	14.57	13.57
10.65 CFS	12.63	11.76	10.94	10.18	9.47	8.81	8.20	7.63
11.05 CFS	7.10	6.60	6.14	5.71	5.30	4.93	4.58	4.26
11.45 CFS	3.96	3.68	3.42	3.18	2.95	2.74	2.55	2.37
11.85 CFS	2.20	2.04	1.89	1.76	1.63	1.51	1.40	1.30
12.25 CFS	1.21	1.12	1.04	.97	.90	.83	.77	.71
12.65 CFS	.66	.61	.57	.53	.49			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.62 WATERSHED INCHES; 33163 CFS-HRS; 2740.6 ACRE-FEET.

OPERATION DIVERT XSECTION 12
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.25	4100.0 *	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
HRS MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.84 SQ.MI.

1.05 CFS	.16	.69	1.94	4.40	8.68	15.37	25.12	38.38
1.45 CFS	55	76	101	130	164	203	246	295
1.85 CFS	349	407	468	552	726	1078	1702	2698
2.25 CFS	4100	4100	4100	4100	4100	4100	4100	4100
2.65 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.05 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.45 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.85 CFS	4100	4100	4100	4100	4100	4100	4100	4100
4.25 CFS	4100	4100	4100	4100	4100	4100	4100	4100
4.65 CFS	4100	4100	4100	4100	4100	4100	4100	4100
5.05 CFS	4100	4100	4100	4100	4100	4100	4100	4100
5.45 CFS	4100	4100	3991	3865	3745	3630	3517	3404
5.85 CFS	3287	3165	3043	2923	2807	2695	2585	2475
6.25 CFS	2367	2259	2152	2045	1937	1831	1727	1631
6.65 CFS	1547	1475	1416	1364	1316	1269	1223	1177
7.05 CFS	1132	1087	1043	999	956	913	871	830

7.45 CFS	790	751	714	678	642	609	576	545
7.85 CFS	516	487	460	434	409	386	363	342
8.25 CFS	322	303	285	268	252	236	222	208
8.65 CFS	195	183	172	161	151	141	132	124
9.05 CFS	116	109	102	95	89	83	78	73
9.45 CFS	67.78	63.31	59.13	55.22	51.55	48.12	44.91	41.90
9.85 CFS	39.10	36.47	34.01	31.72	29.57	27.57	25.70	23.95
10.25 CFS	22.32	20.79	19.37	18.04	16.81	15.65	14.57	13.57
10.65 CFS	12.63	11.76	10.94	10.18	9.47	8.81	8.20	7.63
11.05 CFS	7.10	6.60	6.14	5.71	5.30	4.93	4.58	4.26
11.45 CFS	3.96	3.68	3.42	3.18	2.95	2.74	2.55	2.37
11.85 CFS	2.20	2.04	1.89	1.76	1.63	1.51	1.40	1.30
12.25 CFS	1.21	1.12	1.04	.97	.90	.83	.77	.71
12.65 CFS	.66	.61	.57	.53	.49			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18666 CFS-HRS; 1542.6 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 200)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	13148.4	(DIVERT)
3.81	5286.1	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
2.20 CFS	0	38	1917	4114	6433	8654	10590	12064
2.60 CFS	12935	13134	12656	11474	9821	8065	6463	5214
3.00 CFS	4336	3830	3599	3524	3538	3631	3780	3956
3.40 CFS	4140	4333	4528	4711	4878	5031	5162	5250
3.80 CFS	5285	5271	5216	5130	5023	4898	4760	4613
4.20 CFS	4460	4304	4143	3972	3789	3596	3397	3195
4.60 CFS	2995	2800	2611	2428	2248	2069	1890	1712
5.00 CFS	1535	1361	1191	1029	874	725	579	437
5.40 CFS	297	159	23	0				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14497 CFS-HRS; 1198.0 ACRE-FEET.

OPERATION REACH XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.35	4100.0 *	7.94

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18674 CFS-HRS; 1543.2 ACRE-FEET.

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.40	4100.0 *	5.03

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18671 CFS-HRS; 1543.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.73	28008.6	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 3.94 SQ.MI.

HRS								
.70 CFS	.11	.53	1.63	3.91	7.97	14.38	23.74	37.26
1.10 CFS	56	80	110	147	190	239	295	355
1.50 CFS	419	485	555	629	707	789	876	970
1.90 CFS	1070	1172	1291	1520	1978	2754	3947	5645
2.30 CFS	7914	10709	13856	17125	20269	23051	25326	26959
2.70 CFS	27856	27941	27181	25638	23334	20446	17522	14870
3.10 CFS	12659	10940	9640	8690	7921	7256	6690	6220
3.50 CFS	5813	5453	5146	4895	4684	4501	4348	4218
3.90 CFS	4089	3952	3806	3656	3508	3364	3224	3089
4.30 CFS	2960	2840	2733	2639	2550	2461	2371	2280
4.70 CFS	2188	2099	2016	1942	1879	1824	1775	1729
5.10 CFS	1682	1634	1585	1537	1492	1455	1423	1396
5.50 CFS	1372	1350	1324	1294	1262	1230	1197	1163
5.90 CFS	1128	1091	1048	998	943	885	823	756
6.30 CFS	686	612	539	468	398	331	264	199
6.70 CFS	138	85	45	18	5	0		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 30

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.40	16237.6	6.29

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
4.00	11557.4	8.50

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
4.06	11552.0	8.90

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.68	13580.0	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.06 SQ.MI.

HRS								
1.20 CFS	.32	.94	2.20	4.53	8.43	14.25	22.34	33.25
1.60 CFS	48	65	87	114	145	180	219	260
2.00 CFS	305	403	622	1013	1651	2596	3893	5471
2.40 CFS	7211	8963	10567	11924	12911	13469	13552	13136
2.80 CFS	12289	10903	9457	8031	6802	5872	5130	4648
3.20 CFS	4233	3871	3547	3287	3055	2849	2670	2532
3.60 CFS	2417	2323	2247	2197	2140	2073	1998	1916
4.00 CFS	1834	1756	1682	1611	1545	1485	1430	1385
4.40 CFS	1339	1292	1243	1192	1143	1095	1051	1014
4.80 CFS	980	952	925	899	874	848	822	796
5.20 CFS	773	754	738	723	709	697	684	668
5.60 CFS	652	638	624	611	596	581	561	535
6.00 CFS	506	477	447	416	384	349	313	276
6.40 CFS	239	203	165	126	89	55	29	12
6.80 CFS	2.44	.16						

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
9.75 WATERSHED INCHES; 12960 CFS-HRS; 1071.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 34

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	13913.0	(NULL)
3.98	13359.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 6.00 SQ.MI.

HRS								
1.20 CFS	.32	.94	2.20	4.54	8.47	14.37	22.62	33.79

1.60 CFS	49	67	90	118	151	190	233	279
2.00 CFS	331	437	665	1068	1719	2680	3994	5593
2.40 CFS	7355	9131	10763	12150	13171	13769	13900	13547
2.80 CFS	12787	11520	10239	9034	8094	7531	7235	7282
3.20 CFS	7472	7784	8186	8690	9239	9807	10376	10937
3.60 CFS	11459	11929	12340	12699	12977	13175	13298	13353
4.00 CFS	13354	13307	13219	13096	12942	12763	12562	12350
4.40 CFS	12118	11870	11608	11334	11053	10768	10482	10199
4.80 CFS	9918	9642	9367	9094	8823	8555	8290	8028
5.20 CFS	7773	7527	7288	7056	6829	6609	6394	6181
5.60 CFS	5974	5774	5582	5394	5212	5034	4857	4679
6.00 CFS	4504	4334	4169	4009	3851	3697	3545	3398
6.40 CFS	3255	3116	2979	2846	2718	2596	2485	2385
6.80 CFS	2295	2215	2138	2062	1988	1916	1844	1773
7.20 CFS	1702	1633	1564	1495	1428	1362	1297	1234
7.60 CFS	1172	1112	1054	998	945	893	844	796
8.00 CFS	751	708	667	628	591	555	522	490
8.40 CFS	460	432	405	380	356	334	312	292
8.80 CFS	274	256	239	224	209	195	182	170
9.20 CFS	159	148	139	129	120	112	105	98
9.60 CFS	90.94	84.72	78.91	73.48	68.41	63.69	59.27	55.16
10.00 CFS	51.32	47.74	44.40	41.29	38.39	35.69	33.17	30.83
10.40 CFS	28.65	26.62	24.73	22.97	21.34	19.81	18.40	17.08
10.80 CFS	15.86	14.72	13.66	12.68	11.76	10.91	10.12	9.39
11.20 CFS	8.71	8.08	7.49	6.95	6.44	5.97	5.53	5.13
11.60 CFS	4.75	4.40	4.08	3.78	3.50	3.24	3.00	2.78
12.00 CFS	2.58	2.38	2.21	2.04	1.89	1.75	1.62	1.50
12.40 CFS	1.39	1.28	1.19	1.10	1.02	.94	.87	.80
12.80 CFS	.74	.69	.63	.58	.54	.50		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.63 WATERSHED INCHES; 41173 CFS-HRS; 3402.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 35

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	17992.4	(NULL)
3.98	17459.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
1.15 CFS	.13	.58	1.78	4.30	8.98	16.87	28.87	45.91
1.55 CFS	69	99	137	183	238	302	377	461
1.95 CFS	554	656	817	1111	1616	2456	3763	5660
2.35 CFS	8149	10567	12747	14606	16117	17202	17834	17983
2.75 CFS	17639	16883	15618	14338	13133	12193	11631	11335
3.15 CFS	11382	11572	11884	12286	12790	13339	13907	14476
3.55 CFS	15037	15559	16029	16440	16799	17077	17275	17398
3.95 CFS	17453	17454	17407	17319	17196	17042	16863	16662
4.35 CFS	16450	16218	15970	15708	15434	15153	14868	14582

4.75 CFS	14299	14018	13742	13467	13194	12923	12655	12390
5.15 CFS	12128	11873	11627	11388	11156	10929	10709	10494
5.55 CFS	10281	10074	9839	9576	9296	9008	8722	8434
5.95 CFS	8142	7851	7562	7278	6998	6725	6456	6193
6.35 CFS	5935	5683	5435	5191	4950	4714	4487	4272
6.75 CFS	4077	3900	3743	3600	3466	3338	3215	3094
7.15 CFS	2976	2860	2745	2631	2519	2408	2299	2192
7.55 CFS	2087	1985	1886	1790	1697	1608	1522	1439
7.95 CFS	1360	1285	1212	1143	1078	1015	956	899
8.35 CFS	846	795	747	701	658	618	579	543
8.75 CFS	509	477	447	418	392	366	343	321
9.15 CFS	300	280	262	245	228	213	199	186
9.55 CFS	173	162	151	141	131	122	114	106
9.95 CFS	98.98	92.21	85.89	79.99	74.48	69.34	64.54	60.07
10.35 CFS	55.90	52.01	48.39	45.01	41.87	38.94	36.21	33.66
10.75 CFS	31.29	29.09	27.04	25.13	23.35	21.69	20.15	18.72
11.15 CFS	17.39	16.15	15.00	13.92	12.93	12.00	11.14	10.34
11.55 CFS	9.59	8.90	8.26	7.66	7.11	6.60	6.12	5.68
11.95 CFS	5.26	4.88	4.52	4.19	3.89	3.60	3.34	3.09
12.35 CFS	2.87	2.66	2.46	2.28	2.11	1.96	1.81	1.68
12.75 CFS	1.55	1.44	1.33	1.23	1.14	1.05	.97	.90
13.15 CFS	.83	.77	.71	.65	.61	.56	.51	.47

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.55 WATERSHED INCHES; 59845 CFS-HRS; 4945.6 ACRE-FEET.

OPERATION DIVERT XSECTION 35
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.45	11000.0 *	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
1.15 CFS	.13	.58	1.78	4.30	8.98	16.87	28.87	45.91
1.55 CFS	69	99	137	183	238	302	377	461
1.95 CFS	554	656	817	1111	1616	2456	3763	5660
2.35 CFS	8149	10567	11000	11000	11000	11000	11000	11000
2.75 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.15 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.55 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.95 CFS	11000	11000	11000	11000	11000	11000	11000	11000
4.35 CFS	11000	11000	11000	11000	11000	11000	11000	11000
4.75 CFS	11000	11000	11000	11000	11000	11000	11000	11000
5.15 CFS	11000	11000	11000	11000	11000	10929	10709	10494
5.55 CFS	10281	10074	9839	9576	9296	9008	8722	8434
5.95 CFS	8142	7851	7562	7278	6998	6725	6456	6193
6.35 CFS	5935	5683	5435	5191	4950	4714	4487	4272

6.75 CFS	4077	3900	3743	3600	3466	3338	3215	3094
7.15 CFS	2976	2860	2745	2631	2519	2408	2299	2192
7.55 CFS	2087	1985	1886	1790	1697	1608	1522	1439
7.95 CFS	1360	1285	1212	1143	1078	1015	956	899
8.35 CFS	846	795	747	701	658	618	579	543
8.75 CFS	509	477	447	418	392	366	343	321
9.15 CFS	300	280	262	245	228	213	199	186
9.55 CFS	173	162	151	141	131	122	114	106
9.95 CFS	98.98	92.21	85.89	79.99	74.48	69.34	64.54	60.07
10.35 CFS	55.90	52.01	48.39	45.01	41.87	38.94	36.21	33.66
10.75 CFS	31.29	29.09	27.04	25.13	23.35	21.69	20.15	18.72
11.15 CFS	17.39	16.15	15.00	13.92	12.93	12.00	11.14	10.34
11.55 CFS	9.59	8.90	8.26	7.66	7.11	6.60	6.12	5.68
11.95 CFS	5.26	4.88	4.52	4.19	3.89	3.60	3.34	3.09
12.35 CFS	2.87	2.66	2.46	2.28	2.11	1.96	1.81	1.68
12.75 CFS	1.55	1.44	1.33	1.23	1.14	1.05	.97	.90
13.15 CFS	.83	.77	.71	.65	.61	.56	.51	.47

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.98 WATERSHED INCHES; 48844 CFS-HRS; 4036.5 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 199)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	6992.4	(DIVERT)
3.98	6459.3	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
2.40 CFS	0	1747	3606	5117	6202	6834	6983	6639
2.80 CFS	5883	4618	3338	2133	1193	631	335	382
3.20 CFS	572	884	1286	1790	2339	2907	3476	4037
3.60 CFS	4559	5029	5440	5799	6077	6275	6398	6453
4.00 CFS	6454	6407	6319	6196	6042	5863	5662	5450
4.40 CFS	5218	4970	4708	4434	4153	3868	3582	3299
4.80 CFS	3018	2742	2467	2194	1923	1655	1390	1128
5.20 CFS	873	627	388	156	0			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11001 CFS-HRS; 909.1 ACRE-FEET.

OPERATION REACH XSECTION 45

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.60	11000.0 *	8.46

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.98 WATERSHED INCHES; 48837 CFS-HRS; 4035.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.44	14477.1	(RUNOFF)
5.09	565.7	(RUNOFF)
5.57	467.7	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 1.47 SQ.MI.

HRS								
.70 CFS	.49	1.79	4.72	10.27	19.17	31.25	46.11	63.69
1.10 CFS	84	107	133	161	189	217	246	272
1.50 CFS	296	320	348	382	424	473	525	578
1.90 CFS	629	673	751	1016	1675	2951	4958	7479
2.30 CFS	10139	12487	14048	14453	13548	11805	9813	7930
2.70 CFS	6413	5301	4595	4109	3719	3397	3144	2908
3.10 CFS	2660	2416	2203	2019	1869	1766	1716	1699
3.50 CFS	1689	1673	1643	1594	1528	1446	1355	1265
3.90 CFS	1188	1135	1109	1100	1091	1070	1033	980
4.30 CFS	915	851	800	767	752	748	744	734
4.70 CFS	711	676	634	596	571	559	559	563
5.10 CFS	565	559	539	512	488	468	456	454
5.50 CFS	460	467	466	456	437	410	376	342
5.90 CFS	311	289	278	271	262	243	211	166
6.30 CFS	116	68	32	10	1	0		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION REACH XSECTION 60

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.65	11037.3	9.94

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION REACH XSECTION 67

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.98	7397.2	7.60

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 64

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.98	18393.8	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 12.31 SQ.MI.

HRS								
1.00 CFS	.28	.72	1.60	3.11	5.54	9.19	14.51	22.08
1.40 CFS	33	47	67	92	124	163	210	265
1.80 CFS	330	405	491	588	696	816	970	1207
2.20 CFS	1588	2212	3205	4714	6841	9347	11203	12592
2.60 CFS	13786	14881	15877	16738	17427	17925	18235	18378
3.00 CFS	18383	18283	18103	17867	17594	17296	16984	16665
3.40 CFS	16344	16027	15718	15420	15137	14873	14630	14407
3.80 CFS	14203	14018	13849	13692	13546	13409	13280	13159
4.20 CFS	13045	12940	12844	12756	12674	12599	12527	12459
4.60 CFS	12392	12329	12268	12212	12160	12112	12068	12026
5.00 CFS	11986	11947	11910	11874	11840	11809	11781	11755
5.40 CFS	11731	11675	11531	11344	11135	10918	10685	10430
5.80 CFS	10158	9872	9581	9285	8984	8680	8375	8071
6.20 CFS	7771	7475	7184	6898	6617	6340	6066	5795
6.60 CFS	5526	5260	5000	4750	4516	4299	4102	3922
7.00 CFS	3757	3603	3459	3320	3188	3059	2933	2810
7.40 CFS	2690	2571	2456	2342	2231	2123	2019	1917
7.80 CFS	1819	1724	1633	1545	1461	1380	1303	1230
8.20 CFS	1159	1093	1029	969	912	857	806	757
8.60 CFS	711	667	626	587	551	516	484	453
9.00 CFS	424	397	371	347	325	304	284	265
9.40 CFS	248	232	216	202	188	176	164	153
9.80 CFS	143	133	124	116	108	100	94	87
10.20 CFS	81.15	75.56	70.35	65.49	60.95	56.72	52.78	49.10
10.60 CFS	45.68	42.49	39.51	36.74	34.17	31.76	29.52	27.44
11.00 CFS	25.50	23.70	22.02	20.46	19.00	17.65	16.40	15.23
11.40 CFS	14.14	13.13	12.19	11.31	10.50	9.74	9.04	8.39
11.80 CFS	7.78	7.22	6.70	6.21	5.76	5.34	4.95	4.59
12.20 CFS	4.26	3.95	3.66	3.39	3.14	2.91	2.70	2.50
12.60 CFS	2.32	2.14	1.99	1.84	1.70	1.58	1.46	1.35
13.00 CFS	1.25	1.15	1.07	.99	.91	.84	.78	.72
13.40 CFS	.67	.61	.57	.52	.48			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.48 WATERSHED INCHES; 59391 CFS-HRS; 4908.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.67	32338.6	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.78 SQ.MI.

HRS								
1.10 CFS	.35	1.23	3.30	7.30	14.19	25.19	41.59	63.91
1.50 CFS	93	129	173	226	289	361	444	535
1.90 CFS	634	737	869	1142	1708	2714	4325	6694
2.30 CFS	9866	13685	17849	21989	25760	28874	31081	32214
2.70 CFS	32167	30967	28567	25291	21793	18489	15718	13544
3.10 CFS	11939	10771	9814	8968	8240	7625	7085	6605
3.50 CFS	6203	5882	5620	5407	5246	5124	4988	4829
3.90 CFS	4648	4454	4262	4079	3905	3741	3591	3453
4.30 CFS	3329	3225	3117	3005	2887	2768	2653	2541
4.70 CFS	2441	2356	2280	2217	2154	2093	2032	1970
5.10 CFS	1909	1848	1797	1756	1718	1685	1653	1624
5.50 CFS	1591	1553	1517	1484	1454	1423	1390	1353
5.90 CFS	1303	1240	1173	1104	1034	961	886	805
6.30 CFS	722	637	550	463	372	282	195	118
6.70 CFS	60.08	22.99	4.65	.29				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
9.96 WATERSHED INCHES; 30716 CFS-HRS; 2538.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.83	21194.2	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 3.48 SQ.MI.

HRS								
1.00 CFS	.19	.70	1.87	4.06	7.63	13.12	21.11	32.24
1.40 CFS	47	66	88	115	147	185	228	276
1.80 CFS	330	390	456	526	613	762	1034	1484
2.20 CFS	2161	3116	4397	6018	7955	10115	12368	14560
2.60 CFS	16553	18252	19605	20564	21097	21158	20717	19797
3.00 CFS	18426	16619	14575	12598	10822	9364	8214	7356
3.40 CFS	6708	6164	5698	5314	4987	4694	4434	4215
3.80 CFS	4027	3858	3706	3582	3469	3358	3243	3124
4.20 CFS	3003	2884	2765	2649	2537	2431	2335	2251
4.60 CFS	2177	2104	2032	1957	1882	1806	1734	1669
5.00 CFS	1613	1566	1525	1486	1449	1410	1370	1328
5.40 CFS	1288	1254	1227	1204	1184	1165	1144	1117
5.80 CFS	1087	1055	1022	988	954	920	884	843
6.20 CFS	795	743	686	625	562	497	435	375
6.60 CFS	320	267	216	168	123	81	47	23
7.00 CFS	7.37	1.46	.17					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.35 WATERSHED INCHES; 23254 CFS-HRS; 1921.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 75

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.72	51863.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 8.26 SQ.MI.

HRS								
1.00 CFS	.19	.78	2.22	5.28	10.93	20.42	35.29	57.43
1.40 CFS	89	130	181	244	320	411	517	638
1.80 CFS	774	925	1090	1263	1482	1904	2742	4198
2.20 CFS	6486	9810	14263	19702	25804	32104	38127	43435
2.60 CFS	47634	50466	51771	51531	49664	46449	42510	38287
3.00 CFS	34144	30163	26514	23368	20636	18333	16454	14981
3.40 CFS	13793	12769	11901	11196	10607	10101	9680	9339
3.80 CFS	9015	8687	8354	8036	7732	7437	7148	6866
4.20 CFS	6594	6337	6094	5874	5654	5436	5222	5019
4.60 CFS	4829	4645	4473	4313	4162	4023	3887	3762
5.00 CFS	3645	3536	3434	3335	3245	3165	3087	3012
5.40 CFS	2941	2878	2817	2757	2701	2649	2597	2540
5.80 CFS	2477	2408	2325	2229	2127	2024	1918	1804
6.20 CFS	1681	1548	1408	1262	1112	960	807	657
6.60 CFS	515	385	276	191	127	81	47	23
7.00 CFS	7.37	1.46	.17					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.12 WATERSHED INCHES; 53970 CFS-HRS; 4460.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 76

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.74	68291.0	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
1.00 CFS	.46	1.50	3.81	8.39	16.46	29.61	49.80	79.52
1.40 CFS	121	177	248	336	444	574	726	903
1.80 CFS	1104	1330	1580	1851	2178	2720	3712	5404
2.20 CFS	8074	12021	17468	24416	32645	41451	49331	56027
2.60 CFS	61419	65347	67649	68269	67091	64374	60745	56664
3.00 CFS	52527	48446	44617	41236	38230	35629	33438	31646
3.40 CFS	30137	28797	27619	26615	25744	24974	24309	23745
3.80 CFS	23218	22705	22202	21728	21278	20847	20429	20024
4.20 CFS	19639	19277	18938	18630	18328	18035	17749	17477
4.60 CFS	17221	16974	16741	16525	16322	16136	15955	15788
5.00 CFS	15631	15484	15344	15209	15085	14974	14868	14768
5.40 CFS	14672	14553	14349	14101	13835	13567	13282	12970
5.80 CFS	12634	12280	11906	11513	11111	10704	10293	.9875
6.20 CFS	9452	9023	8592	8160	7729	7300	6873	6452
6.60 CFS	6040	5645	5277	4941	4643	4380	4148	3945
7.00 CFS	3764	3605	3459	3320	3188	3059	2933	2810
7.40 CFS	2690	2571	2456	2342	2231	2123	2019	1917
7.80 CFS	1819	1724	1633	1545	1461	1380	1303	1230
8.20 CFS	1159	1093	1029	969	912	857	806	757

8.60 CFS	711	667	626	587	551	516	484	453
9.00 CFS	424	397	371	347	325	304	284	265
9.40 CFS	248	232	216	202	188	176	164	153
9.80 CFS	143	133	124	116	108	100	94	87
10.20 CFS	81.15	75.56	70.35	65.49	60.95	56.72	52.78	49.10
10.60 CFS	45.68	42.49	39.51	36.74	34.17	31.76	29.52	27.44
11.00 CFS	25.50	23.70	22.02	20.46	19.00	17.65	16.40	15.23
11.40 CFS	14.14	13.13	12.19	11.31	10.50	9.74	9.04	8.39
11.80 CFS	7.78	7.22	6.70	6.21	5.76	5.34	4.95	4.59
12.20 CFS	4.26	3.95	3.66	3.39	3.14	2.91	2.70	2.50
12.60 CFS	2.32	2.14	1.99	1.84	1.70	1.58	1.46	1.35
13.00 CFS	1.25	1.15	1.07	.99	.91	.84	.78	.72
13.40 CFS	.67	.61	.57	.52	.48			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.54 WATERSHED INCHES; 113361 CFS-HRS; 9368.2 ACRE-FEET.

--- XSECTION 76, ALTERNATE 1, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

*** MESSAGE - STRUCTURE 1, USER ENTERED STARTING ELEVATION (1199.2 FEET) CAN ADD .456 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

*** MESSAGE - RESERVOIR ROUTING, STRUCTURE 1, TRUNCATED AT 400 POINTS WITH 3178.82 AC-FT (.24 WATERSHED INCHES) FLOOD STORAGE REMAINING IN RESERVOIR AT ELEV. 1211.88. ***

OPERATION RESVOR STRUCTURE 1 6-hr Local outflow

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.75	23723.0	1215.94

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
.70 CFS	.21	.21	.21	.21	.21	.21	.21	.21
1.10 CFS	.21	.21	.21	.22	.23	.24	.26	.28
1.50 CFS	.32	.38	.45	.55	.67	.83	1.01	1.24
1.90 CFS	1.52	1.84	2.22	2.68	3.29	4.15	5.42	7.32
2.30 CFS	10.10	14.05	18.73	24.28	30.34	36.34	42.42	48.55
2.70 CFS	55	62	67	71	1048	3021	6208	9122
3.10 CFS	11998	14375	16424	18200	19614	20733	21612	22292
3.50 CFS	22805	23178	23438	23604	23694	23723	23702	23638
3.90 CFS	23535	23399	23235	23047	22838	22612	22372	22119
4.30 CFS	21859	21592	21323	21051	20777	20503	20230	19959
4.70 CFS	19691	19426	19166	18912	18664	18422	18187	17959
5.10 CFS	17739	17526	17320	17122	16931	16748	16573	16403
5.50 CFS	16234	16060	15879	15690	15498	15316	15123	14918
5.90 CFS	14701	14471	14228	13973	13706	13427	13138	12838
6.30 CFS	12528	12209	11881	11546	11203	10854	10500	10142
6.70 CFS	9782	9423	9067	8717	8374	8076	7815	7560
7.10 CFS	7311	7069	6833	6604	6381	6164	5953	5747

7.50 CFS	5548	5353	5163	4979	4799	4624	4454	4288
7.90 CFS	4127	3970	3817	3669	3525	3386	3250	3119
8.30 CFS	2992	2869	2750	2653	2596	2539	2483	2427
8.70 CFS	2371	2316	2262	2208	2155	2102	2050	1999
9.10 CFS	1948	1899	1850	1802	1755	1709	1663	1619
9.50 CFS	1575	1533	1491	1450	1410	1371	1333	1296
9.90 CFS	1259	1224	1189	1155	1122	1090	1058	1028
10.30 CFS	998	969	941	913	886	860	835	810
10.70 CFS	786	763	740	718	697	676	656	636
11.10 CFS	617	598	580	563	545	529	513	497
11.50 CFS	482	468	453	439	426	413	400	388
11.90 CFS	376	365	353	343	332	322	312	302
12.30 CFS	293	284	275	267	258	250	243	235
12.70 CFS	228	221	214	207	201	195	189	183
13.10 CFS	177	172	166	161	156	151	147	142
13.50 CFS	138	133	129	125	121	118	114	110
13.90 CFS	107	104	100	97	94	91	88	86
14.30 CFS	83.00	80.41	77.90	75.48	73.12	73.00	72.99	72.99
14.70 CFS	72.98	72.98	72.97	72.97	72.96	72.96	72.95	72.95
15.10 CFS	72.94	72.94	72.93	72.93	72.92	72.92	72.91	72.91
15.50 CFS	72.90	72.90	72.89	72.89	72.88	72.88	72.87	72.87
15.90 CFS	72.87	72.86	72.86	72.85	72.85	72.84	72.84	72.83
16.30 CFS	72.83	72.82	72.82	72.81	72.81	72.80	72.80	72.79
16.70 CFS	72.79	72.78	72.78	72.77	72.77	72.76	72.76	72.75
17.10 CFS	72.75	72.74	72.74	72.74	72.73	72.73	72.72	72.72
17.50 CFS	72.71	72.71	72.70	72.70	72.69	72.69	72.68	72.68
17.90 CFS	72.67	72.67	72.66	72.66	72.65	72.65	72.64	72.64
18.30 CFS	72.63	72.63	72.62	72.62	72.61	72.61	72.61	72.60
18.70 CFS	72.60	72.59	72.59	72.58	72.58	72.57	72.57	72.56
19.10 CFS	72.56	72.55	72.55	72.54	72.54	72.53	72.53	72.52
19.50 CFS	72.52	72.51	72.51	72.50	72.50	72.49	72.49	72.49
19.90 CFS	72.48	72.48	72.47	72.47	72.46	72.46	72.45	72.45
20.30 CFS	72.44	72.44	72.43	72.43	72.42	72.42	72.41	72.41

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.09 WATERSHED INCHES; 80911 CFS-HRS; 6686.5 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 1, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

RAINFALL OF 12.70 inches AND 6.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 1, ARC 2
MAIN TIME INCREMENT .050 HOURS

ALTERNATE 1 STORM 1

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION 1	RUNOFF	2.46	11.09	---	2.71	17873	7265.4
XSECTION 5	REACH	2.46	11.09	8.21	3.32	10200	4146.3
XSECTION 10	REACH	2.46	11.09	9.08	3.96	7060	2869.9
XSECTION 2	RUNOFF	2.38	10.12	---	2.64	16996	7141.2
XSECTION 12	ADDHYD	4.84	10.62	---	2.64	17248	3563.6
XSECTION 12	DIVERT	4.84	5.98	---	2.25F	4100F	847.1
XSECTION 200	DIVERT	.00	5.98	---	2.64	13148	********
XSECTION 20	REACH	4.84	5.98	7.94	3.35F	4100F	847.1
XSECTION 25	REACH	4.84	5.98	5.03	3.40F	4100F	847.1
XSECTION 3	RUNOFF	3.94	11.10	---	2.73	28009	7108.9
XSECTION 30	REACH	3.94	11.10	6.29	3.40	16238	4121.3
XSECTION 5	REACH	3.94	11.10	8.50	4.00	11557	2933.2
XSECTION 25	REACH	3.94	11.10	8.90	4.06	11552	2932.0
XSECTION 4	RUNOFF	2.06	9.75	---	2.68	13580	6592.2
XSECTION 34	ADDHYD	6.00	10.63	---	2.69	13913	2318.8
XSECTION 35	ADDHYD	10.84	8.55	---	2.69	17992	1659.8
XSECTION 35	DIVERT	10.84	6.98	---	2.45F	11000F	1014.8
XSECTION 199	DIVERT	.00	6.98	---	2.69	6992	********
XSECTION 45	REACH	10.84	6.98	8.46	3.60F	11000F	1014.8
XSECTION 6	RUNOFF	1.47	11.12	---	2.44	14477	9848.3
XSECTION 60	REACH	1.47	11.12	9.94	2.65	11037	7508.2
XSECTION 67	REACH	1.47	11.12	7.60	2.98	7397	5032.0
XSECTION 64	ADDHYD	12.31	7.48	---	2.98	18394	1494.2
XSECTION 5	RUNOFF	4.78	9.96	---	2.67	32339	6765.5
XSECTION 7	RUNOFF	3.48	10.35	---	2.83	21194	6090.2
XSECTION 75	ADDHYD	8.26	10.12	---	2.72	51863	6278.8
XSECTION 76	ADDHYD	20.57	8.54	---	2.74	68291	3319.9
STRUCTURE 1	RESVOR	20.57	6.09	1215.94	3.75	23723	1153.3

SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.
QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;
LENGTH FACTOR - VALUE k* GREATER THAN 1.0;
ATT-KIN COEFF - VALUE C GREATER THAN 0.667.

BASEFLOW IS .0 CFS

ALTERNATE 1 STORM 1

XSEC ID	REACH LENGTH (FT)	FLOOD PLAIN LENGTH (FT)	HYDROGRAPH INFORMATION INFLOW PEAK (CFS)	INFLOW TIME (HR)	OUTFLOW PEAK (CFS)	OUTFLOW TIME (HR)	ROUTING PARAMETERS Q-A EQ. COEFF (X)	Q-A EQ. POWER (M)	LENGTH FACTOR (k*)	PEAK RATIO Q/I (Q*)	ATT-KIN COEFF (C)
5	9100		17866	2.7	10182	3.3	1.77	1.09	.634	.570	.08
10	9100		10182	3.3	7060	4.0	2.37	1.06	.361	.693	.08
20	3332		4100	2.3	4100	3.3	.14	1.63	.003	1.000	.50
25	1950		4100	3.3	4100	3.4	.052	1.73	.001	1.000	.65
30	8865		27941	2.8	16238	3.4	.95	1.15	.638	.581	.08
5	8865		16238	3.4	11557	4.0	1.76	1.09	.334	.712	.08
25	1950		11557	4.0	11551	4.1	.062	1.70	.002	.999	.84?
45	4200		11000	2.5	11000	3.6	.049	1.72	.003	1.000	.47
60	7540		14453	2.5	11037	2.7	.28	1.44	.236	.764	.24
67	5140		11037	2.7	7386	3.0	1.78	1.09	.367	.669	.13

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
STRUCTURE 1	20.57	
ALTERNATE 1		23723
XSECTION 1	2.46	
ALTERNATE 1		17873
XSECTION 2	2.38	
ALTERNATE 1		16996
XSECTION 3	3.94	
ALTERNATE 1		28009
XSECTION 4	2.06	
ALTERNATE 1		13580
XSECTION 5	4.78	
ALTERNATE 1		32339
XSECTION 6	1.47	
ALTERNATE 1		14477
XSECTION 7	3.48	
ALTERNATE 1		21194
XSECTION 10	2.46	
ALTERNATE 1		7060
XSECTION 12	4.84	
ALTERNATE 1		4100
XSECTION 20	4.84	
ALTERNATE 1		4100
XSECTION 25	3.94	
ALTERNATE 1		11552
XSECTION 30	3.94	
ALTERNATE 1		16238
XSECTION 34	6.00	

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
XSECTION 34	6.00	
ALTERNATE 1		13913
XSECTION 35	10.84	
ALTERNATE 1		11000
XSECTION 45	10.84	
ALTERNATE 1		11000
XSECTION 60	1.47	
ALTERNATE 1		11037
XSECTION 64	12.31	
ALTERNATE 1		18394
XSECTION 67	1.47	
ALTERNATE 1		7397
XSECTION 75	8.26	
ALTERNATE 1		51863
XSECTION 76	20.57	
ALTERNATE 1		68291
XSECTION 199	.00	
ALTERNATE 1		6992
XSECTION 200	.00	
ALTERNATE 1		13148

ECON2 DATA FILE

```
ECON2
TITLE        WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE         6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT
FLOW-FREQ    -1         23723.                                        ALT  1   1
FLOW-FREQ     1         17873.                                        ALT  1   2
FLOW-FREQ     2         16996.                                        ALT  1   3
FLOW-FREQ     3         28009.                                        ALT  1   4
FLOW-FREQ     4         13580.                                        ALT  1   5
FLOW-FREQ     5         32339.                                        ALT  1   6
FLOW-FREQ     6         14477.                                        ALT  1   7
FLOW-FREQ     7         21194.                                        ALT  1   8
FLOW-FREQ    10          7060.                                        ALT  1   9
FLOW-FREQ    12          4100.                                        ALT  1  10
FLOW-FREQ    20          4100.                                        ALT  1  11
FLOW-FREQ    25         11552.                                        ALT  1  12
FLOW-FREQ    30         16238.                                        ALT  1  13
FLOW-FREQ    34         13913.                                        ALT  1  14
FLOW-FREQ    35         11000.                                        ALT  1  15
FLOW-FREQ    45         11000.                                        ALT  1  16
FLOW-FREQ    60         11037.                                        ALT  1  17
FLOW-FREQ    64         18394.                                        ALT  1  18
FLOW-FREQ    67          7397.                                        ALT  1  19
FLOW-FREQ    75         51863.                                        ALT  1  20
FLOW-FREQ    76         68291.                                        ALT  1  21
FLOW-FREQ   199          6992.                                        ALT  1  22
FLOW-FREQ   200         13148.                                        ALT  1  23
```

```
TR20 ------------------------------------------------------------------------ SCS -
WT3PMP6      WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS      VERSION
07/21/**      6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT      2.04TEST


END OF  1 JOBS IN THIS RUN


                    SCS  TR-20,  VERSION 2.04TEST
                          WT3PMP6   FILES

     INPUT  = 6LADWR.DAT                                , GIVEN DATA FILE
     OUTPUT = 6LLOUT.OUT                                , DATED 07/21/**,16:57:59

              FILES GENERATED - DATED 07/21/**,16:57:59

    FILE LLL.TEC CONTAINS ECON2 INFORMATION

    FILE LLL.TRD CONTAINS READHD INFORMATION

          TOTAL NUMBER OF WARNINGS =    0,  MESSAGES =    2

                       JOB ENDED AT 16:57:59
                   *** TR-20 RUN COMPLETED ***
```

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*****************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

JOB TR-20 WT3PMP72  ECON                PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE     72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED
 5 RAINFL 1             0.1                                          6HRLOCAL
 8          .0000       .003        .006        .009        .013
 8          .016        .020        .025        .030        .035
 8          .039        .046        .052        .058        .065
 8          .071        .080        .090        .099        .109
 8          .118        .283        .449        .567        .622
 8          .669        .701        .732        .756        .780
 8          .795        .809        .824        .838        .852
 8          .866        .876        .885        .894        .904
 8          .913        .920        .926        .932        .939
 8          .945        .950        .954        .959        .964
 8          .969        .972        .976        .980        .984
 8          .988        .991        .993        .995        .998
 8          1.          1.          1.          1.          1.
 9 ENDTBL
 5 RAINFL 2             .1                                           6HR GEN
 8          .000        .005        .013        .020        .028
 8          .038        .045        .053        .060        .070
 8          .080        .085        .095        .108        .120
 8          .138        .150        .165        .190        .210
 8          .238        .280        .350        .440        .550
 8          .590        .620        .645        .668        .685
 8          .700        .720        .735        .753        .765
 8          .775        .790        .800        .810        .820
 8          .835        .843        .850        .863        .870
 8          .880        .890        .898        .908        .915
 8          .925        .930        .940        .945        .955
 8          .963        .970        .978        .985        .990
 8          1.00        1.00        1.00        1.00        1.00
 9 ENDTBL
 5 RAINFL 3             0.1                                          12HRGEN
 8          .000        .003        .007        .010        .013
 8          .016        .019        .022        .025        .028
 8          .031        .034        .037        .040        .043
 8          .045        .050        .054        .058        .062
 8          .066        .071        .075        .080        .085
 8          .089        .095        .101        .107        .112
 8          .118        .125        .132        .139        .146
 8          .153        .162        .171        .180        .189
 8          .198        .211        .224        .237        .250
 8          .264        .300        .345        .391        .436
 8          .491        .536        .564        .586        .607
 8          .629        .643        .657        .672        .686
 8          .700        .711        .721        .732        .742
 8          .753        .761        .769        .778        .786
 8          .795        .802        .809        .817        .824
 8          .832        .837        .843        .848        .854
 8          .859        .865        .870        .875        .881
 8          .886        .891        .895        .900        .905
 8          .909        .913        .917        .921        .925
 8          .929        .933        .936        .940        .944
 8          .948        .951        .954        .957        .960
 8          .963        .966        .969        .971        .974
```

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8          .977        .980        .982        .984        .986
8          .989        .991        .993        .995        .998
8         1.000       01.000       1.000       1.000       1.00
9 ENDTBL
5 RAINFL 4             0.1                                                18HRGEN
8          .000        .001        .002        .003        .004
8          .005        .005        .006        .007        .008
8          .009        .012        .014        .017        .020
8          .023        .025        .028        .031        .033
8          .036        .040        .044        .049        .053
8          .057        .061        .065        .070        .074
8          .078        .084        .090        .096        .102
8          .108        .114        .120        .126        .132
8          .138        .146        .154        .162        .170
8          .179        .187        .195        .203        .211
8          .220        .238        .256        .275        .293
8          .311        .330        .348        .367        .385
8          .403        .430        .457        .484        .511
8          .538        .557        .577        .597        .616
8          .636        .653        .670        .687        .704
8          .721        .734        .746        .759        .771
8          .784        .792        .801        .810        .818
8          .827        .832        .838        .843        .848
8          .853        .856        .859        .862        .864
8          .867        .870        .872        .875        .878
8          .880        .882        .885        .887        .889
8          .891        .893        .895        .897        .899
8          .901        .903        .905        .907        .909
8          .911        .912        .914        .916        .917
8          .919        .920        .922        .924        .925
8          .927        .929        .930        .932        .934
8          .935        .937        .938        .940        .941
8          .943        .945        .946        .948        .949
8          .951        .952        .953        .955        .956
8          .957        .959        .960        .961        .963
8          .964        .965        .967        .968        .970
8          .971        .972        .974        .975        .976
8          .978        .979        .980        .982        .983
8          .984        .985        .986        .988        .989
8          .990        .991        .992        .993        .994
8          .995        .996        .997        .998        .999
8         1.000       1.000       1.000       1.000       1.000
9 ENDTBL
5 RAINFL 5             0.1                                                24HRGEN
8         0.000       0.000       0.001       0.001       0.002
8         0.002       0.002       0.003       0.003       0.003
8         0.004       0.005       0.007       0.009       0.010
8         0.012       0.013       0.015       0.016       0.018
8         0.019       0.022       0.024       0.027       0.030
8         0.032       0.035       0.037       0.040       0.042
8         0.045       0.048       0.051       0.055       0.058
8         0.061       0.064       0.068       0.071       0.074
8         0.078       0.082       0.087       0.091       0.096
8         0.100       0.104       0.109       0.113       0.118
8         0.122       0.127       0.132       0.137       0.142
8         0.147       0.151       0.156       0.161       0.166
```

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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

