

Master Development Drainage Plan
Cheyenne Mountain High School Campus
Cheyenne Mountain School District No. 12
Colorado Springs, Colorado

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Cheyenne Mountain High School Campus
Cheyenne Mountain School District No. 12
Colorado Springs, Colorado

Prepared For:

Cheyenne Mountain School District No. 12
1118 West Cheyenne Road
Colorado Springs, Colorado 80906

Prepared By:

Kiowa Engineering Corporation
2814 International Circle
Colorado Springs, Colorado 80910-3127

January 26, 1998

Kiowa Engineering Corporation

January 26, 1998

Mr. Robin Kidder
City of Colorado Springs
Engineering Division – Stormwater and Subdivision
P.O. Box 1575 Mail Code 1110
Colorado Springs, Colorado 80901-1575

RE: Master Development Drainage Plan, Cheyenne Mountain High School (KIOWA Project No. 9787)

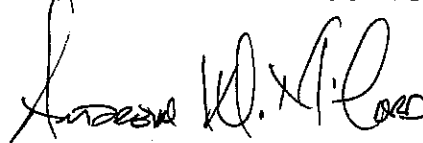
Dear Mr. Kidder:

Cheyenne Mountain School District No. 12 is currently planning additional parking and athletic field additions to the Cheyenne Mountain High School campus. This Master Development Drainage Plan addresses the existing and proposed drainage conditions for Cheyenne Mountain High School. This drainage Study has been prepared according to current City/County drainage criteria and is being submitted for the City's review and approval.

If there are any questions or if we may be of further assistance, please feel free to call at any time.

Sincerely,

KIOWA ENGINEERING CORPORATION



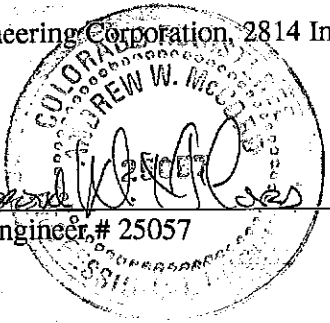
Andrew W. McCord, P.E.
Senior Engineer

Enclosure

ENGINEER'S STATEMENT:

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

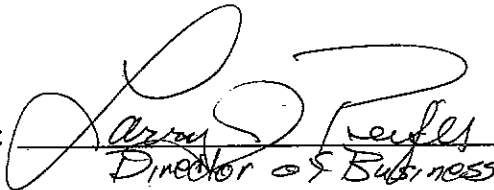
Kiowa Engineering Corporation, 2814 International Circle, Colorado Springs, Colorado 80910-3127



Registered Engineer, # 25057
Date 1/26/98

DEVELOPER'S STATEMENT:

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

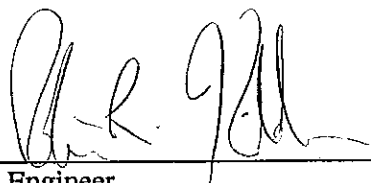
BY: 

Director of Business
Date 1/28/98

ADDRESS: Cheyenne Mountain School District No. 12
1118 West Cheyenne Road
Colorado Springs, Colorado 80906

CITY OF COLORADO SPRINGS:

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



City Engineer
Date 3/5/98

Conditions:

I. INTRODUCTION

Authorization

This Master Development Drainage Plan (MDDP), for the Cheyenne Mountain High School Campus was authorized under the terms of the agreement between Cheyenne Mountain School District No. 12 and Kiowa Engineering Corporation.

Purpose

The purpose of this study is to identify a feasible stormwater management plan to satisfy the existing and future needs within the Cheyenne Mountain High School campus. The need for this study is due to the planned athletic field and parking additions to the Cheyenne Mountain High School campus. The School District has acquired additional land to the west and north of the existing high school site totaling approximately 17 acres.

Summary of Data Obtained

Listed below are the technical reports collected for review as part of preparing this study:

Master Drainage Report Broadmoor-Skyway Property, prepared by Drexel Barrell and Co., dated February 10, 1981.

Soil Survey of El Paso County Area, Colorado, United States Department of Agriculture Soil Conservation Service, issued June 1981.

Drainage Report for Fire Station 13 Subdivision, prepared by Peak Engineering Co., dated March 1983.

Southwest Area Drainage Planning Study, prepared by Lincoln-DeVore, dated 1984.

City of Colorado Springs/El Paso County Drainage Criteria Manual, prepared by City of Colorado Springs, El Paso County, and HDR Infrastructure, Inc., dated October 1987, revised October 1994.

Stratton Preserve Preliminary Drainage Plan and Report, prepared by Rockwell-Minchow Consultants, Inc., dated February 1996.

Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property, prepared by Nolte and Associates, Inc., revised December 1996.

Final Drainage Report Jefferson at Cheyenne Mountain, prepared by Nolte and Associates, Inc., revised December 31, 1996.

Preliminary and Final Drainage Plan and Report for The Village at Stratton Preserve Filing No. 1, prepared by Rockwell-Minchow Consultants, Inc., revised February 1997.

Mapping and Surveying

Mapping used in the planning effort consisted of 2-foot contour interval electronic mapping obtained through the City of Colorado Springs FIMS program. This mapping was compiled using the National Geodetic and Vertical Datum of 1929.

Project Background

Cheyenne Mountain High School was constructed in 1962. At that time, the school was located outside the city limits of Colorado Springs. No drainage report for the original construction has been located. The construction of the school did account for drainage running through the site. These facilities along with drainage facilities added subsequent to the initial construction are shown on Exhibit 1B. In 1981 Drexel Barrel prepared a document entitled *Master Drainage Report Broadmoor-Skyway Property* that included drainage analysis of the Myron Statton Property surrounding the High School. In 1983 a drainage report for Fire Station No. 13 was prepared and approved by the City of Colorado Springs. Fire Station 13 is located opposite the High School on the northeast corner of Cresta Road and La Veta Way. In 1984, the City of Colorado Springs retained Lincoln-DeVore to prepare the Drainage Basin Planning Study for the area including the High School site. This document is entitled the *Southwest Area Drainage Planning Study*. This document served as the overall drainage master plan for the area including the High School until the acceptance of the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property* in December of 1996. This report was prepared in conjunction with the development of a portion of the Myron Stratton Property located between Cresta Road, La Veta Way and Vista Place. This report recommended the construction of a regional detention basin located near the intersection of the La Veta Way and Mercury Drive. With the acceptance of the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property* by the City of Colorado Springs, the method of handling drainage in this area is different than shown in the *Southwest Area Drainage Planning Study*. For this reason, the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property* is now considered to be the overall drainage master plan for the area including the High School.

Cheyenne Mountain School District No. 12 has received additional lands to the west and north of the existing High School property. The District is considering the construction of additional athletic fields and parking areas for the High School campus on this additional property. This report is intended to evaluate the existing drainage facilities on the High School site and to recommend future drainage facilities required by the expansion of the High School campus.

II. STUDY AREA DESCRIPTION

Cheyenne Mountain High School is located in the western portion of Colorado Springs. Cheyenne Mountain High School is located within Section 26 of Township 14 South, Range 67 West of the 6th Principal Meridian in Colorado Springs, El Paso County, Colorado. The site is bounded on the east by Cresta Road, on the south by La Veta Way, on the west by unplatted ground, and on the north by Stratton Preserve which is currently under construction. With the addition of property to the north and west of the High School, the overall property is approximately 52.5 acres in size. The existing and additional property is shown on Exhibit 1A.

The major drainage feature through Cheyenne Mountain High School has been named Cheyenne Run. Cheyenne Run is the existing drainageway which outfalls into the detention basin under construction near the intersection of Vista Place and Mercury Drive. Cheyenne Mountain High School is entirely tributary to Cheyenne Run. A Vicinity Map for the project area is provided on the following page.



Vicinity Map

1"=2,000'

Cheyenne Mountain High School

Development Description

The current High School campus includes academic buildings, auditorium, cafeteria, gymnasium, football practice field, baseball field, football stadium, soccer fields, four tennis courts and related parking and access drives.

The proposed addition to the Cheyenne Mountain High School campus includes expanding the existing football practice field, adding an additional four tennis courts, an all-purpose practice field, softball field, ropes course area, expansion of the existing soccer fields, expansion of the baseball field, addition of an access road south of the football stadium, removal of parking south of the north entrance adjacent to the baseball field, and addition of parking throughout the site.

Climate

This area of El Paso County can be described, in general as high plains, with total precipitation amounts typical of a semi-arid region. Winters are generally cold and dry. Precipitation ranges from 14 to 16 inches per year, with the majority of this precipitation occurring in spring and summer in the form of rainfall. Thunderstorms are common during the summer months, and are typified by quick-moving low-pressure cells which draw moisture from the Gulf of Mexico into the region. Average temperatures range from about 30°F in the winter to 75°F in the summer. The relative humidity ranges from about 25 percent in the summer to 45 percent in the winter.

Soils and Geology

Soils within the Cheyenne Mountain High School campus vary between hydrological soil types A and C, as identified by the U. S. Department of Agriculture, Soil Conservation Service. The predominant soil groupings are in the Chaseville-Midway Complex. The extreme eastern portion of the site is Kutch clay loam. The soils consist of deep and moderately deep, well drained soils that were formed by alluvial sediment. The soils have high infiltration rates, except for the Kutch clay loam which has a low infiltration rate. Surface runoff is medium and the erosion potential is moderate to high. For the developed condition, per the *City/County Drainage Criteria Manual*, Type A soils have been assumed to be B soils for the purposes of preparing the hydrologic model.

Impervious Land Densities

Land use information supplied through the School District for the future condition was reviewed as part of this planning effort. Off-site land use information developed with the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property* was used. The off-site land use assumed development west and upstream of Cheyenne Mountain High School. This information is used in the hydrologic analysis to predict runoff rates and volumes for the purposes of stormwater facility evaluation. The land uses were then used to estimate the curve number (CN) values and runoff coefficients (C) per the *City/County Drainage Criteria Manual*.

III. HYDROLOGIC ANALYSIS

A hydrologic analysis was conducted in order to determine peak discharges and runoff volumes for various storm types, and basin development conditions. This data was used in the evaluation of existing flood problems, and in the evaluation of existing and proposed stormwater facilities on the Cheyenne Mountain High School campus.

Runoff Model

The runoff model used to determine the peak flows and volumes west of the Cheyenne Mountain High School campus is the HEC-1 Flood Hydrograph Computer Program. The HEC-1 computer model was developed by the Hydrologic Engineering Center (HEC), Corps of Engineers, Department of the Army. This model was chosen to compare the peak flows developed in the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property* which used the Colorado Urban Hydrograph Procedure (CUHP). Both hydrological models are in compliance with the *City of Colorado Springs/El Paso County Drainage Criteria Manual* for basins over 100 acres in size.

The runoff model used to determine peak flow rates for the Cheyenne Mountain High School campus is the Rational Method. This method is applicable to sub-basins under approximately 90 acres in size. This hydrologic method is in compliance with the *City of Colorado Springs/El Paso County Drainage Criteria Manual*. The off-site flows were combined with the on-site flows by adding the flows together. Combining flows in this manner does not account for lagging or storage, is inaccurate, however the resulting flows are conservatively estimated.

Basin Characteristics

The study area subject to the hydrologic evaluation is the area encompassed by the Cheyenne Mountain High School campus as well as areas which drain onto the property. Presented on Exhibit 1A is the Off-site Hydrologic map, which shows the off-site drainage basins tributary to the Cheyenne Mountain High School campus. The off-site flows developed are for comparative purposes with the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property*. The flows from the off-site basins were developed for the existing and the developed conditions.

Exhibit 1B shows the existing on-site flows from the Cheyenne Mountain High School campus along with existing off-site flows. This condition reflects the site as it sits today.

Exhibit 1C shows the existing on-site flows from the Cheyenne Mountain High School campus along with future developed off-site flows. This condition reflects future development of the area tributary to the High School.

Basin characteristics such as size, curve numbers (CN-values), runoff coefficient (C), basin slope, flow path, time of concentration (Tc), channel type, slope and size, channel, and velocity were estimated within each sub-basin. These parameters were determined from available topographic, land use and soils maps, and field investigation. Presented in the appendix are the time of concentration calculations, HEC-1 computer modeling, and rational method hydrology summaries.

Design Rainfall

In accordance with the *City/County Drainage Criteria Manual* the 24-hour Type II-A storm with an antecedent moisture condition (AMC) of II was applied in the hydrologic modeling. The 24-hour duration storm events for the 5-year and 100-year recurrence intervals were evaluated. Rainfall depths are 4.4 inches and 2.6 inches for the 100-year and 5-year frequencies, respectively.

Results

The results of the hydrologic analysis have been presented in several formats. The Exhibits included with this report show sub-basin boundaries, design points, sub-basin areas, and peak flows. A summary of flow rates for key design points is presented in the appendix. The HEC-1 input and output along with the Rational Method output has been included in the appendix.

In general, the off-site 5-year and 100-year discharges for the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property* are slightly higher than the off-site 5-year and 100-year discharges presented in this report. The existing on-site discharges are in general agreement with discharges developed in the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property*. Even though the off-site flows developed in this report are slightly less than those in the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property*, off-site flows from the Myron Stratton Home report were used in this report.

IV. HYDRAULIC ANALYSIS

A hydraulic analysis was conducted to ascertain the conveyance capacity of the existing hydraulic structures within the Cheyenne Mountain High School campus. Field verifications of these facilities were conducted and noted. School personnel provided information concerning the location and existence of drainage facilities.

Hydrology

The hydrology used in the hydraulic capacity verification of existing storm drainage facilities is the same as summarized in Section III of this report. The verification was carried out in order to determine the adequacy of the existing systems.

Hydraulic Structure Inventory

As part of the field investigation, the existing drainage facilities were verified and inventoried. The size, type, and condition was recorded for all the culverts, channels, inlets, pipes, and miscellaneous drainage features on the Cheyenne Mountain High School campus. Hydraulic capacities were estimated for the culverts and inlets. The existing drainage facilities are presented on Exhibit 1B, 1C and 2, contained within the map pocket of this report. Hydraulic capacities were estimated using both *HY-8* and *UDINLET* computer analysis programs. *HY-8 Culvert Analysis and Design Software* is a Federal Highway Administration program used in the analysis of culverts. *UDINLET Street Hydraulics and Inlet Sizing* computer program is an inlet analysis program developed by the Urban Drainage and Flood Control District in the Denver Metro area.