8          0.171      0.177      0.184      0.191      0.198
8          0.205      0.214      0.224      0.233      0.242
8          0.252      0.265      0.278      0.291      0.303
8          0.316      0.334      0.351      0.368      0.386
8          0.403      0.425      0.447      0.468      0.490
8          0.512      0.527      0.543      0.558      0.574
8          0.589      0.603      0.617      0.631      0.645
8          0.659      0.671      0.684      0.696      0.709
8          0.721      0.731      0.741      0.751      0.761
8          0.771      0.779      0.786      0.793      0.800
8          0.808      0.814      0.820      0.825      0.831
8          0.837      0.840      0.843      0.847      0.850
8          0.853      0.855      0.857      0.859      0.861
8          0.864      0.866      0.868      0.870      0.872
8          0.874      0.876      0.878      0.880      0.881
8          0.883      0.885      0.886      0.888      0.890
8          0.891      0.893      0.895      0.896      0.898
8          0.899      0.901      0.902      0.904      0.905
8          0.907      0.908      0.909      0.910      0.912
8          0.913      0.914      0.915      0.916      0.917
8          0.919      0.920      0.921      0.922      0.923
8          0.924      0.926      0.927      0.928      0.929
8          0.930      0.932      0.933      0.935      0.936
8          0.938      0.940      0.941      0.943      0.944
8          0.946      0.947      0.947      0.948      0.949
8          0.950      0.950      0.951      0.952      0.953
8          0.953      0.955      0.956      0.957      0.958
8          0.959      0.960      0.961      0.962      0.963
8          0.964      0.965      0.966      0.967      0.968
8          0.969      0.970      0.971      0.972      0.973
8          0.974      0.975      0.976      0.977      0.978
8          0.979      0.980      0.981      0.982      0.983
8          0.984      0.985      0.986      0.987      0.988
8          0.988      0.989      0.990      0.991      0.991
8          0.992      0.993      0.994      0.995      0.995
8          0.996      0.997      0.998      0.998      0.999
8          1.000      1.000      1.000      1.000      1.000
9  ENDTBL
5 RAINFL 6            .25                                                48HRGEN
8          0.0000     0.0015     0.0029     0.0044     0.0058
8          0.0073     0.0088     0.0102     0.0117     0.0131
8          0.0146     0.0160     0.0175     0.0190     0.0204
8          0.0219     0.0233     0.0248     0.0263     0.0277
8          0.0292     0.0306     0.0321     0.0335     0.0350
8          0.0365     0.0379     0.0394     0.0408     0.0423
8          0.0438     0.0452     0.0467     0.0481     0.0496
8          0.0510     0.0525     0.0542     0.0558     0.0575
8          0.0592     0.0608     0.0625     0.0642     0.0658
8          0.0692     0.0725     0.0758     0.0792     0.0825
8          0.0858     0.0892     0.0925     0.0975     0.1025
8          0.1075     0.1125     0.1175     0.1225     0.1275
8          0.1325     0.1442     0.1560     0.1677     0.1794
8          0.1985     0.2176     0.2366     0.2557     0.3239
8          0.3921     0.4603     0.5285     0.5520     0.5754
8          0.5989     0.6224     0.6356     0.6488     0.6620
8          0.6752     0.6862     0.6972     0.7082     0.7192
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8          0.7267      0.7342      0.7417      0.7492      0.7558
 8          0.7625      0.7692      0.7758      0.7825      0.7892
 8          0.7958      0.8025      0.8083      0.8142      0.8200
 8          0.8258      0.8308      0.8358      0.8408      0.8458
 8          0.8508      0.8558      0.8608      0.8658      0.8683
 8          0.8708      0.8733      0.8758      0.8783      0.8808
 8          0.8833      0.8858      0.8875      0.8892      0.8908
 8          0.8925      0.8942      0.8958      0.8975      0.8992
 8          0.9008      0.9025      0.9042      0.9058      0.9075
 8          0.9092      0.9108      0.9125      0.9140      0.9154
 8          0.9169      0.9183      0.9198      0.9213      0.9227
 8          0.9242      0.9256      0.9271      0.9285      0.9300
 8          0.9315      0.9329      0.9344      0.9358      0.9373
 8          0.9388      0.9402      0.9417      0.9431      0.9446
 8          0.9460      0.9475      0.9490      0.9504      0.9519
 8          0.9533      0.9548      0.9563      0.9577      0.9592
 8          0.9606      0.9621      0.9635      0.9650      0.9665
 8          0.9679      0.9694      0.9708      0.9723      0.9737
 8          0.9752      0.9767      0.9781      0.9796      0.9810
 8          0.9825      0.9840      0.9854      0.9869      0.9883
 8          0.9898      0.9912      0.9927      0.9942      0.9956
 8          0.9971      0.9985      1.0000      1.0000      1.0
 9 ENDTBL
 5 RAINFL 7            .25                                           72HRGEN
 8          0.0000      0.0005      0.0009      0.0014      0.0019
 8          0.0025      0.0032      0.0038      0.0044      0.0051
 8          0.0057      0.0063      0.0070      0.0076      0.0082
 8          0.0089      0.0095      0.0103      0.0111      0.0119
 8          0.0127      0.0134      0.0142      0.0150      0.0158
 8          0.0171      0.0184      0.0196      0.0209      0.0222
 8          0.0234      0.0247      0.0259      0.0272      0.0285
 8          0.0297      0.0310      0.0323      0.0335      0.0348
 8          0.0361      0.0375      0.0389      0.0403      0.0418
 8          0.0432      0.0446      0.0460      0.0475      0.0489
 8          0.0503      0.0517      0.0532      0.0546      0.0560
 8          0.0574      0.0589      0.0604      0.0620      0.0636
 8          0.0652      0.0668      0.0684      0.0699      0.0715
 8          0.0731      0.0747      0.0763      0.0778      0.0797
 8          0.0816      0.0835      0.0854      0.0877      0.0899
 8          0.0921      0.0943      0.0968      0.0994      0.1019
 8          0.1044      0.1073      0.1101      0.1130      0.1158
 8          0.1193      0.1228      0.1263      0.1297      0.1335
 8          0.1373      0.1411      0.1449      0.1491      0.1532
 8          0.1573      0.1614      0.1725      0.1837      0.1948
 8          0.2059      0.2241      0.2422      0.2603      0.2784
 8          0.3431      0.4078      0.4726      0.5373      0.5596
 8          0.5819      0.6042      0.6265      0.6390      0.6515
 8          0.6641      0.6766      0.6870      0.6975      0.7079
 8          0.7184      0.7255      0.7326      0.7397      0.7468
 8          0.7535      0.7601      0.7668      0.7734      0.7794
 8          0.7854      0.7915      0.7975      0.8030      0.8085
 8          0.8141      0.8196      0.8247      0.8297      0.8348
 8          0.8399      0.8443      0.8487      0.8532      0.8576
 8          0.8598      0.8620      0.8642      0.8665      0.8685
 8          0.8706      0.8726      0.8747      0.8766      0.8785
 8          0.8804      0.8823      0.8840      0.8858      0.8875
```

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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

8          0.8892     0.8908     0.8924     0.8940     0.8956
8          0.8972     0.8987     0.9003     0.9019     0.9035
8          0.9051     0.9066     0.9082     0.9098     0.9114
8          0.9130     0.9146     0.9160     0.9174     0.9188
8          0.9203     0.9217     0.9231     0.9245     0.9259
8          0.9274     0.9288     0.9302     0.9316     0.9329
8          0.9342     0.9354     0.9367     0.9380     0.9392
8          0.9405     0.9418     0.9430     0.9443     0.9456
8          0.9468     0.9481     0.9494     0.9506     0.9519
8          0.9530     0.9541     0.9552     0.9563     0.9574
8          0.9585     0.9597     0.9608     0.9619     0.9630
8          0.9641     0.9652     0.9661     0.9671     0.9680
8          0.9690     0.9699     0.9709     0.9718     0.9728
8          0.9736     0.9744     0.9752     0.9759     0.9767
8          0.9775     0.9783     0.9791     0.9797     0.9804
8          0.9810     0.9816     0.9823     0.9829     0.9835
8          0.9842     0.9847     0.9851     0.9856     0.9861
8          0.9866     0.9870     0.9875     0.9880     0.9884
8          0.9889     0.9894     0.9899     0.9902     0.9905
8          0.9908     0.9911     0.9915     0.9918     0.9921
8          0.9924     0.9927     0.9930     0.9934     0.9937
8          0.9940     0.9943     0.9946     0.9949     0.9953
8          0.9956     0.9959     0.9962     0.9965     0.9968
8          0.9972     0.9975     0.9978     0.9981     0.9984
8          0.9987     0.9989     0.9991     0.9992     0.9994
8          0.9995     0.9997     0.9998     1.0000     1.0000
9 ENDTBL
5 RAINFL 8     1      2.4                                          10-DAY
8          .0000      .0024      .0048      .0073      .0097
8          .0121      .0148      .0174      .0201      .0228
8          .0254      .0284      .0314      .0344      .0374
8          .0404      .0437      .0471      .0505      .0539
8          .0572      .0612      .0651      .0690      .0729
8          .0768      .0815      .0862      .0909      .0955
8          .1002      .1061      .1120      .1179      .1238
8          .1297      .1377      .1458      .1538      .1618
8          .1699      .1832      .1966      .2099      .2232
8          .2366      .2548      .2778      .3093      .3614
8          1.092      1.174      1.213      1.240      1.260
8          1.276      1.286      1.296      1.306      1.316
8          1.326      1.333      1.340      1.347      1.354
8          1.360      1.365      1.371      1.376      1.381
8          1.386      1.391      1.395      1.399      1.403
8          1.408      1.411      1.415      1.418      1.422
8          1.426      1.429      1.432      1.435      1.438
8          1.442      1.444      1.447      1.450      1.453
8          1.456      1.458      1.461      1.463      1.466
8          1.468      1.471      1.473      1.475      1.477
8          1.48       1.48       1.48       1.48       1.48
9 ENDTBL
4 DIMHYD              .0556                                         WT3
8          0.0        .03        .10        .19        .31
8          .47        .66        .82        .93        .99
8          1.0        .99        .93        .82        .66
8          .47        .31        .03        .00        .00
9 ENDTBL
```

Need to check

```
 2 XSECTN   005        1.0        8.77                          BOSSCS#5
 8                     0.         0.0        0.0
 8                     0.35       5.         5.56
 8                     1.03       50.        30.95
 8                     1.39       100.       52.16
 8                     1.94       200.       88.72
 8                     2.63       400.       148.61
 8                     3.51       800.       260.63
 8                     4.62       1600.      459.66
 8                     6.04       3200.      929.36
 8                     7.38       6400.      1811.51
 8                     8.77       12800.     3374.20
 8                     10.17      25600.     6398.87
 8                     11.89      51200.     10982.51
 9 ENDTBL
 2 XSECTN   010        1.0        8.94                          BOSSCS#4
 8                     0.         0.0        0.0
 8                     0.91       5.         4.95
 8                     2.03       50.        24.80
 8                     2.63       100.       41.32
 8                     3.34       200.       74.14
 8                     4.15       400.       130.28
 8                     5.23       800.       223.37
 8                     6.41       1600.      447.51
 8                     7.65       3200.      898.64
 8                     8.94       6400.      1690.88
 8                     10.29      12800.     3331.95
 8                     11.64      25600.     6185.81
 8                     13.14      51200.     10661.04
 9 ENDTBL
 2 XSECTN   020        1.0        7.3                           REACHC
 8                     0.         0.0        0.0
 8                     1.01       100.       57.78
 8                     1.49       200.       86.81
 8                     1.88       300.       110.25
 8                     2.49       500.       149.47
 8                     3.68       1000.      226.31
 8                     5.40       2000.      346.26
 8                     7.85       4000.      533.39
 8                     9.64       6000.      688.07
 8                     11.16      8000.      838.10
 8                     12.46      10000.     985.31
 8                     13.61      12000.     1122.03
 8                     14.56      14000.     1236.94
 8                     15.43      16000.     1345.18
 8                     16.31      18000.     1456.68
 9 ENDTBL
 2 XSECTN   025        1.0        7.3                           REACHB
 8                     0.         0.0        0.0
 8                     0.63       100.       80.89
 8                     0.93       200.       120.32
 8                     1.17       300.       151.77
 8                     1.56       500.       203.28
 8                     2.30       1000.      302.00
 8                     3.38       2000.      449.24
 8                     4.97       4000.      673.73
```

```
8                       6.23        6000.       855.96
8                       7.31        8000.       1016.35
8                       8.24        10000.      1158.51
8                       9.09        12000.      1293.31
8                       9.90        14000.      1425.57
8                       10.64       16000.      1549.17
8                       11.36       18000.      1673.11
9 ENDTBL
2 XSECTN    030         1.0         9.45                                BOSSCS#6
8                       0.          0.0         0.0
8                       0.77        5.          4.67
8                       1.54        50.         32.06
8                       1.78        100.        56.64
8                       2.10        200.        100.59
8                       2.50        400.        179.97
8                       3.01        800.        320.25
8                       3.63        1600.       589.66
8                       4.35        3200.       1110.72
8                       5.21        6400.       2084.48
8                       6.03        12800.      4119.83
8                       6.99        25600.      6856.75
8                       8.28        51200.      11085.87
9 ENDTBL
2 XSECTN    045         1.0         4.87                                REACHA
8                       0.          0.0         0.0
8                       0.60        100.        85.69
8                       0.90        200.        127.94
8                       1.13        300.        161.93
8                       1.52        500.        217.27
8                       2.25        1000.       324.03
8                       3.31        2000.       483.02
8                       4.87        4000.       722.17
8                       6.09        6000.       914.99
8                       7.15        8000.       1084.61
8                       8.05        10000.      1234.17
8                       8.87        12000.      1373.80
8                       9.64        14000.      1507.84
8                       10.34       16000.      1633.45
8                       11.00       18000.      1753.12
9 ENDTBL
2 XSECTN    060         1.0         4.7                                 2CP6CP7
8                       0.          0.0         0.0
8                       2.36        100.        45.12
8                       2.88        200.        83.75
8                       3.18        300.        114.33
8                       3.64        500.        172.72
8                       4.42        1000.       289.04
8                       5.40        2000.       470.72
8                       6.87        4000.       782.74
8                       7.91        6000.       1020.12
8                       8.79        8000.       1231.25
8                       9.60        10000.      1435.05
8                       10.26       12000.      1618.34
8                       10.94       14000.      1812.58
8                       11.47       16000.      1983.46
8                       11.96       18000.      2150.12
```

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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 9 ENDTBL
 2 XSECTN   067          1.0         8.77                                BOSSCS#5
 8                       0.          0.0         0.0
 8                       0.35        5.          5.56
 8                       1.03        50.         30.95
 8                       1.39        100.        52.16
 8                       1.94        200.        88.72
 8                       2.63        400.        148.61
 8                       3.51        800.        260.63
 8                       4.62        1600.       459.66
 8                       6.04        3200.       929.36
 8                       7.38        6400.       1811.51
 8                       8.77        12800.      3374.20
 8                       10.17       25600.      6398.87
 8                       11.89       51200.      10982.51
 9 ENDTBL
 3 STRUCT       01                                                           95/11/6
 8                       1178.0      0.0         0.
 8                       1188.0      0.02        44.8
 8                       1196.8      0.13        300.
 8                       1199.2      0.21        500.
 8                       1202.0      16.00       845.55
 8                       1204.0      28.000      1176.28
 8                       1206.0      39.00       1575.25
 8                       1208.0      50.00       2044.97
 8                       1210.0      63.00       2593.40
 8                       1212.0      73.000      3218.00
 8                       1213.0      2672.00     3556.67
 8                       1214.0      8218.00     3916.02
 8                       1215.0      15533.0     4294.13
 8                       1216.0      24261.0     4692.68
 8                       1217.0      34202.0     5113.19
 8                       1218.0      45221.0     5556.01
 8                       1219.0      57222.0     6021.50
 8                       1220.0      70131.0     6509.75
 9 ENDTBL
 6 RUNOFF 1 001       1 2.46         87.2        0.85        1 1
 6 REACH  3 005   1   7 9100.                                1           BOSS#6
 6 REACH  3 010   7   2 9100.                                1           BOSS#4
 6 RUNOFF 1 002       3 2.38         79.9        0.73        1 1
 6 ADDHYD 4 012   2 3 1                                      1 1
 6 DIVERT 6 012   1 4 7 4100.        1.00        200.        1 1         OLIVE
 6 REACH  3 020   4   7 3332.                                1           REACH C
 6 REACH  3 025   7   5 1950.                                1           REACH B
 6 RUNOFF 1 003       6 3.94         87.2        0.88        1 1
 6 REACH  3 030   6   7 8865.                                1           BOSS#6
 6 REACH  3 005   7   1 8865.                                1           BOSS#5
 6 REACH  3 025   1   7 1950.                                1           REACH B
 6 RUNOFF 1 004       1 2.06         77.3        0.79        1 1
 6 ADDHYD 4 034   7 1 2                                      1 1
 6 ADDHYD 4 035   5 2 3                                      1 1
 6 DIVERT 6 035   3 4 7 11000.       1.00        199.        1 1         NORTHERN
 6 REACH  3 045   4   5 4200.                                1           REACH A
 6 RUNOFF 1 006       2 1.47         87.7        0.47        1 1
 6 REACH  3 060   2   3 7540.                                1           CP6CP7
 6 REACH  3 067   3   4 5140.                                1           BOSS#5
```

no prime spray ✓

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)*********************

 6 ADDHYD 4 064   5 4 3                                      1 1
 6 RUNOFF 1 005       6 4.78        78.8        0.78         1 1
 6 RUNOFF 1 007       7 3.48        81.7        1.01         1 1
 6 ADDHYD 4 075   6 7 1                                      1 1
 6 ADDHYD 4 076   1 3 2                                      1 1     1
 6 RESVOR 2    01 2   1 1199.2                               1 1     1
   ENDATA
 7 LIST                 1.0                     1.
 7 INCREM 6             0.20
 7 COMPUT 7 001      01 0.          15.8        1.0          7 2  01  07
   ENDCMP 1
   ENDJOB 2

*****************************END OF 80-80 LIST******************************
```

table has .25

RUNOFF OPTION USED WITH RAINTABLE NO. 8, RUNOFF CURVE NO. = 100.

COMPUTED DIMHYD PEAK RATE FACTOR = 664.607

```
EXECUTIVE CONTROL  LIST            1.          0.          1.

          LISTING OF CURRENT DATA


                      COMPUTED TIME INCREMENT
DIMHYD                          .0556

                   .0000       .0300       .1000       .1900       .3100
                   .4700       .6600       .8200       .9300       .9900
                  1.0000       .9900       .9300       .8200       .6600
                   .4700       .3100       .0300       .0000       .0000
ENDTBL

   COMPUTED PEAK RATE FACTOR =  664.607
```

	TABLE NO.	TIME INCREMENT				
RAINFL	1	.1000				
		.0000	.0030	.0060	.0090	.0130
		.0160	.0200	.0250	.0300	.0350
		.0390	.0460	.0520	.0580	.0650
		.0710	.0800	.0900	.0990	.1090
		.1180	.2830	.4490	.5670	.6220
		.6690	.7010	.7320	.7560	.7800
		.7950	.8090	.8240	.8380	.8520
		.8660	.8760	.8850	.8940	.9040
		.9130	.9200	.9260	.9320	.9390
		.9450	.9500	.9540	.9590	.9640
		.9690	.9720	.9760	.9800	.9840
		.9880	.9910	.9930	.9950	.9980
		1.0000	1.0000	1.0000	1.0000	1.0000
ENDTBL						

STANDARD CONTROL INSTRUCTIONS

```
RUNOFF      1       1      2.4600     87.2000      .85001 1 0 0 0 1
REACH       5   1   7   9100.0000       .0000      .00001 0 0 0 0 1
REACH      10   7   2   9100.0000       .0000      .00001 0 0 0 0 1
RUNOFF      2       3      2.3800     79.9000      .73001 1 0 0 0 1
ADDHYD     12   2 3 1                                   1 1 0 0 0 1
DIVERT     12   1 4 7   4100.0000      1.0000   200.00001 1 0 0 0 1
REACH      20   4   7   3332.0000       .0000      .00001 0 0 0 0 1
REACH      25   7   5   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      3       6      3.9400     87.2000      .88001 1 0 0 0 1
REACH      30   6   7   8865.0000       .0000      .00001 0 0 0 0 1
REACH       5   7   1   8865.0000       .0000      .00001 0 0 0 0 1
REACH      25   1   7   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      4       1      2.0600     77.3000      .79001 1 0 0 0 1
ADDHYD     34   7 1 2                                   1 1 0 0 0 1
ADDHYD     35   5 2 3                                   1 1 0 0 0 1
DIVERT     35   3 4 7  11000.0000      1.0000   199.00001 1 0 0 0 1
REACH      45   4   5   4200.0000       .0000      .00001 0 0 0 0 1
RUNOFF      6       2      1.4700     87.7000      .47001 1 0 0 0 1
REACH      60   2   3   7540.0000       .0000      .00001 0 0 0 0 1
REACH      67   3   4   5140.0000       .0000      .00001 0 0 0 0 1
ADDHYD     64   5 4 3                                   1 1 0 0 0 1
RUNOFF      5       6      4.7800     78.8000      .78001 1 0 0 0 1
RUNOFF      7       7      3.4800     81.7000     1.01001 1 0 0 0 1
ADDHYD     75   6 7 1                                   1 1 0 0 0 1
ADDHYD     76   1 3 2                                   1 1 0 0 1 1
RESVOR        1 2   1   1199.2000                       1 1 0 0 1 1
ENDATA
```

END OF LISTING

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .200 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 15.80 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .200 HOURS
ALTERNATE NO. = 1 STORM NO. = 7 RAIN TABLE NO. = 7

OPERATION RUNOFF XSECTION 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.01	6290.9	(RUNOFF)
37.14	222.8	(RUNOFF)
42.48	160.6	(RUNOFF)
43.88	160.6	(RUNOFF)
45.39	144.8	(RUNOFF)
46.63	144.8	(RUNOFF)
48.53	128.1	(RUNOFF)
49.25	128.1	(RUNOFF)
50.01	128.2	(RUNOFF)
50.78	128.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.46 SQ.MI.

HRS								
6.80 CFS	.23	.99	2.60	4.92	7.41	9.80	12.16	14.48
8.40 CFS	16.85	19.25	21.48	23.29	25.31	27.59	29.55	31.06
10.00 CFS	32.94	35.51	38.49	41.46	44.22	46.72	49.35	51.53
11.60 CFS	52.88	53.84	55.72	58.23	60.26	61.25	61.85	63.48
13.20 CFS	65.94	67.81	68.54	68.83	70.26	73.02	76.35	79.85
14.80 CFS	83.14	86.13	88.09	89.48	90.66	91.14	91.12	92.08
16.40 CFS	94	97	98	98	100	105	113	121
18.00 CFS	124	127	135	144	151	152	154	162
19.60 CFS	172	180	184	186	193	204	212	215
21.20 CFS	220	234	253	270	275	277	284	296
22.80 CFS	306	311	315	325	337	345	350	394
24.40 CFS	545	760	926	983	1033	1205	1437	1616
26.00 CFS	1680	1996	3130	4708	5958	6290	6037	5038
27.60 CFS	3598	2474	2209	2138	1905	1567	1316	1248
29.20 CFS	1233	1182	1109	1057	1041	1019	937	822
30.80 CFS	735	709	707	696	681	669	665	660
32.40 CFS	643	621	606	604	601	587	568	556
34.00 CFS	554	552	540	522	510	507	504	489
35.60 CFS	465	448	444	429	373	294	237	222
37.20 CFS	223	219	212	207	206	205	202	197
38.80 CFS	192	190	189	185	179	176	174	172
40.40 CFS	167	164	161	161	161	160	158	156
42.00 CFS	157	159	160	160	159	157	156	158
43.60 CFS	160	161	161	159	154	147	142	142

45.20 CFS	144	145	144	141	141	141	143	145
46.80 CFS	144	142	140	137	134	130	127	126
48.40 CFS	128	128	126	127	128	128	126	127
50.00 CFS	128	127	126	127	128	127	125	122
51.60 CFS	117	112	110	110	110	111	112	114
53.20 CFS	115	113	111	110	110	109	104	99
54.80 CFS	95.92	95.49	95.53	95.31	95.58	95.24	95.48	94.73
56.40 CFS	91.62	86.71	81.65	79.19	77.09	76.07	77.39	79.64
58.00 CFS	80.28	78.85	74.36	69.21	65.85	64.21	62.73	63.19
59.60 CFS	64.51	63.90	62.57	63.01	60.90	54.36	47.42	46.33
61.20 CFS	48.46	49.63	48.07	46.12	46.28	47.66	47.31	45.89
62.80 CFS	46.76	48.96	48.66	43.81	36.83	31.65	30.19	30.89
64.40 CFS	32.94	34.37	33.62	31.35	30.17	30.15	30.41	31.81
66.00 CFS	33.98	34.30	32.52	30.50	30.15	30.18	30.92	32.95
67.60 CFS	34.48	33.68	31.30	30.16	30.15	30.33	31.78	33.88
69.20 CFS	34.35	32.60	30.51	30.15	30.11	29.43	26.91	23.19
70.80 CFS	19.16	16.26	15.21	14.96	15.26	14.90	15.12	14.45
72.40 CFS	11.29	6.32	1.19	.00				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22681 CFS-HRS; 1874.3 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.54	4816.3	6.72
42.76	160.0	1.72
44.25	159.6	1.72
46.94	143.7	1.63
51.01	127.5	1.54
53.42	113.7	1.47
63.33	48.1	1.00
66.47	32.9	.77
68.00	32.7	.77
69.50	32.6	.77

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22692 CFS-HRS; 1875.3 ACRE-FEET.

OPERATION REACH XSECTION 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.12	3932.3	7.95
44.51	159.4	3.05
68.36	32.2	1.59
69.88	32.1	1.58

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22690 CFS-HRS; 1875.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.97	5804.6	(RUNOFF)
27.91	2083.0	(RUNOFF)
32.95	574.5	(RUNOFF)
33.97	527.8	(RUNOFF)
34.96	482.6	(RUNOFF)
35.91	425.5	(RUNOFF)
37.12	212.6	(RUNOFF)
41.10	153.0	(RUNOFF)
42.43	153.0	(RUNOFF)
43.72	153.1	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.38 SQ.MI.

HRS								
9.40 CFS	.14	.63	1.68	3.16	4.81	6.60	8.47	10.27
11.00 CFS	12.14	14.12	15.84	17.19	18.61	20.39	22.36	23.92
12.60 CFS	24.94	26.12	27.84	29.82	31.23	32.00	32.96	34.62
14.20 CFS	36.86	39.25	41.70	44.25	46.40	47.92	49.37	50.69
15.80 CFS	51.39	51.89	53.40	55.71	57.36	58.57	59.27	60.59
17.40 CFS	65.67	72.65	76.93	78.70	82.05	89.12	96.33	99.53
19.00 CFS	101	104	111	119	125	127	129	138
20.60 CFS	147	152	155	161	174	192	201	204
22.20 CFS	207	216	228	235	239	244	255	267
23.80 CFS	272	274	324	491	691	792	812	882
25.40 CFS	1076	1303	1422	1470	1892	3231	4839	5662
27.00 CFS	5799	5531	4259	2748	2071	2073	1988	1688
28.60 CFS	1339	1182	1177	1158	1092	1019	987	985
30.20 CFS	955	852	729	672	672	669	656	639
31.80 CFS	630	630	624	603	580	573	574	569
33.40 CFS	551	532	526	528	524	508	489	481
35.00 CFS	482	479	457	432	422	423	401	330
36.60 CFS	249	212	211	212	207	199	196	196
38.20 CFS	195	191	185	181	181	180	174	169
39.80 CFS	167	166	162	158	155	153	153	153
41.40 CFS	152	150	148	150	152	153	153	151
43.00 CFS	149	149	152	153	153	153	151	145
44.60 CFS	137	134	136	138	138	136	134	134
46.20 CFS	135	138	139	137	134	133	130	126
47.80 CFS	122	120	121	123	122	120	121	123
49.40 CFS	121	120	122	123	120	120	123	122
51.00 CFS	120	119	115	109	106	105	105	105
52.60 CFS	106	108	110	109	107	105	105	105
54.20 CFS	103	98	93	91	91	91	91	91
55.80 CFS	91.23	91.13	90.16	86.63	80.12	76.62	75.20	72.57

57.40 CFS	72.39	75.00	76.69	76.65	74.70	68.97	64.00	62.46
59.00 CFS	60.92	59.14	61.17	62.23	60.18	59.29	60.96	57.31
60.60 CFS	48.43	43.26	44.74	47.42	47.41	45.10	43.32	44.67
62.20 CFS	46.36	44.37	43.36	45.53	47.73	46.08	39.71	32.21
63.80 CFS	28.79	28.81	29.70	32.36	33.49	31.36	29.05	28.80
65.40 CFS	28.79	29.11	31.05	33.35	32.66	29.83	28.80	28.80
67.00 CFS	28.82	29.71	32.40	33.52	31.37	29.04	28.80	28.80
68.60 CFS	29.10	31.02	33.34	32.68	29.88	28.80	28.80	28.77
70.20 CFS	27.82	24.66	20.68	17.06	14.62	14.36	14.56	14.23
71.80 CFS	14.45	14.35	13.29	9.79	3.54	.17		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.26 WATERSHED INCHES; 20363 CFS-HRS; 1682.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.15	7758.9	(NULL)
28.05	5991.2	(NULL)
42.16	319.5	(NULL)
43.60	313.0	(NULL)
45.17	294.5	(NULL)
46.50	285.0	(NULL)
48.33	261.8	(NULL)
49.13	256.0	(NULL)
49.92	252.4	(NULL)
50.66	250.9	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
7.60 CFS	.31	.76	1.47	2.44	3.66	5.08	6.68	8.43
9.20 CFS	10.32	12.37	14.83	17.89	21.39	25.05	28.81	32.69
10.80 CFS	36.59	40.66	44.94	49.03	52.79	56.64	60.79	64.98
12.40 CFS	68.67	71.80	75.05	78.77	82.60	85.76	88.29	91.01
14.00 CFS	94	98	102	106	110	114	118	122
15.60 CFS	125	128	131	135	139	142	145	147
17.20 CFS	150	156	165	171	175	181	192	202
18.80 CFS	210	215	223	235	249	260	266	275
20.40 CFS	289	304	314	323	335	355	379	395
22.00 CFS	406	418	436	457	473	486	500	520
23.60 CFS	540	553	564	622	797	1008	1131	1193
25.20 CFS	1323	1589	1892	2095	2242	2778	4235	5976
26.80 CFS	7013	7503	7727	7011	6032	5765	5982	5910
28.40 CFS	5496	4966	4590	4337	4052	3727	3415	3168
30.00 CFS	2974	2775	2526	2277	2110	2006	1905	1801
31.60 CFS	1705	1627	1568	1510	1446	1387	1348	1322
33.20 CFS	1292	1252	1214	1191	1177	1158	1128	1097
34.80 CFS	1077	1067	1052	1020	984	965	955	921
36.40 CFS	838	745	693	671	644	609	573	543
38.00 CFS	519	497	475	454	437	426	414	400

39.60 CFS	388	380	373	364	355	347	341	337
41.20 CFS	334	330	324	320	319	319	318	316
42.80 CFS	313	310	310	313	313	313	312	310
44.40 CFS	304	297	293	294	294	293	288	285
46.00 CFS	284	283	285	285	282	279	278	274
47.60 CFS	270	265	262	261	262	258	255	255
49.20 CFS	256	252	250	252	252	249	249	251
50.80 CFS	250	248	246	243	236	232	231	230
52.40 CFS	228	226	227	227	226	222	220	220
54.00 CFS	220	217	211	205	203	201	200	198
55.60 CFS	196	194	193	191	186	179	174	172
57.20 CFS	167	165	165	165	163	159	153	147
58.80 CFS	144	141	137	137	137	133	130	130
60.40 CFS	126	116	110	110	110	108	104	100
62.00 CFS	99.93	100.12	96.80	94.73	96.04	97.46	95.17	88.45
63.60 CFS	80.75	76.90	75.87	75.11	75.80	74.97	71.19	67.60
65.20 CFS	66.31	65.31	64.63	65.66	67.17	65.92	62.83	61.76
66.80 CFS	61.70	61.52	62.12	64.50	65.36	63.16	60.98	60.96
68.40 CFS	61.01	61.18	62.91	65.00	64.23	61.54	60.71	60.90
70.00 CFS	60.84	59.75	56.38	52.13	48.04	44.79	43.32	41.96
71.60 CFS	39.92	38.46	36.84	34.42	29.76	22.49	18.03	16.46
73.20 CFS	14.61	12.59	10.60	8.78	7.18	5.80	4.65	3.70
74.80 CFS	2.93	2.30	1.80	1.41	1.09	.85	.65	.50
76.40 CFS	.38							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.78 WATERSHED INCHES; 43053 CFS-HRS; 3557.9 ACRE-FEET.

OPERATION DIVERT XSECTION 12
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	(DIVERT)
42.16	319.5	(DIVERT)
43.60	313.0	(DIVERT)
45.17	294.5	(DIVERT)
46.50	285.0	(DIVERT)
48.33	261.8	(DIVERT)
49.13	256.0	(DIVERT)
49.92	252.4	(DIVERT)
50.66	250.9	(DIVERT)
52.97	227.5	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
7.60 CFS	.31	.76	1.47	2.44	3.66	5.08	6.68	8.43
9.20 CFS	10.32	12.37	14.83	17.89	21.39	25.05	28.81	32.69
10.80 CFS	36.59	40.66	44.94	49.03	52.79	56.64	60.79	64.98

12.40 CFS	68.67	71.80	75.05	78.77	82.60	85.76	88.29	91.01
14.00 CFS	94	98	102	106	110	114	118	122
15.60 CFS	125	128	131	135	139	142	145	147
17.20 CFS	150	156	165	171	175	181	192	202
18.80 CFS	210	215	223	235	249	260	266	275
20.40 CFS	289	304	314	323	335	355	379	395
22.00 CFS	406	418	436	457	473	486	500	520
23.60 CFS	540	553	564	622	797	1008	1131	1193
25.20 CFS	1323	1589	1892	2095	2242	2778	4100	4100
26.80 CFS	4100	4100	4100	4100	4100	4100	4100	4100
28.40 CFS	4100	4100	4100	4100	4052	3727	3415	3168
30.00 CFS	2974	2775	2526	2277	2110	2006	1905	1801
31.60 CFS	1705	1627	1568	1510	1446	1387	1348	1322
33.20 CFS	1292	1252	1214	1191	1177	1158	1128	1097
34.80 CFS	1077	1067	1052	1020	984	965	955	921
36.40 CFS	838	745	693	671	644	609	573	543
38.00 CFS	519	497	475	454	437	426	414	400
39.60 CFS	388	380	373	364	355	347	341	337
41.20 CFS	334	330	324	320	319	319	318	316
42.80 CFS	313	310	310	313	313	313	312	310
44.40 CFS	304	297	293	294	294	293	288	285
46.00 CFS	284	283	285	285	282	279	278	274
47.60 CFS	270	265	262	261	262	258	255	255
49.20 CFS	256	252	250	252	252	249	249	251
50.80 CFS	250	248	246	243	236	232	231	230
52.40 CFS	228	226	227	227	226	222	220	220
54.00 CFS	220	217	211	205	203	201	200	198
55.60 CFS	196	194	193	191	186	179	174	172
57.20 CFS	167	165	165	165	163	159	153	147
58.80 CFS	144	141	137	137	137	133	130	130
60.40 CFS	126	116	110	110	110	108	104	100
62.00 CFS	99.93	100.12	96.80	94.73	96.04	97.46	95.17	88.45
63.60 CFS	80.75	76.90	75.87	75.11	75.80	74.97	71.19	67.60
65.20 CFS	66.31	65.31	64.63	65.66	67.17	65.92	62.83	61.76
66.80 CFS	61.70	61.52	62.12	64.50	65.36	63.16	60.98	60.96
68.40 CFS	61.01	61.18	62.91	65.00	64.23	61.54	60.71	60.90
70.00 CFS	60.84	59.75	56.38	52.13	48.04	44.79	43.32	41.96
71.60 CFS	39.92	38.46	36.84	34.42	29.76	22.49	18.03	16.46
73.20 CFS	14.61	12.59	10.60	8.78	7.18	5.80	4.65	3.70
74.80 CFS	2.93	2.30	1.80	1.41	1.09	.85	.65	.50
76.40 CFS	.38							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 200)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.15	3658.9	(DIVERT)
28.05	1891.2	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
26.20 CFS	0	135	1876	2913	3403	3627	2911	1932
27.80 CFS	1665	1882	1810	1396	866	490	237	0

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5055 CFS-HRS; 417.7 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 20. ***

OPERATION REACH XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	7.94
42.16	319.5	1.94
43.60	313.0	1.92
45.17	294.5	1.86
46.50	285.0	1.82
48.33	261.8	1.73
49.13	256.0	1.71
49.92	252.4	1.69
50.66	250.9	1.69
52.97	227.5	1.60

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 25. ***

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	5.03
42.16	319.5	1.21
43.60	313.0	1.20
45.17	294.5	1.16
46.50	285.0	1.13
48.33	261.8	1.08
49.13	256.0	1.06
49.92	252.4	1.06
50.66	250.9	1.05
52.97	227.5	1.00

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.03	10040.5	(RUNOFF)
37.12	356.5	(RUNOFF)
41.10	257.2	(RUNOFF)
42.50	257.2	(RUNOFF)
43.87	257.2	(RUNOFF)
45.40	231.7	(RUNOFF)
46.65	231.7	(RUNOFF)
48.55	205.0	(RUNOFF)
50.03	205.0	(RUNOFF)
50.79	205.1	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 3.94 SQ.MI.

HRS								
6.80 CFS	.34	1.45	3.89	7.54	11.53	15.39	19.17	22.84
8.40 CFS	26.59	30.43	34.07	37.14	40.32	43.87	47.03	49.53
10.00 CFS	52.51	56.50	61.23	65.95	70.39	74.49	78.70	82.25
11.60 CFS	85	86	89	93	96	98	99	101
13.20 CFS	105	108	110	110	112	117	122	127
14.80 CFS	133	138	141	143	145	146	146	147
16.40 CFS	151	154	157	158	159	167	180	192
18.00 CFS	198	203	215	230	241	244	247	258
19.60 CFS	274	287	294	297	308	325	339	345
21.20 CFS	353	373	403	429	440	443	454	472
22.80 CFS	489	497	504	519	538	551	558	621
24.40 CFS	852	1184	1469	1571	1659	1902	2263	2558
26.00 CFS	2703	3170	4869	7282	9355	10029	9667	.8221
27.60 CFS	5995	4199	3538	3445	3081	2567	2137	2004
29.20 CFS	1977	1901	1788	1701	1668	1637	1511	1335
30.80 CFS	1187	1138	1132	1117	1093	1073	1065	1058

32.40 CFS	1033	998	973	967	963	942	912	892
34.00 CFS	887	884	867	840	818	812	807	785
35.60 CFS	748	719	710	688	605	485	388	355
37.20 CFS	356	351	341	332	329	328	323	316
38.80 CFS	308	305	303	296	288	282	279	275
40.40 CFS	269	263	259	257	257	256	254	251
42.00 CFS	251	254	257	257	255	251	251	253
43.60 CFS	256	257	257	255	248	237	228	227
45.20 CFS	230	232	230	226	225	226	229	232
46.80 CFS	231	227	224	220	215	208	203	203
48.40 CFS	204	205	203	203	205	205	203	203
50.00 CFS	205	204	202	204	205	203	200	195
51.60 CFS	188	180	177	177	177	177	179	183
53.20 CFS	184	181	178	177	177	175	168	160
54.80 CFS	154	153	153	153	153	153	153	152
56.40 CFS	147	140	132	127	124	122	124	127
58.00 CFS	129	127	120	112	106	103	101	101
59.60 CFS	103	102	101	101	98	88	77	74
61.20 CFS	77.10	79.45	77.17	74.29	74.14	76.15	75.93	73.85
62.80 CFS	74.62	77.92	78.02	70.90	60.16	51.49	48.30	49.34
64.40 CFS	52.39	54.88	54.13	50.67	48.42	48.28	48.64	50.74
66.00 CFS	54.08	54.91	52.48	49.07	48.29	48.36	49.44	52.43
67.60 CFS	54.81	53.98	50.67	48.40	48.29	48.68	50.71	53.91
69.20 CFS	54.79	52.53	49.19	48.29	48.24	47.24	43.47	37.73
70.80 CFS	31.21	26.55	24.54	23.82	24.43	24.09	23.99	23.32
72.40 CFS	18.27	11.03	2.94	.12				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 36347 CFS-HRS; 3003.7 ACRE-FEET.

OPERATION REACH XSECTION 30

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.78	7435.3	5.34
42.91	256.8	2.21
44.45	255.5	2.21
47.13	230.4	2.16
50.38	204.6	2.11
51.21	204.2	2.11
53.62	182.4	2.04
63.53	77.1	1.67
66.69	52.7	1.55
68.22	52.2	1.55

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36355 CFS-HRS; 3004.3 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.39	6138.2	7.27
44.55	255.5	2.13
68.57	51.6	1.04
70.11	51.4	1.04

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36353 CFS-HRS; 3004.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 25. ***

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.39	6138.2	6.30
44.55	255.5	1.06
68.57	51.6	.32
70.11	51.4	.32

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36353 CFS-HRS; 3004.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.01	4861.6	(RUNOFF)
32.92	492.2	(RUNOFF)
33.95	452.3	(RUNOFF)
37.13	182.2	(RUNOFF)
42.46	131.5	(RUNOFF)
43.75	131.5	(RUNOFF)
45.36	118.9	(RUNOFF)
46.60	118.9	(RUNOFF)
49.22	105.4	(RUNOFF)
49.98	105.4	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.06 SQ.MI.

HRS								
10.60 CFS	.44	1.24	2.48	3.94	5.36	6.65	7.89	9.27
12.20 CFS	10.74	12.07	13.16	14.21	15.50	16.98	18.25	19.14
13.80 CFS	19.98	21.24	22.86	24.65	26.54	28.44	30.17	31.57
15.40 CFS	32.82	33.98	34.79	35.41	36.53	38.22	39.73	40.82
17.00 CFS	41.60	42.73	45.98	50.80	54.70	56.41	58.79	63.74
18.60 CFS	69.28	72.69	73.87	76.25	81.12	87.59	92.71	94.71

20.20 CFS	97	103	110	115	117	122	132	145
21.80 CFS	154	158	160	167	176	183	187	191
23.40 CFS	200	209	215	217	251	368	521	625
25.00 CFS	653	705	846	1029	1155	1197	1491	2480
26.60 CFS	3780	4657	4861	4677	3805	2608	1849	1768
28.20 CFS	1709	1489	1203	1026	1006	993	945	883
29.80 CFS	847	843	822	746	646	583	575	573
31.40 CFS	564	550	541	540	536	520	501	492
33.00 CFS	492	489	475	459	451	452	450	438
34.60 CFS	423	414	414	411	396	375	363	363
36.20 CFS	348	295	227	186	181	182	178	172
37.80 CFS	168	168	167	165	160	156	156	154
39.40 CFS	150	146	144	143	140	136	133	132
41.00 CFS	131	131	131	129	128	128	131	131
42.60 CFS	131	130	128	128	130	131	131	131
44.20 CFS	130	125	119	116	116	118	119	117
45.80 CFS	115	115	116	118	119	118	116	114
47.40 CFS	112	109	106	104	104	105	105	103
49.00 CFS	104	105	104	103	104	105	104	103
50.60 CFS	105	105	104	102	100	95	91	91
52.20 CFS	90.63	90.64	90.88	92.26	94.14	94.12	92.10	90.69
53.80 CFS	90.67	90.60	89.19	84.94	80.60	78.49	78.43	78.29
55.40 CFS	78.35	78.44	78.27	78.37	77.50	74.80	70.18	66.39
57.00 CFS	64.88	62.84	62.23	63.93	65.76	65.92	64.49	60.24
58.60 CFS	55.90	53.70	52.67	51.12	52.17	53.31	52.22	51.16
60.20 CFS	51.85	49.69	43.38	38.08	38.11	40.32	40.86	39.10
61.80 CFS	37.54	38.17	39.57	38.58	37.50	38.68	40.75	39.92
63.40 CFS	35.14	28.96	25.22	24.80	25.52	27.45	28.54	27.35
65.00 CFS	25.23	24.76	24.76	24.95	26.35	28.23	28.22	26.27
66.60 CFS	24.86	24.76	24.78	25.42	27.43	28.56	27.40	25.33
68.20 CFS	24.77	24.77	25.00	26.37	28.27	28.27	26.22	24.84
69.80 CFS	24.77	24.73	24.01	21.69	18.44	15.17	12.99	12.36
71.40 CFS	12.40	12.44	12.29	12.40	11.54	8.86	4.23	.50
73.00 CFS	.00							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.87 WATERSHED INCHES; 17108 CFS-HRS; 1413.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 34

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	7273.8	(NULL)
28.25	7762.8	(NULL)
43.54	389.7	(NULL)
45.15	371.8	(NULL)
50.68	311.1	(NULL)
61.10	145.4	(NULL)
62.94	122.6	(NULL)
65.94	84.5	(NULL)
67.56	80.3	(NULL)
69.07	79.5	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 6.00 SQ.MI.

HRS								
7.80 CFS	.43	1.07	2.10	3.54	5.35	7.50	9.93	12.62
9.40 CFS	15.50	18.51	21.60	24.76	27.97	31.23	34.74	38.74
11.00 CFS	43.30	48.23	53.28	58.30	63.39	68.64	73.89	78.81
12.60 CFS	83	88	92	97	101	105	109	113
14.20 CFS	117	122	126	130	135	139	144	148
15.80 CFS	153	157	162	167	171	175	178	182
17.40 CFS	188	195	201	206	211	221	232	241
19.00 CFS	248	257	270	284	297	307	317	332
20.60 CFS	349	362	374	388	408	430	450	464
22.20 CFS	479	499	523	545	562	581	604	627
23.80 CFS	646	662	709	839	1006	1125	1186	1298
25.40 CFS	1529	1820	2063	2234	2680	3842	5325	6410
27.00 CFS	6933	7265	7120	6765	6830	7417	7751	7627
28.60 CFS	7224	6815	6489	6116	5675	5217	4808	4463
30.20 CFS	4134	3782	3440	3168	2974	2800	2627	2463
31.80 CFS	2320	2201	2095	1991	1896	1823	1769	1717
33.40 CFS	1660	1606	1565	1536	1506	1468	1430	1400
35.00 CFS	1380	1358	1324	1285	1257	1240	1208	1136
36.60 CFS	1049	988	960	929	884	832	783	741
38.20 CFS	701	664	629	600	577	557	536	517
39.80 CFS	502	490	477	465	454	444	437	430
41.40 CFS	424	416	409	406	404	401	397	393
43.00 CFS	390	388	389	390	388	388	386	381
44.60 CFS	375	371	371	372	370	365	361	358
46.20 CFS	357	356	355	352	349	347	344	340
47.80 CFS	336	333	331	331	328	324	321	321
49.40 CFS	318	315	314	314	312	310	311	311
51.00 CFS	309	307	304	299	295	294	293	290
52.60 CFS	288	286	286	283	279	276	275	275
54.20 CFS	272	267	262	259	258	256	253	250
55.80 CFS	247	245	242	237	230	225	222	218
57.40 CFS	215	213	212	208	204	197	191	187
59.00 CFS	184	180	179	177	172	168	166	162
60.60 CFS	154	147	145	145	143	137	133	130
62.20 CFS	129	126	123	122	123	120	114	108
63.80 CFS	103	102	101	101	99	95	90	87

65.40 CFS	85.71	84.27	84.05	84.42	83.09	80.13	78.18	77.89
67.00 CFS	77.76	78.06	79.59	80.22	78.63	76.40	75.99	76.26
68.60 CFS	76.59	77.80	79.41	79.08	76.85	75.58	75.84	76.07
70.20 CFS	75.37	72.85	69.30	65.63	62.78	60.98	59.24	56.97
71.80 CFS	54.23	51.74	48.46	43.59	37.07	31.66	29.39	27.21
73.40 CFS	24.42	21.29	18.17	15.25	12.65	10.38	8.44	6.82
75.00 CFS	5.48	4.38	3.48	2.76	2.18	1.72	1.35	1.05
76.60 CFS	.82	.64	.50					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.81 WATERSHED INCHES; 53461 CFS-HRS; 4418.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 35

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	11373.8	(NULL)
28.25	11862.8	(NULL)
43.56	702.7	(NULL)
45.16	666.3	(NULL)
46.41	641.0	(NULL)
49.91	566.9	(NULL)
50.66	562.0	(NULL)
52.91	513.5	(NULL)
61.13	255.8	(NULL)
62.96	220.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
7.60 CFS	.44	1.19	2.53	4.54	7.19	10.43	14.18	18.37
9.20 CFS	22.93	27.87	33.34	39.49	46.16	53.02	60.04	67.44
10.80 CFS	75	84	93	102	111	120	129	139
12.40 CFS	147	155	163	171	180	187	193	200
14.00 CFS	207	215	224	232	241	249	257	265
15.60 CFS	274	281	288	296	306	313	320	325
17.20 CFS	332	344	360	372	380	393	413	434
18.80 CFS	450	463	481	505	533	557	573	592
20.40 CFS	621	652	677	697	723	763	809	845
22.00 CFS	870	897	936	980	1018	1048	1081	1124
23.60 CFS	1167	1199	1226	1331	1636	2013	2256	2378
25.20 CFS	2621	3118	3712	4157	4477	5458	7942	9425
26.80 CFS	10510	11033	11365	11220	10865	10930	11517	11851
28.40 CFS	11727	11324	10915	10589	10169	9402	8633	7976
30.00 CFS	7438	6909	6308	5718	5278	4980	4704	4429
31.60 CFS	4168	3947	3769	3605	3436	3284	3171	3091
33.20 CFS	3009	2912	2820	2756	2713	2664	2596	2527
34.80 CFS	2477	2447	2410	2344	2269	2221	2195	2129
36.40 CFS	1974	1794	1681	1631	1573	1493	1405	1326
38.00 CFS	1260	1199	1140	1083	1037	1003	971	936
39.60 CFS	905	882	863	841	820	801	786	774
41.20 CFS	764	753	740	729	724	723	719	714

42.80 CFS	707	700	699	702	703	701	700	696
44.40 CFS	685	672	664	665	666	663	654	646
46.00 CFS	642	640	641	640	634	628	624	618
47.60 CFS	610	601	595	592	592	586	579	577
49.20 CFS	576	570	565	566	566	561	559	562
50.80 CFS	561	557	554	547	536	528	525	522
52.40 CFS	518	514	513	513	509	501	497	496
54.00 CFS	494	490	478	467	462	459	455	451
55.60 CFS	446	442	438	432	423	409	399	394
57.20 CFS	385	380	379	377	371	363	350	337
58.80 CFS	331	325	318	316	313	305	298	297
60.40 CFS	288	269	256	255	255	251	241	233
62.00 CFS	230	229	223	217	218	220	216	203
63.60 CFS	188	180	178	177	177	174	166	158
65.20 CFS	154	151	149	150	152	149	143	140
66.80 CFS	140	139	140	144	146	142	137	137
68.40 CFS	137	138	141	144	143	138	136	137
70.00 CFS	137	135	129	121	114	108	104	101
71.60 CFS	96.90	92.69	88.57	82.87	73.36	59.56	49.69	45.85
73.20 CFS	41.82	37.01	31.89	26.95	22.43	18.45	15.03	12.14
74.80 CFS	9.75	7.78	6.18	4.89	3.85	3.03	2.37	1.85
76.40 CFS	1.44	1.12	.87	.67	.52	.40		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.07 WATERSHED INCHES; 91445 CFS-HRS; 7557.0 ACRE-FEET.

OPERATION DIVERT XSECTION 35
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11000.0 *	(DIVERT)
28.00	11000.0 *	(DIVERT)
43.56	702.7	(DIVERT)
45.16	666.3	(DIVERT)
46.41	641.0	(DIVERT)
49.91	566.9	(DIVERT)
50.66	562.0	(DIVERT)
52.91	513.5	(DIVERT)
61.13	255.8	(DIVERT)
62.96	220.1	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
7.60 CFS	.44	1.19	2.53	4.54	7.19	10.43	14.18	18.37
9.20 CFS	22.93	27.87	33.34	39.49	46.16	53.02	60.04	67.44
10.80 CFS	75	84	93	102	111	120	129	139
12.40 CFS	147	155	163	171	180	187	193	200
14.00 CFS	207	215	224	232	241	249	257	265

15.60 CFS	274	281	288	296	306	313	320	325
17.20 CFS	332	344	360	372	380	393	413	434
18.80 CFS	450	463	481	505	533	557	573	592
20.40 CFS	621	652	677	697	723	763	809	845
22.00 CFS	870	897	936	980	1018	1048	1081	1124
23.60 CFS	1167	1199	1226	1331	1636	2013	2256	2378
25.20 CFS	2621	3118	3712	4157	4477	5458	7942	9425
26.80 CFS	10510	11000	11000	11000	10865	10930	11000	11000
28.40 CFS	11000	11000	10915	10589	10169	9402	8633	7976
30.00 CFS	7438	6909	6308	5718	5278	4980	4704	4429
31.60 CFS	4168	3947	3769	3605	3436	3284	3171	3091
33.20 CFS	3009	2912	2820	2756	2713	2664	2596	2527
34.80 CFS	2477	2447	2410	2344	2269	2221	2195	2129
36.40 CFS	1974	1794	1681	1631	1573	1493	1405	1326
38.00 CFS	1260	1199	1140	1083	1037	1003	971	936
39.60 CFS	905	882	863	841	820	801	786	774
41.20 CFS	764	753	740	729	724	723	719	714
42.80 CFS	707	700	699	702	703	701	700	696
44.40 CFS	685	672	664	665	666	663	654	646
46.00 CFS	642	640	641	640	634	628	624	618
47.60 CFS	610	601	595	592	592	586	579	577
49.20 CFS	576	570	565	566	566	561	559	562
50.80 CFS	561	557	554	547	536	528	525	522
52.40 CFS	518	514	513	513	509	501	497	496
54.00 CFS	494	490	478	467	462	459	455	451
55.60 CFS	446	442	438	432	423	409	399	394
57.20 CFS	385	380	379	377	371	363	350	337
58.80 CFS	331	325	318	316	313	305	298	297
60.40 CFS	288	269	256	255	255	251	241	233
62.00 CFS	230	229	223	217	218	220	216	203
63.60 CFS	188	180	178	177	177	174	166	158
65.20 CFS	154	151	149	150	152	149	143	140
66.80 CFS	140	139	140	144	146	142	137	137
68.40 CFS	137	138	141	144	143	138	136	137
70.00 CFS	137	135	129	121	114	108	104	101
71.60 CFS	96.90	92.69	88.57	82.87	73.36	59.56	49.69	45.85
73.20 CFS	41.82	37.01	31.89	26.95	22.43	18.45	15.03	12.14
74.80 CFS	9.75	7.78	6.18	4.89	3.85	3.03	2.37	1.85
76.40 CFS	1.44	1.12	.87	.67	.52	.40		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.99 WATERSHED INCHES; 90850 CFS-HRS; 7507.8 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 199)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	373.8	(DIVERT)
28.25	862.8	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7

HRS	MAIN TIME INCREMENT = .200 hr,				DRAINAGE AREA =		.00 SQ.MI.	
26.80 CFS	0	33	365	220	0	0	517	851
28.40 CFS	727	324	0					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
595 CFS-HRS; 49.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 45. ***

OPERATION REACH XSECTION 45

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11000.0 *	8.46
28.00	11000.0 *	8.46
43.56	702.7	1.82
45.16	666.3	1.76
46.41	641.0	1.73
49.91	566.9	1.62
50.66	562.0	1.61
52.91	513.5	1.54
61.13	255.8	1.03
62.96	220.1	.95

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.99 WATERSHED INCHES; 90850 CFS-HRS; 7507.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
21.84	167.4	(RUNOFF)
26.91	3876.1	(RUNOFF)
27.90	1343.4	(RUNOFF)
28.90	752.9	(RUNOFF)
30.90	425.2	(RUNOFF)
31.90	399.8	(RUNOFF)
32.90	363.9	(RUNOFF)
33.90	334.0	(RUNOFF)
34.94	306.1	(RUNOFF)
35.88	267.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7

HRS	MAIN TIME INCREMENT = .200 hr,				DRAINAGE AREA =		1.47 SQ.MI.	
6.60 CFS	.30	1.29	2.91	4.65	6.19	7.39	9.02	10.41
8.20 CFS	11.55	13.39	14.79	15.46	16.67	18.57	19.60	19.88
9.80 CFS	21.35	23.15	24.75	27.00	28.43	29.62	31.63	33.39
11.40 CFS	33.22	33.89	34.93	36.91	38.61	38.11	38.59	39.51

13.00 CFS	41.48	43.13	42.35	42.67	43.49	45.46	47.91	49.32
14.60 CFS	52.03	53.78	54.61	55.40	56.16	56.67	55.66	56.24
16.20 CFS	58.78	59.66	60.31	60.86	60.06	62.65	72.28	75.36
17.80 CFS	76.15	77.01	82.04	91.96	92.94	92.70	93.65	97.87
19.40 CFS	107	112	112	111	117	128	129	131
21.00 CFS	133	140	160	166	167	167	171	183
22.60 CFS	187	188	190	196	208	210	209	212
24.20 CFS	307	524	588	593	597	703	936	1001
25.80 CFS	1008	1023	1718	3306	3746	3784	3805	3173
27.40 CFS	1696	1323	1325	1325	1177	831	745	748
29.00 CFS	749	714	640	625	624	623	575	454
30.60 CFS	424	424	424	418	403	397	398	398
32.20 CFS	386	364	359	362	363	352	334	330
33.80 CFS	333	333	324	308	302	303	305	295
35.40 CFS	270	264	267	267	230	152	132	132
37.00 CFS	134	133	123	124	123	122	122	116
38.60 CFS	114	114	114	111	105	106	105	102
40.20 CFS	100	97	96	96	96	96	95	92
41.80 CFS	93.41	95.91	96.01	96.01	95.65	92.75	92.58	95.64
43.40 CFS	96.02	96.03	96.03	95.97	92.86	85.84	84.03	84.16
45.00 CFS	86.47	88.07	84.94	84.04	84.04	84.07	85.63	88.28
46.60 CFS	85.71	84.05	84.02	82.47	78.95	77.69	74.74	74.58
48.20 CFS	77.68	77.20	74.07	75.48	77.98	76.49	73.81	76.40
49.80 CFS	77.96	75.63	73.98	77.17	77.71	74.75	74.53	74.61
51.40 CFS	67.84	66.06	66.06	66.06	66.06	66.07	66.42	69.39
53.00 CFS	69.62	66.38	66.07	66.07	66.07	66.06	63.00	56.65
54.60 CFS	58.04	56.76	56.53	58.22	55.78	58.03	56.77	56.53
56.20 CFS	56.68	49.83	48.06	47.94	45.62	43.90	47.17	48.06
57.80 CFS	48.06	48.02	44.98	38.67	39.99	38.64	36.14	37.60
59.40 CFS	40.33	37.73	36.19	38.46	38.60	30.97	26.10	27.45
61.00 CFS	29.96	30.04	29.21	26.10	27.45	29.92	28.47	25.74
62.60 CFS	28.37	30.04	29.98	26.87	19.78	18.02	18.03	18.06
64.20 CFS	19.62	22.31	19.70	18.02	18.03	18.03	18.02	18.39
65.80 CFS	21.31	21.47	18.41	18.03	18.03	18.03	18.06	19.62
67.40 CFS	22.27	19.68	18.03	18.03	18.03	18.03	18.38	21.33
69.00 CFS	21.48	18.40	18.03	18.03	18.03	18.01	16.44	12.92
70.60 CFS	11.66	8.70	8.53	10.07	7.77	10.00	8.69	8.50
72.20 CFS	8.50	1.80	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.39 WATERSHED INCHES; 13656 CFS-HRS; 1128.5 ACRE-FEET.

OPERATION REACH XSECTION 60

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.40	3596.1	6.57
42.89	95.7	2.26
44.31	96.1	2.27
45.60	87.1	2.05
46.86	86.7	2.05
48.73	77.1	1.82
49.48	76.8	1.81
50.23	76.9	1.81
50.98	76.9	1.82
53.39	68.7	1.62

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.36 WATERSHED INCHES; 13620 CFS-HRS; 1125.6 ACRE-FEET.

OPERATION REACH XSECTION 67

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.76	3220.8	6.05
43.15	95.5	1.36
44.56	95.6	1.36
47.18	85.9	1.29
49.73	76.5	1.22
50.49	76.3	1.22
51.23	76.4	1.22
53.67	67.9	1.16
58.55	47.6	.99
60.71	38.3	.85

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.37 WATERSHED INCHES; 13631 CFS-HRS; 1126.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 64

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.80	14144.0	(NULL)
43.51	797.1	(NULL)
46.36	726.5	(NULL)
49.85	642.6	(NULL)
50.64	638.2	(NULL)
62.95	248.2	(NULL)
65.97	170.2	(NULL)
67.55	164.1	(NULL)
69.05	163.0	(NULL)
69.84	156.4	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 12.31 SQ.MI.

HRS								
7.40 CFS	.46	1.40	3.10	5.61	8.86	12.86	17.48	22.57
9.00 CFS	28.20	34.22	40.45	47.15	54.66	62.64	70.59	78.72
10.60 CFS	87	97	107	118	128	139	149	160
12.20 CFS	171	180	189	198	207	217	225	232
13.80 CFS	240	248	257	266	275	285	295	304
15.40 CFS	314	324	333	342	351	361	369	376
17.00 CFS	383	390	403	419	432	443	459	482
18.60 CFS	506	525	542	564	592	622	648	669
20.20 CFS	692	725	759	787	811	842	885	935
21.80 CFS	975	1007	1042	1088	1138	1180	1215	1254
23.40 CFS	1301	1348	1385	1417	1528	1838	2218	2483
25.00 CFS	2674	2998	3563	4209	4713	5128	6210	8777
26.60 CFS	10324	11598	12607	13205	13709	13950	14144	13935
28.20 CFS	13517	13146	12866	12555	11994	11368	10446	9570
29.80 CFS	8836	8228	7645	7004	6387	5920	5575	5250
31.40 CFS	4934	4645	4403	4208	4030	3852	3693	3574
33.00 CFS	3483	3391	3288	3191	3121	3070	3013	2940
34.60 CFS	2866	2812	2775	2731	2659	2580	2528	2493
36.20 CFS	2417	2254	2070	1946	1869	1781	1676	1571
37.80 CFS	1480	1404	1336	1272	1211	1163	1126	1091
39.40 CFS	1054	1022	997	975	951	929	908	891
41.00 CFS	877	865	852	838	826	821	819	814
42.60 CFS	809	802	795	794	797	797	795	795
44.20 CFS	791	780	767	759	758	757	751	741
45.80 CFS	733	728	726	726	725	719	714	710
47.40 CFS	704	695	686	678	674	672	664	656
49.00 CFS	654	653	646	641	643	642	637	635
50.60 CFS	638	637	632	630	623	611	603	599
52.20 CFS	594	588	583	581	580	576	568	565
53.80 CFS	563	562	556	545	534	528	523	517
55.40 CFS	511	505	500	495	490	480	466	456
57.00 CFS	449	439	431	429	425	419	411	397
58.60 CFS	385	378	370	361	358	354	344	338
60.20 CFS	336	326	308	294	291	289	283	272
61.80 CFS	263	260	258	251	246	247	248	243
63.40 CFS	231	217	209	205	201	199	195	186
65.00 CFS	178	174	171	168	169	170	167	162
66.60 CFS	160	159	159	159	163	164	160	157
68.20 CFS	157	157	157	159	163	162	157	156
69.80 CFS	156	156	154	148	140	132	124	120
71.40 CFS	115	109	104	99	93	83	69	59
73.00 CFS	53.25	47.22	40.69	34.30	28.48	23.39	19.04	15.39
74.60 CFS	12.36	9.88	7.86	6.22	4.91	3.87	3.03	2.37
76.20 CFS	1.85	1.44	1.12	.87	.67	.52	.40	

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.15 WATERSHED INCHES; 104481 CFS-HRS; 8634.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11470.2	(RUNOFF)
32.95	1148.8	(RUNOFF)
33.95	1055.1	(RUNOFF)
35.90	851.1	(RUNOFF)
37.13	424.7	(RUNOFF)
41.10	306.3	(RUNOFF)
42.46	306.5	(RUNOFF)
43.79	306.5	(RUNOFF)
45.35	277.2	(RUNOFF)
46.60	277.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.78 SQ.MI.

HRS								
9.80 CFS	.17	.88	2.64	5.48	8.88	12.34	15.87	19.61
11.40 CFS	23.07	25.98	28.79	32.15	35.85	39.03	41.43	43.75
13.00 CFS	46.94	50.62	53.59	55.52	57.42	60.45	64.54	69.10
14.60 CFS	73.78	78.50	82.82	86.04	88.94	91.63	93.34	94.60
16.20 CFS	97	101	105	108	109	112	120	133
17.80 CFS	142	146	152	164	178	186	189	194
19.40 CFS	207	223	235	239	244	259	277	288
21.00 CFS	294	305	329	361	384	391	397	413
22.60 CFS	435	452	459	470	490	512	525	534
24.20 CFS	623	905	1277	1520	1577	1689	2044	2490
25.80 CFS	2775	2885	3634	5974	9027	11023	11470	11007
27.40 CFS	8865	5998	4286	4139	3998	3467	2789	2389
29.00 CFS	2351	2319	2204	2061	1978	1970	1922	1736
30.60 CFS	1497	1356	1343	1337	1315	1284	1263	1261
32.20 CFS	1250	1213	1168	1146	1149	1141	1108	1070
33.80 CFS	1053	1055	1048	1021	986	965	965	959
35.40 CFS	922	872	846	847	811	683	524	431
37.00 CFS	423	424	415	401	393	392	390	384
38.60 CFS	372	364	363	360	350	340	335	332
40.20 CFS	326	318	311	307	306	306	305	301
41.80 CFS	298	299	304	306	306	303	298	298
43.40 CFS	303	306	306	306	303	292	278	269
45.00 CFS	271	276	277	273	269	268	270	275
46.60 CFS	277	274	269	267	261	254	246	241
48.20 CFS	241	245	244	240	242	246	243	241
49.80 CFS	243	246	242	241	244	245	241	238
51.40 CFS	232	220	212	211	211	211	212	215
53.00 CFS	219	219	214	211	211	211	208	198
54.60 CFS	187	183	183	182	183	183	182	183
56.20 CFS	181	174	163	154	151	146	145	149
57.80 CFS	153	154	150	140	130	125	123	119
59.40 CFS	122	124	122	119	121	116	101	88
61.00 CFS	88.84	94.09	95.16	90.93	87.21	88.97	92.51	89.79

62.60 CFS	87.29	90.19	94.81	92.54	81.45	67.19	58.59	57.70
64.20 CFS	59.20	64.01	66.64	63.72	58.85	57.68	57.68	58.25
65.80 CFS	61.55	65.97	65.73	60.86	57.69	57.69	57.73	59.33
67.40 CFS	64.01	66.55	63.67	58.85	57.70	57.69	58.22	61.50
69.00 CFS	66.00	65.84	60.87	57.79	57.70	57.62	55.95	50.37
70.60 CFS	42.70	35.08	30.08	28.71	28.96	29.05	28.72	29.10
72.20 CFS	27.20	20.64	9.19	.81	.00			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.10 WATERSHED INCHES; 40399 CFS-HRS; 3338.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.12	8392.6	(RUNOFF)
42.60	224.5	(RUNOFF)
43.91	224.8	(RUNOFF)
45.48	201.9	(RUNOFF)
46.73	201.9	(RUNOFF)
48.62	178.6	(RUNOFF)
49.41	178.6	(RUNOFF)
50.13	178.5	(RUNOFF)
50.87	178.7	(RUNOFF)
53.23	159.9	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 3.48 SQ.MI.

HRS								
8.80 CFS	.24	.95	2.29	4.33	6.65	9.00	11.37	13.93
10.40 CFS	16.73	19.73	22.74	25.72	28.67	31.47	33.95	36.07
12.00 CFS	38.28	41.00	43.70	45.92	47.72	49.59	52.14	54.64
13.60 CFS	56.59	58.06	59.73	62.40	65.81	69.63	73.54	77.11
15.20 CFS	80.23	82.71	84.69	86.26	87.33	88.70	90.88	93.63
16.80 CFS	96	98	99	104	111	120	126	131
18.40 CFS	138	147	156	161	165	171	181	192
20.00 CFS	200	205	212	222	233	242	249	262
21.60 CFS	281	301	316	322	330	342	356	367
23.20 CFS	374	385	399	412	421	463	591	813
24.80 CFS	1044	1197	1285	1448	1698	1953	2149	2524
26.40 CFS	3559	5276	7060	8232	8309	7435	5884	4292
28.00 CFS	3293	2991	2765	2398	2026	1783	1719	1673
29.60 CFS	1591	1509	1459	1428	1348	1221	1092	1007
31.20 CFS	986	976	959	941	930	922	906	882
32.80 CFS	858	845	839	827	806	786	775	771
34.40 CFS	761	742	722	711	705	691	666	640
36.00 CFS	624	606	554	464	373	321	310	308
37.60 CFS	301	294	288	287	284	278	272	268
39.20 CFS	265	261	255	249	245	242	237	232
40.80 CFS	228	225	225	224	223	220	220	221
42.40 CFS	223	224	223	221	220	220	223	225
44.00 CFS	225	223	218	211	203	199	200	202

45.60 CFS	202	200	197	198	200	202	202	200
47.20 CFS	197	194	190	184	180	178	178	179
48.80 CFS	178	178	178	179	178	178	178	178
50.40 CFS	178	178	179	178	176	172	167	161
52.00 CFS	156	155	155	155	156	159	160	159
53.60 CFS	157	155	155	153	149	143	137	134
55.20 CFS	134	134	134	134	134	133	130	124
56.80 CFS	118	113	109	108	108	110	112	111
58.40 CFS	107	101	95	91	89	89	89	90
60.00 CFS	89.06	88.07	85.84	80.03	71.88	66.46	66.43	68.48
61.60 CFS	68.33	66.16	65.30	65.78	66.19	65.53	65.34	66.92
63.20 CFS	68.11	64.03	56.32	48.50	43.31	42.97	44.89	46.96
64.80 CFS	47.39	45.74	43.20	42.27	42.48	43.85	46.20	47.42
66.40 CFS	46.73	44.40	42.46	42.33	43.03	44.98	47.00	47.28
68.00 CFS	45.63	43.22	42.31	42.54	43.90	46.13	47.33	46.71
69.60 CFS	44.40	42.49	42.21	41.55	39.07	35.00	29.68	24.77
71.20 CFS	22.38	21.11	21.09	21.33	20.80	20.64	17.41	11.87
72.80 CFS	5.89	1.17	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.52 WATERSHED INCHES; 30362 CFS-HRS; 2509.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 75

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.06	19796.8	(NULL)
42.53	530.7	(NULL)
43.89	531.3	(NULL)
45.39	478.8	(NULL)
46.63	478.9	(NULL)
48.48	423.6	(NULL)
49.23	423.9	(NULL)
49.99	424.1	(NULL)
50.76	424.0	(NULL)
53.13	379.5	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 8.26 SQ.MI.

HRS								
8.80 CFS	.24	.95	2.29	4.33	6.66	9.17	12.25	16.57
10.40 CFS	22.21	28.61	35.07	41.59	48.28	54.54	59.93	64.86
12.00 CFS	70	77	83	87	91	97	103	108
13.60 CFS	112	115	120	127	135	143	152	160
15.20 CFS	166	172	176	180	182	186	192	199
16.80 CFS	204	207	211	224	244	262	273	283
18.40 CFS	302	325	342	350	359	378	404	427
20.00 CFS	439	449	471	499	522	536	553	591
21.60 CFS	642	685	706	719	743	777	808	826
23.20 CFS	844	876	911	937	955	1087	1496	2090
24.80 CFS	2564	2774	2975	3492	4188	4728	5034	6158
26.40 CFS	9533	14303	18083	19702	19317	16300	11881	8578

28.00 CFS	7432	6988	6231	5187	4415	4134	4038	3877
29.60 CFS	3652	3487	3429	3350	3084	2718	2448	2350
31.20 CFS	2323	2291	2243	2205	2190	2172	2119	2049
32.80 CFS	2004	1994	1981	1936	1876	1839	1830	1819
34.40 CFS	1782	1728	1687	1675	1664	1613	1538	1486
36.00 CFS	1471	1416	1238	989	804	744	734	723
37.60 CFS	703	686	680	677	668	651	636	631
39.20 CFS	625	611	594	584	577	567	555	542
40.80 CFS	534	531	531	529	524	518	519	525
42.40 CFS	530	530	526	519	518	524	529	531
44.00 CFS	531	526	510	489	473	470	476	479
45.60 CFS	475	468	466	467	474	479	476	470
47.20 CFS	464	455	443	430	421	419	423	423
48.80 CFS	419	420	424	422	419	421	424	421
50.40 CFS	419	422	424	420	415	404	387	373
52.00 CFS	367	366	366	367	371	378	379	374
53.60 CFS	368	366	366	361	347	330	320	317
55.20 CFS	316	316	316	316	316	314	304	287
56.80 CFS	273	264	256	253	257	263	266	261
58.40 CFS	247	230	220	213	208	210	213	211
60.00 CFS	208	209	201	181	160	155	161	164
61.60 CFS	159	153	154	158	156	153	156	162
63.20 CFS	161	145	124	107	101	102	109	114
64.80 CFS	111	105	101	100	101	105	112	113
66.40 CFS	108	102	100	100	102	109	114	111
68.00 CFS	104	101	100	101	105	112	113	108
69.60 CFS	102	100	100	97	89	78	65	55
71.20 CFS	51.09	50.07	50.14	50.05	49.90	47.84	38.06	21.05
72.80 CFS	6.70	1.17	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.27 WATERSHED INCHES; 70760 CFS-HRS; 5847.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 76

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.12	32763.8	(NULL)
42.29	1343.9	(NULL)
43.78	1326.6	(NULL)
45.23	1232.4	(NULL)
46.56	1204.1	(NULL)
48.34	1095.7	(NULL)
49.15	1077.2	(NULL)
49.95	1066.8	(NULL)
50.71	1061.7	(NULL)
53.03	958.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 20.57 SQ.MI.

7.40 CFS	.46	1.40	3.10	5.61	8.86	12.86	17.52	22.81

9.00 CFS	29	37	45	54	64	75	87	101
10.60 CFS	116	132	148	166	183	199	214	230
12.20 CFS	247	263	276	289	304	319	333	344
13.80 CFS	355	368	384	401	418	437	455	471
15.40 CFS	486	501	513	524	537	553	567	580
17.00 CFS	589	601	627	663	694	716	742	784
18.60 CFS	831	867	892	924	970	1027	1075	1108
20.20 CFS	1141	1196	1258	1308	1347	1395	1476	1577
21.80 CFS	1660	1713	1761	1831	1915	1987	2041	2098
23.40 CFS	2177	2260	2322	2372	2615	3334	4308	5047
25.00 CFS	5448	5972	7055	8397	9441	10163	12368	18311
26.60 CFS	24627	29682	32309	32521	30010	25831	22722	21367
28.20 CFS	20505	19377	18053	16970	16128	15406	14323	13222
29.80 CFS	12323	11657	10995	10088	9105	8368	7925	7573
31.40 CFS	7226	6888	6608	6398	6202	5971	5742	5578
33.00 CFS	5477	5372	5223	5067	4960	4901	4832	4721
34.60 CFS	4594	4499	4451	4395	4271	4118	4014	3963
36.20 CFS	3833	3492	3059	2751	2613	2515	2399	2274
37.80 CFS	2167	2084	2013	1939	1862	1800	1757	1716
39.40 CFS	1665	1616	1581	1552	1519	1484	1450	1425
41.00 CFS	1408	1395	1382	1362	1344	1340	1344	1343
42.60 CFS	1339	1328	1314	1312	1320	1326	1327	1326
44.20 CFS	1318	1291	1256	1232	1227	1232	1230	1216
45.80 CFS	1201	1194	1193	1201	1204	1195	1183	1174
47.40 CFS	1158	1138	1116	1098	1093	1095	1087	1075
49.00 CFS	1074	1077	1068	1060	1064	1066	1057	1054
50.60 CFS	1060	1061	1052	1044	1027	998	976	966
52.20 CFS	960	954	950	952	958	955	942	933
53.80 CFS	930	927	918	891	864	848	839	833
55.40 CFS	827	821	817	812	804	785	754	729
57.00 CFS	713	694	684	686	688	684	672	644
58.60 CFS	616	598	584	569	568	567	556	546
60.20 CFS	545	527	488	455	447	450	446	431
61.80 CFS	416	415	417	407	399	402	410	404
63.40 CFS	377	341	316	306	303	308	308	297
65.00 CFS	283	275	271	269	274	282	281	270
66.60 CFS	262	259	259	261	272	278	271	261
68.20 CFS	258	257	258	265	275	275	265	258
69.80 CFS	257	256	252	237	218	196	179	171
71.40 CFS	165	159	154	149	141	121	90	65
73.00 CFS	54.41	47.22	40.69	34.30	28.48	23.39	19.04	15.39
74.60 CFS	12.36	9.88	7.86	6.22	4.91	3.87	3.03	2.37
76.20 CFS	1.85	1.44	1.12	.87	.67	.52	.40	

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.20 WATERSHED INCHES; 175222 CFS-HRS; 14480.4 ACRE-FEET.

--- XSECTION 76, ALTERNATE 1, STORM 7, HYDROGRAPH ADDED TO READHD FILE ---

*** MESSAGE - STRUCTURE 1, USER ENTERED STARTING ELEVATION (1199.2 FEET) CAN ADD .456 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

*** MESSAGE - RESERVOIR ROUTING, STRUCTURE 1, TRUNCATED AT 400 POINTS WITH 3147.19 AC-FT (.24 WATERSHED INCHES) FLOOD STORAGE REMAINING IN RESERVOIR AT ELEV. 1211.78. ***

72-hr G outflow Hydrograph

OPERATION RESVOR STRUCTURE 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.79	23435.1	1215.91
69.19	272.9	1212.08

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
6.40 CFS	.21	.21	.21	.21	.21	.21	.21	.21
8.00 CFS	.21	.22	.23	.24	.25	.27	.30	.33
9.60 CFS	.37	.41	.46	.52	.59	.67	.77	.87
11.20 CFS	.99	1.12	1.27	1.42	1.59	1.77	1.96	2.16
12.80 CFS	2.37	2.59	2.83	3.07	3.32	3.59	3.86	4.14
14.40 CFS	4.43	4.74	5.06	5.39	5.73	6.09	6.46	6.84
16.00 CFS	7.22	7.62	8.02	8.44	8.87	9.30	9.74	10.20
17.60 CFS	10.68	11.18	11.71	12.25	12.82	13.42	14.05	14.70
19.20 CFS	15.38	16.06	16.65	17.27	17.92	18.58	19.27	19.99
20.80 CFS	20.75	21.53	22.34	23.19	24.09	25.05	26.04	27.07
22.40 CFS	28.10	28.94	29.81	30.72	31.65	32.61	33.60	34.63
24.00 CFS	35.69	36.80	38.14	39.74	41.53	43.55	45.74	48.24
25.60 CFS	51	55	59	63	67	73	3565	10110
27.20 CFS	16341	20915	23062	23435	23009	22373	21628	20735
28.80 CFS	19747	18767	17847	16933	15964	15041	14200	13408
30.40 CFS	12617	11785	10944	10173	9505	8924	8409	7999
32.00 CFS	7661	7353	7067	6793	6537	6308	6108	5925
33.60 CFS	5748	5582	5435	5306	5186	5067	4949	4842
35.20 CFS	4747	4653	4550	4440	4338	4238	4108	3920
36.80 CFS	3690	3462	3259	3078	2910	2754	2640	2570
38.40 CFS	2499	2428	2356	2287	2222	2158	2097	2037
40.00 CFS	1981	1928	1877	1828	1782	1738	1698	1661
41.60 CFS	1627	1594	1564	1537	1514	1494	1474	1456
43.20 CFS	1439	1424	1412	1402	1393	1385	1375	1363
44.80 CFS	1349	1334	1322	1311	1301	1290	1279	1269
46.40 CFS	1260	1253	1247	1240	1233	1225	1216	1205
48.00 CFS	1193	1182	1171	1162	1152	1143	1135	1127
49.60 CFS	1120	1113	1107	1102	1096	1092	1088	1084
51.20 CFS	1080	1075	1067	1058	1047	1037	1028	1019
52.80 CFS	1011	1004	998	992	986	979	973	967
54.40 CFS	960	950	939	927	916	906	896	887
56.00 CFS	879	870	861	850	837	823	809	795
57.60 CFS	782	770	760	750	739	726	712	698
59.20 CFS	683	670	657	646	635	624	613	601

60.80 CFS	585	569	555	542	530	517	505	494
62.40 CFS	485	475	466	459	453	445	435	422
64.00 CFS	409	396	386	376	368	358	349	340
65.60 CFS	331	324	319	314	310	304	299	294
67.20 CFS	290	287	286	285	282	280	277	275
68.80 CFS	273	273	273	273	271	270	268	266
70.40 CFS	264	259	253	245	237	229	221	213
72.00 CFS	206	198	190	180	168	155	143	131
73.60 CFS	120	109	99	90	81	73	73	73
75.20 CFS	72.95	72.93	72.91	72.90	72.88	72.86	72.84	72.82
76.80 CFS	72.80	72.78	72.76	72.74	72.72	72.71	72.69	72.67
78.40 CFS	72.65	72.63	72.61	72.59	72.57	72.55	72.53	72.51
80.00 CFS	72.49	72.48	72.46	72.44	72.42	72.40	72.38	72.36
81.60 CFS	72.34	72.32	72.30	72.28	72.26	72.25	72.23	72.21
83.20 CFS	72.19	72.17	72.15	72.13	72.11	72.09	72.07	72.05
84.80 CFS	72.04	72.02	72.00	71.98	71.96	71.94	71.92	71.90

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.79 WATERSHED INCHES; 143191 CFS-HRS; 11833.3 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 1, STORM 7, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

RAINFALL OF 15.80 inches AND 72.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 7, ARC 2
MAIN TIME INCREMENT .200 HOURS

ALTERNATE 1 STORM 7

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION 1	RUNOFF	2.46	14.29	---	27.01	6291	2557.3
XSECTION 5	REACH	2.46	14.29	6.72	27.54	4816	1957.7
XSECTION 10	REACH	2.46	14.29	7.95	28.12	3932	1598.4
XSECTION 2	RUNOFF	2.38	13.26	---	26.97	5805	2439.1
XSECTION 12	ADDHYD	4.84	13.78	---	27.15	7759	1603.1
XSECTION 12	DIVERT	4.84	12.16	---	26.40F	4100F	847.1
XSECTION 200	DIVERT	.00	12.16	---	27.15	3659	********
XSECTION 20	REACH	4.84	12.16	7.94	26.40F	4100F	847.1
XSECTION 25	REACH	4.84	12.16	5.03	26.40F	4100F	847.1
XSECTION 3	RUNOFF	3.94	14.29	---	27.03	10041	2548.5
XSECTION 30	REACH	3.94	14.30	5.34	27.78	7435	1887.1
XSECTION 5	REACH	3.94	14.30	7.27	28.39	6138	1557.9
XSECTION 25	REACH	3.94	14.30	6.30	28.39	6138	1557.9
XSECTION 4	RUNOFF	2.06	12.87	---	27.01	4862	2360.2
XSECTION 34	ADDHYD	6.00	13.81	---	28.25	7763	1293.8
XSECTION 35	ADDHYD	10.84	13.07	---	28.25	11863	1094.4
XSECTION 35	DIVERT	10.84	12.99	---	27.00F	11000F	1014.8
XSECTION 199	DIVERT	.00	12.99	---	28.25	863	********
XSECTION 45	REACH	10.84	12.99	8.46	27.00F	11000F	1014.8
XSECTION 6	RUNOFF	1.47	14.39	---	26.91	3876	2636.7
XSECTION 60	REACH	1.47	14.36	6.57	27.40	3596	2446.3
XSECTION 67	REACH	1.47	14.37	6.05	27.76	3221	2191.2
XSECTION 64	ADDHYD	12.31	13.15	---	27.80	14144	1149.0
XSECTION 5	RUNOFF	4.78	13.10	---	27.00	11470	2399.6
XSECTION 7	RUNOFF	3.48	13.52	---	27.12	8393	2411.8
XSECTION 75	ADDHYD	8.26	13.27	---	27.06	19797	2396.7
XSECTION 76	ADDHYD	20.57	13.20	---	27.12	32764	1592.8
STRUCTURE 1	RESVOR	20.57	10.79	1215.91	27.79	23435	1139.3

have warnings

SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.
QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;
LENGTH FACTOR - VALUE k* GREATER THAN 1.0;
ATT-KIN COEFF - VALUE C GREATER THAN 0.667.