Presented in a table on Exhibit 2 is a summary of the hydraulic capacities of the existing storm sewer systems and culverts on the Cheyenne Mountain High School campus. In general, the existing drainage facilities within the Cheyenne Mountain High School campus have been designed to convey the 5-year flow. Inlet capacities on the campus are greater than the 5-year flows, however the pipe sizes limit the capacity to approximately 5-year flows. The excess flows are designed to be carried by swales and parking drives located over the main drainage pipes. Downstream of the Cheyenne Mountain High School campus, Cresta Road is used to carry the overflow. Cresta Road conveys the excess flow to La Veta Way. The sidewalk chase currently under construction on the north side of La Veta Way will convey the street runoff to the regional detention pond.

Floodplain Statement

There are no designated FEMA floodplains within the Cheyenne Mountain High School campus. The Cheyenne Mountain High School campus is upstream of the limits of the detailed floodplain study for Cheyenne Run. The Floodplain Insurance Rate Map for El Paso County panel 08041C0736 F, dated March 17, 1997, was reviewed to determine any potential floodplain delineation.

V. RECOMMENDED STORM DRAINAGE IMPROVEMENTS

As a result of the hydrologic and hydraulic evaluations, proposed drainage improvements have been identified for Cheyenne Mountain High School assuming the construction of the proposed athletic and parking facilities. The improvements are presented on Exhibit 2.

Storm Sewer Systems

Size, type, capacity, and location of drainage facilities to serve the proposed improvements for Cheyenne Mountain High School are shown on Exhibit 2. The 5-year design capacity per the current criteria was used in the sizing of new drainage facilities. For the most part, the existing drainage systems are sufficient to carry the design capacity as estimated in this report.

Descriptions of Recommended Improvements

Runoff from Cheyenne Mountain High School leaves the site in three general locations. For the purposes of this report, they are referred to as the north outfall, central outfall and the south outfall. The north outfall is located just north of the northern entrance to Cheyenne Mountain High School. The outfall structure under Cresta Road is the corrugated arch pipe which doubles as a pedestrian walkway. The central outfall is where the existing 30" pipe crosses Cresta Road approximately 300 feet north of the southern entrance to Cheyenne Mountain High School. The south outfall is the intersection of La Veta Way and Cresta Road. An existing radial curb inlet is located at the intersection. The following is a discussion of the three outfalls and proposed drainage improvements for each outfall.

The *north outfall* currently has a 9'x8' corrugated metal arch pipe under Cresta Road. This outfall accepts runoff from areas north and west of the High School site. Only a small portion of the flow to this point is generated on Cheyenne Mountain High School. The flow from Cheyenne Mountain High School to this outfall point is generated mostly from roof drainage and parking lots on the north end of the campus. Under existing conditions, the 5-year and 100-year runoff from the site is 17 cfs and 34 cfs respectively. Since there is no off-site flow onto the High School site which contributes to this outfall point, there is no increase in flow from Cheyenne Mountain High School assuming future upstream development. Future development upstream of the outfall will of course increase the flow at the outfall point, but this will be generated from development north and west of the High School. From runoff rates generated in the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property*, the existing flow at the corrugated metal arch pipe is 52 cfs and 97 cfs for the 5-year and 100-year storms respectively. Assuming development of upstream areas, the flows will increase to 69 cfs and 129 cfs for the 5-year and 100-year storms respectively.

The increase in runoff from Cheyenne Mountain High School, due to the proposed improvements to the campus is 2 cfs in the 5-year storm and 3 cfs in the 100-year storm. The estimated flow rates from Cheyenne Mountain High School to the north outfall point are 19 cfs and 37 cfs for the 5-year and 100-year storms respectively.

Currently, roof drainage and parking lot drainage is collected in 8'x2.5' grated inlet located just north of the left field foul pole of the baseball field. This flow is then directed to the east and then north to a pipe discharge point at the northwest corner of the intersection of the north entrance and Cresta Road. This outfall has been a maintenance problem for a period of time, and Kiowa proposes that the outfall pipe be extended to the north nearer the 9'x8' corrugated metal arch pipe.

With the construction of the proposed parking areas north of the north entrance, inlets should be provided to collect storm runoff from these parking areas. A proposed 24" reinforced concrete pipe is proposed to direct the runoff collected in the inlets to an outlet adjacent to the 9'x8' corrugated metal arch pipe.

The *central outfall* is the 30" RCP which runs through the Cheyenne Mountain High School campus between the baseball and football fields. This pipe is connected to a number of inlets on the campus. This pipe carries flow from the southern portion of building complex including the gymnasium, auditorium and cafeteria. The 30" RCP runs under Cresta Road approximately 300 feet north of the southern entrance to the High School. With the development of Jefferson at Cheyenne Mountain, this 30" pipe has been connected to a 48" RCP on the Jefferson at Cheyenne Mountain site. This 48" RCP runs south parallel to Cresta Road, then east and south around Fire Station 13, the pipe then turns east and runs parallel to La Veta Way until its discharge into the regional detention basin.

The 30" RCP does not have the current capacity to carry the 100-year storm event. Provisions for conveying the 100-year storm runoff has been provided with an informal channel which runs between the art building and auditorium and between the baseball and football fields. Cresta Road carries this overflow runoff off site. At the intersection of Cresta Road and La Veta Way, the flow in the street turns east and its discharged into the regional detention basin through a large sidewalk chase located just west of the intersection of La Veta Way and Vista Place.

The proposed improvements to the central outfall system consist of extensions to the existing pipe system to the west to accommodate the proposed multi-purpose practice fields. A junction box is proposed at the location of the existing 30" pipe inlet located near the southwest corner of the existing football practice field. Two pipes will be extended to the west to collect runoff from the west. The northern pipe is proposed as a 36" RCP which has been sized to collect the future developed flow of 49 cfs. The 100-year overflow will be directed to the south along the property line in a swale to the location of the second pipe extension. The second pipe is proposed to be an 18" RCP which has been designed to pick up the 5-year flow of 20 cfs. The 100-year overflow will then be directed to the east between the two proposed multi-purpose practice fields. The overflow will then take the historic path through the site, between the cafeteria and auditorium and between the football and baseball fields to Cresta Road. A swale will be required between the two proposed multi-purpose practice fields to convey the overflow runoff. The proposed equipment shed between the two fields needs to be relocated away from the drainage path.

The *south outfall* point is the intersection of La Veta Way and Cresta Road. This point includes runoff from the southern portion of Cheyenne Mountain High School, runoff in Cresta Road, along with runoff from La Veta Way. Runoff from Cheyenne Mountain High School includes runoff from off-site which is currently routed to the north and east of the existing tennis courts. This runoff is collected in a 24" CMP near the southeast corner of the existing tennis courts and discharged west of the existing soccer fields. The runoff is then allowed to sheetflow over the soccer fields to the curb inlet located at the intersection of La Veta Way and Cresta Road. The west end of the soccer fields currently shows the remnants of past flooding.

The proposed improvements to the Cheyenne Mountain High School campus will require that the southern drainage be piped around the tennis court expansion and softball field. Once this runoff is collected in a pipe, it should be discharged into the existing storm sewer system located at the intersection of La Veta Way and Cresta Road. In major storms the existing system will likely become surcharged spilling some runoff back onto Cresta Road and La Veta Way. However, more runoff will be in the storm sewer system than is currently capable of entering the existing 30" RCP storm sewer system. During

minor storm events, the amount of water on the surface will be reduced considerably by the addition of a storm sewer system west of the intersection of La Veta Way and Cresta Road.

The proposed south outfall system includes the construction of a 42" RCP from west of the proposed tennis courts to a tie-in with the existing public 30" RCP storm sewer system at La Veta Way and Cresta Road. Inlets are proposed for the new parking lots and at a sump location just east of the proposed tennis courts. The location of the proposed 42" RCP is shown conceptually on Exhibit 2. Depending upon the final layout of the facilities, other routes for the storm sewer system may be utilized.

The proposed improvements to the Cheyenne Mountain High School campus will cause an increase in runoff as compared to the existing condition runoff. This increase in on-site runoff will be 2.2 cfs in the north outfall, 4 cfs in the central outfall and 6 cfs in the south outfall due to the initial storm. The proposed drainage facilities attempt to collect additional runoff into storm sewer facilities and discharge that runoff safely off-site. The amount of runoff on the surface at the intersection of La Veta Way and Cresta Road will be reduced with the construction of the proposed facilities. The storm water facilities necessary on the Cheyenne Mountain High School campus are all considered private facilities and will be maintained by the School District.

Table 1

INITIAL STORM ON-SITE FLOW COMPARISONS	
North Outfall	5-Year Flow
Existing On-Site	16.6 cfs
Proposed On-Site	18.8 cfs
Developed Increase	2.2 cfs
Central Outfall	
Existing On-Site	57 cfs
Proposed On-Site	61 cfs
Developed Increase	4 cfs
South Outfall	
Existing On-Site	39 cfs
Proposed On-Site	45 cfs
Developed Increase	6 cfs

The following Table 2 is a summary of flow at the three outfall points for different development scenarios. The south outfall gives the total surface (In Street) runoff outfalling from the site by combining the flows from the central and south basins that are not captured by inlets and carried underground in a pipe. The existing off-site/existing site is the current condition. The existing off-site/proposed site is the flow assuming no change in off-site conditions and construction of the improvements to the High School campus. The proposed off-site/existing site is the flow assuming developed conditions upstream and no changes to the High School campus. The proposed off-site/proposed site is the projected flow assuming upstream development and construction of the improvements to the High School campus.

Table 2

FLOW COMPARISONS AT OUTFALL POINTS

North Outfall		In Pipe	In Street
Existing off-site/Existing site	5-year	17 cfs	0 cfs
	100-year	34 cfs	0 cfs
Existing off-site/Proposed site	5-year	19 cfs	0 cfs
	100-year	37 cfs	0 cfs
Proposed off-site/Existing site	5-year	17 cfs	0 cfs
	100-year	34 cfs	0 cfs
Proposed off-site/Proposed site	5-year	19 cfs	0 cfs
	100-year	37 cfs	0 cfs
Central Outfall		In Pipe	In Street
Existing off-site/Existing site	5-year	54 cfs	3 cfs
	100-year	114 cfs	75 cfs
Existing off-site/Proposed site	5-year	51 cfs	11 cfs
	100-year	114 cfs	107 cfs
Proposed off-site/Existing site	5-year	107 cfs	3 cfs
	100-year	114 cfs	149 cfs
Proposed off-site/Proposed site	5-year	102 cfs	11 cfs
	100-year	114 cfs	167 cfs
South Outfall		In Pipe	In Street
Existing off-site/Existing site	5-year	42 cfs	0 cfs
	100-year	55 cfs	153 cfs
Existing off-site/Proposed site	5-year	55 cfs	1 cfs
	100-year	104 cfs	149 cfs
Proposed off-site/Existing site	5-year	55 cfs	39 cfs
	100-year	55 cfs	291 cfs
Proposed off-site/Proposed site	5-year	104 cfs	4 cfs
	100-year	104 cfs	272 cfs

Due to the proposed construction of improvements on the High School campus, more runoff will be directed to the south outfall. The improvements in the south outfall will capture a portion of this runoff and carrying the runoff in a pipe system. Even though more stormwater is directed to the south, most of the stormwater will be carried by the pipe system. Assuming that the existing 30" RCP east of Fire Station No. 13 is the limiting facility in the system, some stormwater in the proposed 42" pipe will discharge onto Cresta Road at La Veta Way in the major storm event. The excess runoff will be carried by La Veta to the east and will discharge to the existing detention basin through the existing sidewalk chase. The total amount of flow to the south outfall in the initial storm, including runoff in the street from the central outfall, increases by 14 cfs. 13 cfs of the increase is collected by the storm sewer system. The total amount of flow to the south outfall in the major storm, including runoff in the street from the central outfall, increases by 45 cfs. With the addition of the proposed storm sewer system, 49 cfs is collected. This leaves a reduction of approximately four cfs in the street due to the construction of the proposed stormsewer system.

Detention

The *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property* indicates that if development occurs upstream of Cheyenne Mountain High School, depending upon the configuration of that development, additional small, privately maintained detention basins may be necessary. The need for a detention basin upstream of Cheyenne Mountain High School should be based upon the ability to convey developed flows through the Cheyenne Mountain High School campus. Currently the existing drainage facilities on the Cheyenne Mountain High School campus are able to convey the 5-year future developed flows from off-site. If the developed flows off-site are greater than those developed in the *Master Development Drainage Plan Myron Stratton Home Broadmoor-Skyway Property*, a detention basin will be necessary. If the upstream property remains undeveloped, the drainage facilities on the Cheyenne Mountain High School campus are adequate to convey existing off-site flows.

VI. COST OF CONSTRUCTION

A summary of costs for the proposed drainage facilities presented on Exhibit 2 are contained in this section of the report. Cost estimates have been based upon the unit prices shown on the Table 3.

Costs for the proposed drainage facilities are all considered as "non-reimbursable." The facilities are considered private facilities and will be maintained by the School District. A revocable permit will need to be executed between the City of Colorado Springs and the District in order to connect the private drainage facilities into the public drainage facilities located along Cresta Road.

TABLE 3

Opinion of Cost

Client: Cheyenne Mountain School District No. 12

Project: Cheyenne Mountain High School Campus - MDDP

Kiowa Engineering Corporation

Job No. 9787

Private - Non-Reimbursable

ITEM	QUANTITY	UNIT	UNIT COST	ITEM TOTAL
<i>Cheyenne Mtn. H.S.</i>				
18" RCP Flared End Section	1	ea	\$400.00	\$400.00
36" RCP Flared End Section	1	ea	\$600.00	\$600.00
42" RCP Flared End Section	1	ea	\$700.00	\$700.00
18" Reinforced Concrete Pipe	200	lf	\$21.00	\$4,200.00
24" Reinforced Concrete Pipe	512	lf	\$25.00	\$12,800.00
36" Reinforced Concrete Pipe	350	lf	\$58.00	\$20,300.00
42" Reinforced Concrete Pipe	1,605	lf	\$75.00	\$120,375.00
5' D-10R Inlet	7	ea	\$2,550.00	\$17,850.00
Manhole	4	ea	\$1,200.00	\$4,800.00
Junction Box	1	ea	\$2,000.00	\$2,000.00

TOTAL CONSTRUCTION COST **\$184,025.00**

10 % CONTINGENCY **\$18,402.50**

5 % ENGINEERING **\$9,201.25**

PROJECT TOTAL **\$211,628.75**

Since the Engineer has no control over the cost of labor, materials or equipment, or over the Contractor's method of determining prices, or over competitive bidding or market conditions, his opinions of probable construction cost provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by him

Appendix A
Calculations

KIOWA ENGINEERING CORPORATION

DATE: 03-Nov-97

TIME: 04:07 PM

CURVE DESCRIPTION

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|     |                                             |   |
|-----|---------------------------------------------|---|
| E   | GRASSED WATERWAY                            | 1 |
| F   | PAVED AREA (SHEET FLOW) & SHALLOW GUT. FLOW | 2 |
| C   | SHORT GRASS PASTURE & LAWNS                 | 3 |
| A   | FOREST WITH HEAVY GROUND LITTER & MEADOW    | 4 |
| B   | FALLOW OR MINIMUM TILLAGE CULTIVATION       | 5 |
| D   | NEARLY BARE GROUND                          | 6 |
| N/A | DRAINAGEWAY                                 | 7 |

**TIME OF CONCENTRATION CALCULATION SPREADSHEET**

PROJECT: Cheyenne Mountain HS MDDP

| Basin ID | Channel Condition | **Slope (ft/ft)** |        |        | **Length (ft)** |        |        | **Conveyance Type** |        |        | C10  | **Velocity (ft/sec)** |        |        | **Time of Concentration**<br>** (hr)** |        |        | Tc (hr) | Tc (min) | T lag (hr) |
|----------|-------------------|-------------------|--------|--------|-----------------|--------|--------|---------------------|--------|--------|------|-----------------------|--------|--------|----------------------------------------|--------|--------|---------|----------|------------|
| Number   | Fut/Exist         | Sgmt-1            | Sgmt-2 | Sgmt-3 | Sgmt-1          | Sgmt-2 | Sgmt-3 | Sgmt-1              | Sgmt-2 | Sgmt-3 |      | Sgmt-1                | Sgmt-2 | Sgmt-3 | Sgmt-1                                 | Sgmt-2 | Sgmt-3 | Total   | Total    | Total      |
| A1       | Exist             | 0.087             | 0.192  | 0.096  | 300             | 240    | 540    | 4                   | 3      |        | 0.29 | 1.08                  | 2.19   |        | 0.21                                   | 0.06   | 0.07   | 0.34    | 21       | 0.207      |
| A2       | Exist             | 0.010             | 0.005  | 0.050  | 0               | 240    | 400    | 7                   | 2      |        | 0.77 | N/A                   | 4.46   |        | 0.00                                   |        | 0.02   | 0.02    | 1        | 0.015      |
| A3       | Exist             | 0.038             |        |        | 290             |        |        |                     |        |        | 0.90 |                       |        |        | 0.07                                   |        |        | 0.07    | 4        | 0.041      |
| A4       | Exist             | 0.087             |        |        | 300             |        |        |                     |        |        | 0.30 |                       |        |        | 0.21                                   |        |        | 0.21    | 13       | 0.127      |
| B1       | Exist             | 0.178             | 0.084  |        | 720             | 970    |        | 7                   |        |        | 0.65 | N/A                   |        |        | 0.15                                   |        |        | 0.15    | 9        | 0.087      |
| B2       | Exist             | 0.350             | 0.008  | 0.200  | 40              | 500    | 70     | 3                   | 3      |        | 0.26 | 0.63                  | 3.17   |        | 0.05                                   | 0.22   | 0.01   | 0.28    | 17       | 0.166      |
| B3       | Exist             | 0.267             | 0.007  | 0.067  | 60              | 580    | 90     | 7                   | 3      |        | 0.26 | N/A                   | 1.83   |        | 0.07                                   |        | 0.01   | 0.08    | 5        | 0.049      |
| B4       | Exist             | 0.004             | 0.020  | 0.092  | 25              | 270    | 250    | 3                   | 3      |        | 0.28 | 1.00                  | 2.15   |        | 0.17                                   | 0.07   | 0.03   | 0.28    | 17       | 0.168      |
| C1       | Exist             | 0.192             | 0.055  |        | 520             | 1080   |        | 3                   |        |        | 0.39 | 1.66                  |        |        | 0.19                                   | 0.18   |        | 0.37    | 22       | 0.223      |
| C2       | Exist             | 0.067             | 0.400  | 0.004  | 60              | 50     | 250    | 3                   | 3      |        | 0.31 | 4.48                  | 0.45   |        | 0.10                                   | 0.00   | 0.16   | 0.26    | 16       | 0.156      |
| C3       | Exist             | 0.118             | 0.097  | 0.055  | 500             | 620    | 470    | 3                   | 1      |        | 0.28 | 2.20                  | 3.55   |        | 0.25                                   | 0.08   | 0.04   | 0.37    | 22       | 0.220      |
| DP1      | Exist             | 0.087             | 0.192  | 0.096  | 300             | 240    | 540    | 4                   | 3      |        | 0.43 | 1.08                  | 2.19   |        | 0.18                                   | 0.06   | 0.07   | 0.31    | 18       | 0.184      |
| DP2      | Exist             | 0.087             | 0.192  | 0.096  | 300             | 240    | 540    | 4                   | 3      |        | 0.44 | 1.08                  | 2.19   |        | 0.17                                   | 0.06   | 0.07   | 0.30    | 18       | 0.183      |
| DP3      | Exist             | 0.178             | 0.084  |        | 720             | 970    |        | 7                   |        |        | 0.51 | N/A                   |        |        | 0.19                                   |        |        | 0.19    | 11       | 0.114      |
| DP4      | Exist             | 0.192             | 0.055  | 0.055  | 520             | 1080   | 800    | 3                   | 1      |        | 0.33 | 1.66                  | 3.55   |        | 0.21                                   | 0.18   | 0.06   | 0.45    | 27       | 0.270      |

**Rational Method Calculations  
Cheyenne Mountain High School MDDP**

**Existing Conditions**

| Basin | Area<br>(Sq. Ft.) | Area<br>(Acres) | C10  | C100 | Time of<br>Concentration<br>(minutes) | Rainfall Intensity |                 | Runoff      |               |
|-------|-------------------|-----------------|------|------|---------------------------------------|--------------------|-----------------|-------------|---------------|
|       |                   |                 |      |      |                                       | i5<br>(in/hr)      | i100<br>(in/hr) | Q5<br>(cfs) | Q100<br>(cfs) |
| A1    | 339,335           | 7.79            | 0.29 | 0.35 | 21                                    | 2.84               | 5.04            | 6.4         | 13.8          |
| A2    | 141,570           | 3.25            | 0.77 | 0.83 | 5                                     | 5.19               | 8.93            | 13.0        | 24.1          |
| A3    | 16,555            | 0.38            | 0.90 | 0.95 | 5                                     | 5.19               | 8.93            | 1.8         | 3.2           |
| A4    | 36,590            | 0.84            | 0.30 | 0.35 | 13                                    | 3.61               | 6.38            | 0.9         | 1.9           |
| B1    | 514,010           | 11.80           | 0.65 | 0.70 | 9                                     | 4.23               | 7.41            | 32.2        | 61.2          |
| B2    | 174,240           | 4.00            | 0.26 | 0.35 | 17                                    | 3.17               | 5.62            | 3.3         | 7.9           |
| B3    | 91,040            | 2.09            | 0.26 | 0.35 | 5                                     | 5.19               | 8.93            | 2.8         | 6.5           |
| B4    | 155,075           | 3.56            | 0.28 | 0.35 | 17                                    | 3.17               | 5.62            | 3.2         | 7.0           |
| C1    | 481,775           | 11.06           | 0.39 | 0.44 | 22                                    | 2.77               | 4.92            | 11.9        | 23.9          |
| C2    | 42,255            | 0.97            | 0.31 | 0.38 | 16                                    | 3.27               | 5.79            | 1.0         | 2.1           |
| C3    | 548,856           | 12.60           | 0.28 | 0.35 | 22                                    | 2.77               | 4.92            | 9.9         | 21.7          |
| DP1   | 480,905           | 11.04           | 0.43 | 0.49 | 18                                    | 3.08               | 5.47            | 14.6        | 29.6          |
| DP2   | 534,050           | 12.26           | 0.44 | 0.50 | 18                                    | 3.08               | 5.47            | 16.6        | 33.5          |
| DP3   | 779,290           | 17.89           | 0.51 | 0.58 | 11                                    | 3.89               | 6.85            | 35.8        | 71.2          |
| DP4   | 1,072,886         | 24.63           | 0.33 | 0.39 | 27                                    | 2.47               | 4.39            | 20.2        | 42.3          |

**CHEYENNE MOUNTAIN HIGH SCHOOL  
TIME OF CONCENTRATION CALCULATIONS  
DEVELOPED FLOWS**

| Basins | Slope  |         |       |      | Length |         |      |      | Runoff Coef. or Mannings 'n' |         |       |      | Rn      |      | Velocity |       |      | Tc (sec) |         |      |      | Tc (min) | Basins |
|--------|--------|---------|-------|------|--------|---------|------|------|------------------------------|---------|-------|------|---------|------|----------|-------|------|----------|---------|------|------|----------|--------|
|        | O'land | Manning | Pipe  | road | O'land | Manning | Pipe | road | O'land                       | Manning | Pipe  | road | Manning | Pipe | Manning  | Pipe  | road | O'land   | Manning | Pipe | road |          |        |
| A1     | 0.15   | 0.13    |       | 0.05 | 300    | 383     |      | 450  | 0.42                         | 0.04    |       | 0.9  | 0.15    |      | 3.80     |       | 4.46 | 536      | 101     |      | 101  | 12.30    | A1     |
| A2     | 0.15   | 0.15    |       | 0.02 | 300    | 344     |      | 191  | 0.39                         | 0.04    |       | 0.9  | 0.15    |      | 4.08     |       | 2.82 | 560      | 84      |      | 68   | 11.87    | A2     |
| A3     | 0.04   |         |       | 0.02 | 48     |         |      | 78   | 0.75                         |         |       | 0.9  |         |      |          |       | 2.82 | 171      |         |      | 28   | 3.32     | A3     |
| A4     |        |         | 0.09  | 0.03 |        |         | 765  | 254  |                              |         | 0.012 | 0.9  |         | 0.13 |          | 9.57  | 3.46 |          |         | 80   | 73   | 5.00     | A4     |
| A5     | 0.06   |         |       | 0.06 | 28     |         |      | 330  | 0.84                         |         |       | 0.9  |         |      |          |       | 4.89 | 85       |         |      | 68   | 2.54     | A5     |
| A6     |        |         |       | 0.06 |        |         |      | 142  |                              |         |       | 0.9  |         |      |          |       | 4.89 |          |         |      | 29   | 5.00     | A6     |
| B1     | 0.13   | 0.3     | 0.04  | 0.08 | 300    | 70      | 728  | 169  | 0.31                         | 0.04    | 0.04  | 0.9  | 0.15    | 0.15 | 5.77     | 2.11  | 5.64 | 653      | 12      | 346  | 30   | 16.86    | B1     |
| B2     | 0.2    | 0.23    | 0.02  | 0.08 | 300    | 284     | 270  | 169  | 0.37                         | 0.04    | 0.04  | 0.9  | 0.15    | 0.15 | 5.05     | 1.49  | 5.64 | 523      | 56      | 181  | 30   | 13.18    | B2     |
| B3     | 0.1    |         |       | 0.02 | 167    |         |      | 192  | 0.64                         |         |       | 0.9  |         |      |          |       | 2.82 | 310      |         |      | 68   | 6.30     | B3     |
| B4     |        |         |       | 0.03 |        |         |      | 160  |                              |         |       | 0.9  |         |      |          |       | 3.46 |          |         |      | 46   | 5.00     | B4     |
| B5     |        |         | 0.035 | 0.1  |        |         | 208  | 393  |                              |         | 0.012 | 0.9  |         | 0.13 |          | 5.97  | 6.31 |          |         | 35   | 62   | 5.00     | B5     |
| B6     | 0.03   | 0.3     | 0.07  | 0.07 | 300    | 70      | 280  | 550  | 0.29                         | 0.04    | 0.04  | 0.9  | 0.15    | 0.15 | 5.77     | 2.79  | 5.28 | 1092     | 12      | 101  | 104  | 20.07    | B6     |
| B7     | 0.08   |         | 0.05  | 0.07 | 160    |         | 376  | 550  | 0.78                         |         | 0.013 | 0.9  |         | 0.63 |          | 18.84 | 5.28 | 227      |         | 20   | 104  | 5.86     | B7     |
| B8     | 0.15   |         | 0.035 |      | 212    |         | 172  |      | 0.28                         |         | 0.012 | 0.9  |         | 0.21 |          | 8.22  |      | 544      |         | 21   |      | 9.41     | B8     |
| B9     |        |         |       | 0.07 |        |         |      | 695  |                              |         |       | 0.9  |         |      |          | 5.28  |      |          |         |      | 132  | 5.00     | B9     |
| B10    | 0.02   |         | 0.035 |      | 120    |         | 582  |      | 0.32                         |         | 0.017 | 0.9  |         | 0.17 |          | 5.04  |      | 761      |         | 116  |      | 14.61    | B10    |
| B11    | 0.02   |         | 0.08  |      | 146    |         | 420  |      | 0.54                         |         | 0.017 | 0.9  |         | 0.17 |          | 7.62  |      | 603      |         | 55   |      | 10.96    | B11    |
| C1     | 0.22   | 0.22    |       | 0.04 | 300    | 500     |      | 225  | 0.42                         | 0.04    |       | 0.9  | 0.15    |      | 4.94     |       | 3.99 | 472      | 101     |      | 56   | 10.50    | C1     |
| C2     | 0.25   |         |       | 0.03 | 40     |         |      | 150  | 0.65                         |         |       | 0.9  |         |      |          |       | 3.46 | 109      |         |      | 43   | 5.00     | C2     |
| C3     | 0.2    |         |       | 0.03 | 40     |         |      | 100  | 0.69                         |         |       | 0.9  |         |      |          |       | 3.46 | 107      |         |      | 29   | 5.00     | C3     |
| C4     | 0.12   | 0.3     |       | 0.01 | 300    | 80      |      | 153  | 0.63                         | 0.04    |       | 0.9  | 0.15    |      | 5.77     |       | 2.00 | 399      | 14      |      | 77   | 8.16     | C4     |
| C5     | 0.13   | 0.3     | 0.03  |      | 340    | 70      | 595  |      | 0.31                         | 0.04    | 0.04  | 0.9  | 0.15    | 0.15 | 5.77     | 1.82  |      | 696      | 12      | 326  |      | 17.23    | C5     |
| C6     | 0.03   | 0.3     | 0.03  |      | 200    | 78      | 485  |      | 0.26                         | 0.04    | 0.04  | 0.9  | 0.15    | 0.15 | 5.77     | 1.82  |      | 924      | 14      |      |      | 15.63    | C6     |