			HYDROGRAPH INFORMATION				ROUTING PARAMETERS				
		FLOOD	INFLOW		OUTFLOW		Q-A EQ.			PEAK	ATT-
XSEC ID	REACH LENGTH (FT)	PLAIN LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	COEFF (X)	POWER (M)	LENGTH FACTOR (k*)	RATIO Q/I (Q*)	KIN COEFF (C)
BASEFLOW IS .0 CFS											
ALTERNATE 1 STORM 7											
5	9100		6290	27.0	4800	27.6	1.95	1.08	.175	.763	.26
10	9100		4800	27.6	3922	28.2	2.17	1.07	.126	.817	.27
20	3332		4100	26.4	4100	26.4	.14	1.63	.001	1.000	1.00?
25	1950		4100	26.4	4100	26.4	.052	1.73	.000	1.000	1.00?
30	8865		10029	27.0	7433	27.8	1.57	1.08	.193	.741	.24
5	8865		7433	27.8	6138	28.4	1.91	1.08	.119	.826	.27
25	1950		6138	28.4	6138	28.4	.056	1.72	.001	1.000	1.00?
45	4200		11000	27.0	11000	27.0	.049	1.72	.001	1.000	1.00?
60	7540		3805	27.0	3596	27.4	.48	1.36	.054	.945	.49
67	5140		3596	27.4	3214	27.8	1.59	1.11	.085	.894	.42

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 7
STRUCTURE 1	20.57	
ALTERNATE 1		23435
XSECTION 1	2.46	
ALTERNATE 1		6291
XSECTION 2	2.38	
ALTERNATE 1		5805
XSECTION 3	3.94	
ALTERNATE 1		10041
XSECTION 4	2.06	
ALTERNATE 1		4862
XSECTION 5	4.78	
ALTERNATE 1		11470
XSECTION 6	1.47	
ALTERNATE 1		3876
XSECTION 7	3.48	
ALTERNATE 1		8393
XSECTION 10	2.46	
ALTERNATE 1		3932
XSECTION 12	4.84	
ALTERNATE 1		4100
XSECTION 20	4.84	
ALTERNATE 1		4100
XSECTION 25	3.94	
ALTERNATE 1		6138
XSECTION 30	3.94	
ALTERNATE 1		7435
XSECTION 34	6.00	

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 7
XSECTION 34	6.00	
ALTERNATE 1		7763
XSECTION 35	10.84	
ALTERNATE 1		11000
XSECTION 45	10.84	
ALTERNATE 1		11000
XSECTION 60	1.47	
ALTERNATE 1		3596
XSECTION 64	12.31	
ALTERNATE 1		14144
XSECTION 67	1.47	
ALTERNATE 1		3221
XSECTION 75	8.26	
ALTERNATE 1		19797
XSECTION 76	20.57	
ALTERNATE 1		32764
XSECTION 199	.00	
ALTERNATE 1		863
XSECTION 200	.00	
ALTERNATE 1		3659

ECON2 DATA FILE

```
ECON2
TITLE        WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE        72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED
FLOW-FREQ    -1         23435.                                        ALT  1   1
FLOW-FREQ     1          6291.                                        ALT  1   2
FLOW-FREQ     2          5805.                                        ALT  1   3
FLOW-FREQ     3         10041.                                        ALT  1   4
FLOW-FREQ     4          4862.                                        ALT  1   5
FLOW-FREQ     5         11470.                                        ALT  1   6
FLOW-FREQ     6          3876.                                        ALT  1   7
FLOW-FREQ     7          8393.                                        ALT  1   8
FLOW-FREQ    10          3932.                                        ALT  1   9
FLOW-FREQ    12          4100.                                        ALT  1  10
FLOW-FREQ    20          4100.                                        ALT  1  11
FLOW-FREQ    25          6138.                                        ALT  1  12
FLOW-FREQ    30          7435.                                        ALT  1  13
FLOW-FREQ    34          7763.                                        ALT  1  14
FLOW-FREQ    35         11000.                                        ALT  1  15
FLOW-FREQ    45         11000.                                        ALT  1  16
FLOW-FREQ    60          3596.                                        ALT  1  17
FLOW-FREQ    64         14144.                                        ALT  1  18
FLOW-FREQ    67          3221.                                        ALT  1  19
FLOW-FREQ    75         19797.                                        ALT  1  20
FLOW-FREQ    76         32764.                                        ALT  1  21
FLOW-FREQ   199           863.                                        ALT  1  22
FLOW-FREQ   200          3659.                                        ALT  1  23
```

```
TR20 ------------------------------------------------------------------- SCS -
WT3PMP72     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS      VERSION
07/21/**     72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED      2.04TEST


END OF  1 JOBS IN THIS RUN


                    SCS  TR-20,  VERSION 2.04TEST
                          WT3PMP72  FILES

     INPUT  = WT3PMP72.DAT                              , GIVEN DATA FILE
     OUTPUT = 72OUUT.OUT                                , DATED 07/21/**,17:39:32

              FILES GENERATED - DATED 07/21/**,17:39:32

    FILE LLL.TEC CONTAINS ECON2 INFORMATION

    FILE LLL.TRD CONTAINS READHD INFORMATION


          TOTAL NUMBER OF WARNINGS =    4,  MESSAGES =    2

                      JOB ENDED AT 17:39:32
                  *** TR-20 RUN COMPLETED ***
```

Calculation Package 19

(1)

URS

EXHIBIT 4.7-2

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title:

RESERVOIR ROUTING OF A 6-HR LOCAL AND 72-HR GENERAL PMF HYDROGRAPHS FOR FUTURE CONDITION WITH AN OPEN PRINCIPAL SPILLWAY (ADWR CRITERIA)

Total Number of Pages (including cover sheet):

Total Number of Computer Runs:

Prepared by: Hammad Hussain Date: 07/22/04

Checked by: Todd Ringsmuth Date: 7/22/04

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

Remarks/Conclusions/Results:

See Page 3.

- slight change to Table 1
- need to confirm 72 hr rainfall total → provide reference
- 72 hr run has same 4 warnings as in closed princ. spwy calc → not a problem, provides a conservative answer.

Calculation Approved by: 7/27/04

Project Manager/Date

Revision No.:	Description of Revision:	Approved by:
1	Revised Table 1	Todd Ringsmuth 7-27-04

RESERVOIR ROUTING OF A 6-HR LOCAL AND 72-HR GENERAL PMF HYDROGRAPHS FOR FUTURE CONDITION WITH AN OPEN PRINCIPAL SPILLWAY (ADWR CRITERIA)

(WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3)
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

This particular calculation package addresses the reservoir routing results for the ***Future Condition*** with an ***Open Principal Spillway*** based on ADWR criteria.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

FUTRE CONDITION (Principal Spillway Open)

The Future Condition (Principal Spillway Open) represents the time period following construction of the downstream conveyance channel and the principal spillway is opened. The inlet to the principal spillway is set at elevation 1,200 feet (NAVD 88). It is assumed that the 100-year sediment volume (500 ac-ft) has accumulated in the reservoir. Under this condition outflow from the reservoir occurs through infiltration, flow through the principal spillway, and flow through the emergency spillway.

The reservoir routing for the Future Condition with an Open Principal Spillway was carried out for 6-hr Local and 72-hr General Probable Maximum Flood (PMF) hydrographs based on ADWR criteria. The ADWR criterion for the Future Condition with an Open Principal spillway is explained as follows. .

ADWR Routing Criteria: For the Future Condition (Principal Spillway Open), the antecedent reservoir condition (ARC) for the routing of the 6-hr Local and 72-hr General PMF hydrographs will be based on the inlet elevation of the principal spillway or at elevation 1200.0 ft (NAVD 88).

RESULTS

ADWR Routing: The ARC for the routing of the 6-hour Local and 72-hr General PMF hydrographs was set at the inlet elevation of the principal spillway or at elevation 1200.0 ft (NAVD 88). The reservoir routing results i.e. ARC, peak inflows, peak outflows, and the maximum reservoir elevation for the 6-hour Local and 72-hr General PMF hydrographs for the Future condition (Principal Spillway Open) based on ADWR criteria are provided in Table 1 (Please See page 4). The input file and the detailed output

results of TR-20 modeling of reservoir routing of 6-hour Local and 72-hr General PMF hydrographs based on ADWR criteria are attached at the end of this calculation package.

TABLE 1
RESERVOIR ROUTING RESULTS
(BASED ON ADWR CRITERION ONLY)

(FUTURE CONDITON – PRINCIPAL SPILLWAY OPEN)

Storm Event	Inflow to White Tank FRS No.3		Outflow from White Tank FRS No.3		
	Precipitation (inches)	Peak Inflow (cfs)	Antecedent Reservoir Condition (ARC)	Peak Outflow (cfs)	Maximum Reservoir Elevation (NAVD 88) (ft)
6-hr Local	12.70	68,291	1200.0	24,221	1216.0
72-hr General	15.80	32,764	1200.0	23,195	1215.9

```
*****************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

JOB TR-20 WT3PMP6   ECON                PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE     6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT
 5 RAINFL 1             0.1                                          6HRLOCAL
 8          .0000       .003        .006        .009        .013
 8          .016        .020        .025        .030        .035
 8          .039        .046        .052        .058        .065
 8          .071        .080        .090        .099        .109
 8          .118        .283        .449        .567        .622
 8          .669        .701        .732        .756        .780
 8          .795        .809        .824        .838        .852
 8          .866        .876        .885        .894        .904
 8          .913        .920        .926        .932        .939
 8          .945        .950        .954        .959        .964
 8          .969        .972        .976        .980        .984
 8          .988        .991        .993        .995        .998
 8          1.          1.          1.          1.          1.
 9 ENDTBL
 5 RAINFL 2             .1                                           6HR GEN
 8          .000        .005        .013        .020        .028
 8          .038        .045        .053        .060        .070
 8          .080        .085        .095        .108        .120
 8          .138        .150        .165        .190        .210
 8          .238        .280        .350        .440        .550
 8          .590        .620        .645        .668        .685
 8          .700        .720        .735        .753        .765
 8          .775        .790        .800        .810        .820
 8          .835        .843        .850        .863        .870
 8          .880        .890        .898        .908        .915
 8          .925        .930        .940        .945        .955
 8          .963        .970        .978        .985        .990
 8          1.00        1.00        1.00        1.00        1.00
 9 ENDTBL
 5 RAINFL 3             0.1                                          12HRGEN
 8          .000        .003        .007        .010        .013
 8          .016        .019        .022        .025        .028
 8          .031        .034        .037        .040        .043
 8          .045        .050        .054        .058        .062
 8          .066        .071        .075        .080        .085
 8          .089        .095        .101        .107        .112
 8          .118        .125        .132        .139        .146
 8          .153        .162        .171        .180        .189
 8          .198        .211        .224        .237        .250
 8          .264        .300        .345        .391        .436
 8          .491        .536        .564        .586        .607
 8          .629        .643        .657        .672        .686
 8          .700        .711        .721        .732        .742
 8          .753        .761        .769        .778        .786
 8          .795        .802        .809        .817        .824
 8          .832        .837        .843        .848        .854
 8          .859        .865        .870        .875        .881
 8          .886        .891        .895        .900        .905
 8          .909        .913        .917        .921        .925
 8          .929        .933        .936        .940        .944
 8          .948        .951        .954        .957        .960
 8          .963        .966        .969        .971        .974
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 8          .977        .980        .982        .984        .986
 8          .989        .991        .993        .995        .998
 8          1.000      01.000       1.000       1.000       1.00
 9 ENDTBL
 5 RAINFL 4             0.1                                          18HRGEN
 8          .000        .001        .002        .003        .004
 8          .005        .005        .006        .007        .008
 8          .009        .012        .014        .017        .020
 8          .023        .025        .028        .031        .033
 8          .036        .040        .044        .049        .053
 8          .057        .061        .065        .070        .074
 8          .078        .084        .090        .096        .102
 8          .108        .114        .120        .126        .132
 8          .138        .146        .154        .162        .170
 8          .179        .187        .195        .203        .211
 8          .220        .238        .256        .275        .293
 8          .311        .330        .348        .367        .385
 8          .403        .430        .457        .484        .511
 8          .538        .557        .577        .597        .616
 8          .636        .653        .670        .687        .704
 8          .721        .734        .746        .759        .771
 8          .784        .792        .801        .810        .818
 8          .827        .832        .838        .843        .848
 8          .853        .856        .859        .862        .864
 8          .867        .870        .872        .875        .878
 8          .880        .882        .885        .887        .889
 8          .891        .893        .895        .897        .899
 8          .901        .903        .905        .907        .909
 8          .911        .912        .914        .916        .917
 8          .919        .920        .922        .924        .925
 8          .927        .929        .930        .932        .934
 8          .935        .937        .938        .940        .941
 8          .943        .945        .946        .948        .949
 8          .951        .952        .953        .955        .956
 8          .957        .959        .960        .961        .963
 8          .964        .965        .967        .968        .970
 8          .971        .972        .974        .975        .976
 8          .978        .979        .980        .982        .983
 8          .984        .985        .986        .988        .989
 8          .990        .991        .992        .993        .994
 8          .995        .996        .997        .998        .999
 8          1.000       1.000       1.000       1.000       1.000
 9 ENDTBL
 5 RAINFL 5             0.1                                          24HRGEN
 8          0.000       0.000       0.001       0.001       0.002
 8          0.002       0.002       0.003       0.003       0.003
 8          0.004       0.005       0.007       0.009       0.010
 8          0.012       0.013       0.015       0.016       0.018
 8          0.019       0.022       0.024       0.027       0.030
 8          0.032       0.035       0.037       0.040       0.042
 8          0.045       0.048       0.051       0.055       0.058
 8          0.061       0.064       0.068       0.071       0.074
 8          0.078       0.082       0.087       0.091       0.096
 8          0.100       0.104       0.109       0.113       0.118
 8          0.122       0.127       0.132       0.137       0.142
 8          0.147       0.151       0.156       0.161       0.166
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**********80-80 LIST OF INPUT DATA (CONTINUED)**********

```
8          0.171      0.177      0.184      0.191      0.198
8          0.205      0.214      0.224      0.233      0.242
8          0.252      0.265      0.278      0.291      0.303
8          0.316      0.334      0.351      0.368      0.386
8          0.403      0.425      0.447      0.468      0.490
8          0.512      0.527      0.543      0.558      0.574
8          0.589      0.603      0.617      0.631      0.645
8          0.659      0.671      0.684      0.696      0.709
8          0.721      0.731      0.741      0.751      0.761
8          0.771      0.779      0.786      0.793      0.800
8          0.808      0.814      0.820      0.825      0.831
8          0.837      0.840      0.843      0.847      0.850
8          0.853      0.855      0.857      0.859      0.861
8          0.864      0.866      0.868      0.870      0.872
8          0.874      0.876      0.878      0.880      0.881
8          0.883      0.885      0.886      0.888      0.890
8          0.891      0.893      0.895      0.896      0.898
8          0.899      0.901      0.902      0.904      0.905
8          0.907      0.908      0.909      0.910      0.912
8          0.913      0.914      0.915      0.916      0.917
8          0.919      0.920      0.921      0.922      0.923
8          0.924      0.926      0.927      0.928      0.929
8          0.930      0.932      0.933      0.935      0.936
8          0.938      0.940      0.941      0.943      0.944
8          0.946      0.947      0.947      0.948      0.949
8          0.950      0.950      0.951      0.952      0.953
8          0.953      0.955      0.956      0.957      0.958
8          0.959      0.960      0.961      0.962      0.963
8          0.964      0.965      0.966      0.967      0.968
8          0.969      0.970      0.971      0.972      0.973
8          0.974      0.975      0.976      0.977      0.978
8          0.979      0.980      0.981      0.982      0.983
8          0.984      0.985      0.986      0.987      0.988
8          0.988      0.989      0.990      0.991      0.991
8          0.992      0.993      0.994      0.995      0.995
8          0.996      0.997      0.998      0.998      0.999
8          1.000      1.000      1.000      1.000      1.000
9 ENDTBL
5 RAINFL 6            .25                                          48HRGEN
8          0.0000     0.0015     0.0029     0.0044     0.0058
8          0.0073     0.0088     0.0102     0.0117     0.0131
8          0.0146     0.0160     0.0175     0.0190     0.0204
8          0.0219     0.0233     0.0248     0.0263     0.0277
8          0.0292     0.0306     0.0321     0.0335     0.0350
8          0.0365     0.0379     0.0394     0.0408     0.0423
8          0.0438     0.0452     0.0467     0.0481     0.0496
8          0.0510     0.0525     0.0542     0.0558     0.0575
8          0.0592     0.0608     0.0625     0.0642     0.0658
8          0.0692     0.0725     0.0758     0.0792     0.0825
8          0.0858     0.0892     0.0925     0.0975     0.1025
8          0.1075     0.1125     0.1175     0.1225     0.1275
8          0.1325     0.1442     0.1560     0.1677     0.1794
8          0.1985     0.2176     0.2366     0.2557     0.3239
8          0.3921     0.4603     0.5285     0.5520     0.5754
8          0.5989     0.6224     0.6356     0.6488     0.6620
8          0.6752     0.6862     0.6972     0.7082     0.7192
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8          0.7267     0.7342     0.7417     0.7492     0.7558
8          0.7625     0.7692     0.7758     0.7825     0.7892
8          0.7958     0.8025     0.8083     0.8142     0.8200
8          0.8258     0.8308     0.8358     0.8408     0.8458
8          0.8508     0.8558     0.8608     0.8658     0.8683
8          0.8708     0.8733     0.8758     0.8783     0.8808
8          0.8833     0.8858     0.8875     0.8892     0.8908
8          0.8925     0.8942     0.8958     0.8975     0.8992
8          0.9008     0.9025     0.9042     0.9058     0.9075
8          0.9092     0.9108     0.9125     0.9140     0.9154
8          0.9169     0.9183     0.9198     0.9213     0.9227
8          0.9242     0.9256     0.9271     0.9285     0.9300
8          0.9315     0.9329     0.9344     0.9358     0.9373
8          0.9388     0.9402     0.9417     0.9431     0.9446
8          0.9460     0.9475     0.9490     0.9504     0.9519
8          0.9533     0.9548     0.9563     0.9577     0.9592
8          0.9606     0.9621     0.9635     0.9650     0.9665
8          0.9679     0.9694     0.9708     0.9723     0.9737
8          0.9752     0.9767     0.9781     0.9796     0.9810
8          0.9825     0.9840     0.9854     0.9869     0.9883
8          0.9898     0.9912     0.9927     0.9942     0.9956
8          0.9971     0.9985     1.0000     1.0000     1.0
9 ENDTBL
5 RAINFL 7            .25                                          72HRGEN
8          0.0000     0.0005     0.0009     0.0014     0.0019
8          0.0025     0.0032     0.0038     0.0044     0.0051
8          0.0057     0.0063     0.0070     0.0076     0.0082
8          0.0089     0.0095     0.0103     0.0111     0.0119
8          0.0127     0.0134     0.0142     0.0150     0.0158
8          0.0171     0.0184     0.0196     0.0209     0.0222
8          0.0234     0.0247     0.0259     0.0272     0.0285
8          0.0297     0.0310     0.0323     0.0335     0.0348
8          0.0361     0.0375     0.0389     0.0403     0.0418
8          0.0432     0.0446     0.0460     0.0475     0.0489
8          0.0503     0.0517     0.0532     0.0546     0.0560
8          0.0574     0.0589     0.0604     0.0620     0.0636
8          0.0652     0.0668     0.0684     0.0699     0.0715
8          0.0731     0.0747     0.0763     0.0778     0.0797
8          0.0816     0.0835     0.0854     0.0877     0.0899
8          0.0921     0.0943     0.0968     0.0994     0.1019
8          0.1044     0.1073     0.1101     0.1130     0.1158
8          0.1193     0.1228     0.1263     0.1297     0.1335
8          0.1373     0.1411     0.1449     0.1491     0.1532
8          0.1573     0.1614     0.1725     0.1837     0.1948
8          0.2059     0.2241     0.2422     0.2603     0.2784
8          0.3431     0.4078     0.4726     0.5373     0.5596
8          0.5819     0.6042     0.6265     0.6390     0.6515
8          0.6641     0.6766     0.6870     0.6975     0.7079
8          0.7184     0.7255     0.7326     0.7397     0.7468
8          0.7535     0.7601     0.7668     0.7734     0.7794
8          0.7854     0.7915     0.7975     0.8030     0.8085
8          0.8141     0.8196     0.8247     0.8297     0.8348
8          0.8399     0.8443     0.8487     0.8532     0.8576
8          0.8598     0.8620     0.8642     0.8665     0.8685
8          0.8706     0.8726     0.8747     0.8766     0.8785
8          0.8804     0.8823     0.8840     0.8858     0.8875
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

8          0.8892      0.8908      0.8924      0.8940      0.8956
8          0.8972      0.8987      0.9003      0.9019      0.9035
8          0.9051      0.9066      0.9082      0.9098      0.9114
8          0.9130      0.9146      0.9160      0.9174      0.9188
8          0.9203      0.9217      0.9231      0.9245      0.9259
8          0.9274      0.9288      0.9302      0.9316      0.9329
8          0.9342      0.9354      0.9367      0.9380      0.9392
8          0.9405      0.9418      0.9430      0.9443      0.9456
8          0.9468      0.9481      0.9494      0.9506      0.9519
8          0.9530      0.9541      0.9552      0.9563      0.9574
8          0.9585      0.9597      0.9608      0.9619      0.9630
8          0.9641      0.9652      0.9661      0.9671      0.9680
8          0.9690      0.9699      0.9709      0.9718      0.9728
8          0.9736      0.9744      0.9752      0.9759      0.9767
8          0.9775      0.9783      0.9791      0.9797      0.9804
8          0.9810      0.9816      0.9823      0.9829      0.9835
8          0.9842      0.9847      0.9851      0.9856      0.9861
8          0.9866      0.9870      0.9875      0.9880      0.9884
8          0.9889      0.9894      0.9899      0.9902      0.9905
8          0.9908      0.9911      0.9915      0.9918      0.9921
8          0.9924      0.9927      0.9930      0.9934      0.9937
8          0.9940      0.9943      0.9946      0.9949      0.9953
8          0.9956      0.9959      0.9962      0.9965      0.9968
8          0.9972      0.9975      0.9978      0.9981      0.9984
8          0.9987      0.9989      0.9991      0.9992      0.9994
8          0.9995      0.9997      0.9998      1.0000      1.0000
9 ENDTBL
5 RAINFL 8     1        2.4                                          10-DAY
8          .0000       .0024       .0048       .0073       .0097
8          .0121       .0148       .0174       .0201       .0228
8          .0254       .0284       .0314       .0344       .0374
8          .0404       .0437       .0471       .0505       .0539
8          .0572       .0612       .0651       .0690       .0729
8          .0768       .0815       .0862       .0909       .0955
8          .1002       .1061       .1120       .1179       .1238
8          .1297       .1377       .1458       .1538       .1618
8          .1699       .1832       .1966       .2099       .2232
8          .2366       .2548       .2778       .3093       .3614
8          1.092       1.174       1.213       1.240       1.260
8          1.276       1.286       1.296       1.306       1.316
8          1.326       1.333       1.340       1.347       1.354
8          1.360       1.365       1.371       1.376       1.381
8          1.386       1.391       1.395       1.399       1.403
8          1.408       1.411       1.415       1.418       1.422
8          1.426       1.429       1.432       1.435       1.438
8          1.442       1.444       1.447       1.450       1.453
8          1.456       1.458       1.461       1.463       1.466
8          1.468       1.471       1.473       1.475       1.477
8          1.48        1.48        1.48        1.48        1.48
9 ENDTBL
4 DIMHYD               .0556                                           WT3
8          0.0         .03         .10         .19         .31
8          .47         .66         .82         .93         .99
8          1.0         .99         .93         .82         .66
8          .47         .31         .03         .00         .00
9 ENDTBL
```

56 * 5 * .25
= 14 * 5 = [illegible] hrs ✓
([illegible])

```
2 XSECTN   005        1.0        8.77                          BOSSCS#5
8                     0.         0.0        0.0
8                     0.35       5.         5.56
8                     1.03       50.        30.95
8                     1.39       100.       52.16
8                     1.94       200.       88.72
8                     2.63       400.       148.61
8                     3.51       800.       260.63
8                     4.62       1600.      459.66
8                     6.04       3200.      929.36
8                     7.38       6400.      1811.51
8                     8.77       12800.     3374.20
8                     10.17      25600.     6398.87
8                     11.89      51200.     10982.51
9 ENDTBL
2 XSECTN   010        1.0        8.94                          BOSSCS#4
8                     0.         0.0        0.0
8                     0.91       5.         4.95
8                     2.03       50.        24.80
8                     2.63       100.       41.32
8                     3.34       200.       74.14
8                     4.15       400.       130.28
8                     5.23       800.       223.37
8                     6.41       1600.      447.51
8                     7.65       3200.      898.64
8                     8.94       6400.      1690.88
8                     10.29      12800.     3331.95
8                     11.64      25600.     6185.81
8                     13.14      51200.     10661.04
9 ENDTBL
2 XSECTN   020        1.0        7.3                           REACHC
8                     0.         0.0        0.0
8                     1.01       100.       57.78
8                     1.49       200.       86.81
8                     1.88       300.       110.25
8                     2.49       500.       149.47
8                     3.68       1000.      226.31
8                     5.40       2000.      346.26
8                     7.85       4000.      533.39
8                     9.64       6000.      688.07
8                     11.16      8000.      838.10
8                     12.46      10000.     985.31
8                     13.61      12000.     1122.03
8                     14.56      14000.     1236.94
8                     15.43      16000.     1345.18
8                     16.31      18000.     1456.68
9 ENDTBL
2 XSECTN   025        1.0        7.3                           REACHB
8                     0.         0.0        0.0
8                     0.63       100.       80.89
8                     0.93       200.       120.32
8                     1.17       300.       151.77
8                     1.56       500.       203.28
8                     2.30       1000.      302.00
8                     3.38       2000.      449.24
8                     4.97       4000.      673.73
```

```
 8                    6.23        6000.       855.96
 8                    7.31        8000.       1016.35
 8                    8.24        10000.      1158.51
 8                    9.09        12000.      1293.31
 8                    9.90        14000.      1425.57
 8                    10.64       16000.      1549.17
 8                    11.36       18000.      1673.11
 9 ENDTBL
 2 XSECTN   030       1.0         9.45                                BOSSCS#6
 8                    0.          0.0         0.0
 8                    0.77        5.          4.67
 8                    1.54        50.         32.06
 8                    1.78        100.        56.64
 8                    2.10        200.        100.59
 8                    2.50        400.        179.97
 8                    3.01        800.        320.25
 8                    3.63        1600.       589.66
 8                    4.35        3200.       1110.72
 8                    5.21        6400.       2084.48
 8                    6.03        12800.      4119.83
 8                    6.99        25600.      6856.75
 8                    8.28        51200.      11085.87
 9 ENDTBL
 2 XSECTN   045       1.0         4.87                                REACHA
 8                    0.          0.0         0.0
 8                    0.60        100.        85.69
 8                    0.90        200.        127.94
 8                    1.13        300.        161.93
 8                    1.52        500.        217.27
 8                    2.25        1000.       324.03
 8                    3.31        2000.       483.02
 8                    4.87        4000.       722.17
 8                    6.09        6000.       914.99
 8                    7.15        8000.       1084.61
 8                    8.05        10000.      1234.17
 8                    8.87        12000.      1373.80
 8                    9.64        14000.      1507.84
 8                    10.34       16000.      1633.45
 8                    11.00       18000.      1753.12
 9 ENDTBL
 2 XSECTN   060       1.0         4.7                                 2CP6CP7
 8                    0.          0.0         0.0
 8                    2.36        100.        45.12
 8                    2.88        200.        83.75
 8                    3.18        300.        114.33
 8                    3.64        500.        172.72
 8                    4.42        1000.       289.04
 8                    5.40        2000.       470.72
 8                    6.87        4000.       782.74
 8                    7.91        6000.       1020.12
 8                    8.79        8000.       1231.25
 8                    9.60        10000.      1435.05
 8                    10.26       12000.      1618.34
 8                    10.94       14000.      1812.58
 8                    11.47       16000.      1983.46
 8                    11.96       18000.      2150.12
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 9 ENDTBL
 2 XSECTN   067          1.0         8.77                                  BOSSCS#5
 8                       0.          0.0         0.0
 8                       0.35        5.          5.56
 8                       1.03        50.         30.95
 8                       1.39        100.        52.16
 8                       1.94        200.        88.72
 8                       2.63        400.        148.61
 8                       3.51        800.        260.63
 8                       4.62        1600.       459.66
 8                       6.04        3200.       929.36
 8                       7.38        6400.       1811.51
 8                       8.77        12800.      3374.20
 8                       10.17       25600.      6398.87
 8                       11.89       51200.      10982.51
 9 ENDTBL
 3 STRUCT       01                                                           95/11/6
 8                       1178.0      0.0         0.
 8                       1188.0      0.02        44.8
 8                       1196.8      0.13        300.
 8                       1199.2      0.21        500.
 8                       1202.0      159.0       845.55
 8                       1204.0      187.75      1176.28
 8                       1206.0      214.9       1575.25
 8                       1208.0      240.3       2044.97
 8                       1210.0      265.4       2593.40
 8                       1212.0      289.00      3218.00
 8                       1213.0      2894.00     3556.67
 8                       1214.0      8446.00     3916.02
 8                       1215.0      15766.0     4294.13
 8                       1216.0      24500.0     4692.68
 8                       1217.0      34446.0     5113.19
 8                       1218.0      45471.0     5556.01
 8                       1219.0      57477.0     6021.50
 8                       1220.0      70391.0     6509.75
 9 ENDTBL
 6 RUNOFF 1 001        1 2.46        87.2        0.85        1 1
 6 REACH  3 005   1    7 9100.                               1           BOSS#6
 6 REACH  3 010   7    2 9100.                               1           BOSS#4
 6 RUNOFF 1 002        3 2.38        79.9        0.73        1 1
 6 ADDHYD 4 012   2 3 1                                      1 1
 6 DIVERT 6 012   1 4 7 4100.        1.00        200.        1 1         OLIVE
 6 REACH  3 020   4    7 3332.                               1           REACH C
 6 REACH  3 025   7    5 1950.                               1           REACH B
 6 RUNOFF 1 003        6 3.94        87.2        0.88        1 1
 6 REACH  3 030   6    7 8865.                               1           BOSS#6
 6 REACH  3 005   7    1 8865.                               1           BOSS#5
 6 REACH  3 025   1    7 1950.                               1           REACH B
 6 RUNOFF 1 004        1 2.06        77.3        0.79        1 1
 6 ADDHYD 4 034   7 1 2                                      1 1
 6 ADDHYD 4 035   5 2 3                                      1 1
 6 DIVERT 6 035   3 4 7 11000.       1.00        199.        1 1         NORTHERN
 6 REACH  3 045   4    5 4200.                               1           REACH A
 6 RUNOFF 1 006        2 1.47        87.7        0.47        1 1
 6 REACH  3 060   2    3 7540.                               1           CP6CP7
 6 REACH  3 067   3    4 5140.                               1           BOSS#5
```

incl prime. spw y

per calc by Greg Olmanz, Calc Pkg 3 dated 7/23 04

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)*********************

 6 ADDHYD 4 064   5 4 3                                      1 1
 6 RUNOFF 1 005       6 4.78        78.8        0.78         1 1
 6 RUNOFF 1 007       7 3.48        81.7        1.01         1 1
 6 ADDHYD 4 075   6 7 1                                      1 1
 6 ADDHYD 4 076   1 3 2                                      1 1      1
 6 RESVOR 2    01 2   1 1200.0                               1 1      1
 ENDATA
 7 LIST                 1.0                       1.
 7 INCREM 6             0.05
 7 COMPUT 7 001      01 0.          12.7        1.0          1 2  01  01
   ENDCMP 1
   ENDJOB 2

*******************************END OF 80-80 LIST******************************
```

RUNOFF OPTION USED WITH RAINTABLE NO. 8, RUNOFF CURVE NO. = 100.

COMPUTED DIMHYD PEAK RATE FACTOR = 664.607

```
EXECUTIVE CONTROL  LIST          1.          0.          1.

          LISTING OF CURRENT DATA


                     COMPUTED TIME INCREMENT
DIMHYD                        .0556

                  .0000       .0300       .1000       .1900       .3100
                  .4700       .6600       .8200       .9300       .9900
                 1.0000       .9900       .9300       .8200       .6600
                  .4700       .3100       .0300       .0000       .0000
ENDTBL

   COMPUTED PEAK RATE FACTOR =  664.607
```

	TABLE NO.	TIME INCREMENT				
RAINFL	1	.1000				
		.0000	.0030	.0060	.0090	.0130
		.0160	.0200	.0250	.0300	.0350
		.0390	.0460	.0520	.0580	.0650
		.0710	.0800	.0900	.0990	.1090
		.1180	.2830	.4490	.5670	.6220
		.6690	.7010	.7320	.7560	.7800
		.7950	.8090	.8240	.8380	.8520
		.8660	.8760	.8850	.8940	.9040
		.9130	.9200	.9260	.9320	.9390
		.9450	.9500	.9540	.9590	.9640
		.9690	.9720	.9760	.9800	.9840
		.9880	.9910	.9930	.9950	.9980
		1.0000	1.0000	1.0000	1.0000	1.0000
ENDTBL						

STANDARD CONTROL INSTRUCTIONS

RUNOFF	1			1	2.4600	87.2000	.85001	1	0	0	0	1
REACH	5	1		7	9100.0000	.0000	.00001	0	0	0	0	1
REACH	10	7		2	9100.0000	.0000	.00001	0	0	0	0	1
RUNOFF	2			3	2.3800	79.9000	.73001	1	0	0	0	1
ADDHYD	12	2	3	1			1	1	0	0	0	1
DIVERT	12	1	4	7	4100.0000	1.0000	200.00001	1	0	0	0	1
REACH	20	4		7	3332.0000	.0000	.00001	0	0	0	0	1
REACH	25	7		5	1950.0000	.0000	.00001	0	0	0	0	1
RUNOFF	3			6	3.9400	87.2000	.88001	1	0	0	0	1
REACH	30	6		7	8865.0000	.0000	.00001	0	0	0	0	1
REACH	5	7		1	8865.0000	.0000	.00001	0	0	0	0	1
REACH	25	1		7	1950.0000	.0000	.00001	0	0	0	0	1
RUNOFF	4			1	2.0600	77.3000	.79001	1	0	0	0	1
ADDHYD	34	7	1	2			1	1	0	0	0	1
ADDHYD	35	5	2	3			1	1	0	0	0	1
DIVERT	35	3	4	7	11000.0000	1.0000	199.00001	1	0	0	0	1
REACH	45	4		5	4200.0000	.0000	.00001	0	0	0	0	1
RUNOFF	6			2	1.4700	87.7000	.47001	1	0	0	0	1
REACH	60	2		3	7540.0000	.0000	.00001	0	0	0	0	1
REACH	67	3		4	5140.0000	.0000	.00001	0	0	0	0	1
ADDHYD	64	5	4	3			1	1	0	0	0	1
RUNOFF	5			6	4.7800	78.8000	.78001	1	0	0	0	1
RUNOFF	7			7	3.4800	81.7000	1.01001	1	0	0	0	1
ADDHYD	75	6	7	1			1	1	0	0	0	1
ADDHYD	76	1	3	2			1	1	0	0	1	1
RESVOR	1	2		1	1200.0000		1	1	0	0	1	1
ENDATA												

END OF LISTING

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .050 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 12.70 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .050 HOURS
ALTERNATE NO. = 1 STORM NO. = 1 RAIN TABLE NO. = 1

OPERATION RUNOFF XSECTION 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET) (RUNOFF)
2.71	17873.0	

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.46 SQ.MI.

HRS	.75 CFS	1.15	2.73	5.54	9.95	16.43	25.70	38.37
1.15 CFS	55	75	99	128	160	196	235	276
1.55 CFS	318	362	409	458	510	566	625	688
1.95 CFS	753	830	978	1279	1794	2595	3743	5287
2.35 CFS	7187	9294	11447	13473	15219	16590	17491	17866
2.75 CFS	17674	16919	15643	13899	11960	10148	8586	7352
3.15 CFS	6416	5736	5217	4765	4374	4049	3771	3525
3.55 CFS	3312	3138	2995	2873	2772	2690	2613	2530
3.95 CFS	2439	2343	2247	2154	2065	1978	1896	1819
4.35 CFS	1749	1687	1631	1574	1516	1458	1400	1342
4.75 CFS	1287	1239	1196	1160	1128	1098	1069	1038
5.15 CFS	1007	976	947	922	901	882	867	852
5.55 CFS	837	819	800	781	762	742	721	700
5.95 CFS	676	646	612	576	539	500	458	413
6.35 CFS	367	322	278	234	191	147	106	68
6.75 CFS	37.92	17.14	5.12	.74	.04			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.32	10200.1	8.21

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION REACH XSECTION 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.96	7060.0	9.08

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.09 WATERSHED INCHES; 17613 CFS-HRS; 1455.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	16995.9	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.38 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.67	15.34	25.03	38.19
1.45 CFS	55	75	99	128	161	198	240	286
1.85 CFS	336	390	445	523	689	1033	1648	2632
2.25 CFS	4059	5924	8106	10407	12610	14524	15972	16813
2.65 CFS	16970	16435	15174	13412	11508	9715	8223	7053
3.05 CFS	6203	5583	5079	4636	4253	3923	3631	3372
3.45 CFS	3155	2982	2842	2733	2654	2597	2536	2461
3.85 CFS	2371	2271	2170	2073	1981	1896	1820	1752
4.25 CFS	1694	1642	1588	1530	1468	1405	1343	1286
4.65 CFS	1236	1194	1158	1126	1094	1061	1028	995
5.05 CFS	962	932	906	886	869	852	836	819
5.45 CFS	801	781	762	746	733	721	708	691
5.85 CFS	668	636	601	565	530	495	459	422
6.25 CFS	383	341	298	252	204	155	108	65
6.65 CFS	33.37	12.75	2.82	.21				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.12 WATERSHED INCHES; 15550 CFS-HRS; 1285.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	17248.4	(NULL)
3.81	9386.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.68	15.37	25.12	38.38
1.45 CFS	55	76	101	130	164	203	246	295
1.85 CFS	349	407	468	552	726	1078	1702	2698
2.25 CFS	4138	6017	8214	10533	12754	14690	16164	17035
2.65 CFS	17234	16756	15574	13921	12165	10563	9314	8436
3.05 CFS	7930	7699	7624	7638	7731	7880	8056	8240
3.45 CFS	8433	8628	8811	8978	9131	9262	9350	9385
3.85 CFS	9371	9316	9230	9123	8998	8860	8713	8560
4.25 CFS	8404	8243	8072	7889	7696	7497	7295	7095
4.65 CFS	6900	6711	6528	6348	6169	5990	5812	5635

5.05 CFS	5461	5291	5129	4974	4825	4679	4537	4397
5.45 CFS	4259	4123	3991	3865	3745	3630	3517	3404
5.85 CFS	3287	3165	3043	2923	2807	2695	2585	2475
6.25 CFS	2367	2259	2152	2045	1937	1831	1727	1631
6.65 CFS	1547	1475	1416	1364	1316	1269	1223	1177
7.05 CFS	1132	1087	1043	999	956	913	871	830
7.45 CFS	790	751	714	678	642	609	576	545
7.85 CFS	516	487	460	434	409	386	363	342
8.25 CFS	322	303	285	268	252	236	222	208
8.65 CFS	195	183	172	161	151	141	132	124
9.05 CFS	116	109	102	95	89	83	78	73
9.45 CFS	67.78	63.31	59.13	55.22	51.55	48.12	44.91	41.90
9.85 CFS	39.10	36.47	34.01	31.72	29.57	27.57	25.70	23.95
10.25 CFS	22.32	20.79	19.37	18.04	16.81	15.65	14.57	13.57
10.65 CFS	12.63	11.76	10.94	10.18	9.47	8.81	8.20	7.63
11.05 CFS	7.10	6.60	6.14	5.71	5.30	4.93	4.58	4.26
11.45 CFS	3.96	3.68	3.42	3.18	2.95	2.74	2.55	2.37
11.85 CFS	2.20	2.04	1.89	1.76	1.63	1.51	1.40	1.30
12.25 CFS	1.21	1.12	1.04	.97	.90	.83	.77	.71
12.65 CFS	.66	.61	.57	.53	.49			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.62 WATERSHED INCHES; 33163 CFS-HRS; 2740.6 ACRE-FEET.

OPERATION DIVERT XSECTION 12
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.25	4100.0 *	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
1.05 CFS	.16	.69	1.94	4.40	8.68	15.37	25.12	38.38
1.45 CFS	55	76	101	130	164	203	246	295
1.85 CFS	349	407	468	552	726	1078	1702	2698
2.25 CFS	4100	4100	4100	4100	4100	4100	4100	4100
2.65 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.05 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.45 CFS	4100	4100	4100	4100	4100	4100	4100	4100
3.85 CFS	4100	4100	4100	4100	4100	4100	4100	4100
4.25 CFS	4100	4100	4100	4100	4100	4100	4100	4100
4.65 CFS	4100	4100	4100	4100	4100	4100	4100	4100
5.05 CFS	4100	4100	4100	4100	4100	4100	4100	4100
5.45 CFS	4100	4100	3991	3865	3745	3630	3517	3404
5.85 CFS	3287	3165	3043	2923	2807	2695	2585	2475
6.25 CFS	2367	2259	2152	2045	1937	1831	1727	1631
6.65 CFS	1547	1475	1416	1364	1316	1269	1223	1177
7.05 CFS	1132	1087	1043	999	956	913	871	830

7.45 CFS	790	751	714	678	642	609	576	545
7.85 CFS	516	487	460	434	409	386	363	342
8.25 CFS	322	303	285	268	252	236	222	208
8.65 CFS	195	183	172	161	151	141	132	124
9.05 CFS	116	109	102	95	89	83	78	73
9.45 CFS	67.78	63.31	59.13	55.22	51.55	48.12	44.91	41.90
9.85 CFS	39.10	36.47	34.01	31.72	29.57	27.57	25.70	23.95
10.25 CFS	22.32	20.79	19.37	18.04	16.81	15.65	14.57	13.57
10.65 CFS	12.63	11.76	10.94	10.18	9.47	8.81	8.20	7.63
11.05 CFS	7.10	6.60	6.14	5.71	5.30	4.93	4.58	4.26
11.45 CFS	3.96	3.68	3.42	3.18	2.95	2.74	2.55	2.37
11.85 CFS	2.20	2.04	1.89	1.76	1.63	1.51	1.40	1.30
12.25 CFS	1.21	1.12	1.04	.97	.90	.83	.77	.71
12.65 CFS	.66	.61	.57	.53	.49			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18666 CFS-HRS; 1542.6 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 200)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.64	13148.4	(DIVERT)
3.81	5286.1	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
2.20 CFS	0	38	1917	4114	6433	8654	10590	12064
2.60 CFS	12935	13134	12656	11474	9821	8065	6463	5214
3.00 CFS	4336	3830	3599	3524	3538	3631	3780	3956
3.40 CFS	4140	4333	4528	4711	4878	5031	5162	5250
3.80 CFS	5285	5271	5216	5130	5023	4898	4760	4613
4.20 CFS	4460	4304	4143	3972	3789	3596	3397	3195
4.60 CFS	2995	2800	2611	2428	2248	2069	1890	1712
5.00 CFS	1535	1361	1191	1029	874	725	579	437
5.40 CFS	297	159	23	0				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14497 CFS-HRS; 1198.0 ACRE-FEET.

OPERATION REACH XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.35	4100.0 *	7.94

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18674 CFS-HRS; 1543.2 ACRE-FEET.

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.40	4100.0 *	5.03

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.98 WATERSHED INCHES; 18671 CFS-HRS; 1543.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.73	28008.6	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 3.94 SQ.MI.

HRS								
.70 CFS	.11	.53	1.63	3.91	7.97	14.38	23.74	37.26
1.10 CFS	56	80	110	147	190	239	295	355
1.50 CFS	419	485	555	629	707	789	876	970
1.90 CFS	1070	1172	1291	1520	1978	2754	3947	5645
2.30 CFS	7914	10709	13856	17125	20269	23051	25326	26959
2.70 CFS	27856	27941	27181	25638	23334	20446	17522	14870
3.10 CFS	12659	10940	9640	8690	7921	7256	6690	6220
3.50 CFS	5813	5453	5146	4895	4684	4501	4348	4218
3.90 CFS	4089	3952	3806	3656	3508	3364	3224	3089
4.30 CFS	2960	2840	2733	2639	2550	2461	2371	2280
4.70 CFS	2188	2099	2016	1942	1879	1824	1775	1729
5.10 CFS	1682	1634	1585	1537	1492	1455	1423	1396
5.50 CFS	1372	1350	1324	1294	1262	1230	1197	1163
5.90 CFS	1128	1091	1048	998	943	885	823	756
6.30 CFS	686	612	539	468	398	331	264	199
6.70 CFS	138	85	45	18	5	0		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 30

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.40	16237.6	6.29

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
4.00	11557.4	8.50

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
4.06	11552.0	8.90

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.10 WATERSHED INCHES; 28213 CFS-HRS; 2331.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.68	13580.0	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 2.06 SQ.MI.