**CHEYENNE MOUNTAIN HIGH SCHOOL  
TIME OF CONCENTRATION CALCULATIONS  
DEVELOPED FLOWS**

| Flow Basins      | Slope |      | Length |      | Runoff Coef. or Mannings 'n' |       | Rn<br>Pipe | Velocity |       | Tc (min) |      | Tc (Add.)       |          | Flow Basins  |                  |
|------------------|-------|------|--------|------|------------------------------|-------|------------|----------|-------|----------|------|-----------------|----------|--------------|------------------|
|                  | Road  | Pipe | Road   | Pipe | Road                         | Pipe  |            | Road     | Pipe  | Road     | Pipe | Basin           | Tc (min) |              | Tc (min)         |
| A(2,3)           |       | 0.1  |        | 280  |                              | 0.013 | 0.31       |          | 16.61 |          | 0.28 | A(2)            | 11.87    | <b>12.15</b> | A(2,3)           |
| A(2,3,5)         |       |      |        |      |                              |       |            |          |       |          |      | A(2,3)          | 12.15    | <b>12.15</b> | A(2,3,5)         |
| A(1,4,6)         | 0.05  |      | 551    |      | 0.9                          |       |            | 4.46     |       | 2.06     |      | A(1)            | 12.30    | <b>14.36</b> | A(1,4,6)         |
| A(1,2,3,4,5,6)   |       |      |        |      |                              |       |            |          |       |          |      | A(1,4,6)        | 14.36    | <b>14.36</b> | A(1,2,3,4,5,6)   |
| B(1,3)           |       | 0.05 |        | 195  |                              | 0.013 | 0.63       |          | 18.84 |          | 0.17 | B(1)            | 16.86    | <b>17.03</b> | B(1,3)           |
| B(2,4,5)         |       |      |        |      |                              |       |            |          |       |          |      | B(2)+B(5)       | 14.80    | <b>14.80</b> | B(2,4,5)         |
| B(1,2,3,4,5,6,7) |       | 0.06 |        | 652  |                              | 0.013 | 0.63       |          | 20.64 |          | 0.53 | B(2,4,5)        | 14.80    | <b>15.33</b> | B(1,2,3,4,5,6,7) |
| B(8,9,10,11)     | 0.04  |      | 354    |      | 0.9                          |       |            | 3.99     |       | 1.48     |      | C(8)            | 14.61    | <b>16.09</b> | C(6,7,8,9)       |
| C(1,2,3)         |       | 0.08 |        | 260  |                              | 0.013 | 0.5        |          | 20.43 |          | 0.21 | C(1)            | 10.50    | <b>10.71</b> | C(1,2,3)         |
| C(1,2,3,4)       |       | 0.05 |        | 195  |                              | 0.013 | 0.5        |          | 16.15 |          | 0.20 | C(1)+C(1,2,3)   | 10.71    | <b>10.91</b> | C(1,2,3,4)       |
| C(1,2,3,4,6)     |       | 0.05 |        | 1071 |                              | 0.013 | 0.63       |          | 18.84 |          | 0.95 | C(1)+C(1,2,3,4) | 10.91    | <b>11.86</b> | C(1,2,3,4,10)    |

DEVELOPED FLOWS

| Basin | Area<br>(Sq. Ft.) | Area<br>(Acres) | C10  | C100 | Time of<br>Concentration<br>(minutes) | Rainfall Intensity |                 | Runoff      |               |
|-------|-------------------|-----------------|------|------|---------------------------------------|--------------------|-----------------|-------------|---------------|
|       |                   |                 |      |      |                                       | i5<br>(in/hr)      | i100<br>(in/hr) | Q5<br>(cfs) | Q100<br>(cfs) |
| A1    | 137,252           | 3.15            | 0.42 | 0.47 | 12.3                                  | 3.70               | 6.54            | 4.9         | 9.7           |
| A2    | 113,193           | 2.60            | 0.39 | 0.44 | 11.9                                  | 3.76               | 6.64            | 3.8         | 7.6           |
| A3    | 8,472             | 0.19            | 0.75 | 0.80 | 5.0                                   | 5.19               | 8.93            | 0.8         | 1.4           |
| A4    | 104,014           | 2.39            | 0.90 | 0.95 | 5.0                                   | 5.19               | 8.93            | 11.2        | 20.2          |
| A5    | 40,738            | 0.94            | 0.84 | 0.89 | 2.5                                   | 6.14               | 10.28           | 4.8         | 8.6           |
| A6    | 29,428            | 0.68            | 0.57 | 0.62 | 5.0                                   | 5.19               | 8.93            | 2.0         | 3.7           |
| B1    | 311,539           | 7.15            | 0.31 | 0.38 | 16.9                                  | 3.18               | 5.65            | 7.1         | 15.3          |
| B2    | 338,054           | 7.76            | 0.37 | 0.44 | 13.2                                  | 3.59               | 6.34            | 10.3        | 21.6          |
| B3    | 63,315            | 1.45            | 0.64 | 0.71 | 6.3                                   | 4.82               | 8.36            | 4.5         | 8.6           |
| B4    | 9,675             | 0.22            | 0.67 | 0.74 | 5.0                                   | 5.19               | 8.93            | 0.8         | 1.5           |
| B5    | 96,160            | 2.21            | 0.77 | 0.83 | 5.0                                   | 5.19               | 8.93            | 8.8         | 16.4          |
| B6    | 194,033           | 4.45            | 0.29 | 0.38 | 20.1                                  | 2.91               | 5.17            | 3.8         | 8.7           |
| B7    | 198,141           | 4.55            | 0.78 | 0.83 | 5.9                                   | 4.94               | 8.54            | 17.5        | 32.3          |
| B8    | 37,243            | 0.85            | 0.28 | 0.38 | 9.4                                   | 4.15               | 7.29            | 1.0         | 2.4           |
| B9    | 39,035            | 0.90            | 0.64 | 0.71 | 5.0                                   | 5.19               | 8.93            | 3.0         | 5.7           |
| B10   | 101,618           | 2.33            | 0.32 | 0.41 | 14.6                                  | 3.42               | 6.05            | 2.6         | 5.8           |
| B11   | 144,390           | 3.31            | 0.54 | 0.62 | 11.0                                  | 3.90               | 6.86            | 7.0         | 14.1          |
| C1    | 181,238           | 4.16            | 0.42 | 0.47 | 10.5                                  | 3.97               | 6.98            | 6.9         | 13.7          |
| C2    | 14,736            | 0.34            | 0.60 | 0.65 | 5.0                                   | 5.19               | 8.93            | 1.1         | 2.0           |
| C3    | 7,903             | 0.18            | 0.69 | 0.74 | 5.0                                   | 5.19               | 8.93            | 0.6         | 1.2           |
| C4    | 133,902           | 3.07            | 0.63 | 0.68 | 8.2                                   | 4.39               | 7.68            | 8.5         | 16.1          |
| C5    | 232,110           | 5.33            | 0.31 | 0.38 | 17.2                                  | 3.15               | 5.59            | 5.2         | 11.3          |
| C6    | 267,977           | 6.15            | 0.26 | 0.35 | 15.6                                  | 3.31               | 5.86            | 5.3         | 12.6          |

DEVELOPED FLOWS

| Design Point         | Area<br>(Sq. Ft.) | Area<br>(Acres) | C10  | C100 | Time of<br>Concentration<br>(minutes) | Rainfall Intensity |                 | Runoff      |               | Off Site Flows |               | Total Runoff |               |
|----------------------|-------------------|-----------------|------|------|---------------------------------------|--------------------|-----------------|-------------|---------------|----------------|---------------|--------------|---------------|
|                      |                   |                 |      |      |                                       | i5<br>(in/hr)      | i100<br>(in/hr) | Q5<br>(cfs) | Q100<br>(cfs) | Q5<br>(cfs)    | Q100<br>(cfs) | Q5<br>(cfs)  | Q100<br>(cfs) |
| 1 [A(2,3)]           | 121,665           | 2.79            | 0.41 | 0.46 | 12.15                                 | 3.72               | 6.57            | 4.3         | 8.4           |                |               | 4.3          | 8.4           |
| 2 [A(1,5,6)]         | 270,694           | 6.21            | 0.62 | 0.63 | 14.36                                 | 3.44               | 6.10            | 13.3        | 23.9          |                |               | 13.3         | 23.9          |
| [A(1,4,5,6)]         | 311,432           | 7.15            | 0.62 | 0.63 | 14.36                                 | 3.44               | 6.10            | 15.3        | 27.5          |                |               | 15.3         | 27.5          |
| 3 [A(1,2,3,4,5,6)]   | 473,835           | 10.88           | 0.55 | 0.61 | 14.36                                 | 3.44               | 6.10            | 20.6        | 40.5          |                |               | 20.6         | 40.5          |
| 4 [B(1)]             | 311,539           | 7.15            | 0.31 | 0.38 | 16.9                                  | 3.18               | 5.65            | 7.1         | 15.3          | 69             | 171           | 76           | 186           |
| 5 [B(1,3)]           | 374,854           | 8.61            | 0.37 | 0.44 | 17.03                                 | 3.17               | 5.62            | 10.1        | 21.3          | 69             | 171           | 79           | 192           |
| B(2,4,5)             | 443,889           | 10.19           | 0.46 | 0.53 | 14.8                                  | 3.40               | 6.01            | 15.9        | 32.5          |                |               | 15.9         | 32.5          |
| 6 [B(1,2,3,4,5,6,7)] | 1,210,917         | 27.80           | 0.35 | 0.53 | 15.33                                 | 3.34               | 5.91            | 32.5        | 87.1          | 69             | 171           | 101          | 258           |
| 9 [B(8,9,10,11)]     | 322,286           | 7.40            | 0.45 | 0.54 | 16.09                                 | 3.26               | 5.78            | 10.9        | 23.1          |                |               | 10.9         | 23.1          |
| 7 [C(1)]             | 181,238           | 4.16            | 0.42 | 0.47 | 10.5                                  | 3.97               | 6.98            | 6.9         | 13.7          | 71             | 155           | 78           | 169           |
| C(1,2,3)             | 203,877           | 4.68            | 0.44 | 0.49 | 10.71                                 | 3.93               | 6.93            | 8.1         | 15.9          | 71             | 155           | 79           | 171           |
| 8 [C(1,2,3,4)]       | 337,779           | 7.75            | 0.52 | 0.57 | 10.91                                 | 3.90               | 6.87            | 15.7        | 30.4          | 71             | 155           | 87           | 185           |
| 10 [C(1,2,3,4,6)]    | 605,756           | 13.91           | 0.40 | 0.47 | 11.86                                 | 3.76               | 6.64            | 20.9        | 43.4          | 71             | 155           | 92           | 198           |

Engineering Corp-Denver Colorado.....  
 ON DATE 10-13-1997 AT TIME 15:28:41

\*\*\* PROJECT TITLE: Nolte Street Flow

\*\*\* STREET CROSS SECTIONAL IDEAL CAPACITY:

THE GIVEN STREET X-SECTIONAL GOEMETRIES:

LONGITUDINAL STREET SLOPE (%) = 1.00  
 MANNING N = 0.016  
 CURB HEIGHT (in) = 8.00  
 MAXIMUM FLOW DEPTH (in) = 8.00

STREET ON LEFTSIDE OF CROWN:

LEFTSIDE STREET WIDTH (ft) = 24.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in) = 1.50  
 GUTTER WIDTH (ft) = 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

STREET ON RIGHTSIDE OF CROWN

RIGHTSIDE STREET WIDTH (ft) = 24.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in) = 1.50  
 GUTTER WIDTH (ft) = 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

\*\*\* RATING CURVE FOR STREET IDEAL CAPACITY-FLOWRATE VS DEPTH:

| FLOW DEPTH<br>AT GUTTER<br>INCHES | RATE<br>CFS | LEFTSIDE      |              |             | RIGHTSIDE     |              |        | TOTAL<br>FLOW<br>CFS |
|-----------------------------------|-------------|---------------|--------------|-------------|---------------|--------------|--------|----------------------|
|                                   |             | VLCITY<br>FPS | SPREAD<br>FT | RATE<br>CFS | VLCITY<br>FPS | SPREAD<br>FT |        |                      |
| 1.00                              | 0.10        | 2.48          | 1.01         | 0.10        | 2.48          | 1.01         | 0.21   |                      |
| 2.00                              | 0.66        | 3.94          | 2.08         | 0.66        | 3.94          | 2.08         | 1.33   |                      |
| 3.00                              | 2.30        | 4.47          | 6.25         | 2.30        | 4.47          | 6.25         | 4.61   |                      |
| 4.00                              | 6.35        | 5.25          | 10.42        | 6.35        | 5.25          | 10.42        | 12.71  |                      |
| 5.00                              | 13.90       | 6.17          | 14.58        | 13.90       | 6.17          | 14.58        | 27.80  |                      |
| 6.00                              | 25.85       | 7.10          | 18.75        | 25.85       | 7.10          | 18.75        | 51.70  |                      |
| 7.00                              | 43.03       | 8.00          | 22.92        | 43.03       | 8.00          | 22.92        | 86.06  |                      |
| 8.00                              | 66.01       | 8.85          | 24.00        | 66.01       | 8.85          | 24.00        | 132.02 |                      |

THE CURB HEIGHT IS 8 INCHES.