HRS								
1.20 CFS	.32	.94	2.20	4.53	8.43	14.25	22.34	33.25
1.60 CFS	48	65	87	114	145	180	219	260
2.00 CFS	305	403	622	1013	1651	2596	3893	5471
2.40 CFS	7211	8963	10567	11924	12911	13469	13552	13136
2.80 CFS	12289	10903	9457	8031	6802	5872	5130	4648
3.20 CFS	4233	3871	3547	3287	3055	2849	2670	2532
3.60 CFS	2417	2323	2247	2197	2140	2073	1998	1916
4.00 CFS	1834	1756	1682	1611	1545	1485	1430	1385
4.40 CFS	1339	1292	1243	1192	1143	1095	1051	1014
4.80 CFS	980	952	925	899	874	848	822	796
5.20 CFS	773	754	738	723	709	697	684	668
5.60 CFS	652	638	624	611	596	581	561	535
6.00 CFS	506	477	447	416	384	349	313	276
6.40 CFS	239	203	165	126	89	55	29	12
6.80 CFS	2.44	.16						

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
9.75 WATERSHED INCHES; 12960 CFS-HRS; 1071.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 34

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	13913.0	(NULL)
3.98	13359.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 6.00 SQ.MI.

HRS								
1.20 CFS	.32	.94	2.20	4.54	8.47	14.37	22.62	33.79

1.60 CFS	49	67	90	118	151	190	233	279
2.00 CFS	331	437	665	1068	1719	2680	3994	5593
2.40 CFS	7355	9131	10763	12150	13171	13769	13900	13547
2.80 CFS	12787	11520	10239	9034	8094	7531	7235	7282
3.20 CFS	7472	7784	8186	8690	9239	9807	10376	10937
3.60 CFS	11459	11929	12340	12699	12977	13175	13298	13353
4.00 CFS	13354	13307	13219	13096	12942	12763	12562	12350
4.40 CFS	12118	11870	11608	11334	11053	10768	10482	10199
4.80 CFS	9918	9642	9367	9094	8823	8555	8290	8028
5.20 CFS	7773	7527	7288	7056	6829	6609	6394	6181
5.60 CFS	5974	5774	5582	5394	5212	5034	4857	4679
6.00 CFS	4504	4334	4169	4009	3851	3697	3545	3398
6.40 CFS	3255	3116	2979	2846	2718	2596	2485	2385
6.80 CFS	2295	2215	2138	2062	1988	1916	1844	1773
7.20 CFS	1702	1633	1564	1495	1428	1362	1297	1234
7.60 CFS	1172	1112	1054	998	945	893	844	796
8.00 CFS	751	708	667	628	591	555	522	490
8.40 CFS	460	432	405	380	356	334	312	292
8.80 CFS	274	256	239	224	209	195	182	170
9.20 CFS	159	148	139	129	120	112	105	98
9.60 CFS	90.94	84.72	78.91	73.48	68.41	63.69	59.27	55.16
10.00 CFS	51.32	47.74	44.40	41.29	38.39	35.69	33.17	30.83
10.40 CFS	28.65	26.62	24.73	22.97	21.34	19.81	18.40	17.08
10.80 CFS	15.86	14.72	13.66	12.68	11.76	10.91	10.12	9.39
11.20 CFS	8.71	8.08	7.49	6.95	6.44	5.97	5.53	5.13
11.60 CFS	4.75	4.40	4.08	3.78	3.50	3.24	3.00	2.78
12.00 CFS	2.58	2.38	2.21	2.04	1.89	1.75	1.62	1.50
12.40 CFS	1.39	1.28	1.19	1.10	1.02	.94	.87	.80
12.80 CFS	.74	.69	.63	.58	.54	.50		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.63 WATERSHED INCHES; 41173 CFS-HRS; 3402.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 35

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	17992.4	(NULL)
3.98	17459.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
1.15 CFS	.13	.58	1.78	4.30	8.98	16.87	28.87	45.91
1.55 CFS	69	99	137	183	238	302	377	461
1.95 CFS	554	656	817	1111	1616	2456	3763	5660
2.35 CFS	8149	10567	12747	14606	16117	17202	17834	17983
2.75 CFS	17639	16883	15618	14338	13133	12193	11631	11335
3.15 CFS	11382	11572	11884	12286	12790	13339	13907	14476
3.55 CFS	15037	15559	16029	16440	16799	17077	17275	17398
3.95 CFS	17453	17454	17407	17319	17196	17042	16863	16662
4.35 CFS	16450	16218	15970	15708	15434	15153	14868	14582

4.75 CFS	14299	14018	13742	13467	13194	12923	12655	12390
5.15 CFS	12128	11873	11627	11388	11156	10929	10709	10494
5.55 CFS	10281	10074	9839	9576	9296	9008	8722	8434
5.95 CFS	8142	7851	7562	7278	6998	6725	6456	6193
6.35 CFS	5935	5683	5435	5191	4950	4714	4487	4272
6.75 CFS	4077	3900	3743	3600	3466	3338	3215	3094
7.15 CFS	2976	2860	2745	2631	2519	2408	2299	2192
7.55 CFS	2087	1985	1886	1790	1697	1608	1522	1439
7.95 CFS	1360	1285	1212	1143	1078	1015	956	899
8.35 CFS	846	795	747	701	658	618	579	543
8.75 CFS	509	477	447	418	392	366	343	321
9.15 CFS	300	280	262	245	228	213	199	186
9.55 CFS	173	162	151	141	131	122	114	106
9.95 CFS	98.98	92.21	85.89	79.99	74.48	69.34	64.54	60.07
10.35 CFS	55.90	52.01	48.39	45.01	41.87	38.94	36.21	33.66
10.75 CFS	31.29	29.09	27.04	25.13	23.35	21.69	20.15	18.72
11.15 CFS	17.39	16.15	15.00	13.92	12.93	12.00	11.14	10.34
11.55 CFS	9.59	8.90	8.26	7.66	7.11	6.60	6.12	5.68
11.95 CFS	5.26	4.88	4.52	4.19	3.89	3.60	3.34	3.09
12.35 CFS	2.87	2.66	2.46	2.28	2.11	1.96	1.81	1.68
12.75 CFS	1.55	1.44	1.33	1.23	1.14	1.05	.97	.90
13.15 CFS	.83	.77	.71	.65	.61	.56	.51	.47

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.55 WATERSHED INCHES; 59845 CFS-HRS; 4945.6 ACRE-FEET.

OPERATION DIVERT XSECTION 35
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.45	11000.0 *	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
1.15 CFS	.13	.58	1.78	4.30	8.98	16.87	28.87	45.91
1.55 CFS	69	99	137	183	238	302	377	461
1.95 CFS	554	656	817	1111	1616	2456	3763	5660
2.35 CFS	8149	10567	11000	11000	11000	11000	11000	11000
2.75 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.15 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.55 CFS	11000	11000	11000	11000	11000	11000	11000	11000
3.95 CFS	11000	11000	11000	11000	11000	11000	11000	11000
4.35 CFS	11000	11000	11000	11000	11000	11000	11000	11000
4.75 CFS	11000	11000	11000	11000	11000	11000	11000	11000
5.15 CFS	11000	11000	11000	11000	11000	10929	10709	10494
5.55 CFS	10281	10074	9839	9576	9296	9008	8722	8434
5.95 CFS	8142	7851	7562	7278	6998	6725	6456	6193
6.35 CFS	5935	5683	5435	5191	4950	4714	4487	4272

6.75 CFS	4077	3900	3743	3600	3466	3338	3215	3094
7.15 CFS	2976	2860	2745	2631	2519	2408	2299	2192
7.55 CFS	2087	1985	1886	1790	1697	1608	1522	1439
7.95 CFS	1360	1285	1212	1143	1078	1015	956	899
8.35 CFS	846	795	747	701	658	618	579	543
8.75 CFS	509	477	447	418	392	366	343	321
9.15 CFS	300	280	262	245	228	213	199	186
9.55 CFS	173	162	151	141	131	122	114	106
9.95 CFS	98.98	92.21	85.89	79.99	74.48	69.34	64.54	60.07
10.35 CFS	55.90	52.01	48.39	45.01	41.87	38.94	36.21	33.66
10.75 CFS	31.29	29.09	27.04	25.13	23.35	21.69	20.15	18.72
11.15 CFS	17.39	16.15	15.00	13.92	12.93	12.00	11.14	10.34
11.55 CFS	9.59	8.90	8.26	7.66	7.11	6.60	6.12	5.68
11.95 CFS	5.26	4.88	4.52	4.19	3.89	3.60	3.34	3.09
12.35 CFS	2.87	2.66	2.46	2.28	2.11	1.96	1.81	1.68
12.75 CFS	1.55	1.44	1.33	1.23	1.14	1.05	.97	.90
13.15 CFS	.83	.77	.71	.65	.61	.56	.51	.47

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.98 WATERSHED INCHES; 48844 CFS-HRS; 4036.5 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 199)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.69	6992.4	(DIVERT)
3.98	6459.3	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
2.40 CFS	0	1747	3606	5117	6202	6834	6983	6639
2.80 CFS	5883	4618	3338	2133	1193	631	335	382
3.20 CFS	572	884	1286	1790	2339	2907	3476	4037
3.60 CFS	4559	5029	5440	5799	6077	6275	6398	6453
4.00 CFS	6454	6407	6319	6196	6042	5863	5662	5450
4.40 CFS	5218	4970	4708	4434	4153	3868	3582	3299
4.80 CFS	3018	2742	2467	2194	1923	1655	1390	1128
5.20 CFS	873	627	388	156	0			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11001 CFS-HRS; 909.1 ACRE-FEET.

OPERATION REACH XSECTION 45

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
3.60	11000.0 *	8.46

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.98 WATERSHED INCHES; 48837 CFS-HRS; 4035.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.44	14477.1	(RUNOFF)
5.09	565.7	(RUNOFF)
5.57	467.7	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 1.47 SQ.MI.

HRS								
.70 CFS	.49	1.79	4.72	10.27	19.17	31.25	46.11	63.69
1.10 CFS	84	107	133	161	189	217	246	272
1.50 CFS	296	320	348	382	424	473	525	578
1.90 CFS	629	673	751	1016	1675	2951	4958	7479
2.30 CFS	10139	12487	14048	14453	13548	11805	9813	7930
2.70 CFS	6413	5301	4595	4109	3719	3397	3144	2908
3.10 CFS	2660	2416	2203	2019	1869	1766	1716	1699
3.50 CFS	1689	1673	1643	1594	1528	1446	1355	1265
3.90 CFS	1188	1135	1109	1100	1091	1070	1033	980
4.30 CFS	915	851	800	767	752	748	744	734
4.70 CFS	711	676	634	596	571	559	559	563
5.10 CFS	565	559	539	512	488	468	456	454
5.50 CFS	460	467	466	456	437	410	376	342
5.90 CFS	311	289	278	271	262	243	211	166
6.30 CFS	116	68	32	10	1	0		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION REACH XSECTION 60

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.65	11037.3	9.94

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION REACH XSECTION 67

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.98	7397.2	7.60

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.12 WATERSHED INCHES; 10551 CFS-HRS; 871.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 64

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.98	18393.8	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 12.31 SQ.MI.

HRS								
1.00	CFS	.28	.72	1.60	3.11	5.54	9.19	14.51	22.08
1.40	CFS	33	47	67	92	124	163	210	265
1.80	CFS	330	405	491	588	696	816	970	1207
2.20	CFS	1588	2212	3205	4714	6841	9347	11203	12592
2.60	CFS	13786	14881	15877	16738	17427	17925	18235	18378
3.00	CFS	18383	18283	18103	17867	17594	17296	16984	16665
3.40	CFS	16344	16027	15718	15420	15137	14873	14630	14407
3.80	CFS	14203	14018	13849	13692	13546	13409	13280	13159
4.20	CFS	13045	12940	12844	12756	12674	12599	12527	12459
4.60	CFS	12392	12329	12268	12212	12160	12112	12068	12026
5.00	CFS	11986	11947	11910	11874	11840	11809	11781	11755
5.40	CFS	11731	11675	11531	11344	11135	10918	10685	10430
5.80	CFS	10158	9872	9581	9285	8984	8680	8375	8071
6.20	CFS	7771	7475	7184	6898	6617	6340	6066	5795
6.60	CFS	5526	5260	5000	4750	4516	4299	4102	3922
7.00	CFS	3757	3603	3459	3320	3188	3059	2933	2810
7.40	CFS	2690	2571	2456	2342	2231	2123	2019	1917
7.80	CFS	1819	1724	1633	1545	1461	1380	1303	1230
8.20	CFS	1159	1093	1029	969	912	857	806	757
8.60	CFS	711	667	626	587	551	516	484	453
9.00	CFS	424	397	371	347	325	304	284	265
9.40	CFS	248	232	216	202	188	176	164	153
9.80	CFS	143	133	124	116	108	100	94	87
10.20	CFS	81.15	75.56	70.35	65.49	60.95	56.72	52.78	49.10
10.60	CFS	45.68	42.49	39.51	36.74	34.17	31.76	29.52	27.44
11.00	CFS	25.50	23.70	22.02	20.46	19.00	17.65	16.40	15.23
11.40	CFS	14.14	13.13	12.19	11.31	10.50	9.74	9.04	8.39
11.80	CFS	7.78	7.22	6.70	6.21	5.76	5.34	4.95	4.59
12.20	CFS	4.26	3.95	3.66	3.39	3.14	2.91	2.70	2.50
12.60	CFS	2.32	2.14	1.99	1.84	1.70	1.58	1.46	1.35
13.00	CFS	1.25	1.15	1.07	.99	.91	.84	.78	.72
13.40	CFS	.67	.61	.57	.52	.48			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.48 WATERSHED INCHES; 59391 CFS-HRS; 4908.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.67	32338.6	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 4.78 SQ.MI.

HRS								
1.10	CFS	.35	1.23	3.30	7.30	14.19	25.19	41.59	63.91
1.50	CFS	93	129	173	226	289	361	444	535
1.90	CFS	634	737	869	1142	1708	2714	4325	6694
2.30	CFS	9866	13685	17849	21989	25760	28874	31081	32214
2.70	CFS	32167	30967	28567	25291	21793	18489	15718	13544
3.10	CFS	11939	10771	9814	8968	8240	7625	7085	6605
3.50	CFS	6203	5882	5620	5407	5246	5124	4988	4829
3.90	CFS	4648	4454	4262	4079	3905	3741	3591	3453
4.30	CFS	3329	3225	3117	3005	2887	2768	2653	2541
4.70	CFS	2441	2356	2280	2217	2154	2093	2032	1970
5.10	CFS	1909	1848	1797	1756	1718	1685	1653	1624
5.50	CFS	1591	1553	1517	1484	1454	1423	1390	1353
5.90	CFS	1303	1240	1173	1104	1034	961	886	805
6.30	CFS	722	637	550	463	372	282	195	118
6.70	CFS	60.08	22.99	4.65	.29				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
9.96 WATERSHED INCHES; 30716 CFS-HRS; 2538.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.83	21194.2	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 3.48 SQ.MI.

HRS								
1.00	CFS	.19	.70	1.87	4.06	7.63	13.12	21.11	32.24
1.40	CFS	47	66	88	115	147	185	228	276
1.80	CFS	330	390	456	526	613	762	1034	1484
2.20	CFS	2161	3116	4397	6018	7955	10115	12368	14560
2.60	CFS	16553	18252	19605	20564	21097	21158	20717	19797
3.00	CFS	18426	16619	14575	12598	10822	9364	8214	7356
3.40	CFS	6708	6164	5698	5314	4987	4694	4434	4215
3.80	CFS	4027	3858	3706	3582	3469	3358	3243	3124
4.20	CFS	3003	2884	2765	2649	2537	2431	2335	2251
4.60	CFS	2177	2104	2032	1957	1882	1806	1734	1669
5.00	CFS	1613	1566	1525	1486	1449	1410	1370	1328
5.40	CFS	1288	1254	1227	1204	1184	1165	1144	1117
5.80	CFS	1087	1055	1022	988	954	920	884	843
6.20	CFS	795	743	686	625	562	497	435	375
6.60	CFS	320	267	216	168	123	81	47	23
7.00	CFS	7.37	1.46	.17					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.35 WATERSHED INCHES; 23254 CFS-HRS; 1921.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 75

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.72	51863.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 8.26 SQ.MI.

HRS								
1.00 CFS	.19	.78	2.22	5.28	10.93	20.42	35.29	57.43
1.40 CFS	89	130	181	244	320	411	517	638
1.80 CFS	774	925	1090	1263	1482	1904	2742	4198
2.20 CFS	6486	9810	14263	19702	25804	32104	38127	43435
2.60 CFS	47634	50466	51771	51531	49664	46449	42510	38287
3.00 CFS	34144	30163	26514	23368	20636	18333	16454	14981
3.40 CFS	13793	12769	11901	11196	10607	10101	9680	9339
3.80 CFS	9015	8687	8354	8036	7732	7437	7148	6866
4.20 CFS	6594	6337	6094	5874	5654	5436	5222	5019
4.60 CFS	4829	4645	4473	4313	4162	4023	3887	3762
5.00 CFS	3645	3536	3434	3335	3245	3165	3087	3012
5.40 CFS	2941	2878	2817	2757	2701	2649	2597	2540
5.80 CFS	2477	2408	2325	2229	2127	2024	1918	1804
6.20 CFS	1681	1548	1408	1262	1112	960	807	657
6.60 CFS	515	385	276	191	127	81	47	23
7.00 CFS	7.37	1.46	.17					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
10.12 WATERSHED INCHES; 53970 CFS-HRS; 4460.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 76

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
2.74	68291.0	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
1.00 CFS	.46	1.50	3.81	8.39	16.46	29.61	49.80	79.52
1.40 CFS	121	177	248	336	444	574	726	903
1.80 CFS	1104	1330	1580	1851	2178	2720	3712	5404
2.20 CFS	8074	12021	17468	24416	32645	41451	49331	56027
2.60 CFS	61419	65347	67649	68269	67091	64374	60745	56664
3.00 CFS	52527	48446	44617	41236	38230	35629	33438	31646
3.40 CFS	30137	28797	27619	26615	25744	24974	24309	23745
3.80 CFS	23218	22705	22202	21728	21278	20847	20429	20024
4.20 CFS	19639	19277	18938	18630	18328	18035	17749	17477
4.60 CFS	17221	16974	16741	16525	16322	16136	15955	15788
5.00 CFS	15631	15484	15344	15209	15085	14974	14868	14768
5.40 CFS	14672	14553	14349	14101	13835	13567	13282	12970
5.80 CFS	12634	12280	11906	11513	11111	10704	10293	.9875
6.20 CFS	9452	9023	8592	8160	7729	7300	6873	6452
6.60 CFS	6040	5645	5277	4941	4643	4380	4148	3945
7.00 CFS	3764	3605	3459	3320	3188	3059	2933	2810
7.40 CFS	2690	2571	2456	2342	2231	2123	2019	1917
7.80 CFS	1819	1724	1633	1545	1461	1380	1303	1230
8.20 CFS	1159	1093	1029	969	912	857	806	757

8.60 CFS	711	667	626	587	551	516	484	453
9.00 CFS	424	397	371	347	325	304	284	265
9.40 CFS	248	232	216	202	188	176	164	153
9.80 CFS	143	133	124	116	108	100	94	87
10.20 CFS	81.15	75.56	70.35	65.49	60.95	56.72	52.78	49.10
10.60 CFS	45.68	42.49	39.51	36.74	34.17	31.76	29.52	27.44
11.00 CFS	25.50	23.70	22.02	20.46	19.00	17.65	16.40	15.23
11.40 CFS	14.14	13.13	12.19	11.31	10.50	9.74	9.04	8.39
11.80 CFS	7.78	7.22	6.70	6.21	5.76	5.34	4.95	4.59
12.20 CFS	4.26	3.95	3.66	3.39	3.14	2.91	2.70	2.50
12.60 CFS	2.32	2.14	1.99	1.84	1.70	1.58	1.46	1.35
13.00 CFS	1.25	1.15	1.07	.99	.91	.84	.78	.72
13.40 CFS	.67	.61	.57	.52	.48			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.54 WATERSHED INCHES; 113361 CFS-HRS; 9368.2 ACRE-FEET.

--- XSECTION 76, ALTERNATE 1, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

*** MESSAGE - STRUCTURE 1, USER ENTERED STARTING ELEVATION (1200.0 FEET) CAN ADD .546 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

*** MESSAGE - RESERVOIR ROUTING, STRUCTURE 1, TRUNCATED AT 400 POINTS WITH 3020.58 AC-FT (.23 WATERSHED INCHES) FLOOD STORAGE REMAINING IN RESERVOIR AT ELEV. 1211.38. ***

6-hr local outflow

OPERATION RESVOR STRUCTURE 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
.70	45.6	1200.00
3.71	24221.1	1215.97

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
HRS MAIN TIME INCREMENT = .050 hr, DRAINAGE AREA = 20.57 SQ.MI.

.70 CFS	45.58	45.49	45.41	45.32	45.24	45.15	45.06	44.98
1.10 CFS	44.90	44.83	44.77	44.72	44.72	44.75	44.86	45.06
1.50 CFS	45.37	45.84	46.49	47.37	48.51	49.97	51.78	53.99
1.90 CFS	57	60	64	68	74	83	95	114
2.30 CFS	142	163	173	187	200	214	228	241
2.70 CFS	254	267	277	287	1891	4426	7530	10611
3.10 CFS	13374	15648	17719	19383	20696	21722	22517	23119
3.50 CFS	23560	23868	24068	24180	24220	24203	24141	24039
3.90 CFS	23901	23733	23540	23326	23093	22844	22583	22313
4.30 CFS	22035	21753	21470	21185	20900	20615	20332	20052
4.70 CFS	19775	19503	19236	18976	18722	18475	18235	18003
5.10 CFS	17779	17562	17353	17152	16958	16773	16595	16423
5.50 CFS	16252	16077	15894	15711	15535	15350	15154	14946
5.90 CFS	14727	14495	14250	13993	13724	13444	13153	12852
6.30 CFS	12541	12221	11892	11555	11211	10861	10506	10148
6.70 CFS	9787	9427	9071	8720	8391	8122	7858	7600

7.10 CFS	7348	7103	6865	6634	6408	6190	5977	5770
7.50 CFS	5568	5372	5181	4996	4815	4638	4467	4300
7.90 CFS	4138	3980	3827	3678	3534	3393	3257	3125
8.30 CFS	2998	2884	2823	2762	2702	2642	2582	2523
8.70 CFS	2464	2406	2349	2292	2236	2181	2126	2072
9.10 CFS	2020	1968	1917	1866	1817	1769	1722	1675
9.50 CFS	1630	1585	1542	1499	1458	1417	1377	1339
9.90 CFS	1301	1264	1228	1193	1158	1125	1092	1061
10.30 CFS	1030	1000	970	942	914	887	861	835
10.70 CFS	810	786	763	740	718	696	675	655
11.10 CFS	635	616	597	579	562	544	528	512
11.50 CFS	496	481	466	452	438	425	412	399
11.90 CFS	387	375	363	352	341	331	321	311
12.30 CFS	301	292	289	289	289	289	289	289
12.70 CFS	289	289	289	289	289	288	288	288
13.10 CFS	288	288	288	288	288	288	288	288
13.50 CFS	288	288	288	288	288	288	288	288
13.90 CFS	288	288	288	287	287	287	287	287
14.30 CFS	287	287	287	287	287	287	287	287
14.70 CFS	287	287	287	287	287	287	287	287
15.10 CFS	287	287	286	286	286	286	286	286
15.50 CFS	286	286	286	286	286	286	286	286
15.90 CFS	286	286	286	286	286	286	286	286
16.30 CFS	285	285	285	285	285	285	285	285
16.70 CFS	285	285	285	285	285	285	285	285
17.10 CFS	285	285	285	285	285	285	284	284
17.50 CFS	284	284	284	284	284	284	284	284
17.90 CFS	284	284	284	284	284	284	284	284
18.30 CFS	284	284	284	284	284	283	283	283
18.70 CFS	283	283	283	283	283	283	283	283
19.10 CFS	283	283	283	283	283	283	283	283
19.50 CFS	283	283	283	283	282	282	282	282
19.90 CFS	282	282	282	282	282	282	282	282
20.30 CFS	282	282	282	282	282	282	282	282

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.33 WATERSHED INCHES; 84022 CFS-HRS; 6943.6 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 1, STORM 1, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

RAINFALL OF 12.70 inches AND 6.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 1, ARC 2
MAIN TIME INCREMENT .050 HOURS

ALTERNATE 1 STORM 1

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION 1	RUNOFF	2.46	11.09	---	2.71	17873	7265.4
XSECTION 5	REACH	2.46	11.09	8.21	3.32	10200	4146.3
XSECTION 10	REACH	2.46	11.09	9.08	3.96	7060	2869.9
XSECTION 2	RUNOFF	2.38	10.12	---	2.64	16996	7141.2
XSECTION 12	ADDHYD	4.84	10.62	---	2.64	17248	3563.6
XSECTION 12	DIVERT	4.84	5.98	---	2.25F	4100F	847.1
XSECTION 200	DIVERT	.00	5.98	---	2.64	13148	********
XSECTION 20	REACH	4.84	5.98	7.94	3.35F	4100F	847.1
XSECTION 25	REACH	4.84	5.98	5.03	3.40F	4100F	847.1
XSECTION 3	RUNOFF	3.94	11.10	---	2.73	28009	7108.9
XSECTION 30	REACH	3.94	11.10	6.29	3.40	16238	4121.3
XSECTION 5	REACH	3.94	11.10	8.50	4.00	11557	2933.2
XSECTION 25	REACH	3.94	11.10	8.90	4.06	11552	2932.0
XSECTION 4	RUNOFF	2.06	9.75	---	2.68	13580	6592.2
XSECTION 34	ADDHYD	6.00	10.63	---	2.69	13913	2318.8
XSECTION 35	ADDHYD	10.84	8.55	---	2.69	17992	1659.8
XSECTION 35	DIVERT	10.84	6.98	---	2.45F	11000F	1014.8
XSECTION 199	DIVERT	.00	6.98	---	2.69	6992	********
XSECTION 45	REACH	10.84	6.98	8.46	3.60F	11000F	1014.8
XSECTION 6	RUNOFF	1.47	11.12	---	2.44	14477	9848.3
XSECTION 60	REACH	1.47	11.12	9.94	2.65	11037	7508.2
XSECTION 67	REACH	1.47	11.12	7.60	2.98	7397	5032.0
XSECTION 64	ADDHYD	12.31	7.48	---	2.98	18394	1494.2
XSECTION 5	RUNOFF	4.78	9.96	---	2.67	32339	6765.5
XSECTION 7	RUNOFF	3.48	10.35	---	2.83	21194	6090.2
XSECTION 75	ADDHYD	8.26	10.12	---	2.72	51863	6278.8
XSECTION 76	ADDHYD	20.57	8.54	---	2.74	68291	3319.9
STRUCTURE 1	RESVOR	20.57	6.33	1215.97	3.71	24221	1177.5

SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.
QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;
LENGTH FACTOR - VALUE k* GREATER THAN 1.0;
ATT-KIN COEFF - VALUE C GREATER THAN 0.667.

BASEFLOW IS .0 CFS

ALTERNATE 1 STORM 1

XSEC ID	REACH LENGTH (FT)	FLOOD PLAIN LENGTH (FT)	HYDROGRAPH INFORMATION INFLOW PEAK (CFS)	INFLOW TIME (HR)	OUTFLOW PEAK (CFS)	OUTFLOW TIME (HR)	ROUTING PARAMETERS Q-A EQ. COEFF (X)	POWER (M)	LENGTH FACTOR (k*)	PEAK RATIO Q/I (Q*)	ATT-KIN COEFF (C)
5	9100		17866	2.7	10182	3.3	1.77	1.09	.634	.570	.08
10	9100		10182	3.3	7060	4.0	2.37	1.06	.361	.693	.08
20	3332		4100	2.3	4100	3.3	.14	1.63	.003	1.000	.50
25	1950		4100	3.3	4100	3.4	.052	1.73	.001	1.000	.65
30	8865		27941	2.8	16238	3.4	.95	1.15	.638	.581	.08
5	8865		16238	3.4	11557	4.0	1.76	1.09	.334	.712	.08
25	1950		11557	4.0	11551	4.1	.062	1.70	.002	.999	.84?
45	4200		11000	2.5	11000	3.6	.049	1.72	.003	1.000	.47
60	7540		14453	2.5	11037	2.7	.28	1.44	.236	.764	.24
67	5140		11037	2.7	7386	3.0	1.78	1.09	.367	.669	.13

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
STRUCTURE 1	20.57	
ALTERNATE 1		24221
XSECTION 1	2.46	
ALTERNATE 1		17873
XSECTION 2	2.38	
ALTERNATE 1		16996
XSECTION 3	3.94	
ALTERNATE 1		28009
XSECTION 4	2.06	
ALTERNATE 1		13580
XSECTION 5	4.78	
ALTERNATE 1		32339
XSECTION 6	1.47	
ALTERNATE 1		14477
XSECTION 7	3.48	
ALTERNATE 1		21194
XSECTION 10	2.46	
ALTERNATE 1		7060
XSECTION 12	4.84	
ALTERNATE 1		4100
XSECTION 20	4.84	
ALTERNATE 1		4100
XSECTION 25	3.94	
ALTERNATE 1		11552
XSECTION 30	3.94	
ALTERNATE 1		16238
XSECTION 34	6.00	

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1
XSECTION 34	6.00	
ALTERNATE 1		13913
XSECTION 35	10.84	
ALTERNATE 1		11000
XSECTION 45	10.84	
ALTERNATE 1		11000
XSECTION 60	1.47	
ALTERNATE 1		11037
XSECTION 64	12.31	
ALTERNATE 1		18394
XSECTION 67	1.47	
ALTERNATE 1		7397
XSECTION 75	8.26	
ALTERNATE 1		51863
XSECTION 76	20.57	
ALTERNATE 1		68291
XSECTION 199	.00	
ALTERNATE 1		6992
XSECTION 200	.00	
ALTERNATE 1		13148

ECON2 DATA FILE

```
ECON2
TITLE        WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE         6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT
FLOW-FREQ    -1         24221.                                        ALT  1   1
FLOW-FREQ     1         17873.                                        ALT  1   2
FLOW-FREQ     2         16996.                                        ALT  1   3
FLOW-FREQ     3         28009.                                        ALT  1   4
FLOW-FREQ     4         13580.                                        ALT  1   5
FLOW-FREQ     5         32339.                                        ALT  1   6
FLOW-FREQ     6         14477.                                        ALT  1   7
FLOW-FREQ     7         21194.                                        ALT  1   8
FLOW-FREQ    10          7060.                                        ALT  1   9
FLOW-FREQ    12          4100.                                        ALT  1  10
FLOW-FREQ    20          4100.                                        ALT  1  11
FLOW-FREQ    25         11552.                                        ALT  1  12
FLOW-FREQ    30         16238.                                        ALT  1  13
FLOW-FREQ    34         13913.                                        ALT  1  14
FLOW-FREQ    35         11000.                                        ALT  1  15
FLOW-FREQ    45         11000.                                        ALT  1  16
FLOW-FREQ    60         11037.                                        ALT  1  17
FLOW-FREQ    64         18394.                                        ALT  1  18
FLOW-FREQ    67          7397.                                        ALT  1  19
FLOW-FREQ    75         51863.                                        ALT  1  20
FLOW-FREQ    76         68291.                                        ALT  1  21
FLOW-FREQ   199          6992.                                        ALT  1  22
FLOW-FREQ   200         13148.                                        ALT  1  23
```

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TR20 ------------------------------------------------------------------------ SCS -
WT3PMP6      WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS      VERSION
07/15/**      6HR LOCAL, INITIAL EMPTY RESERVOIR W/100-YR SEDIMENT      2.04TEST


END OF  1 JOBS IN THIS RUN


                    SCS  TR-20,  VERSION 2.04TEST
                          WT3PMP6   FILES

     INPUT  = 6L1200.DAT                                , GIVEN DATA FILE
     OUTPUT = 1200OUT.OUT                               , DATED 07/15/**,17:50:47

              FILES GENERATED - DATED 07/15/**,17:50:47

    FILE kkk.TEC CONTAINS ECON2 INFORMATION

    FILE kkk.TRD CONTAINS READHD INFORMATION


           TOTAL NUMBER OF WARNINGS =   0,  MESSAGES =   2

                        JOB ENDED AT 17:50:47
                    *** TR-20 RUN COMPLETED ***
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******************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY******************

JOB TR-20 WT3PMP72  ECON                PASS=001  SUMMARY
TITLE     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE     72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED
 5 RAINFL 1            0.1                                          6HRLOCAL
 8          .0000      .003       .006       .009       .013
 8          .016       .020       .025       .030       .035
 8          .039       .046       .052       .058       .065
 8          .071       .080       .090       .099       .109
 8          .118       .283       .449       .567       .622
 8          .669       .701       .732       .756       .780
 8          .795       .809       .824       .838       .852
 8          .866       .876       .885       .894       .904
 8          .913       .920       .926       .932       .939
 8          .945       .950       .954       .959       .964
 8          .969       .972       .976       .980       .984
 8          .988       .991       .993       .995       .998
 8          1.         1.         1.         1.         1.
 9 ENDTBL
 5 RAINFL 2            .1                                           6HR GEN
 8          .000       .005       .013       .020       .028
 8          .038       .045       .053       .060       .070
 8          .080       .085       .095       .108       .120
 8          .138       .150       .165       .190       .210
 8          .238       .280       .350       .440       .550
 8          .590       .620       .645       .668       .685
 8          .700       .720       .735       .753       .765
 8          .775       .790       .800       .810       .820
 8          .835       .843       .850       .863       .870
 8          .880       .890       .898       .908       .915
 8          .925       .930       .940       .945       .955
 8          .963       .970       .978       .985       .990
 8          1.00       1.00       1.00       1.00       1.00
 9 ENDTBL
 5 RAINFL 3            0.1                                          12HRGEN
 8          .000       .003       .007       .010       .013
 8          .016       .019       .022       .025       .028
 8          .031       .034       .037       .040       .043
 8          .045       .050       .054       .058       .062
 8          .066       .071       .075       .080       .085
 8          .089       .095       .101       .107       .112
 8          .118       .125       .132       .139       .146
 8          .153       .162       .171       .180       .189
 8          .198       .211       .224       .237       .250
 8          .264       .300       .345       .391       .436
 8          .491       .536       .564       .586       .607
 8          .629       .643       .657       .672       .686
 8          .700       .711       .721       .732       .742
 8          .753       .761       .769       .778       .786
 8          .795       .802       .809       .817       .824
 8          .832       .837       .843       .848       .854
 8          .859       .865       .870       .875       .881
 8          .886       .891       .895       .900       .905
 8          .909       .913       .917       .921       .925
 8          .929       .933       .936       .940       .944
 8          .948       .951       .954       .957       .960
 8          .963       .966       .969       .971       .974
```

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8          .977        .980        .982        .984        .986
8          .989        .991        .993        .995        .998
8          1.000      01.000       1.000       1.000       1.00
9 ENDTBL
5 RAINFL 4             0.1                                                18HRGEN
8          .000        .001        .002        .003        .004
8          .005        .005        .006        .007        .008
8          .009        .012        .014        .017        .020
8          .023        .025        .028        .031        .033
8          .036        .040        .044        .049        .053
8          .057        .061        .065        .070        .074
8          .078        .084        .090        .096        .102
8          .108        .114        .120        .126        .132
8          .138        .146        .154        .162        .170
8          .179        .187        .195        .203        .211
8          .220        .238        .256        .275        .293
8          .311        .330        .348        .367        .385
8          .403        .430        .457        .484        .511
8          .538        .557        .577        .597        .616
8          .636        .653        .670        .687        .704
8          .721        .734        .746        .759        .771
8          .784        .792        .801        .810        .818
8          .827        .832        .838        .843        .848
8          .853        .856        .859        .862        .864
8          .867        .870        .872        .875        .878
8          .880        .882        .885        .887        .889
8          .891        .893        .895        .897        .899
8          .901        .903        .905        .907        .909
8          .911        .912        .914        .916        .917
8          .919        .920        .922        .924        .925
8          .927        .929        .930        .932        .934
8          .935        .937        .938        .940        .941
8          .943        .945        .946        .948        .949
8          .951        .952        .953        .955        .956
8          .957        .959        .960        .961        .963
8          .964        .965        .967        .968        .970
8          .971        .972        .974        .975        .976
8          .978        .979        .980        .982        .983
8          .984        .985        .986        .988        .989
8          .990        .991        .992        .993        .994
8          .995        .996        .997        .998        .999
8          1.000       1.000       1.000       1.000       1.000
9 ENDTBL
5 RAINFL 5             0.1                                                24HRGEN
8          0.000       0.000       0.001       0.001       0.002
8          0.002       0.002       0.003       0.003       0.003
8          0.004       0.005       0.007       0.009       0.010
8          0.012       0.013       0.015       0.016       0.018
8          0.019       0.022       0.024       0.027       0.030
8          0.032       0.035       0.037       0.040       0.042
8          0.045       0.048       0.051       0.055       0.058
8          0.061       0.064       0.068       0.071       0.074
8          0.078       0.082       0.087       0.091       0.096
8          0.100       0.104       0.109       0.113       0.118
8          0.122       0.127       0.132       0.137       0.142
8          0.147       0.151       0.156       0.161       0.166
```

**********80-80 LIST OF INPUT DATA (CONTINUED)**********

```
8          0.171      0.177      0.184      0.191      0.198
8          0.205      0.214      0.224      0.233      0.242
8          0.252      0.265      0.278      0.291      0.303
8          0.316      0.334      0.351      0.368      0.386
8          0.403      0.425      0.447      0.468      0.490
8          0.512      0.527      0.543      0.558      0.574
8          0.589      0.603      0.617      0.631      0.645
8          0.659      0.671      0.684      0.696      0.709
8          0.721      0.731      0.741      0.751      0.761
8          0.771      0.779      0.786      0.793      0.800
8          0.808      0.814      0.820      0.825      0.831
8          0.837      0.840      0.843      0.847      0.850
8          0.853      0.855      0.857      0.859      0.861
8          0.864      0.866      0.868      0.870      0.872
8          0.874      0.876      0.878      0.880      0.881
8          0.883      0.885      0.886      0.888      0.890
8          0.891      0.893      0.895      0.896      0.898
8          0.899      0.901      0.902      0.904      0.905
8          0.907      0.908      0.909      0.910      0.912
8          0.913      0.914      0.915      0.916      0.917
8          0.919      0.920      0.921      0.922      0.923
8          0.924      0.926      0.927      0.928      0.929
8          0.930      0.932      0.933      0.935      0.936
8          0.938      0.940      0.941      0.943      0.944
8          0.946      0.947      0.947      0.948      0.949
8          0.950      0.950      0.951      0.952      0.953
8          0.953      0.955      0.956      0.957      0.958
8          0.959      0.960      0.961      0.962      0.963
8          0.964      0.965      0.966      0.967      0.968
8          0.969      0.970      0.971      0.972      0.973
8          0.974      0.975      0.976      0.977      0.978
8          0.979      0.980      0.981      0.982      0.983
8          0.984      0.985      0.986      0.987      0.988
8          0.988      0.989      0.990      0.991      0.991
8          0.992      0.993      0.994      0.995      0.995
8          0.996      0.997      0.998      0.998      0.999
8          1.000      1.000      1.000      1.000      1.000
9  ENDTBL
5 RAINFL 6            .25                                          48HRGEN
8          0.0000     0.0015     0.0029     0.0044     0.0058
8          0.0073     0.0088     0.0102     0.0117     0.0131
8          0.0146     0.0160     0.0175     0.0190     0.0204
8          0.0219     0.0233     0.0248     0.0263     0.0277
8          0.0292     0.0306     0.0321     0.0335     0.0350
8          0.0365     0.0379     0.0394     0.0408     0.0423
8          0.0438     0.0452     0.0467     0.0481     0.0496
8          0.0510     0.0525     0.0542     0.0558     0.0575
8          0.0592     0.0608     0.0625     0.0642     0.0658
8          0.0692     0.0725     0.0758     0.0792     0.0825
8          0.0858     0.0892     0.0925     0.0975     0.1025
8          0.1075     0.1125     0.1175     0.1225     0.1275
8          0.1325     0.1442     0.1560     0.1677     0.1794
8          0.1985     0.2176     0.2366     0.2557     0.3239
8          0.3921     0.4603     0.5285     0.5520     0.5754
8          0.5989     0.6224     0.6356     0.6488     0.6620
8          0.6752     0.6862     0.6972     0.7082     0.7192
```