THE STREET CAPACITY REDUCTION FACTOR FOR MINOR STORM= .6725

THE STREET CAPACITY REDUCTION FACTOR FOR MAJOR STORM= .55





|      |       |      |       |       |      |       |        |
|------|-------|------|-------|-------|------|-------|--------|
| 1.00 | 0.09  | 2.03 | 1.01  | 0.09  | 2.03 | 1.01  | 0.17   |
| 2.00 | 0.54  | 3.23 | 2.08  | 0.54  | 3.23 | 2.08  | 1.09   |
| 3.00 | 1.89  | 3.66 | 6.25  | 1.89  | 3.66 | 6.25  | 3.77   |
| 4.00 | 5.21  | 4.30 | 10.42 | 5.21  | 4.30 | 10.42 | 10.41  |
| 5.00 | 11.39 | 5.06 | 14.58 | 11.39 | 5.06 | 14.58 | 22.78  |
| 6.00 | 21.18 | 5.82 | 18.75 | 21.18 | 5.82 | 18.75 | 42.36  |
| 7.00 | 35.26 | 6.56 | 22.92 | 35.26 | 6.56 | 22.92 | 70.52  |
| 8.00 | 54.09 | 7.25 | 24.00 | 54.09 | 7.25 | 24.00 | 108.18 |

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THE CURB HEIGHT IS 8 INCHES.

THE STREET CAPACITY REDUCTION FACTOR FOR MINOR STORM= .77025

THE STREET CAPACITY REDUCTION FACTOR FOR MAJOR STORM= .665

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 UDINLET: STREET CAPACITY ANALYSIS  
 DEVELOPED BY DR. JAMES GUO, CIVIL ENG, U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD POOL FUND STUDY  
 -----

USER=:Kiowa Engineering Corp-Denver Colorado.....  
 ON DATE 10-13-1997 AT TIME 15:38:36

\*\*\* PROJECT TITLE: Cresta Road 12" Cap

\*\*\* STREET CROSS SECTIONAL IDEAL CAPACITY:

THE GIVEN STREET X-SECTIONAL GOOMETRIES:

LONGITUDINAL STREET SLOPE (%) = 1.00  
 MANNING N = 0.016  
 CURB HEIGHT (in) = 8.00  
 MAXIMUM FLOW DEPTH (in) = 12.00

STREET ON LEFTSIDE OF CROWN:

LEFTSIDE STREET WIDTH (ft) = 24.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in) = 1.50  
 GUTTER WIDTH (ft) = 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

STREET ON RIGHTSIDE OF CROWN

RIGHTSIDE STREET WIDTH (ft) = 24.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in) = 1.50  
 GUTTER WIDTH (ft) = 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

\*\*\* RATING CURVE FOR STREET IDEAL CAPACITY-FLOWRATE VS DEPTH:

| FLOW DEPTH<br>AT GUTTER<br>INCHES | RATE<br>CFS | LEFTSIDE      |              | RIGHTSIDE   |               |              | TOTAL<br>FLOW<br>CFS |
|-----------------------------------|-------------|---------------|--------------|-------------|---------------|--------------|----------------------|
|                                   |             | VLCITY<br>FPS | SPREAD<br>FT | RATE<br>CFS | VLCITY<br>FPS | SPREAD<br>FT |                      |
| 1.00                              | 0.09        | 2.03          | 1.01         | 0.09        | 2.03          | 1.01         | 0.17                 |
| 2.00                              | 0.54        | 3.23          | 2.08         | 0.54        | 3.23          | 2.08         | 1.09                 |
| 3.00                              | 1.89        | 3.66          | 6.25         | 1.89        | 3.66          | 6.25         | 3.77                 |
| 4.00                              | 5.21        | 4.30          | 10.42        | 5.21        | 4.30          | 10.42        | 10.41                |
| 5.00                              | 11.39       | 5.06          | 14.58        | 11.39       | 5.06          | 14.58        | 22.78                |
| 6.00                              | 21.18       | 5.82          | 18.75        | 21.18       | 5.82          | 18.75        | 42.36                |
| 7.00                              | 35.26       | 6.56          | 22.92        | 35.26       | 6.56          | 22.92        | 70.52                |
| 8.00                              | 54.09       | 7.25          | 24.00        | 54.09       | 7.25          | 24.00        | 108.18               |
| 9.00                              | 77.48       | 7.70          | 28.17        | 77.48       | 7.70          | 28.17        | 154.97               |
| 10.00                             | 105.96      | 7.93          | 32.33        | 105.96      | 7.93          | 32.33        | 211.92               |
| 11.00                             | 140.04      | 8.07          | 36.50        | 140.04      | 8.07          | 36.50        | 280.07               |
| 12.00                             | 180.15      | 8.17          | 40.67        | 180.15      | 8.17          | 40.67        | 360.31               |

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 THE CURB H

EIGHT IS 8 INCHES.

THE STREET CAPACITY REDUCTION FACTOR FOR MINOR STORM= .77025

THE STREET CAPACITY REDUCTION FACTOR FOR MAJOR STORM= .665

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 UDINLET: STREET CAPACITY ANALYSIS  
 DEVELOPED BY DR. JAMES GUO, CIVIL ENG, U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD POOL FUND STUDY  
 -----

USER=:Kiowa Engineering Corp-Denver Colorado.....  
 ON DATE 10-13-1997 AT TIME 15:33:48

\*\*\* PROJECT TITLE: La Veta Street Capacity

\*\*\* STREET CROSS SECTIONAL IDEAL CAPACITY:

THE GIVEN STREET X-SECTIONAL GOOMETRIES:

LONGITUDINAL STREET SLOPE (%)= 1.00  
 MANNING N = 0.016  
 CURB HEIGHT (in)= 8.00  
 MAXIMUM FLOW DEPTH (in)= 8.00

STREET ON LEFTSIDE OF CROWN:

LEFTSIDE STREET WIDTH (ft)= 18.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in)= 1.50  
 GUTTER WIDTH (ft)= 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

STREET ON RIGHTSIDE OF CROWN

RIGHTSIDE STREET WIDTH (ft)= 18.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in)= 1.50  
 GUTTER WIDTH (ft)= 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

\*\*\* RATING CURVE FOR STREET IDEAL CAPACITY-FLOWRATE VS DEPTH:

| FLOW DEPTH<br>AT GUTTER<br>INCHES | RATE<br>CFS | LEFTSIDE      |              | RIGHTSIDE   |               |              | TOTAL<br>FLOW<br>CFS |
|-----------------------------------|-------------|---------------|--------------|-------------|---------------|--------------|----------------------|
|                                   |             | VLCITY<br>FPS | SPREAD<br>FT | RATE<br>CFS | VLCITY<br>FPS | SPREAD<br>FT |                      |
| 1.00                              | 0.09        | 2.09          | 1.01         | 0.09        | 2.09          | 1.01         | 0.18                 |
| 2.00                              | 0.56        | 3.33          | 2.08         | 0.56        | 3.33          | 2.08         | 1.12                 |
| 3.00                              | 1.95        | 3.77          | 6.25         | 1.95        | 3.77          | 6.25         | 3.89                 |
| 4.00                              | 5.37        | 4.44          | 10.42        | 5.37        | 4.44          | 10.42        | 10.74                |
| 5.00                              | 11.75       | 5.22          | 14.58        | 11.75       | 5.22          | 14.58        | 23.49                |
| 6.00                              | 21.84       | 6.00          | 18.00        | 21.84       | 6.00          | 18.00        | 43.68                |
| 7.00                              | 35.80       | 6.66          | 18.00        | 35.80       | 6.66          | 18.00        | 71.60                |
| 8.00                              | 53.04       | 7.11          | 18.00        | 53.04       | 7.11          | 18.00        | 106.08               |

-----  
 THE CURB HEIGHT IS 8 INCHES.  
 THE STREET CAPACITY REDUCTION FACTOR FOR MINOR STORM= .7575  
 THE STREET CAPACITY REDUCTION FACTOR FOR MAJOR STORM= .65  
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 UDINLET: STREET CAPACITY ANALYSIS  
 DEVELOPED BY DR. JAMES GUO, CIVIL ENG, U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD POOL FUND STUDY  
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USER=:Kiowa Engineering Corp-Denver Colorado.....  
 ON DATE 10-13-1997 AT TIME 15:35:36

\*\*\* PROJECT TITLE: La Veta 12" Capacity

\*\*\* STREET CROSS SECTIONAL IDEAL CAPACITY:

THE GIVEN STREET X-SECTIONAL GOOMETRIES:

LONGITUDINAL STREET SLOPE (%) = 1.00  
 MANNING N = 0.016  
 CURB HEIGHT (in) = 8.00  
 MAXIMUM FLOW DEPTH (in) = 12.00

STREET ON LEFTSIDE OF CROWN:

LEFTSIDE STREET WIDTH (ft) = 18.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in) = 1.50  
 GUTTER WIDTH (ft) = 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

STREET ON RIGHTSIDE OF CROWN

RIGHTSIDE STREET WIDTH (ft) = 18.00  
 CROSS SLOPE (%) = 2.00  
 DEPRESSION AT GUTTER (in) = 1.50  
 GUTTER WIDTH (ft) = 2.00  
 SIDEWALK CROSS SLOPE (1V:ZH) Z = 50.00

\*\*\* RATING CURVE FOR STREET IDEAL CAPACITY-FLOWRATE VS DEPTH:

| FLOW DEPTH<br>AT GUTTER<br>INCHES | RATE<br>CFS | LEFTSIDE      |              | RIGHTSIDE   |               |              | TOTAL<br>FLOW<br>CFS |
|-----------------------------------|-------------|---------------|--------------|-------------|---------------|--------------|----------------------|
|                                   |             | VLCITY<br>FPS | SPREAD<br>FT | RATE<br>CFS | VLCITY<br>FPS | SPREAD<br>FT |                      |
| 1.00                              | 0.09        | 2.09          | 1.01         | 0.09        | 2.09          | 1.01         | 0.18                 |
| 2.00                              | 0.56        | 3.33          | 2.08         | 0.56        | 3.33          | 2.08         | 1.12                 |
| 3.00                              | 1.95        | 3.77          | 6.25         | 1.95        | 3.77          | 6.25         | 3.89                 |
| 4.00                              | 5.37        | 4.44          | 10.42        | 5.37        | 4.44          | 10.42        | 10.74                |
| 5.00                              | 11.75       | 5.22          | 14.58        | 11.75       | 5.22          | 14.58        | 23.49                |
| 6.00                              | 21.84       | 6.00          | 18.00        | 21.84       | 6.00          | 18.00        | 43.68                |
| 7.00                              | 35.80       | 6.66          | 18.00        | 35.80       | 6.66          | 18.00        | 71.60                |
| 8.00                              | 53.04       | 7.11          | 18.00        | 53.04       | 7.11          | 18.00        | 106.08               |
| 9.00                              | 73.53       | 7.31          | 22.17        | 73.53       | 7.31          | 22.17        | 147.06               |
| 10.00                             | 98.09       | 7.34          | 26.33        | 98.09       | 7.34          | 26.33        | 196.18               |
| 11.00                             | 127.38      | 7.34          | 30.50        | 127.38      | 7.34          | 30.50        | 254.75               |
| 12.00                             | 161.94      | 7.35          | 34.67        | 161.94      | 7.35          | 34.67        | 323.87               |

THE CURB HEIGHT IS 8 INCHES.

THE STREET CAPACITY REDUCTION FACTOR FOR MINOR STORM= .7575  
 THE STREET CAPACITY REDUCTION FACTOR FOR MAJOR STORM= .65

### PIPE DIAMETER CALCULATIONS

| Pipe Material    | Manning's 'n' |
|------------------|---------------|
| Concrete         | 0.013         |
| Corrugated Metal | 0.024         |
| Polyethylene     | 0.012         |

| ID # | Q (cfs) | Mannings 'n' | Slope (ft/ft) | Pipe Length (ft) | Calculated Pipe Dia. (in.) | Actual Pipe Dia. (in.) | Minimum Slope of Pipe (ft/ft) | Capacity (cfs) | ID # |
|------|---------|--------------|---------------|------------------|----------------------------|------------------------|-------------------------------|----------------|------|
| 25   | 76      | 0.013        | 0.059         | 350              | 27.14                      | 36                     | 0.013                         | 76             | 25   |
| 26   | 23      | 0.013        | 0.060         | 200              | 17.26                      | 18                     | 0.048                         | 23             | 26   |
| 29   | 78      | 0.013        | 0.033         | 120              | 30.52                      | 42                     | 0.010                         | 101            | 29   |
| 31   | 94      | 0.013        | 0.100         | 150              | 26.59                      | 42                     | 0.010                         | 101            | 31   |
| 33   | 110     | 0.013        | 0.038         | 105              | 33.82                      | 42                     | 0.012                         | 110            | 33   |
| 35   | 126     | 0.013        | 0.040         | 50               | 35.24                      | 42                     | 0.016                         | 126            | 35   |
| 37   | 126     | 0.013        | 0.053         | 150              | 33.43                      | 42                     | 0.016                         | 126            | 37   |
| 39   | 142     | 0.013        | 0.036         | 230              | 37.60                      | 42                     | 0.020                         | 142            | 39   |
| 41   | 142     | 0.013        | 0.069         | 800              | 33.28                      | 42                     | 0.020                         | 142            | 41   |
| 43   | 16      | 0.013        | 0.083         | 60               | 14.18                      | 24                     | 0.010                         | 23             | 43   |
| 45   | 16      | 0.013        | 0.010         | 10               | 21.08                      | 24                     | 0.010                         | 23             | 45   |
| 46   | 32      | 0.013        | 0.080         | 45               | 18.51                      | 24                     | 0.020                         | 32             | 46   |
| 48   | 32      | 0.013        | 0.065         | 205              | 19.25                      | 24                     | 0.020                         | 32             | 48   |
| 50   | 16      | 0.013        | 0.01          | 20               | 21.08                      | 24                     | 0.010                         | 23             | 50   |
| 52   | 24      | 0.013        | 0.025         | 160              | 20.67                      | 24                     | 0.011                         | 24             | 52   |
| 53   | 37      | 0.013        | 0.075         | 12               | 19.78                      | 24                     | 0.027                         | 37             | 53   |
| 54   |         | 0.013        | 0.04          | 310              |                            | 18                     |                               | 21             | 54   |
| 55   |         | 0.013        | 0.07          | 1205             |                            | 30                     |                               | 109            | 55   |