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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8          0.7267      0.7342      0.7417      0.7492      0.7558
 8          0.7625      0.7692      0.7758      0.7825      0.7892
 8          0.7958      0.8025      0.8083      0.8142      0.8200
 8          0.8258      0.8308      0.8358      0.8408      0.8458
 8          0.8508      0.8558      0.8608      0.8658      0.8683
 8          0.8708      0.8733      0.8758      0.8783      0.8808
 8          0.8833      0.8858      0.8875      0.8892      0.8908
 8          0.8925      0.8942      0.8958      0.8975      0.8992
 8          0.9008      0.9025      0.9042      0.9058      0.9075
 8          0.9092      0.9108      0.9125      0.9140      0.9154
 8          0.9169      0.9183      0.9198      0.9213      0.9227
 8          0.9242      0.9256      0.9271      0.9285      0.9300
 8          0.9315      0.9329      0.9344      0.9358      0.9373
 8          0.9388      0.9402      0.9417      0.9431      0.9446
 8          0.9460      0.9475      0.9490      0.9504      0.9519
 8          0.9533      0.9548      0.9563      0.9577      0.9592
 8          0.9606      0.9621      0.9635      0.9650      0.9665
 8          0.9679      0.9694      0.9708      0.9723      0.9737
 8          0.9752      0.9767      0.9781      0.9796      0.9810
 8          0.9825      0.9840      0.9854      0.9869      0.9883
 8          0.9898      0.9912      0.9927      0.9942      0.9956
 8          0.9971      0.9985      1.0000      1.0000      1.0
 9 ENDTBL
 5 RAINFL 7            .25                                           72HRGEN
 8          0.0000      0.0005      0.0009      0.0014      0.0019
 8          0.0025      0.0032      0.0038      0.0044      0.0051
 8          0.0057      0.0063      0.0070      0.0076      0.0082
 8          0.0089      0.0095      0.0103      0.0111      0.0119
 8          0.0127      0.0134      0.0142      0.0150      0.0158
 8          0.0171      0.0184      0.0196      0.0209      0.0222
 8          0.0234      0.0247      0.0259      0.0272      0.0285
 8          0.0297      0.0310      0.0323      0.0335      0.0348
 8          0.0361      0.0375      0.0389      0.0403      0.0418
 8          0.0432      0.0446      0.0460      0.0475      0.0489
 8          0.0503      0.0517      0.0532      0.0546      0.0560
 8          0.0574      0.0589      0.0604      0.0620      0.0636
 8          0.0652      0.0668      0.0684      0.0699      0.0715
 8          0.0731      0.0747      0.0763      0.0778      0.0797
 8          0.0816      0.0835      0.0854      0.0877      0.0899
 8          0.0921      0.0943      0.0968      0.0994      0.1019
 8          0.1044      0.1073      0.1101      0.1130      0.1158
 8          0.1193      0.1228      0.1263      0.1297      0.1335
 8          0.1373      0.1411      0.1449      0.1491      0.1532
 8          0.1573      0.1614      0.1725      0.1837      0.1948
 8          0.2059      0.2241      0.2422      0.2603      0.2784
 8          0.3431      0.4078      0.4726      0.5373      0.5596
 8          0.5819      0.6042      0.6265      0.6390      0.6515
 8          0.6641      0.6766      0.6870      0.6975      0.7079
 8          0.7184      0.7255      0.7326      0.7397      0.7468
 8          0.7535      0.7601      0.7668      0.7734      0.7794
 8          0.7854      0.7915      0.7975      0.8030      0.8085
 8          0.8141      0.8196      0.8247      0.8297      0.8348
 8          0.8399      0.8443      0.8487      0.8532      0.8576
 8          0.8598      0.8620      0.8642      0.8665      0.8685
 8          0.8706      0.8726      0.8747      0.8766      0.8785
 8          0.8804      0.8823      0.8840      0.8858      0.8875
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8          0.8892      0.8908      0.8924      0.8940      0.8956
8          0.8972      0.8987      0.9003      0.9019      0.9035
8          0.9051      0.9066      0.9082      0.9098      0.9114
8          0.9130      0.9146      0.9160      0.9174      0.9188
8          0.9203      0.9217      0.9231      0.9245      0.9259
8          0.9274      0.9288      0.9302      0.9316      0.9329
8          0.9342      0.9354      0.9367      0.9380      0.9392
8          0.9405      0.9418      0.9430      0.9443      0.9456
8          0.9468      0.9481      0.9494      0.9506      0.9519
8          0.9530      0.9541      0.9552      0.9563      0.9574
8          0.9585      0.9597      0.9608      0.9619      0.9630
8          0.9641      0.9652      0.9661      0.9671      0.9680
8          0.9690      0.9699      0.9709      0.9718      0.9728
8          0.9736      0.9744      0.9752      0.9759      0.9767
8          0.9775      0.9783      0.9791      0.9797      0.9804
8          0.9810      0.9816      0.9823      0.9829      0.9835
8          0.9842      0.9847      0.9851      0.9856      0.9861
8          0.9866      0.9870      0.9875      0.9880      0.9884
8          0.9889      0.9894      0.9899      0.9902      0.9905
8          0.9908      0.9911      0.9915      0.9918      0.9921
8          0.9924      0.9927      0.9930      0.9934      0.9937
8          0.9940      0.9943      0.9946      0.9949      0.9953
8          0.9956      0.9959      0.9962      0.9965      0.9968
8          0.9972      0.9975      0.9978      0.9981      0.9984
8          0.9987      0.9989      0.9991      0.9992      0.9994
8          0.9995      0.9997      0.9998      1.0000      1.0000
9 ENDTBL
5 RAINFL 8     1       2.4                                          10-DAY
8          .0000       .0024       .0048       .0073       .0097
8          .0121       .0148       .0174       .0201       .0228
8          .0254       .0284       .0314       .0344       .0374
8          .0404       .0437       .0471       .0505       .0539
8          .0572       .0612       .0651       .0690       .0729
8          .0768       .0815       .0862       .0909       .0955
8          .1002       .1061       .1120       .1179       .1238
8          .1297       .1377       .1458       .1538       .1618
8          .1699       .1832       .1966       .2099       .2232
8          .2366       .2548       .2778       .3093       .3614
8          1.092       1.174       1.213       1.240       1.260
8          1.276       1.286       1.296       1.306       1.316
8          1.326       1.333       1.340       1.347       1.354
8          1.360       1.365       1.371       1.376       1.381
8          1.386       1.391       1.395       1.399       1.403
8          1.408       1.411       1.415       1.418       1.422
8          1.426       1.429       1.432       1.435       1.438
8          1.442       1.444       1.447       1.450       1.453
8          1.456       1.458       1.461       1.463       1.466
8          1.468       1.471       1.473       1.475       1.477
8          1.48        1.48        1.48        1.48        1.48
9 ENDTBL
4 DIMHYD               .0556                                          WT3
8          0.0         .03         .10         .19         .31
8          .47         .66         .82         .93         .99
8          1.0         .99         .93         .82         .66
8          .47         .31         .03         .00         .00
9 ENDTBL
```

```
2 XSECTN   005        1.0        8.77                          BOSSCS#5
8                     0.         0.0        0.0
8                     0.35       5.         5.56
8                     1.03       50.        30.95
8                     1.39       100.       52.16
8                     1.94       200.       88.72
8                     2.63       400.       148.61
8                     3.51       800.       260.63
8                     4.62       1600.      459.66
8                     6.04       3200.      929.36
8                     7.38       6400.      1811.51
8                     8.77       12800.     3374.20
8                     10.17      25600.     6398.87
8                     11.89      51200.     10982.51
9 ENDTBL
2 XSECTN   010        1.0        8.94                          BOSSCS#4
8                     0.         0.0        0.0
8                     0.91       5.         4.95
8                     2.03       50.        24.80
8                     2.63       100.       41.32
8                     3.34       200.       74.14
8                     4.15       400.       130.28
8                     5.23       800.       223.37
8                     6.41       1600.      447.51
8                     7.65       3200.      898.64
8                     8.94       6400.      1690.88
8                     10.29      12800.     3331.95
8                     11.64      25600.     6185.81
8                     13.14      51200.     10661.04
9 ENDTBL
2 XSECTN   020        1.0        7.3                           REACHC
8                     0.         0.0        0.0
8                     1.01       100.       57.78
8                     1.49       200.       86.81
8                     1.88       300.       110.25
8                     2.49       500.       149.47
8                     3.68       1000.      226.31
8                     5.40       2000.      346.26
8                     7.85       4000.      533.39
8                     9.64       6000.      688.07
8                     11.16      8000.      838.10
8                     12.46      10000.     985.31
8                     13.61      12000.     1122.03
8                     14.56      14000.     1236.94
8                     15.43      16000.     1345.18
8                     16.31      18000.     1456.68
9 ENDTBL
2 XSECTN   025        1.0        7.3                           REACHB
8                     0.         0.0        0.0
8                     0.63       100.       80.89
8                     0.93       200.       120.32
8                     1.17       300.       151.77
8                     1.56       500.       203.28
8                     2.30       1000.      302.00
8                     3.38       2000.      449.24
8                     4.97       4000.      673.73
```

```
8                       6.23        6000.       855.96
8                       7.31        8000.       1016.35
8                       8.24        10000.      1158.51
8                       9.09        12000.      1293.31
8                       9.90        14000.      1425.57
8                       10.64       16000.      1549.17
8                       11.36       18000.      1673.11
9 ENDTBL
2 XSECTN    030         1.0         9.45                                BOSSCS#6
8                       0.          0.0         0.0
8                       0.77        5.          4.67
8                       1.54        50.         32.06
8                       1.78        100.        56.64
8                       2.10        200.        100.59
8                       2.50        400.        179.97
8                       3.01        800.        320.25
8                       3.63        1600.       589.66
8                       4.35        3200.       1110.72
8                       5.21        6400.       2084.48
8                       6.03        12800.      4119.83
8                       6.99        25600.      6856.75
8                       8.28        51200.      11085.87
9 ENDTBL
2 XSECTN    045         1.0         4.87                                REACHA
8                       0.          0.0         0.0
8                       0.60        100.        85.69
8                       0.90        200.        127.94
8                       1.13        300.        161.93
8                       1.52        500.        217.27
8                       2.25        1000.       324.03
8                       3.31        2000.       483.02
8                       4.87        4000.       722.17
8                       6.09        6000.       914.99
8                       7.15        8000.       1084.61
8                       8.05        10000.      1234.17
8                       8.87        12000.      1373.80
8                       9.64        14000.      1507.84
8                       10.34       16000.      1633.45
8                       11.00       18000.      1753.12
9 ENDTBL
2 XSECTN    060         1.0         4.7                                 2CP6CP7
8                       0.          0.0         0.0
8                       2.36        100.        45.12
8                       2.88        200.        83.75
8                       3.18        300.        114.33
8                       3.64        500.        172.72
8                       4.42        1000.       289.04
8                       5.40        2000.       470.72
8                       6.87        4000.       782.74
8                       7.91        6000.       1020.12
8                       8.79        8000.       1231.25
8                       9.60        10000.      1435.05
8                       10.26       12000.      1618.34
8                       10.94       14000.      1812.58
8                       11.47       16000.      1983.46
8                       11.96       18000.      2150.12
```

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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 9 ENDTBL
 2 XSECTN   067          1.0         8.77                                BOSSCS#5
 8                       0.          0.0         0.0
 8                       0.35        5.          5.56
 8                       1.03        50.         30.95
 8                       1.39        100.        52.16
 8                       1.94        200.        88.72
 8                       2.63        400.        148.61
 8                       3.51        800.        260.63
 8                       4.62        1600.       459.66
 8                       6.04        3200.       929.36
 8                       7.38        6400.       1811.51
 8                       8.77        12800.      3374.20
 8                       10.17       25600.      6398.87
 8                       11.89       51200.      10982.51
 9 ENDTBL
 3 STRUCT       01                                                           95/11/6
 8                       1178.0      0.0         0.
 8                       1188.0      0.02        44.8
 8                       1196.8      0.13        300.
 8                       1199.2      0.21        500.
 8                       1202.0      159.0       845.55
 8                       1204.0      187.75      1176.28
 8                       1206.0      214.9       1575.25
 8                       1208.0      240.3       2044.97
 8                       1210.0      265.4       2593.40
 8                       1212.0      289.00      3218.00
 8                       1213.0      2894.00     3556.67
 8                       1214.0      8446.00     3916.02
 8                       1215.0      15766.0     4294.13
 8                       1216.0      24500.0     4692.68
 8                       1217.0      34446.0     5113.19
 8                       1218.0      45471.0     5556.01
 8                       1219.0      57477.0     6021.50
 8                       1220.0      70391.0     6509.75
 9 ENDTBL
 6 RUNOFF 1 001       1 2.46         87.2        0.85        1 1
 6 REACH  3 005   1   7 9100.                                 1           BOSS#6
 6 REACH  3 010   7   2 9100.                                 1           BOSS#4
 6 RUNOFF 1 002       3 2.38         79.9        0.73        1 1
 6 ADDHYD 4 012   2 3 1                                       1 1
 6 DIVERT 6 012   1 4 7 4100.        1.00        200.        1 1         OLIVE
 6 REACH  3 020   4   7 3332.                                 1           REACH C
 6 REACH  3 025   7   5 1950.                                 1           REACH B
 6 RUNOFF 1 003       6 3.94         87.2        0.88        1 1
 6 REACH  3 030   6   7 8865.                                 1           BOSS#6
 6 REACH  3 005   7   1 8865.                                 1           BOSS#5
 6 REACH  3 025   1   7 1950.                                 1           REACH B
 6 RUNOFF 1 004       1 2.06         77.3        0.79        1 1
 6 ADDHYD 4 034   7 1 2                                       1 1
 6 ADDHYD 4 035   5 2 3                                       1 1
 6 DIVERT 6 035   3 4 7 11000.       1.00        199.        1 1         NORTHERN
 6 REACH  3 045   4   5 4200.                                 1           REACH A
 6 RUNOFF 1 006       2 1.47         87.7        0.47        1 1
 6 REACH  3 060   2   3 7540.                                 1           CP6CP7
 6 REACH  3 067   3   4 5140.                                 1           BOSS#5
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incl. prime spwy

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**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 6 ADDHYD 4 064    5 4 3                                        1 1
 6 RUNOFF 1 005        6 4.78        78.8        0.78          1 1
 6 RUNOFF 1 007        7 3.48        81.7        1.01          1 1
 6 ADDHYD 4 075    6 7 1                                        1 1
 6 ADDHYD 4 076    1 3 2                                        1 1      1
 6 RESVOR 2     01 2   1 1200.0                                 1 1      1
   ENDATA
 7 LIST                  1.0                       1.
 7 INCREM 6              0.20
 7 COMPUT 7 001       01 0.          15.8         1.0          7 2  01  07
   ENDCMP 1
   ENDJOB 2

********************************END OF 80-80 LIST********************************
```

RUNOFF OPTION USED WITH RAINTABLE NO. 8, RUNOFF CURVE NO. = 100.

COMPUTED DIMHYD PEAK RATE FACTOR = 664.607

```
EXECUTIVE CONTROL  LIST          1.          0.          1.

          LISTING OF CURRENT DATA


                     COMPUTED TIME INCREMENT
DIMHYD                        .0556

                  .0000       .0300       .1000       .1900       .3100
                  .4700       .6600       .8200       .9300       .9900
                 1.0000       .9900       .9300       .8200       .6600
                  .4700       .3100       .0300       .0000       .0000
ENDTBL

   COMPUTED PEAK RATE FACTOR =  664.607
```

TABLE NO.		TIME INCREMENT				
RAINFL	1	.1000				
		.0000	.0030	.0060	.0090	.0130
		.0160	.0200	.0250	.0300	.0350
		.0390	.0460	.0520	.0580	.0650
		.0710	.0800	.0900	.0990	.1090
		.1180	.2830	.4490	.5670	.6220
		.6690	.7010	.7320	.7560	.7800
		.7950	.8090	.8240	.8380	.8520
		.8660	.8760	.8850	.8940	.9040
		.9130	.9200	.9260	.9320	.9390
		.9450	.9500	.9540	.9590	.9640
		.9690	.9720	.9760	.9800	.9840
		.9880	.9910	.9930	.9950	.9980
		1.0000	1.0000	1.0000	1.0000	1.0000

ENDTBL

STANDARD CONTROL INSTRUCTIONS

```
RUNOFF      1       1      2.4600     87.2000      .85001 1 0 0 0 1
REACH       5   1   7   9100.0000       .0000      .00001 0 0 0 0 1
REACH      10   7   2   9100.0000       .0000      .00001 0 0 0 0 1
RUNOFF      2       3      2.3800     79.9000      .73001 1 0 0 0 1
ADDHYD     12   2 3 1                                   1 1 0 0 0 1
DIVERT     12   1 4 7   4100.0000      1.0000   200.00001 1 0 0 0 1
REACH      20   4   7   3332.0000       .0000      .00001 0 0 0 0 1
REACH      25   7   5   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      3       6      3.9400     87.2000      .88001 1 0 0 0 1
REACH      30   6   7   8865.0000       .0000      .00001 0 0 0 0 1
REACH       5   7   1   8865.0000       .0000      .00001 0 0 0 0 1
REACH      25   1   7   1950.0000       .0000      .00001 0 0 0 0 1
RUNOFF      4       1      2.0600     77.3000      .79001 1 0 0 0 1
ADDHYD     34   7 1 2                                   1 1 0 0 0 1
ADDHYD     35   5 2 3                                   1 1 0 0 0 1
DIVERT     35   3 4 7  11000.0000      1.0000   199.00001 1 0 0 0 1
REACH      45   4   5   4200.0000       .0000      .00001 0 0 0 0 1
RUNOFF      6       2      1.4700     87.7000      .47001 1 0 0 0 1
REACH      60   2   3   7540.0000       .0000      .00001 0 0 0 0 1
REACH      67   3   4   5140.0000       .0000      .00001 0 0 0 0 1
ADDHYD     64   5 4 3                                   1 1 0 0 0 1
RUNOFF      5       6      4.7800     78.8000      .78001 1 0 0 0 1
RUNOFF      7       7      3.4800     81.7000     1.01001 1 0 0 0 1
ADDHYD     75   6 7 1                                   1 1 0 0 0 1
ADDHYD     76   1 3 2                                   1 1 0 0 1 1
RESVOR        1 2   1   1200.0000                       1 1 0 0 1 1
ENDATA
```

END OF LISTING

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .200 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 1
STARTING TIME = .00 RAIN DEPTH = 15.80 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .200 HOURS
ALTERNATE NO. = 1 STORM NO. = 7 RAIN TABLE NO. = 7

OPERATION RUNOFF XSECTION 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.01	6290.9	(RUNOFF)
37.14	222.8	(RUNOFF)
42.48	160.6	(RUNOFF)
43.88	160.6	(RUNOFF)
45.39	144.8	(RUNOFF)
46.63	144.8	(RUNOFF)
48.53	128.1	(RUNOFF)
49.25	128.1	(RUNOFF)
50.01	128.2	(RUNOFF)
50.78	128.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.46 SQ.MI.

HRS								
6.80 CFS	.23	.99	2.60	4.92	7.41	9.80	12.16	14.48
8.40 CFS	16.85	19.25	21.48	23.29	25.31	27.59	29.55	31.06
10.00 CFS	32.94	35.51	38.49	41.46	44.22	46.72	49.35	51.53
11.60 CFS	52.88	53.84	55.72	58.23	60.26	61.25	61.85	63.48
13.20 CFS	65.94	67.81	68.54	68.83	70.26	73.02	76.35	79.85
14.80 CFS	83.14	86.13	88.09	89.48	90.66	91.14	91.12	92.08
16.40 CFS	94	97	98	98	100	105	113	121
18.00 CFS	124	127	135	144	151	152	154	162
19.60 CFS	172	180	184	186	193	204	212	215
21.20 CFS	220	234	253	270	275	277	284	296
22.80 CFS	306	311	315	325	337	345	350	394
24.40 CFS	545	760	926	983	1033	1205	1437	1616
26.00 CFS	1680	1996	3130	4708	5958	6290	6037	5038
27.60 CFS	3598	2474	2209	2138	1905	1567	1316	1248
29.20 CFS	1233	1182	1109	1057	1041	1019	937	822
30.80 CFS	735	709	707	696	681	669	665	660
32.40 CFS	643	621	606	604	601	587	568	556
34.00 CFS	554	552	540	522	510	507	504	489
35.60 CFS	465	448	444	429	373	294	237	222
37.20 CFS	223	219	212	207	206	205	202	197
38.80 CFS	192	190	189	185	179	176	174	172
40.40 CFS	167	164	161	161	161	160	158	156
42.00 CFS	157	159	160	160	159	157	156	158
43.60 CFS	160	161	161	159	154	147	142	142

45.20 CFS	144	145	144	141	141	141	143	145
46.80 CFS	144	142	140	137	134	130	127	126
48.40 CFS	128	128	126	127	128	128	126	127
50.00 CFS	128	127	126	127	128	127	125	122
51.60 CFS	117	112	110	110	110	111	112	114
53.20 CFS	115	113	111	110	110	109	104	99
54.80 CFS	95.92	95.49	95.53	95.31	95.58	95.24	95.48	94.73
56.40 CFS	91.62	86.71	81.65	79.19	77.09	76.07	77.39	79.64
58.00 CFS	80.28	78.85	74.36	69.21	65.85	64.21	62.73	63.19
59.60 CFS	64.51	63.90	62.57	63.01	60.90	54.36	47.42	46.33
61.20 CFS	48.46	49.63	48.07	46.12	46.28	47.66	47.31	45.89
62.80 CFS	46.76	48.96	48.66	43.81	36.83	31.65	30.19	30.89
64.40 CFS	32.94	34.37	33.62	31.35	30.17	30.15	30.41	31.81
66.00 CFS	33.98	34.30	32.52	30.50	30.15	30.18	30.92	32.95
67.60 CFS	34.48	33.68	31.30	30.16	30.15	30.33	31.78	33.88
69.20 CFS	34.35	32.60	30.51	30.15	30.11	29.43	26.91	23.19
70.80 CFS	19.16	16.26	15.21	14.96	15.26	14.90	15.12	14.45
72.40 CFS	11.29	6.32	1.19	.00				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22681 CFS-HRS; 1874.3 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.54	4816.3	6.72
42.76	160.0	1.72
44.25	159.6	1.72
46.94	143.7	1.63
51.01	127.5	1.54
53.42	113.7	1.47
63.33	48.1	1.00
66.47	32.9	.77
68.00	32.7	.77
69.50	32.6	.77

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22692 CFS-HRS; 1875.3 ACRE-FEET.

OPERATION REACH XSECTION 10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.12	3932.3	7.95
44.51	159.4	3.05
68.36	32.2	1.59
69.88	32.1	1.58

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 22690 CFS-HRS; 1875.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.97	5804.6	(RUNOFF)
27.91	2083.0	(RUNOFF)
32.95	574.5	(RUNOFF)
33.97	527.8	(RUNOFF)
34.96	482.6	(RUNOFF)
35.91	425.5	(RUNOFF)
37.12	212.6	(RUNOFF)
41.10	153.0	(RUNOFF)
42.43	153.0	(RUNOFF)
43.72	153.1	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.38 SQ.MI.

HRS								
9.40 CFS	.14	.63	1.68	3.16	4.81	6.60	8.47	10.27
11.00 CFS	12.14	14.12	15.84	17.19	18.61	20.39	22.36	23.92
12.60 CFS	24.94	26.12	27.84	29.82	31.23	32.00	32.96	34.62
14.20 CFS	36.86	39.25	41.70	44.25	46.40	47.92	49.37	50.69
15.80 CFS	51.39	51.89	53.40	55.71	57.36	58.57	59.27	60.59
17.40 CFS	65.67	72.65	76.93	78.70	82.05	89.12	96.33	99.53
19.00 CFS	101	104	111	119	125	127	129	138
20.60 CFS	147	152	155	161	174	192	201	204
22.20 CFS	207	216	228	235	239	244	255	267
23.80 CFS	272	274	324	491	691	792	812	882
25.40 CFS	1076	1303	1422	1470	1892	3231	4839	5662
27.00 CFS	5799	5531	4259	2748	2071	2073	1988	1688
28.60 CFS	1339	1182	1177	1158	1092	1019	987	985
30.20 CFS	955	852	729	672	672	669	656	639
31.80 CFS	630	630	624	603	580	573	574	569
33.40 CFS	551	532	526	528	524	508	489	481
35.00 CFS	482	479	457	432	422	423	401	330
36.60 CFS	249	212	211	212	207	199	196	196
38.20 CFS	195	191	185	181	181	180	174	169
39.80 CFS	167	166	162	158	155	153	153	153
41.40 CFS	152	150	148	150	152	153	153	151
43.00 CFS	149	149	152	153	153	153	151	145
44.60 CFS	137	134	136	138	138	136	134	134
46.20 CFS	135	138	139	137	134	133	130	126
47.80 CFS	122	120	121	123	122	120	121	123
49.40 CFS	121	120	122	123	120	120	123	122
51.00 CFS	120	119	115	109	106	105	105	105
52.60 CFS	106	108	110	109	107	105	105	105
54.20 CFS	103	98	93	91	91	91	91	91
55.80 CFS	91.23	91.13	90.16	86.63	80.12	76.62	75.20	72.57

57.40 CFS	72.39	75.00	76.69	76.65	74.70	68.97	64.00	62.46
59.00 CFS	60.92	59.14	61.17	62.23	60.18	59.29	60.96	57.31
60.60 CFS	48.43	43.26	44.74	47.42	47.41	45.10	43.32	44.67
62.20 CFS	46.36	44.37	43.36	45.53	47.73	46.08	39.71	32.21
63.80 CFS	28.79	28.81	29.70	32.36	33.49	31.36	29.05	28.80
65.40 CFS	28.79	29.11	31.05	33.35	32.66	29.83	28.80	28.80
67.00 CFS	28.82	29.71	32.40	33.52	31.37	29.04	28.80	28.80
68.60 CFS	29.10	31.02	33.34	32.68	29.88	28.80	28.80	28.77
70.20 CFS	27.82	24.66	20.68	17.06	14.62	14.36	14.56	14.23
71.80 CFS	14.45	14.35	13.29	9.79	3.54	.17		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.26 WATERSHED INCHES; 20363 CFS-HRS; 1682.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.15	7758.9	(NULL)
28.05	5991.2	(NULL)
42.16	319.5	(NULL)
43.60	313.0	(NULL)
45.17	294.5	(NULL)
46.50	285.0	(NULL)
48.33	261.8	(NULL)
49.13	256.0	(NULL)
49.92	252.4	(NULL)
50.66	250.9	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
7.60 CFS	.31	.76	1.47	2.44	3.66	5.08	6.68	8.43
9.20 CFS	10.32	12.37	14.83	17.89	21.39	25.05	28.81	32.69
10.80 CFS	36.59	40.66	44.94	49.03	52.79	56.64	60.79	64.98
12.40 CFS	68.67	71.80	75.05	78.77	82.60	85.76	88.29	91.01
14.00 CFS	94	98	102	106	110	114	118	122
15.60 CFS	125	128	131	135	139	142	145	147
17.20 CFS	150	156	165	171	175	181	192	202
18.80 CFS	210	215	223	235	249	260	266	275
20.40 CFS	289	304	314	323	335	355	379	395
22.00 CFS	406	418	436	457	473	486	500	520
23.60 CFS	540	553	564	622	797	1008	1131	1193
25.20 CFS	1323	1589	1892	2095	2242	2778	4235	5976
26.80 CFS	7013	7503	7727	7011	6032	5765	5982	5910
28.40 CFS	5496	4966	4590	4337	4052	3727	3415	3168
30.00 CFS	2974	2775	2526	2277	2110	2006	1905	1801
31.60 CFS	1705	1627	1568	1510	1446	1387	1348	1322
33.20 CFS	1292	1252	1214	1191	1177	1158	1128	1097
34.80 CFS	1077	1067	1052	1020	984	965	955	921
36.40 CFS	838	745	693	671	644	609	573	543
38.00 CFS	519	497	475	454	437	426	414	400

39.60 CFS	388	380	373	364	355	347	341	337
41.20 CFS	334	330	324	320	319	319	318	316
42.80 CFS	313	310	310	313	313	313	312	310
44.40 CFS	304	297	293	294	294	293	288	285
46.00 CFS	284	283	285	285	282	279	278	274
47.60 CFS	270	265	262	261	262	258	255	255
49.20 CFS	256	252	250	252	252	249	249	251
50.80 CFS	250	248	246	243	236	232	231	230
52.40 CFS	228	226	227	227	226	222	220	220
54.00 CFS	220	217	211	205	203	201	200	198
55.60 CFS	196	194	193	191	186	179	174	172
57.20 CFS	167	165	165	165	163	159	153	147
58.80 CFS	144	141	137	137	137	133	130	130
60.40 CFS	126	116	110	110	110	108	104	100
62.00 CFS	99.93	100.12	96.80	94.73	96.04	97.46	95.17	88.45
63.60 CFS	80.75	76.90	75.87	75.11	75.80	74.97	71.19	67.60
65.20 CFS	66.31	65.31	64.63	65.66	67.17	65.92	62.83	61.76
66.80 CFS	61.70	61.52	62.12	64.50	65.36	63.16	60.98	60.96
68.40 CFS	61.01	61.18	62.91	65.00	64.23	61.54	60.71	60.90
70.00 CFS	60.84	59.75	56.38	52.13	48.04	44.79	43.32	41.96
71.60 CFS	39.92	38.46	36.84	34.42	29.76	22.49	18.03	16.46
73.20 CFS	14.61	12.59	10.60	8.78	7.18	5.80	4.65	3.70
74.80 CFS	2.93	2.30	1.80	1.41	1.09	.85	.65	.50
76.40 CFS	.38							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.78 WATERSHED INCHES; 43053 CFS-HRS; 3557.9 ACRE-FEET.

OPERATION DIVERT XSECTION 12
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	(DIVERT)
42.16	319.5	(DIVERT)
43.60	313.0	(DIVERT)
45.17	294.5	(DIVERT)
46.50	285.0	(DIVERT)
48.33	261.8	(DIVERT)
49.13	256.0	(DIVERT)
49.92	252.4	(DIVERT)
50.66	250.9	(DIVERT)
52.97	227.5	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.84 SQ.MI.

HRS								
7.60 CFS	.31	.76	1.47	2.44	3.66	5.08	6.68	8.43
9.20 CFS	10.32	12.37	14.83	17.89	21.39	25.05	28.81	32.69
10.80 CFS	36.59	40.66	44.94	49.03	52.79	56.64	60.79	64.98

12.40 CFS	68.67	71.80	75.05	78.77	82.60	85.76	88.29	91.01
14.00 CFS	94	98	102	106	110	114	118	122
15.60 CFS	125	128	131	135	139	142	145	147
17.20 CFS	150	156	165	171	175	181	192	202
18.80 CFS	210	215	223	235	249	260	266	275
20.40 CFS	289	304	314	323	335	355	379	395
22.00 CFS	406	418	436	457	473	486	500	520
23.60 CFS	540	553	564	622	797	1008	1131	1193
25.20 CFS	1323	1589	1892	2095	2242	2778	4100	4100
26.80 CFS	4100	4100	4100	4100	4100	4100	4100	4100
28.40 CFS	4100	4100	4100	4100	4052	3727	3415	3168
30.00 CFS	2974	2775	2526	2277	2110	2006	1905	1801
31.60 CFS	1705	1627	1568	1510	1446	1387	1348	1322
33.20 CFS	1292	1252	1214	1191	1177	1158	1128	1097
34.80 CFS	1077	1067	1052	1020	984	965	955	921
36.40 CFS	838	745	693	671	644	609	573	543
38.00 CFS	519	497	475	454	437	426	414	400
39.60 CFS	388	380	373	364	355	347	341	337
41.20 CFS	334	330	324	320	319	319	318	316
42.80 CFS	313	310	310	313	313	313	312	310
44.40 CFS	304	297	293	294	294	293	288	285
46.00 CFS	284	283	285	285	282	279	278	274
47.60 CFS	270	265	262	261	262	258	255	255
49.20 CFS	256	252	250	252	252	249	249	251
50.80 CFS	250	248	246	243	236	232	231	230
52.40 CFS	228	226	227	227	226	222	220	220
54.00 CFS	220	217	211	205	203	201	200	198
55.60 CFS	196	194	193	191	186	179	174	172
57.20 CFS	167	165	165	165	163	159	153	147
58.80 CFS	144	141	137	137	137	133	130	130
60.40 CFS	126	116	110	110	110	108	104	100
62.00 CFS	99.93	100.12	96.80	94.73	96.04	97.46	95.17	88.45
63.60 CFS	80.75	76.90	75.87	75.11	75.80	74.97	71.19	67.60
65.20 CFS	66.31	65.31	64.63	65.66	67.17	65.92	62.83	61.76
66.80 CFS	61.70	61.52	62.12	64.50	65.36	63.16	60.98	60.96
68.40 CFS	61.01	61.18	62.91	65.00	64.23	61.54	60.71	60.90
70.00 CFS	60.84	59.75	56.38	52.13	48.04	44.79	43.32	41.96
71.60 CFS	39.92	38.46	36.84	34.42	29.76	22.49	18.03	16.46
73.20 CFS	14.61	12.59	10.60	8.78	7.18	5.80	4.65	3.70
74.80 CFS	2.93	2.30	1.80	1.41	1.09	.85	.65	.50
76.40 CFS	.38							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 200)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.15	3658.9	(DIVERT)
28.05	1891.2	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = .00 SQ.MI.

HRS								
26.20 CFS	0	135	1876	2913	3403	3627	2911	1932
27.80 CFS	1665	1882	1810	1396	866	490	237	0

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5055 CFS-HRS; 417.7 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 20. ***

OPERATION REACH XSECTION 20

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	7.94
42.16	319.5	1.94
43.60	313.0	1.92
45.17	294.5	1.86
46.50	285.0	1.82
48.33	261.8	1.73
49.13	256.0	1.71
49.92	252.4	1.69
50.66	250.9	1.69
52.97	227.5	1.60

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 25. ***

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
26.40	4100.0 *	5.03
42.16	319.5	1.21
43.60	313.0	1.20
45.17	294.5	1.16
46.50	285.0	1.13
48.33	261.8	1.08
49.13	256.0	1.06
49.92	252.4	1.06
50.66	250.9	1.05
52.97	227.5	1.00

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.16 WATERSHED INCHES; 37998 CFS-HRS; 3140.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.03	10040.5	(RUNOFF)
37.12	356.5	(RUNOFF)
41.10	257.2	(RUNOFF)
42.50	257.2	(RUNOFF)
43.87	257.2	(RUNOFF)
45.40	231.7	(RUNOFF)
46.65	231.7	(RUNOFF)
48.55	205.0	(RUNOFF)
50.03	205.0	(RUNOFF)
50.79	205.1	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 3.94 SQ.MI.

HRS								
6.80 CFS	.34	1.45	3.89	7.54	11.53	15.39	19.17	22.84
8.40 CFS	26.59	30.43	34.07	37.14	40.32	43.87	47.03	49.53
10.00 CFS	52.51	56.50	61.23	65.95	70.39	74.49	78.70	82.25
11.60 CFS	85	86	89	93	96	98	99	101
13.20 CFS	105	108	110	110	112	117	122	127
14.80 CFS	133	138	141	143	145	146	146	147
16.40 CFS	151	154	157	158	159	167	180	192
18.00 CFS	198	203	215	230	241	244	247	258
19.60 CFS	274	287	294	297	308	325	339	345
21.20 CFS	353	373	403	429	440	443	454	472
22.80 CFS	489	497	504	519	538	551	558	621
24.40 CFS	852	1184	1469	1571	1659	1902	2263	2558
26.00 CFS	2703	3170	4869	7282	9355	10029	9667	8221
27.60 CFS	5995	4199	3538	3445	3081	2567	2137	2004
29.20 CFS	1977	1901	1788	1701	1668	1637	1511	1335
30.80 CFS	1187	1138	1132	1117	1093	1073	1065	1058

32.40 CFS	1033	998	973	967	963	942	912	892
34.00 CFS	887	884	867	840	818	812	807	785
35.60 CFS	748	719	710	688	605	485	388	355
37.20 CFS	356	351	341	332	329	328	323	316
38.80 CFS	308	305	303	296	288	282	279	275
40.40 CFS	269	263	259	257	257	256	254	251
42.00 CFS	251	254	257	257	255	251	251	253
43.60 CFS	256	257	257	255	248	237	228	227
45.20 CFS	230	232	230	226	225	226	229	232
46.80 CFS	231	227	224	220	215	208	203	203
48.40 CFS	204	205	203	203	205	205	203	203
50.00 CFS	205	204	202	204	205	203	200	195
51.60 CFS	188	180	177	177	177	177	179	183
53.20 CFS	184	181	178	177	177	175	168	160
54.80 CFS	154	153	153	153	153	153	153	152
56.40 CFS	147	140	132	127	124	122	124	127
58.00 CFS	129	127	120	112	106	103	101	101
59.60 CFS	103	102	101	101	98	88	77	74
61.20 CFS	77.10	79.45	77.17	74.29	74.14	76.15	75.93	73.85
62.80 CFS	74.62	77.92	78.02	70.90	60.16	51.49	48.30	49.34
64.40 CFS	52.39	54.88	54.13	50.67	48.42	48.28	48.64	50.74
66.00 CFS	54.08	54.91	52.48	49.07	48.29	48.36	49.44	52.43
67.60 CFS	54.81	53.98	50.67	48.40	48.29	48.68	50.71	53.91
69.20 CFS	54.79	52.53	49.19	48.29	48.24	47.24	43.47	37.73
70.80 CFS	31.21	26.55	24.54	23.82	24.43	24.09	23.99	23.32
72.40 CFS	18.27	11.03	2.94	.12				

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.29 WATERSHED INCHES; 36347 CFS-HRS; 3003.7 ACRE-FEET.

OPERATION REACH XSECTION 30

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.78	7435.3	5.34
42.91	256.8	2.21
44.45	255.5	2.21
47.13	230.4	2.16
50.38	204.6	2.11
51.21	204.2	2.11
53.62	182.4	2.04
63.53	77.1	1.67
66.69	52.7	1.55
68.22	52.2	1.55

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36355 CFS-HRS; 3004.3 ACRE-FEET.

OPERATION REACH XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.39	6138.2	7.27
44.55	255.5	2.13
68.57	51.6	1.04
70.11	51.4	1.04

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36353 CFS-HRS; 3004.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 25. ***

OPERATION REACH XSECTION 25

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.39	6138.2	6.30
44.55	255.5	1.06
68.57	51.6	.32
70.11	51.4	.32

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.30 WATERSHED INCHES; 36353 CFS-HRS; 3004.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.01	4861.6	(RUNOFF)
32.92	492.2	(RUNOFF)
33.95	452.3	(RUNOFF)
37.13	182.2	(RUNOFF)
42.46	131.5	(RUNOFF)
43.75	131.5	(RUNOFF)
45.36	118.9	(RUNOFF)
46.60	118.9	(RUNOFF)
49.22	105.4	(RUNOFF)
49.98	105.4	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 2.06 SQ.MI.

HRS								
10.60 CFS	.44	1.24	2.48	3.94	5.36	6.65	7.89	9.27
12.20 CFS	10.74	12.07	13.16	14.21	15.50	16.98	18.25	19.14
13.80 CFS	19.98	21.24	22.86	24.65	26.54	28.44	30.17	31.57
15.40 CFS	32.82	33.98	34.79	35.41	36.53	38.22	39.73	40.82
17.00 CFS	41.60	42.73	45.98	50.80	54.70	56.41	58.79	63.74
18.60 CFS	69.28	72.69	73.87	76.25	81.12	87.59	92.71	94.71

20.20 CFS	97	103	110	115	117	122	132	145
21.80 CFS	154	158	160	167	176	183	187	191
23.40 CFS	200	209	215	217	251	368	521	625
25.00 CFS	653	705	846	1029	1155	1197	1491	2480
26.60 CFS	3780	4657	4861	4677	3805	2608	1849	1768
28.20 CFS	1709	1489	1203	1026	1006	993	945	883
29.80 CFS	847	843	822	746	646	583	575	573
31.40 CFS	564	550	541	540	536	520	501	492
33.00 CFS	492	489	475	459	451	452	450	438
34.60 CFS	423	414	414	411	396	375	363	363
36.20 CFS	348	295	227	186	181	182	178	172
37.80 CFS	168	168	167	165	160	156	156	154
39.40 CFS	150	146	144	143	140	136	133	132
41.00 CFS	131	131	131	129	128	128	131	131
42.60 CFS	131	130	128	128	130	131	131	131
44.20 CFS	130	125	119	116	116	118	119	117
45.80 CFS	115	115	116	118	119	118	116	114
47.40 CFS	112	109	106	104	104	105	105	103
49.00 CFS	104	105	104	103	104	105	104	103
50.60 CFS	105	105	104	102	100	95	91	91
52.20 CFS	90.63	90.64	90.88	92.26	94.14	94.12	92.10	90.69
53.80 CFS	90.67	90.60	89.19	84.94	80.60	78.49	78.43	78.29
55.40 CFS	78.35	78.44	78.27	78.37	77.50	74.80	70.18	66.39
57.00 CFS	64.88	62.84	62.23	63.93	65.76	65.92	64.49	60.24
58.60 CFS	55.90	53.70	52.67	51.12	52.17	53.31	52.22	51.16
60.20 CFS	51.85	49.69	43.38	38.08	38.11	40.32	40.86	39.10
61.80 CFS	37.54	38.17	39.57	38.58	37.50	38.68	40.75	39.92
63.40 CFS	35.14	28.96	25.22	24.80	25.52	27.45	28.54	27.35
65.00 CFS	25.23	24.76	24.76	24.95	26.35	28.23	28.22	26.27
66.60 CFS	24.86	24.76	24.78	25.42	27.43	28.56	27.40	25.33
68.20 CFS	24.77	24.77	25.00	26.37	28.27	28.27	26.22	24.84
69.80 CFS	24.77	24.73	24.01	21.69	18.44	15.17	12.99	12.36
71.40 CFS	12.40	12.44	12.29	12.40	11.54	8.86	4.23	.50
73.00 CFS	.00							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.87 WATERSHED INCHES; 17108 CFS-HRS; 1413.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 34

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	7273.8	(NULL)
28.25	7762.8	(NULL)
43.54	389.7	(NULL)
45.15	371.8	(NULL)
50.68	311.1	(NULL)
61.10	145.4	(NULL)
62.94	122.6	(NULL)
65.94	84.5	(NULL)
67.56	80.3	(NULL)
69.07	79.5	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 6.00 SQ.MI.

HRS								
7.80 CFS	.43	1.07	2.10	3.54	5.35	7.50	9.93	12.62
9.40 CFS	15.50	18.51	21.60	24.76	27.97	31.23	34.74	38.74
11.00 CFS	43.30	48.23	53.28	58.30	63.39	68.64	73.89	78.81
12.60 CFS	83	88	92	97	101	105	109	113
14.20 CFS	117	122	126	130	135	139	144	148
15.80 CFS	153	157	162	167	171	175	178	182
17.40 CFS	188	195	201	206	211	221	232	241
19.00 CFS	248	257	270	284	297	307	317	332
20.60 CFS	349	362	374	388	408	430	450	464
22.20 CFS	479	499	523	545	562	581	604	627
23.80 CFS	646	662	709	839	1006	1125	1186	1298
25.40 CFS	1529	1820	2063	2234	2680	3842	5325	6410
27.00 CFS	6933	7265	7120	6765	6830	7417	7751	7627
28.60 CFS	7224	6815	6489	6116	5675	5217	4808	4463
30.20 CFS	4134	3782	3440	3168	2974	2800	2627	2463
31.80 CFS	2320	2201	2095	1991	1896	1823	1769	1717
33.40 CFS	1660	1606	1565	1536	1506	1468	1430	1400
35.00 CFS	1380	1358	1324	1285	1257	1240	1208	1136
36.60 CFS	1049	988	960	929	884	832	783	741
38.20 CFS	701	664	629	600	577	557	536	517
39.80 CFS	502	490	477	465	454	444	437	430
41.40 CFS	424	416	409	406	404	401	397	393
43.00 CFS	390	388	389	390	388	388	386	381
44.60 CFS	375	371	371	372	370	365	361	358
46.20 CFS	357	356	355	352	349	347	344	340
47.80 CFS	336	333	331	331	328	324	321	321
49.40 CFS	318	315	314	314	312	310	311	311
51.00 CFS	309	307	304	299	295	294	293	290
52.60 CFS	288	286	286	283	279	276	275	275
54.20 CFS	272	267	262	259	258	256	253	250
55.80 CFS	247	245	242	237	230	225	222	218
57.40 CFS	215	213	212	208	204	197	191	187
59.00 CFS	184	180	179	177	172	168	166	162
60.60 CFS	154	147	145	145	143	137	133	130
62.20 CFS	129	126	123	122	123	120	114	108
63.80 CFS	103	102	101	101	99	95	90	87

65.40 CFS	85.71	84.27	84.05	84.42	83.09	80.13	78.18	77.89
67.00 CFS	77.76	78.06	79.59	80.22	78.63	76.40	75.99	76.26
68.60 CFS	76.59	77.80	79.41	79.08	76.85	75.58	75.84	76.07
70.20 CFS	75.37	72.85	69.30	65.63	62.78	60.98	59.24	56.97
71.80 CFS	54.23	51.74	48.46	43.59	37.07	31.66	29.39	27.21
73.40 CFS	24.42	21.29	18.17	15.25	12.65	10.38	8.44	6.82
75.00 CFS	5.48	4.38	3.48	2.76	2.18	1.72	1.35	1.05
76.60 CFS	.82	.64	.50					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.81 WATERSHED INCHES; 53461 CFS-HRS; 4418.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 35

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	11373.8	(NULL)
28.25	11862.8	(NULL)
43.56	702.7	(NULL)
45.16	666.3	(NULL)
46.41	641.0	(NULL)
49.91	566.9	(NULL)
50.66	562.0	(NULL)
52.91	513.5	(NULL)
61.13	255.8	(NULL)
62.96	220.1	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
7.60 CFS	.44	1.19	2.53	4.54	7.19	10.43	14.18	18.37
9.20 CFS	22.93	27.87	33.34	39.49	46.16	53.02	60.04	67.44
10.80 CFS	75	84	93	102	111	120	129	139
12.40 CFS	147	155	163	171	180	187	193	200
14.00 CFS	207	215	224	232	241	249	257	265
15.60 CFS	274	281	288	296	306	313	320	325
17.20 CFS	332	344	360	372	380	393	413	434
18.80 CFS	450	463	481	505	533	557	573	592
20.40 CFS	621	652	677	697	723	763	809	845
22.00 CFS	870	897	936	980	1018	1048	1081	1124
23.60 CFS	1167	1199	1226	1331	1636	2013	2256	2378
25.20 CFS	2621	3118	3712	4157	4477	5458	7942	9425
26.80 CFS	10510	11033	11365	11220	10865	10930	11517	11851
28.40 CFS	11727	11324	10915	10589	10169	9402	8633	7976
30.00 CFS	7438	6909	6308	5718	5278	4980	4704	4429
31.60 CFS	4168	3947	3769	3605	3436	3284	3171	3091
33.20 CFS	3009	2912	2820	2756	2713	2664	2596	2527
34.80 CFS	2477	2447	2410	2344	2269	2221	2195	2129
36.40 CFS	1974	1794	1681	1631	1573	1493	1405	1326
38.00 CFS	1260	1199	1140	1083	1037	1003	971	936
39.60 CFS	905	882	863	841	820	801	786	774
41.20 CFS	764	753	740	729	724	723	719	714

42.80 CFS	707	700	699	702	703	701	700	696
44.40 CFS	685	672	664	665	666	663	654	646
46.00 CFS	642	640	641	640	634	628	624	618
47.60 CFS	610	601	595	592	592	586	579	577
49.20 CFS	576	570	565	566	566	561	559	562
50.80 CFS	561	557	554	547	536	528	525	522
52.40 CFS	518	514	513	513	509	501	497	496
54.00 CFS	494	490	478	467	462	459	455	451
55.60 CFS	446	442	438	432	423	409	399	394
57.20 CFS	385	380	379	377	371	363	350	337
58.80 CFS	331	325	318	316	313	305	298	297
60.40 CFS	288	269	256	255	255	251	241	233
62.00 CFS	230	229	223	217	218	220	216	203
63.60 CFS	188	180	178	177	177	174	166	158
65.20 CFS	154	151	149	150	152	149	143	140
66.80 CFS	140	139	140	144	146	142	137	137
68.40 CFS	137	138	141	144	143	138	136	137
70.00 CFS	137	135	129	121	114	108	104	101
71.60 CFS	96.90	92.69	88.57	82.87	73.36	59.56	49.69	45.85
73.20 CFS	41.82	37.01	31.89	26.95	22.43	18.45	15.03	12.14
74.80 CFS	9.75	7.78	6.18	4.89	3.85	3.03	2.37	1.85
76.40 CFS	1.44	1.12	.87	.67	.52	.40		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.07 WATERSHED INCHES; 91445 CFS-HRS; 7557.0 ACRE-FEET.