WATER DEPTH IN PROPOSED SWALE

Channel Bottom Width = 3'

Side Slopes = 3:1

Channel Depth = 3'

S = 0.0296

Q<sub>100</sub> = 111 cfs

n = 0.04

$$\begin{aligned} A &= (b + zd)d \\ &= (3 + 3d)d \\ &= 3d + 3d^2 \end{aligned}$$

$$\begin{aligned} P &= b + 2d\sqrt{1+z^2} \\ &= 3 + 2d\sqrt{1+3^2} \\ &= 3 + 6.32d \end{aligned}$$

$$\begin{aligned} R_n &= \frac{A}{P} \\ &= \frac{3d + 3d^2}{3 + 6.32d} \end{aligned}$$

$$Q = \frac{1.49}{n} A R_n^{2/3} S^{1/2}$$

$$A R_n^{2/3} = \frac{Q n}{1.49 S^{1/2}}$$

$$= \frac{111 (0.035)}{1.49 (0.0296)^{1/2}}$$

$$A R_n^{2/3} = 15.16 \rightarrow \underline{d = 1.88 ft}$$



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UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

USER: Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 15:26:22

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 1

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft) = 1.25  
INLET GRATE LENGTH (ft) = 1.25  
INLET GRATE TYPE = Nonstandard Grate  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft) = 2.50  
GRATE OPENING AREA RATIO (%) = 0.50  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 10.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.020  
GUTTER DEPRESSION (inch) = 30.00  
GUTTER WIDTH (ft) = 1.50

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 0.68  
GUTTER FLOW DEPTH (ft) = 1.15  
FLOW VELOCITY ON STREET (fps) = 19.40  
FLOW CROSS SECTION AREA (sq ft) = 0.39  
GRATE CLOGGING FACTOR (%) = 50.00  
CURB OPENING CLOGGING FACTOR(%) = 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs) = 7.60  
IDEAL GRATE INLET CAPACITY (cfs) = 8.02  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs) = 4.01  
CARRY-OVER FLOW (cfs) = 3.59  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs) = 4.01  
CARRY-OVER FLOW (cfs) = 3.59

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 UDINLET: INLET HYDRAULICS AND SIZING  
 DEVELOPED BY  
 DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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USER: Kiowa Engineering Corp-Denver Colorado.....  
 RUN DATE 11-05-1997 AT TIME 15:28:32

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 2

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft) = 1.50  
 INLET GRATE LENGTH (ft) = 1.50  
 INLET GRATE TYPE = Nonstandard Grate  
 NUMBER OF GRATES = 1.00  
 IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 5.00  
 STREET CROSS SLOPE (%) = 1.00  
 STREET MANNING N = 0.016  
 GUTTER DEPRESSION (inch) = 1.50  
 GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 18.06  
 GUTTER FLOW DEPTH (ft) = 0.31  
 FLOW VELOCITY ON STREET (fps) = 5.51  
 FLOW CROSS SECTION AREA (sq ft) = 1.76  
 GRATE CLOGGING FACTOR (%) = 50.00  
 CURB OPENING CLOGGING FACTOR(%) = 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs) = 9.70  
 IDEAL GRATE INLET CAPACITY

(cfs) = 3.80

BY FAA HEC-12 METHOD:

FLOW INTERCEPTED (cfs) = 3.76  
 CARRY-OVER FLOW (cfs) = 5.94

BY DENVER UDFCD METHOD:

FLOW INTERCEPTED (cfs) = 1.90  
 CARRY-OVER FLOW (cfs) = 7.80

-----  
 UDINLET: INLET HYDRAULICS AND SIZING  
 DEVELOPED BY  
 DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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USER: Kiowa Engineering Corp-Denver Colorado.....  
 RUN DATE 11-05-1997 AT TIME 15:30:45

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 3

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

|                          |       |                   |
|--------------------------|-------|-------------------|
| INLET GRATE WIDTH        | (ft)= | 2.50              |
| INLET GRATE LENGTH       | (ft)= | 8.00              |
| INLET GRATE TYPE         | =     | Nonstandard Grate |
| NUMBER OF GRATES         | =     | 1.00              |
| SUMP DEPTH ON GRATE      | (ft)= | 0.67              |
| GRATE OPENING AREA RATIO | (%) = | 0.60              |

IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

|                                 |       |
|---------------------------------|-------|
| STREET LONGITUDINAL SLOPE (%) = | 3.00  |
| STREET CROSS SLOPE (%) =        | 1.00  |
| STREET MANNING N =              | 0.016 |
| GUTTER DEPRESSION (inch) =      | 1.50  |
| GUTTER WIDTH (ft) =             | 2.00  |

STREET FLOW HYDRAULICS:

|                                    |       |
|------------------------------------|-------|
| WATER SPREAD ON STREET (ft) =      | 26.88 |
| GUTTER FLOW DEPTH (ft) =           | 0.39  |
| FLOW VELOCITY ON STREET (fps) =    | 5.32  |
| FLOW CROSS SECTION AREA (sq ft) =  | 3.77  |
| GRATE CLOGGING FACTOR (%) =        | 50.00 |
| CURB OPENING CLOGGING FACTOR (%) = | 10.00 |

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

|                                    |       |
|------------------------------------|-------|
| DESIGN DISCHARGE (cfs) =           | 20.20 |
| IDEAL GRATE INLET CAPACITY (cfs) = | 66.55 |
| BY FAA HEC-12 METHOD:              |       |
| FLOW INTERCEPTED (cfs) =           | 20.20 |
| CARRY-OVER FLOW (cfs) =            | 0.00  |
| BY DENVER UDFCD METHOD:            |       |
| FLOW INTERCEPTED (cfs) =           | 20.20 |
| CARRY-OVER FLOW (cfs) =            | 0.00  |

-----  
UDINLET: INLET HYDRAULICS AND SIZING

DEVELOPED BY

DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER

SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

SER:Kiowa Engineering Corp-Denver Colorado.....  
N DATE 11-05-1997 AT TIME 15:33:10

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 4

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 2.00  
INLET GRATE LENGTH (ft)= 4.00  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft)= 1.00  
GRATE OPENING AREA RATIO (%) = 0.60  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 5.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 21.81  
GUTTER FLOW DEPTH (ft) = 0.34  
FLOW VELOCITY ON STREET (fps)= 6.05  
FLOW CROSS SECTION AREA (sq ft)= 2.50  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 15.30  
IDEAL GRATE INLET CAPACITY (cfs)= 29.91  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs)= 14.96  
CARRY-OVER FLOW (cfs)= 0.34  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs)= 14.96  
CARRY-OVER FLOW (cfs)= 0.34

-----  
 UDINLET: INLET HYDRAULICS AND SIZING  
 DEVELOPED BY  
 DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
 -----

SER:Kiowa Engineering Corp-Denver Colorado.....  
 N DATE 11-05-1997 AT TIME 15:35:01

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 5

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

|                          |       |                   |
|--------------------------|-------|-------------------|
| INLET GRATE WIDTH        | (ft)= | 1.00              |
| INLET GRATE LENGTH       | (ft)= | 1.00              |
| INLET GRATE TYPE         | =     | Nonstandard Grate |
| NUMBER OF GRATES         | =     | 1.00              |
| SUMP DEPTH ON GRATE      | (ft)= | 0.50              |
| GRATE OPENING AREA RATIO | (%) = | 0.60              |

IS THE INLET GRATE NEXT TO A CURB ?-- YES

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

|                               |   |       |
|-------------------------------|---|-------|
| STREET LONGITUDINAL SLOPE (%) | = | 2.00  |
| STREET CROSS SLOPE (%)        | = | 1.00  |
| STREET MANNING N              | = | 0.016 |
| GUTTER DEPRESSION (inch)      | = | 1.50  |
| GUTTER WIDTH (ft)             | = | 2.00  |

STREET FLOW HYDRAULICS:

|                                  |   |       |
|----------------------------------|---|-------|
| WATER SPREAD ON STREET (ft)      | = | 20.88 |
| GUTTER FLOW DEPTH (ft)           | = | 0.33  |
| FLOW VELOCITY ON STREET (fps)    | = | 3.74  |
| FLOW CROSS SECTION AREA (sq ft)  | = | 2.30  |
| GRATE CLOGGING FACTOR (%)        | = | 50.00 |
| CURB OPENING CLOGGING FACTOR (%) | = | 10.00 |

INLET INTERCEPTION CAPACITY:

FOR

1 GRATE INLETS:

|                            |        |      |
|----------------------------|--------|------|
| DESIGN DISCHARGE           | (cfs)= | 8.60 |
| IDEAL GRATE INLET CAPACITY | (cfs)= | 2.95 |
| BY FAA HEC-12 METHOD:      |        |      |
| FLOW INTERCEPTED           | (cfs)= | 1.47 |
| CARRY-OVER FLOW            | (cfs)= | 7.13 |
| BY DENVER UDFCD METHOD:    |        |      |
| FLOW INTERCEPTED           | (cfs)= | 1.47 |
| CARRY-OVER FLOW            | (cfs)= | 7.13 |

-----  
 UDINLET: INLET HYDARULICS AND SIZING  
 DEVELOPED BY  
 DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
 -----

SER:Kiowa Engineering Corp-Denver Colorado.....  
 N DATE 11-05-1997 AT TIME 15:37:21

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 6

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

|                          |       |                   |
|--------------------------|-------|-------------------|
| INLET GRATE WIDTH        | (ft)= | 1.00              |
| INLET GRATE LENGTH       | (ft)= | 30.00             |
| INLET GRATE TYPE         | =     | Nonstandard Grate |
| NUMBER OF GRATES         | =     | 1.00              |
| SUMP DEPTH ON GRATE      | (ft)= | 0.20              |
| GRATE OPENING AREA RATIO | (%) = | 0.00              |

IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

|                               |   |       |
|-------------------------------|---|-------|
| STREET LONGITUDINAL SLOPE (%) | = | 2.00  |
| STREET CROSS SLOPE (%)        | = | 1.00  |
| STREET MANNING N              | = | 0.016 |
| GUTTER DEPRESSION (inch)      | = | 1.50  |
| GUTTER WIDTH (ft)             | = | 2.00  |

STREET FLOW HYDRAULICS:

|                                   |   |       |
|-----------------------------------|---|-------|
| WATER SPREAD ON STREET (ft)       | = | 20.88 |
| GUTTER FLOW DEPTH (ft)            | = | 0.33  |
| FLOW VELOCITY ON STREET (fps)     | = | 3.74  |
| FLOW CROSS SECTION AREA (sq ft)   | = | 2.30  |
| GRATE CLOGGING FACTOR (%)         | = | 50.00 |
| CURB OPENNING CLOGGING FACTOR (%) | = | 10.00 |

INLET INTERCEPTION CAPACITY:

OR 1 GRATE INLETS:

|                            |        |      |
|----------------------------|--------|------|
| DESIGN DISCHARGE           | (cfs)= | 8.60 |
| IDEAL GRATE INLET CAPACITY | (cfs)= | 8.25 |
| BY FAA HEC-12 METHOD:      |        |      |
| FLOW INTERCEPTED           | (cfs)= | 7.21 |
| CARRY-OVER FLOW            | (cfs)= | 1.39 |
| BY DENVER UDFCD METHOD:    |        |      |
| FLOW INTERCEPTED           | (cfs)= | 4.13 |
| CARRY-OVER FLOW            | (cfs)= | 4.47 |

UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY

DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD

USER: Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 15:38:57

PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 7

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 2.00  
INLET GRATE LENGTH (ft)= 4.00  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft)= 1.00  
GRATE OPENING AREA RATIO (%) = 0.60  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 4.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.025  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 21.81  
GUTTER FLOW DEPTH (ft) = 0.34  
FLOW VELOCITY ON STREET (fps)= 3.47  
FLOW CROSS SECTION AREA (sq ft)= 2.50  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR

1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 8.60  
IDEAL GRATE INLET CAPACITY (cfs)= 29.91  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs)= 8.60  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs)= 8.60  
CARRY-OVER FLOW (cfs)= 0.00

CURRENT DATE: 11-05-1997  
 CURRENT TIME: 16:12:06

FILE DATE: 11-05-1997  
 FILE NAME: 8

\*\*\*\*\*  
 \*\*\*\*\* FHWA CULVERT ANALYSIS \*\*\*\*\*  
 \*\*\*\*\* HY-8, VERSION 3.2 \*\*\*\*\*  
 \*\*\*\*\*

| C<br>U<br>L<br>V<br># | SITE DATA              |                         |                           | CULVERT SHAPE, MATERIAL, INLET |              |              |              |               |
|-----------------------|------------------------|-------------------------|---------------------------|--------------------------------|--------------|--------------|--------------|---------------|
|                       | INLET<br>ELEV.<br>(FT) | OUTLET<br>ELEV.<br>(FT) | CULVERT<br>LENGTH<br>(FT) | BARRELS<br>SHAPE<br>MATERIAL   | SPAN<br>(FT) | RISE<br>(FT) | MANNING<br>n | INLET<br>TYPE |
| 1                     | 6233.00                | 6231.00                 | 60.03                     | 1 CSP                          | 1.50         | 1.50         | .024         | CONVENTIONAL  |
| 2                     |                        |                         |                           |                                |              |              |              |               |
| 3                     |                        |                         |                           |                                |              |              |              |               |
| 4                     |                        |                         |                           |                                |              |              |              |               |
| 5                     |                        |                         |                           |                                |              |              |              |               |
| 6                     |                        |                         |                           |                                |              |              |              |               |