OPERATION DIVERT XSECTION 35
OUTPUT #1 HYDROGRAPH

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11000.0 *	(DIVERT)
28.00	11000.0 *	(DIVERT)
43.56	702.7	(DIVERT)
45.16	666.3	(DIVERT)
46.41	641.0	(DIVERT)
49.91	566.9	(DIVERT)
50.66	562.0	(DIVERT)
52.91	513.5	(DIVERT)
61.13	255.8	(DIVERT)
62.96	220.1	(DIVERT)

* FIRST POINT OF FLAT PEAK

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 10.84 SQ.MI.

HRS								
7.60 CFS	.44	1.19	2.53	4.54	7.19	10.43	14.18	18.37
9.20 CFS	22.93	27.87	33.34	39.49	46.16	53.02	60.04	67.44
10.80 CFS	75	84	93	102	111	120	129	139
12.40 CFS	147	155	163	171	180	187	193	200
14.00 CFS	207	215	224	232	241	249	257	265

15.60 CFS	274	281	288	296	306	313	320	325
17.20 CFS	332	344	360	372	380	393	413	434
18.80 CFS	450	463	481	505	533	557	573	592
20.40 CFS	621	652	677	697	723	763	809	845
22.00 CFS	870	897	936	980	1018	1048	1081	1124
23.60 CFS	1167	1199	1226	1331	1636	2013	2256	2378
25.20 CFS	2621	3118	3712	4157	4477	5458	7942	9425
26.80 CFS	10510	11000	11000	11000	10865	10930	11000	11000
28.40 CFS	11000	11000	10915	10589	10169	9402	8633	7976
30.00 CFS	7438	6909	6308	5718	5278	4980	4704	4429
31.60 CFS	4168	3947	3769	3605	3436	3284	3171	3091
33.20 CFS	3009	2912	2820	2756	2713	2664	2596	2527
34.80 CFS	2477	2447	2410	2344	2269	2221	2195	2129
36.40 CFS	1974	1794	1681	1631	1573	1493	1405	1326
38.00 CFS	1260	1199	1140	1083	1037	1003	971	936
39.60 CFS	905	882	863	841	820	801	786	774
41.20 CFS	764	753	740	729	724	723	719	714
42.80 CFS	707	700	699	702	703	701	700	696
44.40 CFS	685	672	664	665	666	663	654	646
46.00 CFS	642	640	641	640	634	628	624	618
47.60 CFS	610	601	595	592	592	586	579	577
49.20 CFS	576	570	565	566	566	561	559	562
50.80 CFS	561	557	554	547	536	528	525	522
52.40 CFS	518	514	513	513	509	501	497	496
54.00 CFS	494	490	478	467	462	459	455	451
55.60 CFS	446	442	438	432	423	409	399	394
57.20 CFS	385	380	379	377	371	363	350	337
58.80 CFS	331	325	318	316	313	305	298	297
60.40 CFS	288	269	256	255	255	251	241	233
62.00 CFS	230	229	223	217	218	220	216	203
63.60 CFS	188	180	178	177	177	174	166	158
65.20 CFS	154	151	149	150	152	149	143	140
66.80 CFS	140	139	140	144	146	142	137	137
68.40 CFS	137	138	141	144	143	138	136	137
70.00 CFS	137	135	129	121	114	108	104	101
71.60 CFS	96.90	92.69	88.57	82.87	73.36	59.56	49.69	45.85
73.20 CFS	41.82	37.01	31.89	26.95	22.43	18.45	15.03	12.14
74.80 CFS	9.75	7.78	6.18	4.89	3.85	3.03	2.37	1.85
76.40 CFS	1.44	1.12	.87	.67	.52	.40		

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.99 WATERSHED INCHES; 90850 CFS-HRS; 7507.8 ACRE-FEET.

OUTPUT #2 DIVERTED HYDROGRAPH (XSECTION 199)

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.24	373.8	(DIVERT)
28.25	862.8	(DIVERT)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = .00 SQ.MI.

26.80 CFS	0	33	365	220	0	0	517	851
28.40 CFS	727	324	0					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
595 CFS-HRS; 49.2 ACRE-FEET.

*** WARNING - ROUTING COEFFICIENT (C) EQUALS 1.0,
CONSIDER SMALLER MAIN TIME INCREMENT FOR XSECTION 45. ***

OPERATION REACH XSECTION 45

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11000.0 *	8.46
28.00	11000.0 *	8.46
43.56	702.7	1.82
45.16	666.3	1.76
46.41	641.0	1.73
49.91	566.9	1.62
50.66	562.0	1.61
52.91	513.5	1.54
61.13	255.8	1.03
62.96	220.1	.95

* FIRST POINT OF FLAT PEAK

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
12.99 WATERSHED INCHES; 90850 CFS-HRS; 7507.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
21.84	167.4	(RUNOFF)
26.91	3876.1	(RUNOFF)
27.90	1343.4	(RUNOFF)
28.90	752.9	(RUNOFF)
30.90	425.2	(RUNOFF)
31.90	399.8	(RUNOFF)
32.90	363.9	(RUNOFF)
33.90	334.0	(RUNOFF)
34.94	306.1	(RUNOFF)
35.88	267.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 1.47 SQ.MI.

6.60 CFS	.30	1.29	2.91	4.65	6.19	7.39	9.02	10.41
8.20 CFS	11.55	13.39	14.79	15.46	16.67	18.57	19.60	19.88
9.80 CFS	21.35	23.15	24.75	27.00	28.43	29.62	31.63	33.39
11.40 CFS	33.22	33.89	34.93	36.91	38.61	38.11	38.59	39.51

13.00 CFS	41.48	43.13	42.35	42.67	43.49	45.46	47.91	49.32
14.60 CFS	52.03	53.78	54.61	55.40	56.16	56.67	55.66	56.24
16.20 CFS	58.78	59.66	60.31	60.86	60.06	62.65	72.28	75.36
17.80 CFS	76.15	77.01	82.04	91.96	92.94	92.70	93.65	97.87
19.40 CFS	107	112	112	111	117	128	129	131
21.00 CFS	133	140	160	166	167	167	171	183
22.60 CFS	187	188	190	196	208	210	209	212
24.20 CFS	307	524	588	593	597	703	936	1001
25.80 CFS	1008	1023	1718	3306	3746	3784	3805	3173
27.40 CFS	1696	1323	1325	1325	1177	831	745	748
29.00 CFS	749	714	640	625	624	623	575	454
30.60 CFS	424	424	424	418	403	397	398	398
32.20 CFS	386	364	359	362	363	352	334	330
33.80 CFS	333	333	324	308	302	303	305	295
35.40 CFS	270	264	267	267	230	152	132	132
37.00 CFS	134	133	123	124	123	122	122	116
38.60 CFS	114	114	114	111	105	106	105	102
40.20 CFS	100	97	96	96	96	96	95	92
41.80 CFS	93.41	95.91	96.01	96.01	95.65	92.75	92.58	95.64
43.40 CFS	96.02	96.03	96.03	95.97	92.86	85.84	84.03	84.16
45.00 CFS	86.47	88.07	84.94	84.04	84.04	84.07	85.63	88.28
46.60 CFS	85.71	84.05	84.02	82.47	78.95	77.69	74.74	74.58
48.20 CFS	77.68	77.20	74.07	75.48	77.98	76.49	73.81	76.40
49.80 CFS	77.96	75.63	73.98	77.17	77.71	74.75	74.53	74.61
51.40 CFS	67.84	66.06	66.06	66.06	66.06	66.07	66.42	69.39
53.00 CFS	69.62	66.38	66.07	66.07	66.07	66.06	63.00	56.65
54.60 CFS	58.04	56.76	56.53	58.22	55.78	58.03	56.77	56.53
56.20 CFS	56.68	49.83	48.06	47.94	45.62	43.90	47.17	48.06
57.80 CFS	48.06	48.02	44.98	38.67	39.99	38.64	36.14	37.60
59.40 CFS	40.33	37.73	36.19	38.46	38.60	30.97	26.10	27.45
61.00 CFS	29.96	30.04	29.21	26.10	27.45	29.92	28.47	25.74
62.60 CFS	28.37	30.04	29.98	26.87	19.78	18.02	18.03	18.06
64.20 CFS	19.62	22.31	19.70	18.02	18.03	18.03	18.02	18.39
65.80 CFS	21.31	21.47	18.41	18.03	18.03	18.03	18.06	19.62
67.40 CFS	22.27	19.68	18.03	18.03	18.03	18.03	18.38	21.33
69.00 CFS	21.48	18.40	18.03	18.03	18.03	18.01	16.44	12.92
70.60 CFS	11.66	8.70	8.53	10.07	7.77	10.00	8.69	8.50
72.20 CFS	8.50	1.80	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.39 WATERSHED INCHES; 13656 CFS-HRS; 1128.5 ACRE-FEET.

OPERATION REACH XSECTION 60

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.40	3596.1	6.57
42.89	95.7	2.26
44.31	96.1	2.27
45.60	87.1	2.05
46.86	86.7	2.05
48.73	77.1	1.82
49.48	76.8	1.81
50.23	76.9	1.81
50.98	76.9	1.82
53.39	68.7	1.62

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.36 WATERSHED INCHES; 13620 CFS-HRS; 1125.6 ACRE-FEET.

OPERATION REACH XSECTION 67

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.76	3220.8	6.05
43.15	95.5	1.36
44.56	95.6	1.36
47.18	85.9	1.29
49.73	76.5	1.22
50.49	76.3	1.22
51.23	76.4	1.22
53.67	67.9	1.16
58.55	47.6	.99
60.71	38.3	.85

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
14.37 WATERSHED INCHES; 13631 CFS-HRS; 1126.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 64

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.80	14144.0	(NULL)
43.51	797.1	(NULL)
46.36	726.5	(NULL)
49.85	642.6	(NULL)
50.64	638.2	(NULL)
62.95	248.2	(NULL)
65.97	170.2	(NULL)
67.55	164.1	(NULL)
69.05	163.0	(NULL)
69.84	156.4	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 12.31 SQ.MI.

HRS									
7.40	CFS	.46	1.40	3.10	5.61	8.86	12.86	17.48	22.57
9.00	CFS	28.20	34.22	40.45	47.15	54.66	62.64	70.59	78.72
10.60	CFS	87	97	107	118	128	139	149	160
12.20	CFS	171	180	189	198	207	217	225	232
13.80	CFS	240	248	257	266	275	285	295	304
15.40	CFS	314	324	333	342	351	361	369	376
17.00	CFS	383	390	403	419	432	443	459	482
18.60	CFS	506	525	542	564	592	622	648	669
20.20	CFS	692	725	759	787	811	842	885	935
21.80	CFS	975	1007	1042	1088	1138	1180	1215	1254
23.40	CFS	1301	1348	1385	1417	1528	1838	2218	2483
25.00	CFS	2674	2998	3563	4209	4713	5128	6210	8777
26.60	CFS	10324	11598	12607	13205	13709	13950	14144	13935
28.20	CFS	13517	13146	12866	12555	11994	11368	10446	9570
29.80	CFS	8836	8228	7645	7004	6387	5920	5575	5250
31.40	CFS	4934	4645	4403	4208	4030	3852	3693	3574
33.00	CFS	3483	3391	3288	3191	3121	3070	3013	2940
34.60	CFS	2866	2812	2775	2731	2659	2580	2528	2493
36.20	CFS	2417	2254	2070	1946	1869	1781	1676	1571
37.80	CFS	1480	1404	1336	1272	1211	1163	1126	1091
39.40	CFS	1054	1022	997	975	951	929	908	891
41.00	CFS	877	865	852	838	826	821	819	814
42.60	CFS	809	802	795	794	797	797	795	795
44.20	CFS	791	780	767	759	758	757	751	741
45.80	CFS	733	728	726	726	725	719	714	710
47.40	CFS	704	695	686	678	674	672	664	656
49.00	CFS	654	653	646	641	643	642	637	635
50.60	CFS	638	637	632	630	623	611	603	599
52.20	CFS	594	588	583	581	580	576	568	565
53.80	CFS	563	562	556	545	534	528	523	517
55.40	CFS	511	505	500	495	490	480	466	456
57.00	CFS	449	439	431	429	425	419	411	397
58.60	CFS	385	378	370	361	358	354	344	338
60.20	CFS	336	326	308	294	291	289	283	272
61.80	CFS	263	260	258	251	246	247	248	243
63.40	CFS	231	217	209	205	201	199	195	186
65.00	CFS	178	174	171	168	169	170	167	162
66.60	CFS	160	159	159	159	163	164	160	157
68.20	CFS	157	157	157	159	163	162	157	156
69.80	CFS	156	156	154	148	140	132	124	120
71.40	CFS	115	109	104	99	93	83	69	59
73.00	CFS	53.25	47.22	40.69	34.30	28.48	23.39	19.04	15.39
74.60	CFS	12.36	9.88	7.86	6.22	4.91	3.87	3.03	2.37
76.20	CFS	1.85	1.44	1.12	.87	.67	.52	.40	

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.15 WATERSHED INCHES; 104481 CFS-HRS; 8634.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.00	11470.2	(RUNOFF)
32.95	1148.8	(RUNOFF)
33.95	1055.1	(RUNOFF)
35.90	851.1	(RUNOFF)
37.13	424.7	(RUNOFF)
41.10	306.3	(RUNOFF)
42.46	306.5	(RUNOFF)
43.79	306.5	(RUNOFF)
45.35	277.2	(RUNOFF)
46.60	277.3	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 4.78 SQ.MI.

HRS								
9.80 CFS	.17	.88	2.64	5.48	8.88	12.34	15.87	19.61
11.40 CFS	23.07	25.98	28.79	32.15	35.85	39.03	41.43	43.75
13.00 CFS	46.94	50.62	53.59	55.52	57.42	60.45	64.54	69.10
14.60 CFS	73.78	78.50	82.82	86.04	88.94	91.63	93.34	94.60
16.20 CFS	97	101	105	108	109	112	120	133
17.80 CFS	142	146	152	164	178	186	189	194
19.40 CFS	207	223	235	239	244	259	277	288
21.00 CFS	294	305	329	361	384	391	397	413
22.60 CFS	435	452	459	470	490	512	525	534
24.20 CFS	623	905	1277	1520	1577	1689	2044	2490
25.80 CFS	2775	2885	3634	5974	9027	11023	11470	11007
27.40 CFS	8865	5998	4286	4139	3998	3467	2789	2389
29.00 CFS	2351	2319	2204	2061	1978	1970	1922	1736
30.60 CFS	1497	1356	1343	1337	1315	1284	1263	1261
32.20 CFS	1250	1213	1168	1146	1149	1141	1108	1070
33.80 CFS	1053	1055	1048	1021	986	965	965	959
35.40 CFS	922	872	846	847	811	683	524	431
37.00 CFS	423	424	415	401	393	392	390	384
38.60 CFS	372	364	363	360	350	340	335	332
40.20 CFS	326	318	311	307	306	306	305	301
41.80 CFS	298	299	304	306	306	303	298	298
43.40 CFS	303	306	306	306	303	292	278	269
45.00 CFS	271	276	277	273	269	268	270	275
46.60 CFS	277	274	269	267	261	254	246	241
48.20 CFS	241	245	244	240	242	246	243	241
49.80 CFS	243	246	242	241	244	245	241	238
51.40 CFS	232	220	212	211	211	211	212	215
53.00 CFS	219	219	214	211	211	211	208	198
54.60 CFS	187	183	183	182	183	183	182	183
56.20 CFS	181	174	163	154	151	146	145	149
57.80 CFS	153	154	150	140	130	125	123	119
59.40 CFS	122	124	122	119	121	116	101	88
61.00 CFS	88.84	94.09	95.16	90.93	87.21	88.97	92.51	89.79

62.60 CFS	87.29	90.19	94.81	92.54	81.45	67.19	58.59	57.70
64.20 CFS	59.20	64.01	66.64	63.72	58.85	57.68	57.68	58.25
65.80 CFS	61.55	65.97	65.73	60.86	57.69	57.69	57.73	59.33
67.40 CFS	64.01	66.55	63.67	58.85	57.70	57.69	58.22	61.50
69.00 CFS	66.00	65.84	60.87	57.79	57.70	57.62	55.95	50.37
70.60 CFS	42.70	35.08	30.08	28.71	28.96	29.05	28.72	29.10
72.20 CFS	27.20	20.64	9.19	.81	.00			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.10 WATERSHED INCHES; 40399 CFS-HRS; 3338.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.12	8392.6	(RUNOFF)
42.60	224.5	(RUNOFF)
43.91	224.8	(RUNOFF)
45.48	201.9	(RUNOFF)
46.73	201.9	(RUNOFF)
48.62	178.6	(RUNOFF)
49.41	178.6	(RUNOFF)
50.13	178.5	(RUNOFF)
50.87	178.7	(RUNOFF)
53.23	159.9	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 3.48 SQ.MI.

HRS								
8.80 CFS	.24	.95	2.29	4.33	6.65	9.00	11.37	13.93
10.40 CFS	16.73	19.73	22.74	25.72	28.67	31.47	33.95	36.07
12.00 CFS	38.28	41.00	43.70	45.92	47.72	49.59	52.14	54.64
13.60 CFS	56.59	58.06	59.73	62.40	65.81	69.63	73.54	77.11
15.20 CFS	80.23	82.71	84.69	86.26	87.33	88.70	90.88	93.63
16.80 CFS	96	98	99	104	111	120	126	131
18.40 CFS	138	147	156	161	165	171	181	192
20.00 CFS	200	205	212	222	233	242	249	262
21.60 CFS	281	301	316	322	330	342	356	367
23.20 CFS	374	385	399	412	421	463	591	813
24.80 CFS	1044	1197	1285	1448	1698	1953	2149	2524
26.40 CFS	3559	5276	7060	8232	8309	7435	5884	4292
28.00 CFS	3293	2991	2765	2398	2026	1783	1719	1673
29.60 CFS	1591	1509	1459	1428	1348	1221	1092	1007
31.20 CFS	986	976	959	941	930	922	906	882
32.80 CFS	858	845	839	827	806	786	775	771
34.40 CFS	761	742	722	711	705	691	666	640
36.00 CFS	624	606	554	464	373	321	310	308
37.60 CFS	301	294	288	287	284	278	272	268
39.20 CFS	265	261	255	249	245	242	237	232
40.80 CFS	228	225	225	224	223	220	220	221
42.40 CFS	223	224	223	221	220	220	223	225
44.00 CFS	225	223	218	211	203	199	200	202

45.60 CFS	202	200	197	198	200	202	202	200
47.20 CFS	197	194	190	184	180	178	178	179
48.80 CFS	178	178	178	179	178	178	178	178
50.40 CFS	178	178	179	178	176	172	167	161
52.00 CFS	156	155	155	155	156	159	160	159
53.60 CFS	157	155	155	153	149	143	137	134
55.20 CFS	134	134	134	134	134	133	130	124
56.80 CFS	118	113	109	108	108	110	112	111
58.40 CFS	107	101	95	91	89	89	89	90
60.00 CFS	89.06	88.07	85.84	80.03	71.88	66.46	66.43	68.48
61.60 CFS	68.33	66.16	65.30	65.78	66.19	65.53	65.34	66.92
63.20 CFS	68.11	64.03	56.32	48.50	43.31	42.97	44.89	46.96
64.80 CFS	47.39	45.74	43.20	42.27	42.48	43.85	46.20	47.42
66.40 CFS	46.73	44.40	42.46	42.33	43.03	44.98	47.00	47.28
68.00 CFS	45.63	43.22	42.31	42.54	43.90	46.13	47.33	46.71
69.60 CFS	44.40	42.49	42.21	41.55	39.07	35.00	29.68	24.77
71.20 CFS	22.38	21.11	21.09	21.33	20.80	20.64	17.41	11.87
72.80 CFS	5.89	1.17	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.52 WATERSHED INCHES; 30362 CFS-HRS; 2509.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 75

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.06	19796.8	(NULL)
42.53	530.7	(NULL)
43.89	531.3	(NULL)
45.39	478.8	(NULL)
46.63	478.9	(NULL)
48.48	423.6	(NULL)
49.23	423.9	(NULL)
49.99	424.1	(NULL)
50.76	424.0	(NULL)
53.13	379.5	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 8.26 SQ.MI.

HRS								
8.80 CFS	.24	.95	2.29	4.33	6.66	9.17	12.25	16.57
10.40 CFS	22.21	28.61	35.07	41.59	48.28	54.54	59.93	64.86
12.00 CFS	70	77	83	87	91	97	103	108
13.60 CFS	112	115	120	127	135	143	152	160
15.20 CFS	166	172	176	180	182	186	192	199
16.80 CFS	204	207	211	224	244	262	273	283
18.40 CFS	302	325	342	350	359	378	404	427
20.00 CFS	439	449	471	499	522	536	553	591
21.60 CFS	642	685	706	719	743	777	808	826
23.20 CFS	844	876	911	937	955	1087	1496	2090
24.80 CFS	2564	2774	2975	3492	4188	4728	5034	6158
26.40 CFS	9533	14303	18083	19702	19317	16300	11881	8578

28.00 CFS	7432	6988	6231	5187	4415	4134	4038	3877
29.60 CFS	3652	3487	3429	3350	3084	2718	2448	2350
31.20 CFS	2323	2291	2243	2205	2190	2172	2119	2049
32.80 CFS	2004	1994	1981	1936	1876	1839	1830	1819
34.40 CFS	1782	1728	1687	1675	1664	1613	1538	1486
36.00 CFS	1471	1416	1238	989	804	744	734	723
37.60 CFS	703	686	680	677	668	651	636	631
39.20 CFS	625	611	594	584	577	567	555	542
40.80 CFS	534	531	531	529	524	518	519	525
42.40 CFS	530	530	526	519	518	524	529	531
44.00 CFS	531	526	510	489	473	470	476	479
45.60 CFS	475	468	466	467	474	479	476	470
47.20 CFS	464	455	443	430	421	419	423	423
48.80 CFS	419	420	424	422	419	421	424	421
50.40 CFS	419	422	424	420	415	404	387	373
52.00 CFS	367	366	366	367	371	378	379	374
53.60 CFS	368	366	366	361	347	330	320	317
55.20 CFS	316	316	316	316	316	314	304	287
56.80 CFS	273	264	256	253	257	263	266	261
58.40 CFS	247	230	220	213	208	210	213	211
60.00 CFS	208	209	201	181	160	155	161	164
61.60 CFS	159	153	154	158	156	153	156	162
63.20 CFS	161	145	124	107	101	102	109	114
64.80 CFS	111	105	101	100	101	105	112	113
66.40 CFS	108	102	100	100	102	109	114	111
68.00 CFS	104	101	100	101	105	112	113	108
69.60 CFS	102	100	100	97	89	78	65	55
71.20 CFS	51.09	50.07	50.14	50.05	49.90	47.84	38.06	21.05
72.80 CFS	6.70	1.17	.00					

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.27 WATERSHED INCHES; 70760 CFS-HRS; 5847.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 76

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
27.12	32763.8	(NULL)
42.29	1343.9	(NULL)
43.78	1326.6	(NULL)
45.23	1232.4	(NULL)
46.56	1204.1	(NULL)
48.34	1095.7	(NULL)
49.15	1077.2	(NULL)
49.95	1066.8	(NULL)
50.71	1061.7	(NULL)
53.03	958.3	(NULL)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
HRS MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 20.57 SQ.MI.

7.40 CFS	.46	1.40	3.10	5.61	8.86	12.86	17.52	22.81

9.00 CFS	29	37	45	54	64	75	87	101
10.60 CFS	116	132	148	166	183	199	214	230
12.20 CFS	247	263	276	289	304	319	333	344
13.80 CFS	355	368	384	401	418	437	455	471
15.40 CFS	486	501	513	524	537	553	567	580
17.00 CFS	589	601	627	663	694	716	742	784
18.60 CFS	831	867	892	924	970	1027	1075	1108
20.20 CFS	1141	1196	1258	1308	1347	1395	1476	1577
21.80 CFS	1660	1713	1761	1831	1915	1987	2041	2098
23.40 CFS	2177	2260	2322	2372	2615	3334	4308	5047
25.00 CFS	5448	5972	7055	8397	9441	10163	12368	18311
26.60 CFS	24627	29682	32309	32521	30010	25831	22722	21367
28.20 CFS	20505	19377	18053	16970	16128	15406	14323	13222
29.80 CFS	12323	11657	10995	10088	9105	8368	7925	7573
31.40 CFS	7226	6888	6608	6398	6202	5971	5742	5578
33.00 CFS	5477	5372	5223	5067	4960	4901	4832	4721
34.60 CFS	4594	4499	4451	4395	4271	4118	4014	3963
36.20 CFS	3833	3492	3059	2751	2613	2515	2399	2274
37.80 CFS	2167	2084	2013	1939	1862	1800	1757	1716
39.40 CFS	1665	1616	1581	1552	1519	1484	1450	1425
41.00 CFS	1408	1395	1382	1362	1344	1340	1344	1343
42.60 CFS	1339	1328	1314	1312	1320	1326	1327	1326
44.20 CFS	1318	1291	1256	1232	1227	1232	1230	1216
45.80 CFS	1201	1194	1193	1201	1204	1195	1183	1174
47.40 CFS	1158	1138	1116	1098	1093	1095	1087	1075
49.00 CFS	1074	1077	1068	1060	1064	1066	1057	1054
50.60 CFS	1060	1061	1052	1044	1027	998	976	966
52.20 CFS	960	954	950	952	958	955	942	933
53.80 CFS	930	927	918	891	864	848	839	833
55.40 CFS	827	821	817	812	804	785	754	729
57.00 CFS	713	694	684	686	688	684	672	644
58.60 CFS	616	598	584	569	568	567	556	546
60.20 CFS	545	527	488	455	447	450	446	431
61.80 CFS	416	415	417	407	399	402	410	404
63.40 CFS	377	341	316	306	303	308	308	297
65.00 CFS	283	275	271	269	274	282	281	270
66.60 CFS	262	259	259	261	272	278	271	261
68.20 CFS	258	257	258	265	275	275	265	258
69.80 CFS	257	256	252	237	218	196	179	171
71.40 CFS	165	159	154	149	141	121	90	65
73.00 CFS	54.41	47.22	40.69	34.30	28.48	23.39	19.04	15.39
74.60 CFS	12.36	9.88	7.86	6.22	4.91	3.87	3.03	2.37
76.20 CFS	1.85	1.44	1.12	.87	.67	.52	.40	

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
13.20 WATERSHED INCHES; 175222 CFS-HRS; 14480.4 ACRE-FEET.

--- XSECTION 76, ALTERNATE 1, STORM 7, HYDROGRAPH ADDED TO READHD FILE ---

*** MESSAGE - STRUCTURE 1, USER ENTERED STARTING ELEVATION (1200.0 FEET) CAN ADD .546 INCHES OF RUNOFF TO THE OUTFLOW HYDROGRAPH VOLUME.***

*** MESSAGE - RESERVOIR ROUTING, STRUCTURE 1, TRUNCATED AT 400 POINTS WITH 2876.62 AC-FT (.22 WATERSHED INCHES) FLOOD STORAGE REMAINING IN RESERVOIR AT ELEV. 1210.91. ***

72-hr General outflow.

OPERATION RESVOR STRUCTURE 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
6.40	45.6	1200.00
27.82	23194.8	1215.85

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 7
MAIN TIME INCREMENT = .200 hr, DRAINAGE AREA = 20.57 SQ.MI.

HRS								
6.40 CFS	45.58	45.24	44.89	44.55	44.22	43.88	43.56	43.25
8.00 CFS	42.95	42.68	42.44	42.24	42.07	41.95	41.88	41.87
9.60 CFS	41.92	42.05	42.26	42.55	42.94	43.44	44.05	44.77
11.20 CFS	45.62	46.60	47.69	48.89	50.20	51.63	53.17	54.81
12.80 CFS	56.54	58.35	60.27	62.28	64.37	66.53	68.77	71.09
14.40 CFS	73.52	76.06	78.72	81.50	84.38	87.37	90.44	93.59
16.00 CFS	97	100	103	107	110	114	118	121
17.60 CFS	125	130	134	138	143	148	153	159
19.20 CFS	160	161	162	164	165	166	168	169
20.80 CFS	171	173	174	176	178	180	182	185
22.40 CFS	187	189	191	193	195	197	200	202
24.00 CFS	204	207	210	214	218	223	228	233
25.60 CFS	240	247	254	262	272	285	2795	9234
27.20 CFS	15629	20409	22713	23192	22840	22256	21546	20678
28.80 CFS	19707	18738	17827	16919	15954	15057	14211	13415
30.40 CFS	12623	11788	10946	10174	9505	8924	8416	8038
32.00 CFS	7690	7376	7084	6806	6546	6316	6114	5929
33.60 CFS	5751	5584	5436	5307	5187	5067	4949	4842
35.20 CFS	4747	4653	4549	4440	4338	4238	4108	3919
36.80 CFS	3690	3461	3258	3077	2909	2820	2737	2654
38.40 CFS	2573	2493	2414	2338	2266	2197	2131	2067
40.00 CFS	2007	1951	1897	1846	1797	1751	1710	1671
41.60 CFS	1635	1602	1571	1543	1519	1498	1478	1460
43.20 CFS	1442	1427	1415	1404	1395	1386	1376	1364
44.80 CFS	1350	1335	1323	1312	1301	1290	1279	1269
46.40 CFS	1260	1253	1247	1240	1233	1225	1216	1205
48.00 CFS	1193	1182	1171	1162	1152	1143	1135	1127
49.60 CFS	1120	1113	1107	1102	1096	1091	1088	1084
51.20 CFS	1080	1075	1067	1058	1047	1037	1028	1018
52.80 CFS	1010	1004	998	992	986	979	973	967
54.40 CFS	960	950	939	927	916	906	896	887
56.00 CFS	878	870	861	850	837	823	809	795
57.60 CFS	781	770	760	750	739	726	712	697
59.20 CFS	683	669	657	646	634	624	613	601

60.80 CFS	585	569	555	542	530	517	505	494
62.40 CFS	484	475	466	459	452	445	435	422
64.00 CFS	409	396	385	376	367	358	349	340
65.60 CFS	331	324	319	314	309	304	299	294
67.20 CFS	290	289	289	289	289	289	289	289
68.80 CFS	289	289	289	289	289	289	289	289
70.40 CFS	289	289	289	289	289	288	288	288
72.00 CFS	288	288	288	288	288	288	287	287
73.60 CFS	287	287	287	287	287	286	286	286
75.20 CFS	286	286	285	285	285	285	285	285
76.80 CFS	284	284	284	284	284	284	283	283
78.40 CFS	283	283	283	282	282	282	282	282
80.00 CFS	282	281	281	281	281	281	281	280
81.60 CFS	280	280	280	280	279	279	279	279
83.20 CFS	279	279	278	278	278	278	278	278
84.80 CFS	277	277	277	277	277	277	276	276

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
11.13 WATERSHED INCHES; 147691 CFS-HRS; 12205.1 ACRE-FEET.

--- STRUCTURE 1, ALTERNATE 1, STORM 7, HYDROGRAPH ADDED TO READHD FILE ---

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

RAINFALL OF 15.80 inches AND 72.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 7, ARC 2
MAIN TIME INCREMENT .200 HOURS

ALTERNATE 1 STORM 7

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION 1	RUNOFF	2.46	14.29	---	27.01	6291	2557.3
XSECTION 5	REACH	2.46	14.29	6.72	27.54	4816	1957.7
XSECTION 10	REACH	2.46	14.29	7.95	28.12	3932	1598.4
XSECTION 2	RUNOFF	2.38	13.26	---	26.97	5805	2439.1
XSECTION 12	ADDHYD	4.84	13.78	---	27.15	7759	1603.1
XSECTION 12	DIVERT	4.84	12.16	---	26.40F	4100F	847.1
XSECTION 200	DIVERT	.00	12.16	---	27.15	3659	********
XSECTION 20	REACH	4.84	12.16	7.94	26.40F	4100F	847.1
XSECTION 25	REACH	4.84	12.16	5.03	26.40F	4100F	847.1
XSECTION 3	RUNOFF	3.94	14.29	---	27.03	10041	2548.5
XSECTION 30	REACH	3.94	14.30	5.34	27.78	7435	1887.1
XSECTION 5	REACH	3.94	14.30	7.27	28.39	6138	1557.9
XSECTION 25	REACH	3.94	14.30	6.30	28.39	6138	1557.9
XSECTION 4	RUNOFF	2.06	12.87	---	27.01	4862	2360.2
XSECTION 34	ADDHYD	6.00	13.81	---	28.25	7763	1293.8
XSECTION 35	ADDHYD	10.84	13.07	---	28.25	11863	1094.4
XSECTION 35	DIVERT	10.84	12.99	---	27.00F	11000F	1014.8
XSECTION 199	DIVERT	.00	12.99	---	28.25	863	********
XSECTION 45	REACH	10.84	12.99	8.46	27.00F	11000F	1014.8
XSECTION 6	RUNOFF	1.47	14.39	---	26.91	3876	2636.7
XSECTION 60	REACH	1.47	14.36	6.57	27.40	3596	2446.3
XSECTION 67	REACH	1.47	14.37	6.05	27.76	3221	2191.2
XSECTION 64	ADDHYD	12.31	13.15	---	27.80	14144	1149.0
XSECTION 5	RUNOFF	4.78	13.10	---	27.00	11470	2399.6
XSECTION 7	RUNOFF	3.48	13.52	---	27.12	8393	2411.8
XSECTION 75	ADDHYD	8.26	13.27	---	27.06	19797	2396.7
XSECTION 76	ADDHYD	20.57	13.20	---	27.12	32764	1592.8
STRUCTURE 1	RESVOR	20.57	11.13	1215.85	27.82	23195	1127.6

SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.
QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;
LENGTH FACTOR - VALUE k* GREATER THAN 1.0;
ATT-KIN COEFF - VALUE C GREATER THAN 0.667.

			HYDROGRAPH INFORMATION				ROUTING PARAMETERS				
		FLOOD	INFLOW		OUTFLOW		Q-A EQ.			PEAK	ATT-
XSEC ID	REACH LENGTH (FT)	PLAIN LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	COEFF (X)	POWER (M)	LENGTH FACTOR (k*)	RATIO Q/I (Q*)	KIN COEFF (C)
BASEFLOW IS .0 CFS											
ALTERNATE 1 STORM 7											
5	9100		6290	27.0	4800	27.6	1.95	1.08	.175	.763	.26
10	9100		4800	27.6	3922	28.2	2.17	1.07	.126	.817	.27
20	3332		4100	26.4	4100	26.4	.14	1.63	.001	1.000	1.00?
25	1950		4100	26.4	4100	26.4	.052	1.73	.000	1.000	1.00?
30	8865		10029	27.0	7433	27.8	1.57	1.08	.193	.741	.24
5	8865		7433	27.8	6138	28.4	1.91	1.08	.119	.826	.27
25	1950		6138	28.4	6138	28.4	.056	1.72	.001	1.000	1.00?
45	4200		11000	27.0	11000	27.0	.049	1.72	.001	1.000	1.00?
60	7540		3805	27.0	3596	27.4	.48	1.36	.054	.945	.49
67	5140		3596	27.4	3214	27.8	1.59	1.11	.085	.894	.42

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 7
STRUCTURE 1	20.57	
ALTERNATE 1		23195
XSECTION 1	2.46	
ALTERNATE 1		6291
XSECTION 2	2.38	
ALTERNATE 1		5805
XSECTION 3	3.94	
ALTERNATE 1		10041
XSECTION 4	2.06	
ALTERNATE 1		4862
XSECTION 5	4.78	
ALTERNATE 1		11470
XSECTION 6	1.47	
ALTERNATE 1		3876
XSECTION 7	3.48	
ALTERNATE 1		8393
XSECTION 10	2.46	
ALTERNATE 1		3932
XSECTION 12	4.84	
ALTERNATE 1		4100
XSECTION 20	4.84	
ALTERNATE 1		4100
XSECTION 25	3.94	
ALTERNATE 1		6138
XSECTION 30	3.94	
ALTERNATE 1		7435
XSECTION 34	6.00	

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 7
XSECTION 34	6.00	
ALTERNATE 1		7763
XSECTION 35	10.84	
ALTERNATE 1		11000
XSECTION 45	10.84	
ALTERNATE 1		11000
XSECTION 60	1.47	
ALTERNATE 1		3596
XSECTION 64	12.31	
ALTERNATE 1		14144
XSECTION 67	1.47	
ALTERNATE 1		3221
XSECTION 75	8.26	
ALTERNATE 1		19797
XSECTION 76	20.57	
ALTERNATE 1		32764
XSECTION 199	.00	
ALTERNATE 1		863
XSECTION 200	.00	
ALTERNATE 1		3659

ECON2 DATA FILE

```
ECON2
TITLE        WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS
TITLE        72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED
FLOW-FREQ    -1         23195.                                        ALT  1   1
FLOW-FREQ     1          6291.                                        ALT  1   2
FLOW-FREQ     2          5805.                                        ALT  1   3
FLOW-FREQ     3         10041.                                        ALT  1   4
FLOW-FREQ     4          4862.                                        ALT  1   5
FLOW-FREQ     5         11470.                                        ALT  1   6
FLOW-FREQ     6          3876.                                        ALT  1   7
FLOW-FREQ     7          8393.                                        ALT  1   8
FLOW-FREQ    10          3932.                                        ALT  1   9
FLOW-FREQ    12          4100.                                        ALT  1  10
FLOW-FREQ    20          4100.                                        ALT  1  11
FLOW-FREQ    25          6138.                                        ALT  1  12
FLOW-FREQ    30          7435.                                        ALT  1  13
FLOW-FREQ    34          7763.                                        ALT  1  14
FLOW-FREQ    35         11000.                                        ALT  1  15
FLOW-FREQ    45         11000.                                        ALT  1  16
FLOW-FREQ    60          3596.                                        ALT  1  17
FLOW-FREQ    64         14144.                                        ALT  1  18
FLOW-FREQ    67          3221.                                        ALT  1  19
FLOW-FREQ    75         19797.                                        ALT  1  20
FLOW-FREQ    76         32764.                                        ALT  1  21
FLOW-FREQ   199           863.                                        ALT  1  22
FLOW-FREQ   200          3659.                                        ALT  1  23
```

```
TR20 ------------------------------------------------------------------ SCS -
WT3PMP72     WHITE TANK FRS #3, WATERSHED DIVIDED INTO 7 SUB-BASINS      VERSION
07/21/**     72-HR PMP (MTI=.2), RESERVOIR INIT EMPTY W/100-YR SED      2.04TEST


END OF  1 JOBS IN THIS RUN


                    SCS  TR-20,  VERSION 2.04TEST
                          WT3PMP72  FILES

 INPUT  = WT3PMP72.DAT                          , GIVEN DATA FILE
 OUTPUT = 72OUT.OUT                             , DATED 07/21/**,17:45:12

          FILES GENERATED - DATED 07/21/**,17:45:12

FILE LLL.TEC CONTAINS ECON2 INFORMATION

FILE LLL.TRD CONTAINS READHD INFORMATION


       TOTAL NUMBER OF WARNINGS =    4,  MESSAGES =   2

                    JOB ENDED AT 17:45:12
                 *** TR-20 RUN COMPLETED ***
```

①

URS

Calculation Package 25

EXHIBIT 4.7-2

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title: **LEVEL-POOL RESERVOIR CALCULATIONS FOR WHITE TANK FRS NO. 3 SPILLWAY**

Total Number of Pages (including cover sheet): _____

Total Number of Computer Runs: _____

Prepared by: Hammad Hussain Date: 07/15/04

Checked by: JUNBU KIM Date: _____

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

Remarks/Conclusions/Results:

See Page 4.

Calculation Approved by: [signature] 7/23/04
Project Manager/Date

Revision No.:	Description of Revision:	Approved by:

Project Manager/Date

LEVEL-POOL RESERVOIR CALCULATIONS FOR WHITE TANK FRS NO. 3 SPILLWAY

(WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3)
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

The purpose of this calculation package is to determine whether:

1) The reservoir upstream of White Tank FRS No.3 Spillway conforms to the level pool assumption;

2) The flows through the reservoir do not result in appreciable slope on the water surface and;

3) The reservoir has enough conveyance capacity.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

As the water enters the reservoir of the White Tank FRS No. 3 upstream of the proposed spillway, and flows from North to South, the reservoir narrows down because of the proposed excavation plan and the constraints imposed by the extent of the property line (Please See Figure 1 on page 5). Therefore, one of the major concerns about the proposed alignment of White Tank FRS No.3 Spillway is the formation of a long and narrow reservoir upstream of the spillway, which may not conform to the level-pool reservoir assumption because the flows may cause an appreciable slope on the water surface. The elevation of the water surface in a level-pool reservoir is same at all points across the reservoir. The proposed spillway at White Tank FRS No.3 is a curved spillway with a radius of 700 ft and a total length of 1200 ft. The alignment of the proposed spillway is shown on Figure 1 of Page 5.