\*\*\*\*\*  
 SUMMARY OF CULVERT FLOWS (CFS) FILE: 8 DATE: 11-05-1997

| ELEV (FT) | TOTAL | 1  | 2 | 3 | 4 | 5 | 6 | ROADWAY | ITR         |
|-----------|-------|----|---|---|---|---|---|---------|-------------|
| 6233.00   | 0     | 0  | 0 | 0 | 0 | 0 | 0 | 0       | 1           |
| 6234.25   | 5     | 5  | 0 | 0 | 0 | 0 | 0 | 0       | 1           |
| 6235.48   | 10    | 10 | 0 | 0 | 0 | 0 | 0 | 0       | 30          |
| 6235.69   | 15    | 10 | 0 | 0 | 0 | 0 | 0 | 5       | 7           |
| 6235.79   | 20    | 10 | 0 | 0 | 0 | 0 | 0 | 9       | 7           |
| 6235.87   | 25    | 11 | 0 | 0 | 0 | 0 | 0 | 14      | 4           |
| 6235.96   | 30    | 11 | 0 | 0 | 0 | 0 | 0 | 19      | 4           |
| 6235.99   | 32    | 11 | 0 | 0 | 0 | 0 | 0 | 21      | 3           |
| 6236.11   | 40    | 11 | 0 | 0 | 0 | 0 | 0 | 29      | 4           |
| 6236.17   | 45    | 11 | 0 | 0 | 0 | 0 | 0 | 34      | 3           |
| 6236.24   | 50    | 11 | 0 | 0 | 0 | 0 | 0 | 39      | 3           |
| 6235.50   | 10    | 10 | 0 | 0 | 0 | 0 | 0 | 0       | OVERTOPPING |

\*\*\*\*\*  
 SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: 8 DATE: 11-05-1997

| HEAD<br>ELEV(FT) | HEAD<br>ERROR(FT) | TOTAL<br>FLOW(CFS) | FLOW<br>ERROR(CFS) | % FLOW<br>ERROR |
|------------------|-------------------|--------------------|--------------------|-----------------|
| 6233.00          | 0.00              | 0                  | 0                  | 0.00            |
| 6234.25          | 0.00              | 5                  | 0                  | 0.00            |
| 6235.48          | -0.00             | 10                 | 0                  | 2.09            |
| 6235.69          | -0.00             | 15                 | 0                  | 0.48            |
| 6235.79          | 0.00              | 20                 | 0                  | 1.28            |
| 6235.87          | -0.01             | 25                 | 0                  | 0.64            |
| 6235.96          | -0.01             | 30                 | 0                  | 0.51            |
| 6235.99          | -0.01             | 32                 | 0                  | 0.75            |
| 6236.11          | -0.01             | 40                 | 0                  | 0.33            |
| 6236.17          | -0.00             | 45                 | 0                  | 0.69            |
| 6236.24          | -0.00             | 50                 | 0                  | 0.55            |

\*\*\*\*\*  
 <1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000  
 \*\*\*\*\*



CURRENT DATE: 11-05-1997  
 CURRENT TIME: 16:12:06

FILE DATE: 11-05-1997  
 FILE NAME: 8

\*\*\*\*\*  
 \*\*\*\*\* CULVERT # 1 \*\*\*\*\*  
 \*\*\*\*\*  
 PERFORMANCE CURVE FOR 1 BARREL(S)

| Q<br>(cfs) | HWE<br>(ft) | TWE<br>(ft) | ICH<br>(ft) | OCH<br>(ft) | FLOW<br>TYPE | CCE<br>(ft) | FCE<br>(ft) | TCE<br>(ft) | VO<br>(fps) |
|------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|
| 0          | 6233.00     | 6233.00     | 0.00        | 0.00        | 0-NF         | 0.00        | 6233.00     | 0.00        | 0.00        |
| 5          | 6234.25     | 6233.00     | 1.25        | 0.65        | 4-FF         | 0.00        | 0.00        | 0.00        | 2.83        |
| 10         | 6235.48     | 6233.00     | 2.18        | 2.48        | 4-FF         | 0.00        | 0.00        | 0.00        | 5.54        |
| 10         | 6235.68     | 6233.00     | 2.27        | 2.68        | 4-FF         | 0.00        | 0.00        | 0.00        | 5.76        |
| 10         | 6235.78     | 6233.00     | 2.32        | 2.78        | 4-FF         | 0.00        | 0.00        | 0.00        | 5.87        |
| 11         | 6236.19     | 6233.00     | 2.51        | 3.19        | 4-FF         | 0.00        | 0.00        | 0.00        | 6.28        |
| 11         | 6236.19     | 6233.00     | 2.51        | 3.19        | 4-FF         | 0.00        | 0.00        | 0.00        | 6.28        |
| 11         | 6236.19     | 6233.00     | 2.51        | 3.19        | 4-FF         | 0.00        | 0.00        | 0.00        | 6.28        |
| 11         | 6235.51     | 6233.00     | 2.51        | 2.42        | 3-M1         | 0.00        | 0.00        | 0.00        | 6.28        |
| 11         | 6236.19     | 6233.00     | 2.51        | 3.19        | 4-FF         | 0.00        | 0.00        | 0.00        | 6.28        |
| 11         | 6236.25     | 6233.00     | 2.54        | 3.25        | 4-FF         | 0.00        | 0.00        | 0.00        | 6.34        |

El. inlet face invert      6233.00 ft      El. outlet invert      6231.00 ft  
 El. inlet throat invert      0.00 ft      El. inlet crest      0.00 ft

\*\*\*\*\*

\*\*\*\*\* SITE DATA \*\*\*\*\* CULVERT INVERT \*\*\*\*\*  
 INLET STATION (FT)      0.00  
 INLET ELEVATION (FT)      6233.00  
 OUTLET STATION (FT)      60.00  
 OUTLET ELEVATION (FT)      6231.00  
 NUMBER OF BARRELS      1.00  
 SLOPE (V-FT/H-FT)      0.0333  
 CULVERT LENGTH ALONG SLOPE (FT)      60.03

\*\*\*\*\* CULVERT DATA SUMMARY \*\*\*\*\*  
 BARREL SHAPE      CIRCULAR  
 BARREL DIAMETER      1.50 FT  
 BARREL MATERIAL      CORRUGATED STEEL  
 BARREL MANNING'S N      0.024  
 INLET TYPE      CONVENTIONAL  
 INLET EDGE AND WALL      SQUARE EDGE WITH HEADWALL  
 INLET DEPRESSION      NONE

\*\*\*\*\*

CURRENT DATE: 11-05-1997  
CURRENT TIME: 16:12:06

FILE DATE: 11-05-1997  
FILE NAME: 8

\*\*\*\*\*  
\*\*\*\*\* TAILWATER \*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

CONSTANT WATER SURFACE ELEVATION  
6233.00

\*\*\*\*\*  
\*\*\*\*\* ROADWAY OVERTOPPING DATA \*\*\*\*\*  
\*\*\*\*\*

|                                  |         |
|----------------------------------|---------|
| ROADWAY SURFACE                  | PAVED   |
| EMBANKMENT TOP WIDTH (FT)        | 50.00   |
| CREST LENGTH (FT)                | 20.00   |
| OVERTOPPING CREST ELEVATION (FT) | 6235.50 |

\*\*\*\*\*

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 UDINLET: INLET HYDRAULICS AND SIZING  
 DEVELOPED BY  
 DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
 SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
 -----

SER:Kiowa Engineering Corp-Denver Colorado.....  
 N DATE 11-05-1997 AT TIME 15:41:09

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 9

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

|                          |       |                   |
|--------------------------|-------|-------------------|
| INLET GRATE WIDTH        | (ft)= | 2.00              |
| INLET GRATE LENGTH       | (ft)= | 4.00              |
| INLET GRATE TYPE         | =     | Nonstandard Grate |
| NUMBER OF GRATES         | =     | 1.00              |
| SUMP DEPTH ON GRATE      | (ft)= | 0.50              |
| GRATE OPENING AREA RATIO | (%) = | 0.60              |

IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

|                               |   |       |
|-------------------------------|---|-------|
| STREET LONGITUDINAL SLOPE (%) | = | 5.00  |
| STREET CROSS SLOPE (%)        | = | 1.00  |
| STREET MANNING N              | = | 0.016 |
| GUTTER DEPRESSION (inch)      | = | 1.50  |
| GUTTER WIDTH (ft)             | = | 2.00  |

STREET FLOW HYDRAULICS:

|                                  |   |       |
|----------------------------------|---|-------|
| WATER SPREAD ON STREET (ft)      | = | 29.50 |
| GUTTER FLOW DEPTH (ft)           | = | 0.42  |
| FLOW VELOCITY ON STREET (fps)    | = | 7.18  |
| FLOW CROSS SECTION AREA (sq ft)  | = | 4.48  |
| GRATE CLOGGING FACTOR (%)        | = | 50.00 |
| CURB OPENING CLOGGING FACTOR (%) | = | 10.00 |

INLET INTERCEPTION CAPACITY:

FOR 1

GRATE INLETS:

|                            |        |       |
|----------------------------|--------|-------|
| DESIGN DISCHARGE           | (cfs)= | 32.30 |
| IDEAL GRATE INLET CAPACITY | (cfs)= | 24.75 |
| BY FAA HEC-12 METHOD:      |        |       |
| FLOW INTERCEPTED           | (cfs)= | 12.38 |
| CARRY-OVER FLOW            | (cfs)= | 19.92 |
| BY DENVER UDFCD METHOD:    |        |       |
| FLOW INTERCEPTED           | (cfs)= | 12.38 |
| CARRY-OVER FLOW            | (cfs)= | 19.92 |

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
V DATE 11-05-1997 AT TIME 15:44:41

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 10

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 1.50  
INLET GRATE LENGTH (ft)= 1.67  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft)= 0.33  
GRATE OPENING AREA RATIO (%) = 0.60

IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 3.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 25.00  
GUTTER FLOW DEPTH (ft) = 0.38  
FLOW VELOCITY ON STREET (fps)= 5.05  
FLOW CROSS SECTION AREA (sq ft)= 3.25  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENNING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 16.40  
IDEAL GRATE INLET CAPACITY (cfs)= 6.79  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs)= 3.39  
CARRY-OVER FLOW (cfs)= 13.01  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs)= 3.39  
CARRY-OVER FLOW (cfs)= 13.01

UDINLET: INLET HYDRAULICS AND SIZING

DEVELOPED BY

DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD

SER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 15:46:22

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 11

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 1.25  
INLET GRATE LENGTH (ft)= 1.25  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 3.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 25.00  
GUTTER FLOW DEPTH (ft) = 0.38  
FLOW VELOCITY ON STREET (fps)= 5.05  
FLOW CROSS SECTION AREA (sq ft)= 3.25  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENNING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:  
DESIGN DISCHARGE (cfs)= 16.40  
IDEAL GRATE INLET CAPA

ITY (cfs)= 4.51

BY FAA HEC-12 METHOD:

FLOW INTERCEPTED (cfs)= 4.45  
CARRY-OVER FLOW (cfs)= 11.95

BY DENVER UDFCD METHOD:

FLOW INTERCEPTED (cfs)= 2.25  
CARRY-OVER FLOW (cfs)= 14.15

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 15:48:05

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 12

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 1.50  
INLET GRATE LENGTH (ft)= 1.50  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft)= 1.50  
GRATE OPENING AREA RATIO (%) = 0.60  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 3.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 32.69  
GUTTER FLOW DEPTH (ft) = 0.45  
FLOW VELOCITY ON STREET (fps)= 5.91  
FLOW CROSS SECTION AREA (sq ft)= 5.47  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 32.30  
IDEAL GRATE INLET CAPACITY (cfs)= 10.14  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs)= 5.07  
CARRY-OVER FLOW (cfs)= 27.23  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs)= 5.07  
CARRY-OVER FLOW (cfs)= 27.23

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

SER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 15:49:38

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 13

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 2.00  
INLET GRATE LENGTH (ft)= 4.00  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00

IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 5.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 29.50  
GUTTER FLOW DEPTH (ft) = 0.42  
FLOW VELOCITY ON STREET (fps)= 7.18  
FLOW CROSS SECTION AREA (sq ft)= 4.48  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENNING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 32.30  
IDEAL GRATE INLET CAPACITY (cfs)= 8.36

BY FAA HEC-12 METHOD:

FLOW INTERCEPTED (cfs)= 7.48  
CARRY-OVER FLOW (cfs)= 24.82

BY DENVER UDFCD METHOD:

FLOW INTERCEPTED (cfs)= 4.18  
CARRY-OVER FLOW (cfs)= 28.12

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 15:51:19

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 14

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

|                                |       |       |
|--------------------------------|-------|-------|
| GIVEN CURB OPENING LENGTH      | (ft)= | 6.00  |
| REQUIRED CURB OPENING LENGTH   | (ft)= | 87.44 |
| IDEAL CURB OPENING EFFICIENCY  | =     | 0.12  |
| ACTUAL CURB OPENING EFFICIENCY | =     | 0.11  |

STREET GEOMETRIES:

|                           |         |       |
|---------------------------|---------|-------|
| STREET LONGITUDINAL SLOPE | (%) =   | 5.00  |
| STREET CROSS SLOPE        | (%) =   | 2.00  |
| STREET MANNING N          | =       | 0.016 |
| GUTTER DEPRESSION         | (inch)= | 1.50  |
| GUTTER WIDTH              | (ft) =  | 2.00  |

STREET FLOW HYDRAULICS:

|                              |          |       |
|------------------------------|----------|-------|
| WATER SPREAD ON STREET       | (ft) =   | 19.09 |
| GUTTER FLOW DEPTH            | (ft) =   | 0.51  |
| FLOW VELOCITY ON STREET      | (fps)=   | 8.58  |
| FLOW CROSS SECTION AREA      | (sq ft)= | 3.77  |
| GRATE CLOGGING FACTOR        | (%)=     | 50.00 |
| CURB OPENING CLOGGING FACTOR | (%)=     | 10.00 |