EW cross-sections, cross sections 1-13, were drawn across the reservoir, perpendicular to the spillway, extended to the embankment to the West (See Figure 1 on Page 5). The bottom width of each cross-section as shown on Figure 1 varied depending upon the location of FCDMC's property line and the proposed excavation line. The side slope was assumed to be equal to 6:1 on both sides (H:V) which was used to calculate the top width of flow. The water surface elevation at each cross section was assumed to be equal to 1216.4 ft resulting form the reservoir routing of a 6-hr Local PMP storm. The flow depth at each cross section was the difference between the

water surface elevation of 1216.4 ft and the reservoir invert at that cross-section. It should be noted that reservoir inverts from South to North (from cross section 13 to cross section 1) at 0.2 percent slope. The reservoir elevation at South end of the spillway (at cross section 13) is 1206.0 ft. The cross-sections 1-13 were drawn perpendicularly every 100 feet along the spillway. Based on the flow depth and top width at each cross section, flow area and hydraulic radius at each cross section was estimated (see Table 1 on Page 6).

From a continuity standpoint, the discharge passing through each cross-section was supposed to be equal to the discharge passing through the spillway at that point. The reservoir routing of a 6-hour local PMP storm based on the NRCS criteria resulted in maximum outflow discharge equal to approximately 30,000 cfs. It was assumed that the spillway discharge would linearly decrease every 100 ft over its entire length from North to South. Therefore, the spillway discharge was calculated at every 100 ft along the entire length of the spillway with, 30,000 cfs passing through the North end of the spillway (cross-section 1), and zero discharge passing through the South end of the spillway (cross section 13) (Please See Table 1 on Page 6).

FCDMC used a Manning's n of 0.045 in its HECRAS model. Therefore, URS also decided to use the same Manning's n for this analysis.

Given that the discharge passing through each cross-section (Q), Manning's n, flow area and hydraulic radius were known, the water surface slope at each cross-section was calculated using the Manning relationship:

$$Q = A * V$$

Where

$$V = 1.49 / n * R^{2/3} * S^{1/2}$$

Where

Q = Flow Discharge (cfs)

A = Flow Area (ft^2)

V = Mean flow velocity (ft/sec)

n = Manning's Roughness Coefficient

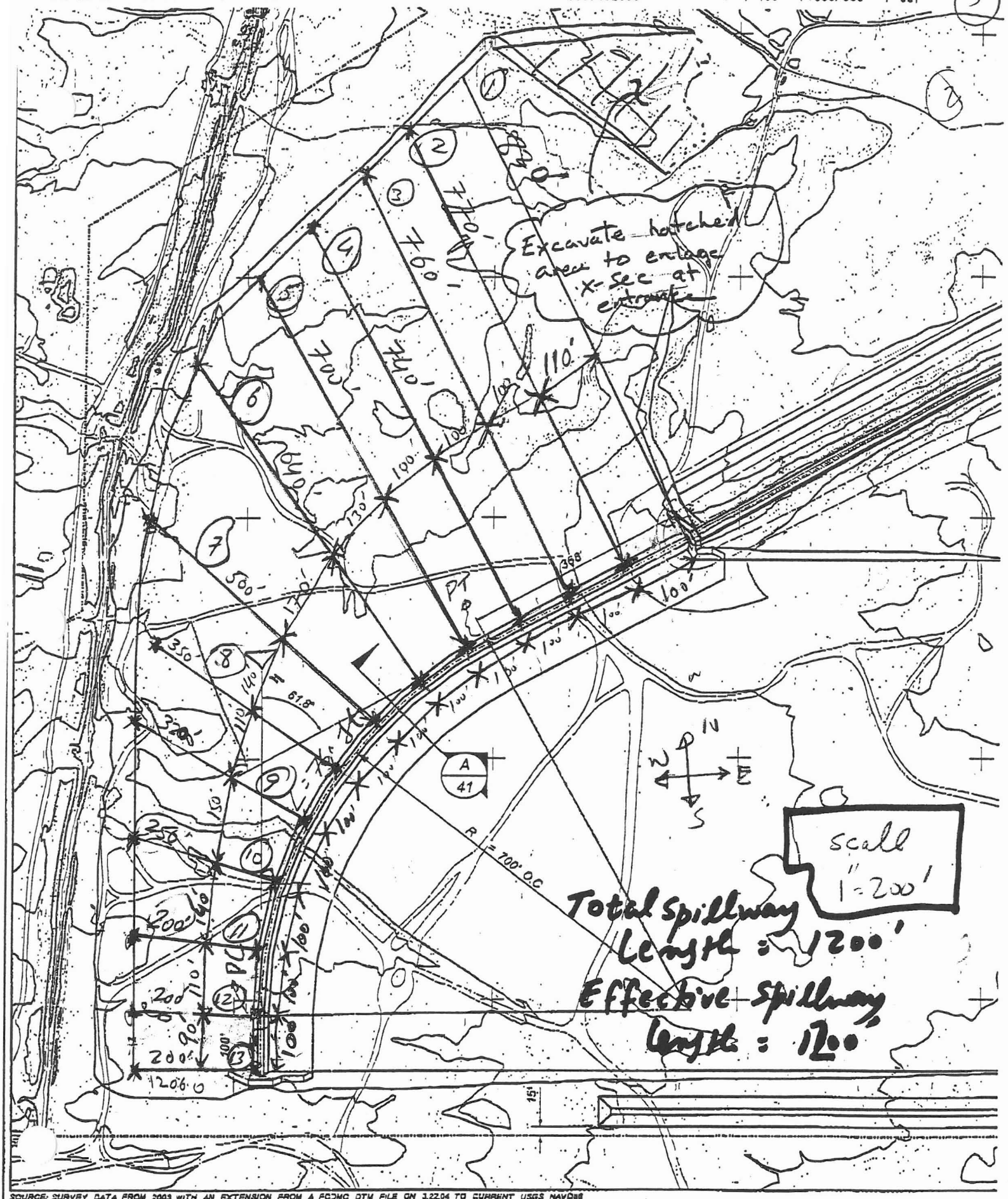
R = Hydraulic Radius (ft)

S = Water Surface Slope (ft/ft)

The average water surface slope at each cross-section was calculated. As noted above, the water surface elevation at each cross section was assumed 1216.4 ft and the next step was to re-calculate the water surface elevation at each cross section based on the average water surface slope at each cross-section and the distance between the subsequent cross sections.

RESULTS

The results indicated that the water surface elevation drops by 0.25 ft in 1500 ft (See Table 1 on page 6). Given that the water surface does not drop significantly throughout the entire reservoir length, it is safe to assume that the reservoir upstream of the spillway conforms to the level-pool concept.



SOURCE: SURVEY DATA FROM 2003 WITH AN EXTENSION FROM A FCDMC DTM FILE ON 3.22.04 TO CURRENT USGS NAVD88

P:\FCDMC\23443698 White Tanks\Calcs\SpillwayPlan.dgn

XREFS: 32604_TOPO.DGN, PL-FCD.DGN

TABLE 1

LEVEL-POOL RESERVOIR CALCULATIONS

(TOTAL SPILLWAY LENGTH = 1200 FT)

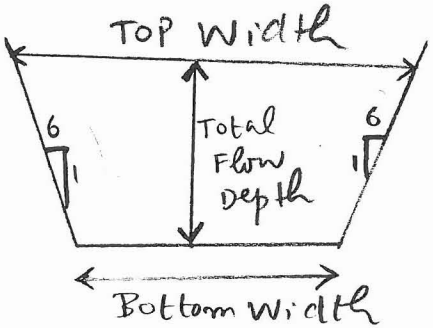
6-hr Local WSE		1216.4	ft
Invert Elevation at South End		1206.0	ft
Side Slope	6		

Cross Section No*1	Bottom Width	Distance From Upstream Cross Section	Excavation Depth	Total Depth	Top Width	Area (A)	Flow Perimeter	Hydraulic Radius	Mannings n	Length Along Spillway	Spillway Discharge (Q)	Flow Velocity (V=Q/A)	Water Surface Slope	Average Water Surface Slope	Water Surface Elevation*2
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft2)	(ft)	(ft)		(ft)	(cfs)	(ft/sec)	(ft/ft)	(ft/ft)	(ft)
1	820	0	2.9	13.3	980	11967	982	12.19	0.045	0	30000	2.51	2.01E-04	2.01E-04	1216.65
2	770	110	2.7	13.1	927	11098	929	11.94	0.045	100	27500	2.48	2.02E-04	1.91E-04	1216.63
3	760	100	2.5	12.9	915	10784	917	11.76	0.045	200	25000	2.32	1.80E-04	1.71E-04	1216.61
4	740	100	2.3	12.7	892	10348	894	11.57	0.045	300	22500	2.17	1.62E-04	1.56E-04	1216.60
5	700	100	2.1	12.5	850	9671	852	11.35	0.045	400	20000	2.07	1.50E-04	1.49E-04	1216.58
6	640	130	1.8	12.2	787	8717	789	11.05	0.045	500	17500	2.01	1.47E-04	1.68E-04	1216.56
7	500	170	1.5	11.9	643	6787	645	10.53	0.045	600	15000	2.21	1.90E-04	2.34E-04	1216.53
8	350	140	1.2	11.6	489	4867	491	9.91	0.045	700	12500	2.57	2.78E-04	2.51E-04	1216.50
9	320	110	1.0	11.4	457	4419	458	9.64	0.045	800	10000	2.26	2.24E-04	2.20E-04	1216.47
10	250	150	0.7	11.1	383	3507	385	9.11	0.045	900	7500	2.14	2.16E-04	1.86E-04	1216.44
11	200	140	0.4	10.8	330	2860	331	8.63	0.045	1000	5000	1.75	1.55E-04	9.85E-05	1216.41
12	200	110	0.2	10.6	327	2788	329	8.48	0.045	1100	2500	0.90	4.18E-05	2.09E-05	1216.40
13	200	90	0	10.4	325	2729	327	8.36	0.045	1200	0	0.00	0.00E+00	0.00E+00	1216.40

1 The water surface elevation (WSE) at the downstream most cross-section 13 was assumed to be equal to 1216.4 ft and the WSE at each cross section upstream was caluclated based on the average water surface slope and the distance betweeen the cross sections.

2 The direction of flow into the reservoir is from North to South (from Cross-Section 1 to Cross-Section 13) whereas the channel inverts at 0.2 % slope in the opposite direction from South to North (from Cross-Section 13 to Cross-Section 1).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	TABLE 1															
2	LEVEL-POOL RESERVOIR CALCULATIONS															
3	(TOTAL SPILLWAY LENGTH = 1200 FT)															
4	6-hr Local WSE			1216.4	ft											
5	End			1206	ft											
6	Side Slope	6	(H:V)													
7																
8	Cross Section No*1	Bottom Width	Distance From Upstream Cross Section	Excavation Depth	Total Depth	Top Width	Area (A)	Flow Perimeter	Hydraulic Radius	Mannings n	Length Along Spillway	Spillway Discharge (Q)	Flow Velocity (V=Q/A)	Water Surface Slope	Average Water Surface Slope	Water Surface Elevation*2
9		(ft)	(ft)	(ft)	(ft)	(ft)	(ft2)	(ft)	(ft)		(ft)	(cfs)	(ft/sec)	(ft/ft)	(ft/ft)	(ft)
10	1	820	0	=(C11*0.002)+D11	=(D10+$E$22)	=B10+((E10*$B$6)*2)	=(B10*E10)+((0.5*(E10*$B$6)*(E10))*2)	=B10+(((E10)^2+((E10*$B$6)^2))^0.5)*2	=G10/H10	0.045	0	30000	=L10/G10	=((M10*J10/1.49)*(1/(I10)^0.67))^2	=(N11+N10)/2	=P11+(O10*C11)
11	=(A10+1)	770	110	=(C12*0.002)+D12	=(D11+$E$22)	=B11+((E11*$B$6)*2)	=(B11*E11)+((0.5*(E11*$B$6)*(E11))*2)	=B11+(((E11)^2+((E11*$B$6)^2))^0.5)*2	=G11/H11	0.045	100	=((1200-K11)/1200)*$L$10	=L11/G11	=((M11*J11/1.49)*(1/(I11)^0.67))^2	=(N12+N11)/2	=P12+(O11*C12)
12	=(A11+1)	760	100	=(C13*0.002)+D13	=(D12+$E$22)	=B12+((E12*$B$6)*2)	=(B12*E12)+((0.5*(E12*$B$6)*(E12))*2)	=B12+(((E12)^2+((E12*$B$6)^2))^0.5)*2	=G12/H12	0.045	=(K11+100)	=((1200-K12)/1200)*$L$10	=L12/G12	=((M12*J12/1.49)*(1/(I12)^0.67))^2	=(N13+N12)/2	=P13+(O12*C13)
13	=(A12+1)	740	100	=(C14*0.002)+D14	=(D13+$E$22)	=B13+((E13*$B$6)*2)	=(B13*E13)+((0.5*(E13*$B$6)*(E13))*2)	=B13+(((E13)^2+((E13*$B$6)^2))^0.5)*2	=G13/H13	0.045	=(K12+100)	=((1200-K13)/1200)*$L$10	=L13/G13	=((M13*J13/1.49)*(1/(I13)^0.67))^2	=(N14+N13)/2	=P14+(O13*C14)
14	=(A13+1)	700	100	=(C15*0.002)+D15	=(D14+$E$22)	=B14+((E14*$B$6)*2)	=(B14*E14)+((0.5*(E14*$B$6)*(E14))*2)	=B14+(((E14)^2+((E14*$B$6)^2))^0.5)*2	=G14/H14	0.045	=(K13+100)	=((1200-K14)/1200)*$L$10	=L14/G14	=((M14*J14/1.49)*(1/(I14)^0.67))^2	=(N15+N14)/2	=P15+(O14*C15)
15	=(A14+1)	640	130	=(C16*0.002)+D16	=(D15+$E$22)	=B15+((E15*$B$6)*2)	=(B15*E15)+((0.5*(E15*$B$6)*(E15))*2)	=B15+(((E15)^2+((E15*$B$6)^2))^0.5)*2	=G15/H15	0.045	=(K14+100)	=((1200-K15)/1200)*$L$10	=L15/G15	=((M15*J15/1.49)*(1/(I15)^0.67))^2	=(N16+N15)/2	=P16+(O15*C16)
16	=(A15+1)	500	170	=(C17*0.002)+D17	=(D16+$E$22)	=B16+((E16*$B$6)*2)	=(B16*E16)+((0.5*(E16*$B$6)*(E16))*2)	=B16+(((E16)^2+((E16*$B$6)^2))^0.5)*2	=G16/H16	0.045	=(K15+100)	=((1200-K16)/1200)*$L$10	=L16/G16	=((M16*J16/1.49)*(1/(I16)^0.67))^2	=(N17+N16)/2	=P17+(O16*C17)
17	=(A16+1)	350	140	=(C18*0.002)+D18	=(D17+$E$22)	=B17+((E17*$B$6)*2)	=(B17*E17)+((0.5*(E17*$B$6)*(E17))*2)	=B17+(((E17)^2+((E17*$B$6)^2))^0.5)*2	=G17/H17	0.045	=(K16+100)	=((1200-K17)/1200)*$L$10	=L17/G17	=((M17*J17/1.49)*(1/(I17)^0.67))^2	=(N18+N17)/2	=P18+(O17*C18)
18	=(A17+1)	320	110	=(C19*0.002)+D19	=(D18+$E$22)	=B18+((E18*$B$6)*2)	=(B18*E18)+((0.5*(E18*$B$6)*(E18))*2)	=B18+(((E18)^2+((E18*$B$6)^2))^0.5)*2	=G18/H18	0.045	=(K17+100)	=((1200-K18)/1200)*$L$10	=L18/G18	=((M18*J18/1.49)*(1/(I18)^0.67))^2	=(N19+N18)/2	=P19+(O18*C19)
19	=(A18+1)	250	150	=(C20*0.002)+D20	=(D19+$E$22)	=B19+((E19*$B$6)*2)	=(B19*E19)+((0.5*(E19*$B$6)*(E19))*2)	=B19+(((E19)^2+((E19*$B$6)^2))^0.5)*2	=G19/H19	0.045	=(K18+100)	=((1200-K19)/1200)*$L$10	=L19/G19	=((M19*J19/1.49)*(1/(I19)^0.67))^2	=(N20+N19)/2	=P20+(O19*C20)
20	=(A19+1)	200	140	=(C21*0.002)+D21	=(D20+$E$22)	=B20+((E20*$B$6)*2)	=(B20*E20)+((0.5*(E20*$B$6)*(E20))*2)	=B20+(((E20)^2+((E20*$B$6)^2))^0.5)*2	=G20/H20	0.045	=(K19+100)	=((1200-K20)/1200)*$L$10	=L20/G20	=((M20*J20/1.49)*(1/(I20)^0.67))^2	=(N21+N20)/2	=P21+(O20*C21)
21	=(A20+1)	200	110	=(C22*0.002)+D22	=(D21+$E$22)	=B21+((E21*$B$6)*2)	=(B21*E21)+((0.5*(E21*$B$6)*(E21))*2)	=B21+(((E21)^2+((E21*$B$6)^2))^0.5)*2	=G21/H21	0.045	=(K20+100)	=((1200-K21)/1200)*$L$10	=L21/G21	=((M21*J21/1.49)*(1/(I21)^0.67))^2	=(N22+N21)/2	=P22+(O21*C22)
22	13	200	90	0	=D4-D5	=B22+((E22*$B$6)*2)	=(B22*E22)+((0.5*(E22*$B$6)*(E22))*2)	=B22+(((E22)^2+((E22*$B$6)^2))^0.5)*2	=G22/H22	0.045	=(K21+100)	=((1200-K22)/1200)*$L$10	=L22/G22	=((M22*J22/1.49)*(1/(I22)^0.67))^2	=N22	=1216.4
23																
24																
25	1 The water surface elevation (WSE) at the downstream most cross-section 13 was assumed to be equal to 1216.4 ft and the WSE at each cross section upstream was caluclated based on the average water surface slope and the distance betweeen the cross section.															
26																
27	2 The direction of flow into the reservoir is from North to South (from Cross-Section 1 to Cross-Section 13) whereas the channel inverts at 0.2 % slope in the opposite direction from South to North (from Cross-Section 13 to Cross-Section 1).															
28																



Top Width =
= (Bottom Width) *
* [(Flow Depth * Side slope) * 2]

(4)

(1)

Calculation Package 26

URS

EXHIBIT 4.7-2

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title:

DETERMINATION OF SUBMERGENCE EFFECTS AT WHITE TANK FRS NO. 3 SPILLWAY

Total Number of Pages (including cover sheet):

Total Number of Computer Runs:

Prepared by: Hammad Hussain Date: 07/16/04

Checked by: JUNEU KIM Date: 7/16/04

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

Remarks/Conclusions/Results:

See Page 4.

Calculation Approved by: 7/23/04
Project Manager/Date

Revision No.:	Description of Revision:	Approved by:

DETERMINATION OF SUBMERGENCE EFFECTS AT WHITE TANK FRS NO. 3 SPILLWAY

(WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3)
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

The purpose of this calculation package is to determine the submergence effect at the White Tank FRS No. 3 Spillway.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

When the water level below an overflow weir is high enough to affect the discharge, the weir is said to be submerged. The vertical distance from the crest of the overflow (spillway in this case) to the downstream apron and the depth of flow in the downstream channel, as it relates to the head pool level, are factors that alter the discharge coefficient (*Design of Small Dams, United State Department of Interior Bureau of Reclamation, Third edition, 1987*). Please see attached Pages 6-9.

In order to determine the possible submergence effects at White Tank FRS No.3 Spillway, Figure 9-26 of *Design of Small Dams, Third Edition, 1987* was used. Figure 9-26 presents a chart plotted with Degree of Submergence on Y-axis and Position of Downstream Apron on X-Axis (Please See Page 9). The degree of submergence was determined using the following relationship:

$$\textit{Degree of Submergence} = h_d/H_e$$

Where h_d = Difference in head pool level and tail water level

H_e = Height of water above the spillway crest

The position of downstream apron was determined using the following relationship:

$$\textit{Position of Downstream Apron} = (h_d + d) / H_e$$

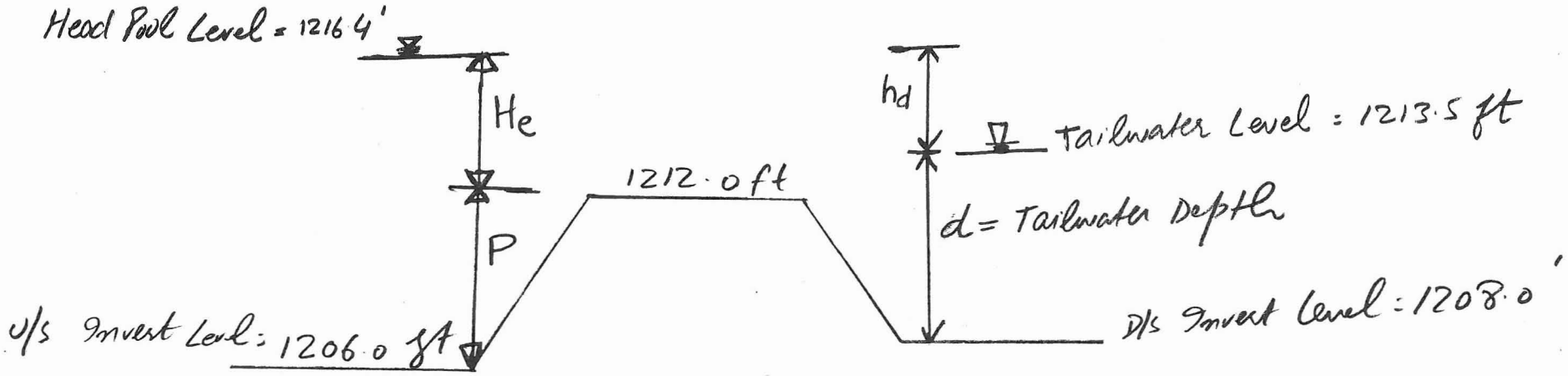
Where d = Tail water depth (ft)

h_d and H_e are same as defined above.

RESULTS

Form Figure 9-26, it can be seen that in order to have no submergence effects, the $(h_d + d) / H_e$ should exceed about 1.7 and h_d/H_e should exceed at least 0.65. Based on the computation results tabulated in Table 1, the ***Degree of Submergence*** was found to be equal to 0.67 and ***Position of Downstream Apron*** was found to be equal to 1.91. Therefore, the proposed spillway at White tank FRS No.3 should not experience any submergence effects.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**TABLE 1**													
2	**SUBMERGENCE EFFECT AT WHITE TANK FRS NO. 3 SPILLWAY**													
3														
4	Head Pool Level	Upstream Channel Invert	Spillway Crest Level	Height of Spillway (P)	Height of Water Above the Crest (H_e)	D/S Channel Invert	Tailwater Depth (d)	Tailwater Level (ft)	Water Level Difference (h_d)	Degree of Submergence (h_d/He)	Position of D/S Apron (h_d+d)/H_e	Allowable Degree of Submergence	Position of D/S Apron	Submergence Effect
5	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
6	1216.4	1206.0	1212.0	6.0	4.4	1208.0	5.5	1213.5	2.90	**0.66**	**1.91**	0.65 or Greater	1.7 or Greater	None



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**TABLE 1**													
2	**SUBMERGENCE EFFECT AT WHITE TANK FRS NO. 3 SPILLWAY**													
3														
4	Upstream Water Level	Upstream Channel Invert	Spillway Crest Level	Height of Spillway (P)	Height of Water Above the Crest (H_e)	D/S Channel Invert	Tailwater Depth (d)	Tailwater Level (ft)	Water Level Difference (h_d)	Degree of Submergence (h_d/He)	Position of D/S Apron (h_d+d)/H_e	Allowable Degree of Submergence	Position of D/S Apron	Submergence Effect
5	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
6	1216.4	1206	1212	=C6-B6	=A6-C6	1208	5.5	=F6+G6	=A6-H6	**=I6/E6**	**=(I6+G6)/E6**	0.65 or Greater	1.7 or Greater	None

(6)

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

DESIGN OF SMALL DAMS

A Water Resources Technical Publication

First Edition, 1960
Second Edition, 1973
Revised Reprint, 1977
Third Edition, 1987

to direction of flow, when $0.5H_o \leq r \leq 0.15H_o$: $K_a = 0.10$

- For rounded abutments where $r > 0.5H_o$ and headwall is placed not more than 45° to direction of flow: $K_a = 0.0$

where r = radius abutment rounding.

9.12. ***Discharge Coefficient for Uncontrolled Ogee Crests.***—(a) *Effect of Depth of Approach.*—For a high sharp-crested weir placed in a channel, the velocity of approach is small and the underside of the nappe flowing over the weir attains maximum vertical contraction. As the approach depth is decreased, the velocity of approach increases and the vertical contraction diminishes. For sharp-crested wiers whose heights are not less than about one-fifth the heads producing flow over them, the discharge coefficient remains fairly constant with a value of about 3.3, although the contraction diminishes. For weir heights less than about one-fifth the head, the contraction of the flow becomes increasingly suppressed and the crest coefficient decreases. When the weir height becomes zero, the contraction is entirely suppressed and the overflow weir becomes, in effect, a channel or a broad-crested weir, for which the theoretical discharge coefficient is 3.087. If the sharp-crested weir coefficients are related to the head measured from the point of maximum contraction instead of to the head above the sharp crest, coefficients applicable to ogee crests shaped to profiles of undernappes for various approach velocities can be established. The relationship of the ogee crest coefficient, C_o, to various values of P/H_o is shown on figure 9-23. These coefficients are valid only when the ogee is formed to the ideal nappe shape; that is, when $H_e/H_o = 1$.

(b) *Effect of Heads Different from Design Head.*—When the ogee crest shape is different from the ideal shape or when the crest has been shaped for a head larger or smaller than the one under consideration, the discharge coefficient will differ from that shown on figure 9-23. A wider shape will result in positive pressures along the crest contact surface, thereby reducing the discharge. With a narrower crest shape, negative pressures along the contact surface will occur, resulting in an increased discharge. Figure 9-24 shows the variation of the coefficient as related to values of H_e/H_o, where H_e is the actual head being considered.

An approximate discharge coefficient for an irregularly shaped crest whose profile has not been formed according to the undernappe of the overflow jet can be estimated by finding the ideal shape that most nearly matches it. The design head, H_o, corresponding to the matching shape can then be used as a basis for determining the coefficients [19].

The coefficients for partial heads on the crest, for preparing a discharge-head relationship, can be determined from figure 9-24.

(c) *Effect of Upstream Face Slope.*—For small ratios of the approach depth to the head on the crest, sloping the upstream face of the overflow results in an increase in the discharge coefficient. For large ratios the effect is a decrease in the coefficient. Within the range considered in this text, the discharge coefficient is reduced for large ratios of P/H_o only for relatively flat upstream slopes. Figure 9-25 shows the ratio for the coefficient for an overflow ogee crest with a sloping (inclined) face, C_i, to the coefficient for a crest with a vertical upstream face, C_v, as obtained from figure 9-23 (and as adjusted by figure 9-24 if appropriate), as related to values of P/H_o.

(d) *Effect of Downstream Apron Interference and Downstream Submergence.*—When the water level below an overflow weir is high enough to affect the discharge, the weir is said to be submerged. The vertical distance from the crest of the overflow to the downstream apron and the depth of flow in the downstream channel, as it relates to the head pool level, are factors that alter the discharge coefficient.

Five distinct characteristic flows can occur below an overflow crest, depending on the relative positions of the apron and the downstream water surface: (1) flow can continue at supercritical stage; (2) a partial or incomplete hydraulic jump can occur immediately downstream from the crest; (3) a true hydraulic jump can occur; (4) a drowned jump can occur in which the high-velocity jet will follow the face of the overflow and then continue in an erratic and fluctuating path for a considerable distance under and through the slower water; and (5) no jump may occur—the jet will break away from the face of the overflow and ride along the surface for a short distance and then erratically intermingle with the slow moving water underneath. Figure 9-26 shows the relationship of the floor positions and downstream submergences that produce these distinctive flows.

Where the downstream flow is at supercritical stage or where the hydraulic jump occurs, the decrease in the discharge coefficient is principally caused by the back-pressure effect of the down-

stream apron and is independent of any submergence effect from the tailwater. Figure 9-27 shows the effect of downstream apron conditions on the discharge coefficient. It should be noted that this curve plots, in a slightly different form, the same data represented by the vertical dashed lines on figure 9-26. As the downstream apron level nears the crest of the overflow, $(h_d + d)/H_e$ approaches 1.0, and the discharge coefficient is about 77 percent of the coefficient for unretarded flow. On the basis of a coefficient of 4.0 for unretarded flow over a high weir, the coefficient when the weir is submerged will be about 3.08, which is virtually the coefficient for a broad-crested weir.

From figure 9-26, it can be seen that when $(h_d + d)/H_e$ exceeds about 1.7, the downstream floor position has little effect on the coefficient, but there is a decrease in the coefficient caused by tailwater submergence. Figure 9-28 shows the ratio of the discharge coefficient where affected by tailwater conditions to the coefficient for free flow conditions. This curve plots, in a slightly different form, the data represented by the horizontal dashed lines on figure 9-26. Where the dashed lines on figure 9-26 are curved, the decrease in the coefficient is the result of a combination of tailwater effects and downstream apron position.

9.13. *Examples of Designs of Uncontrolled Ogee Crests.*—The two examples cited below illustrate the methods of designing uncontrolled ogee crests, including the computation of approach channel losses and velocity head, the determination of the total length of the crest, and the correction of the discharge coefficient for various effects.

(a) *Example 1.*—Design an uncontrolled overflow ogee crest for a chute spillway that will discharge 2,000 ft³/s at a 5-foot head, and prepare a discharge-head curve. The upstream face of the

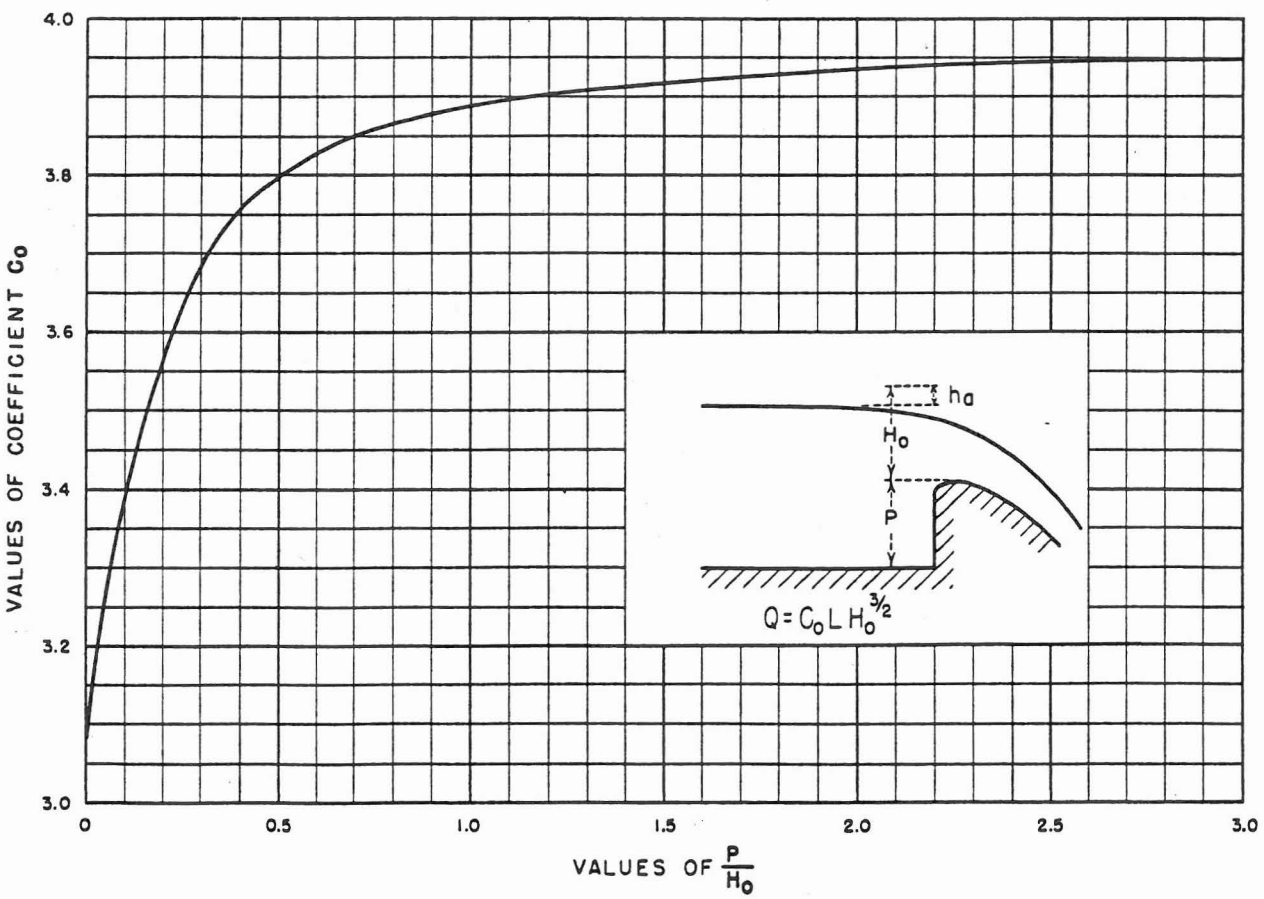


Figure 9-23.—Discharge coefficients for vertical-faced ogee crest. 288-D-2409.

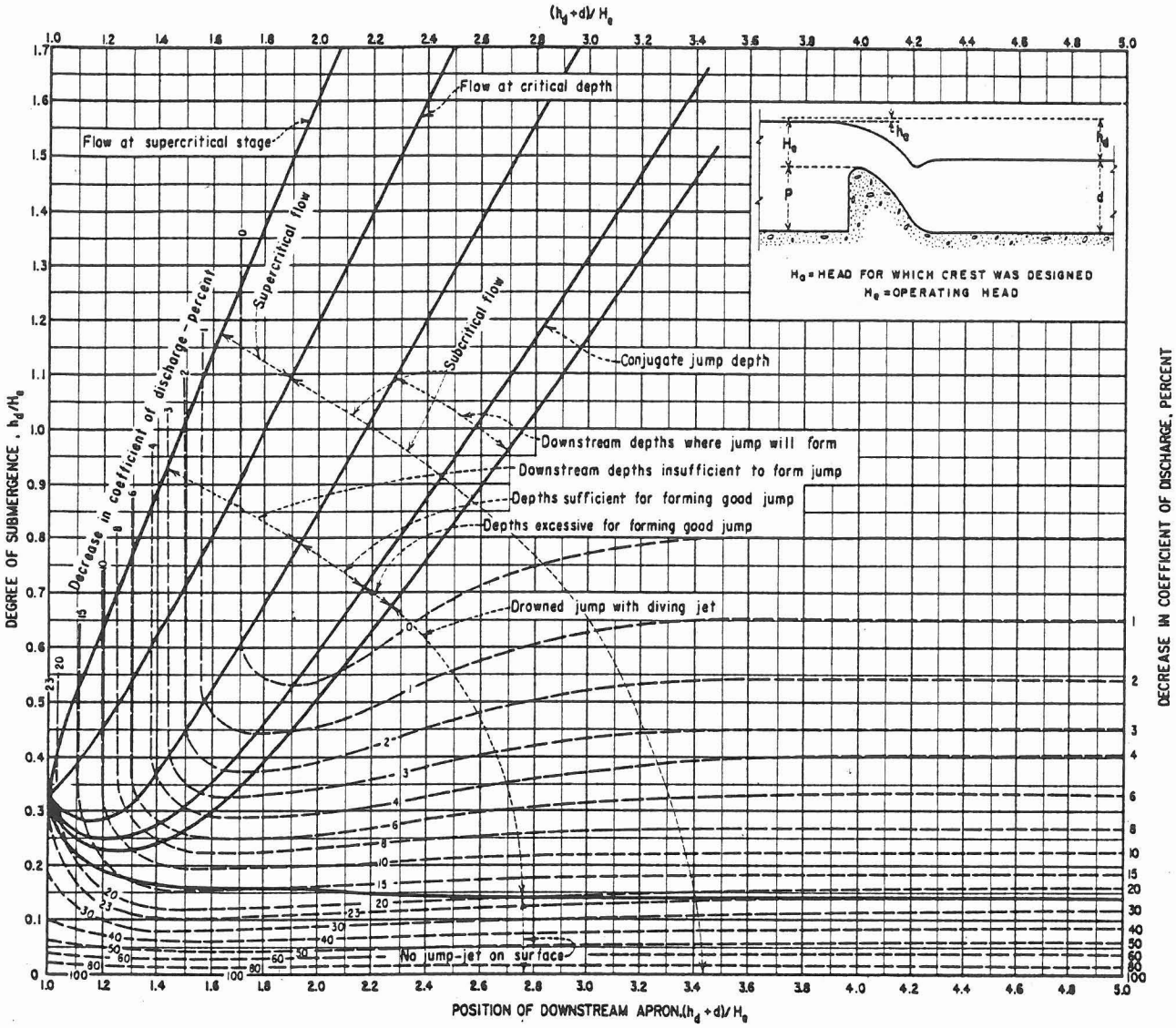


Figure 9-26.—Effects of downstream influences on flow over weir crests. 288-D-2412.

solutions will show both procedures.

(1) *Procedure 1.*—First, assume the position of the approach and downstream apron levels with respect to the crest level, say 2 feet below crest level. Then $H_e + P$ is approximately 7 feet.

To evaluate the approach channel losses, assume a value of C to obtain an approximate approach velocity, say $C = 3.7$. Then the discharge per unit of crest length, q, is equal to $CH_e^{3/2} = 3.7 \times 5^{3/2} = 41$ ft³/s. Therefore, the velocity of approach $v_a = q/(H_e + P) = 41/7 = 5.9$ ft/s, and the approach velocity head, $h_a = v_a^2/2g = 5.9^2/64.4 = 0.5$ feet.

Assuming the friction coefficient in Manning's formula $n = 0.0225$, and assuming the hydraulic radius r = the depth of approach, then the friction slope is equal to:

$$s = \left(\frac{v_a n}{1.486 r^{2/3}}\right)^2 = \left(\frac{5.9 \times 0.0225}{1.486 \times 7^{2/3}}\right)^2 = 0.0006$$

Therefore, the total approach channel friction loss, $h_f = 100\ (0.0006) = 0.06$ feet. Assuming an entrance loss into the approach channel equal to $0.1h_a$, the total loss of head in the approach is approximately $0.06 + (0.1 \times 0.5) = 0.11$ feet.

Calculation Package 27

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URS

EXHIBIT 4.7-2

CALCULATION COVER SHEET

Client: Flood Control District of Maricopa County (FCDMC)

Project Name: White Tank FRS No. 3 Design

Project/Calculation Number: 23443748

Title: **ESTIMATION OF UNIFORM FLOW DEPTH DOWNSTREAM OF WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3**

Total Number of Pages (including cover sheet): _____

Total Number of Computer Runs: _____

Prepared by: Hammad Hussain Date: 06/25/04

Checked by: Todd Ringsmuth Date: 7-27-04

Description and Purpose:

See Page 2

Design Basis /Assumptions

See Page 2

Remarks/Conclusions/Results:

See Pages 2-4.

Calculation Approved by: Todd Ringsmuth 7-27-04

Project Manager/Date

Revision No.:	Description of Revision:	Approved by:

Project Manager/Date

ESTIMATION OF UNIFORM FLOW DEPTH DOWNSTREAM OF WHITE TANK FLOOD RETARDING STRUCTURE (FRS) NO. 3

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC)
23443748

PROBLEM STATEMENT

The aim of this calculation package is to determine the uniform flow depth downstream of White Tank FRS No. 3 within a excavated spillway channel.

DESIGN BASIS/ASSUMPTIONS/REFERENCES

The outflows released from the emergency spillway at White Tank FRS No.3 are planned to be discharged into a channel (referred as Excavated Spillway Channel from hereon) of bottom width of approximately 845 ft with a side slopes of 2 to 1 (H: V). The Excavated Spillway Channel slopes at 0.5 percent until it daylights to the existing grade, approximately 1560 ft long. Further downstream, the Excavated Spillway Channel transitions into a natural channel, which is wider and steeper (1 percent) than the Excavated Spillway Channel. Therefore, the water depth within the natural channel is expected to be lower than the flow depth in the Excavated Spillway Channel causing no backwater effects. A uniform flow is expected to occur within the Excavated Spillway Channel .

The reservoir routing of a 6-hour local PMF storm for future conditions with a broad-crested weir in place and a closed Principal Spillway revealed the maximum outflow discharge to be equal to 30,000 cfs. Therefore, the Excavated Spillway Channel was designed for a capacity of 30,000 cfs. A Manning's Roughness coefficient of 0.06 and 0.045 was used for the channel banks and the channel bed respectively. It should be noted that these Manning's Roughness coefficients were selected with an anticipation of future vegetation growth in the channel. A computer software FLOWMASTER was used to determine the uniform flow depth for the Excavated Spillway Channel. Please note that the FLOWMASTER does not allow entering separate Manning's Roughness coefficient for channel banks and the channel bed. Therefore, an average Manning's Roughness coefficient of 0.05 was used for the FLOWMASTER analysis.

RESULTS

The FLOWMASTER analysis indicates a uniform flow depth of 5.45 ft within the downstream channel with the mean flow velocity equal to 6.45 ft/sec (Please See Pages 3 and 4).

White Tank FRS No.3 Downstream Conveyance Channel Sizing
Worksheet for Trapezoidal Channel

3

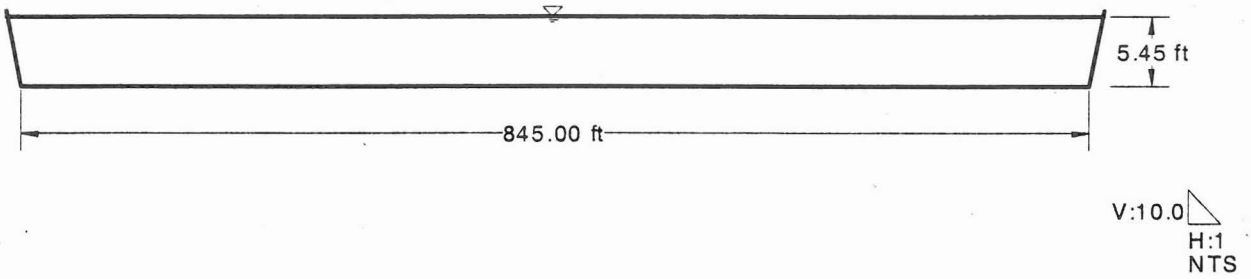
Project Description	
Worksheet	Channel Sizing (n=0.05, S=0.5%)
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.050	
Slope	0.005000	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	845.00	ft
Discharge	30,000.00	cfs

Results		
Depth	5.45	ft
Flow Area	4,660.6	ft²
Wetted Perim	869.35	ft
Top Width	866.78	ft
Critical Depth	3.39	ft
Critical Slope	0.024382	ft/ft
Velocity	6.44	ft/s
Velocity Head	0.64	ft
Specific Energ	6.09	ft
Froude Numb	0.49	
Flow Type	Subcritical	

Cross Section Of White Tank FRS No.3 Downstream Conveyance Channel
Cross Section for Trapezoidal Channel

4

Project Description	
Worksheet	Channel Sizing (n=0.05, S=0.5%,
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coeffic	0.050	
Slope	0.005000	ft/ft
Depth	5.45	ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	845.00	ft
Discharge	30,000.00	cfs