INLET INTERCEPTION CAPACITY:

|                                     |        |       |
|-------------------------------------|--------|-------|
| IDEAL INTERCEPTION CAPACITY         | (cfs)= | 3.88  |
| BY FAA HEC-12 METHOD: DESIGN FLOW   | (cfs)= | 32.30 |
| FLOW INTERCEPTED                    | (cfs)= | 3.50  |
| CARRY-OVER FLOW                     | (cfs)= | 28.80 |
| BY DENVER UDFCD METHOD: DESIGN FLOW | (cfs)= | 32.30 |
| FLOW INTERCEPTED                    | (cfs)= | 3.49  |
| CARRY-OVER FLOW                     | (cfs)= | 28.81 |



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UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
N DATE 11-05-1997 AT TIME 15:53:21

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 15

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 0.33  
INLET GRATE LENGTH (ft)= 100.00  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 2.00  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 1.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.025  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 24.63  
GUTTER FLOW DEPTH (ft) = 0.37  
FLOW VELOCITY ON STREET (fps)= 1.85  
FLOW CROSS SECTION AREA (sq ft)= 3.16  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENNING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 2 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 5.80  
IDEAL GRATE INLET CAPACITY (cfs)= 5.80  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs)= 5.80  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs)= 2.90  
CARRY-OVER FLOW (cfs)= 2.90

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UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
N DATE 11-05-1997 AT TIME 15:56:52

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 16

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

|                          |       |                   |
|--------------------------|-------|-------------------|
| INLET GRATE WIDTH        | (ft)= | 1.50              |
| INLET GRATE LENGTH       | (ft)= | 1.50              |
| INLET GRATE TYPE         | =     | Nonstandard Grate |
| NUMBER OF GRATES         | =     | 1.00              |
| SUMP DEPTH ON GRATE      | (ft)= | 0.33              |
| GRATE OPENING AREA RATIO | (%) = | 0.60              |

IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

|                               |   |       |
|-------------------------------|---|-------|
| STREET LONGITUDINAL SLOPE (%) | = | 1.00  |
| STREET CROSS SLOPE (%)        | = | 1.00  |
| STREET MANNING N              | = | 0.025 |
| GUTTER DEPRESSION (inch)      | = | 1.50  |
| GUTTER WIDTH (ft)             | = | 2.00  |

STREET FLOW HYDRAULICS:

|                                   |   |       |
|-----------------------------------|---|-------|
| WATER SPREAD ON STREET (ft)       | = | 24.63 |
| GUTTER FLOW DEPTH (ft)            | = | 0.37  |
| FLOW VELOCITY ON STREET (fps)     | = | 1.85  |
| FLOW CROSS SECTION AREA (sq ft)   | = | 3.16  |
| GRATE CLOGGING FACTOR (%)         | = | 50.00 |
| CURB OPENNING CLOGGING FACTOR (%) | = | 10.00 |

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

|                            |        |      |
|----------------------------|--------|------|
| DESIGN DISCHARGE           | (cfs)= | 5.80 |
| IDEAL GRATE INLET CAPACITY | (cfs)= | 6.08 |
| BY FAA HEC-12 METHOD:      |        |      |
| FLOW INTERCEPTED           | (cfs)= | 3.04 |
| CARRY-OVER FLOW            | (cfs)= | 2.76 |
| BY DENVER UDFCD METHOD:    |        |      |
| FLOW INTERCEPTED           | (cfs)= | 3.04 |
| CARRY-OVER FLOW            | (cfs)= | 2.76 |

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 UDINLET: INLET HYDRAULICS AND SIZING  
 DEVELOPED BY  
 DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
 N DATE 11-05-1997 AT TIME 15:58:31

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 17

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

|                                                   |       |                   |
|---------------------------------------------------|-------|-------------------|
| INLET GRATE WIDTH                                 | (ft)= | 0.33              |
| INLET GRATE LENGTH                                | (ft)= | 50.00             |
| INLET GRATE TYPE                                  | =     | Nonstandard Grate |
| NUMBER OF GRATES                                  | =     | 1.00              |
| IS THE INLET GRATE NEXT TO A CURB ?-- NO          |       |                   |
| Note: Sump is the additional depth to flow depth. |       |                   |

STREET GEOMETRIES:

|                               |   |       |
|-------------------------------|---|-------|
| STREET LONGITUDINAL SLOPE (%) | = | 1.00  |
| STREET CROSS SLOPE (%)        | = | 1.00  |
| STREET MANNING N              | = | 0.025 |
| GUTTER DEPRESSION (inch)      | = | 1.50  |
| GUTTER WIDTH (ft)             | = | 2.00  |

STREET FLOW HYDRAULICS:

|                                   |   |       |
|-----------------------------------|---|-------|
| WATER SPREAD ON STREET (ft)       | = | 34.75 |
| GUTTER FLOW DEPTH (ft)            | = | 0.47  |
| FLOW VELOCITY ON STREET (fps)     | = | 2.27  |
| FLOW CROSS SECTION AREA (sq ft)   | = | 6.16  |
| GRATE CLOGGING FACTOR (%)         | = | 50.00 |
| CURB OPENNING CLOGGING FACTOR (%) | = | 10.00 |

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:  
 DESIGN DISCHARGE (cfs) = 14.10  
 IDEAL GRATE INLET CAPAC

|                         |         |
|-------------------------|---------|
| BY (cfs) =              | 14.01   |
| BY FAA HEC-12 METHOD:   |         |
| FLOW INTERCEPTED (cfs)  | = 13.66 |
| CARRY-OVER FLOW (cfs)   | = 0.44  |
| BY DENVER UDFCD METHOD: |         |
| FLOW INTERCEPTED (cfs)  | = 7.00  |
| CARRY-OVER FLOW (cfs)   | = 7.10  |

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 16:01:33

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 18

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 1.50  
INLET GRATE LENGTH (ft)= 1.50  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft)= 0.33  
GRATE OPENING AREA RATIO (%) = 0.60  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 1.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.025  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 34.75  
GUTTER FLOW DEPTH (ft) = 0.47  
FLOW VELOCITY ON STREET (fps)= 2.27  
FLOW CROSS SECTION AREA (sq ft)= 6.16  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 14.10  
IDEAL GRATE INLET CAPACITY (cfs)= 6.50

BY FAA HEC-12 METHOD:

FLOW INTERCEPTED (cfs)= 3.25  
CARRY-OVER FLOW (cfs)= 10.85

BY DENVER UDFCD METHOD:

FLOW INTERCEPTED (cfs)= 3.25  
CARRY-OVER FLOW (cfs)= 10.85

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
N DATE 11-05-1997 AT TIME 16:00:09

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 19

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 0.33  
INLET GRATE LENGTH (ft)= 50.00  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00

IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 1.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.025  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 34.75  
GUTTER FLOW DEPTH (ft) = 0.47  
FLOW VELOCITY ON STREET (fps)= 2.27  
FLOW CROSS SECTION AREA (sq ft)= 6.16  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 14.10  
IDEAL GRATE INLET CAPACITY (cfs)= 14.01

BY FAA HEC-12 METHOD:

FLOW INTERCEPTED (cfs)= 13.66  
CARRY-OVER FLOW (cfs)= 0.44

BY DENVER UDFCD METHOD:

FLOW INTERCEPTED (cfs)= 7.00  
CARRY-OVER FLOW (cfs)= 7.10

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
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SER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 16:02:56

\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 20

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

|                                          |       |                   |
|------------------------------------------|-------|-------------------|
| INLET GRATE WIDTH                        | (ft)= | 1.50              |
| INLET GRATE LENGTH                       | (ft)= | 1.50              |
| INLET GRATE TYPE                         | =     | Nonstandard Grate |
| NUMBER OF GRATES                         | =     | 1.00              |
| SUMP DEPTH ON GRATE                      | (ft)= | 0.33              |
| GRATE OPENING AREA RATIO                 | (%) = | 0.60              |
| IS THE INLET GRATE NEXT TO A CURB ?-- NO |       |                   |

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

|                               |   |       |
|-------------------------------|---|-------|
| STREET LONGITUDINAL SLOPE (%) | = | 1.00  |
| STREET CROSS SLOPE (%)        | = | 1.00  |
| STREET MANNING N              | = | 0.025 |
| GUTTER DEPRESSION (inch)      | = | 1.50  |
| GUTTER WIDTH (ft)             | = | 2.00  |

STREET FLOW HYDRAULICS:

|                                  |   |       |
|----------------------------------|---|-------|
| WATER SPREAD ON STREET (ft)      | = | 34.75 |
| GUTTER FLOW DEPTH (ft)           | = | 0.47  |
| FLOW VELOCITY ON STREET (fps)    | = | 2.27  |
| FLOW CROSS SECTION AREA (sq ft)  | = | 6.16  |
| GRATE CLOGGING FACTOR (%)        | = | 50.00 |
| CURB OPENING CLOGGING FACTOR (%) | = | 10.00 |

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

|                            |        |       |
|----------------------------|--------|-------|
| DESIGN DISCHARGE           | (cfs)= | 14.10 |
| IDEAL GRATE INLET CAPACITY | (cfs)= | 6.50  |
| BY FAA HEC-12 METHOD:      |        |       |
| FLOW INTERCEPTED           | (cfs)= | 3.25  |
| CARRY-OVER FLOW            | (cfs)= | 10.85 |
| BY DENVER UDFCD METHOD:    |        |       |
| FLOW INTERCEPTED           | (cfs)= | 3.25  |
| CARRY-OVER FLOW            | (cfs)= | 10.85 |

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY

DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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USER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 16:04:23

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 21

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 1.50  
INLET GRATE LENGTH (ft)= 1.50  
INLET GRATE TYPE =Nonstandard Grate  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft)= 0.33  
GRATE OPENING AREA RATIO (%) = 0.60  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 1.00  
STREET CROSS SLOPE (%) = 1.00  
STREET MANNING N = 0.025  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 16.94  
GUTTER FLOW DEPTH (ft) = 0.29  
FLOW VELOCITY ON STREET (fps)= 1.53  
FLOW CROSS SECTION AREA (sq ft)= 1.56  
GRATE CLOGGING FACTOR (%) = 50.00  
CURB OPENNING CLOGGING FACTOR(%) = 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 2.40  
IDEAL GRATE INLET CAPACITY (cfs)= 5.74  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs)= 2.40  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs)= 2.40  
CARRY-OVER FLOW (cfs)= 0.00

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UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY

DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
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JSER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-05-1997 AT TIME 16:06:32

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 22

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH (ft)= 16.00  
HEIGHT OF CURB OPENING (in)= 8.00  
INCLINED THROAT ANGLE (degree)= 0.00  
LATERAL WIDTH OF DEPRESSION (ft)= 3.00  
SUMP DEPTH (ft)= 0.50

Note: The sump depth is additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 2.50  
STREET CROSS SLOPE (%) = 2.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 3.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 14.69  
GUTTER FLOW DEPTH (ft) = 0.42  
FLOW VELOCITY ON STREET (fps)= 5.39  
FLOW CROSS SECTION AREA (sq ft)= 2.34  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY (cfs)= 54.97  
BY FAA HEC-12 METHOD: DESIGN FLOW (cfs)= 12.60  
FLOW INTERCEPTED (cfs)= 12.60  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD: DESIGN FLOW (cfs)= 12.60  
FLOW INTERCEPTED (cfs)= 12.60  
CARRY-OVER FLOW (cfs)= 0.00



CURRENT DATE: 11-07-1997  
 CURRENT TIME: 08:47:48

FILE DATE: 11-06-1997  
 FILE NAME: 23

\*\*\*\*\*  
 \*\*\*\*\* FHWA CULVERT ANALYSIS \*\*\*\*\*  
 \*\*\*\*\* HY-8, VERSION 3.2 \*\*\*\*\*  
 \*\*\*\*\*

| C<br>U<br>L<br>V<br># | SITE DATA              |                         |                           | CULVERT SHAPE, MATERIAL, INLET |              |              |              |               |
|-----------------------|------------------------|-------------------------|---------------------------|--------------------------------|--------------|--------------|--------------|---------------|
|                       | INLET<br>ELEV.<br>(FT) | OUTLET<br>ELEV.<br>(FT) | CULVERT<br>LENGTH<br>(FT) | BARRELS<br>SHAPE<br>MATERIAL   | SPAN<br>(FT) | RISE<br>(FT) | MANNING<br>n | INLET<br>TYPE |
| 1                     | 6285.50                | 6265.00                 | 342.53                    | 1 RCP                          | 3.00         | 3.00         | .012         | IMPR SDT CIR  |
| 2                     |                        |                         |                           |                                |              |              |              |               |
| 3                     |                        |                         |                           |                                |              |              |              |               |
| 4                     |                        |                         |                           |                                |              |              |              |               |
| 5                     |                        |                         |                           |                                |              |              |              |               |
| 6                     |                        |                         |                           |                                |              |              |              |               |

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 SUMMARY OF CULVERT FLOWS (CFS) FILE: 23 DATE: 11-06-1997

| ELEV (FT) | TOTAL | 1  | 2 | 3 | 4 | 5 | 6 | ROADWAY | ITR |
|-----------|-------|----|---|---|---|---|---|---------|-----|
| 6285.50   | 0     | 0  | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6286.00   | 5     | 5  | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6286.41   | 10    | 10 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6286.71   | 15    | 15 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6286.90   | 20    | 20 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6287.15   | 25    | 25 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6287.41   | 29    | 29 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6287.68   | 34    | 34 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6287.94   | 39    | 39 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6288.20   | 44    | 44 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6288.46   | 49    | 49 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |
| 6290.00   | 76    | 76 | 0 | 0 | 0 | 0 | 0 | 0       | 1   |

\*\*\*\*\*

\*\*\*\*\*  
 SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: 23 DATE: 11-06-1997

| HEAD<br>ELEV(FT) | HEAD<br>ERROR(FT) | TOTAL<br>FLOW(CFS) | FLOW<br>ERROR(CFS) | % FLOW<br>ERROR |
|------------------|-------------------|--------------------|--------------------|-----------------|
| 6285.50          | 0.00              | 0                  | 0                  | 0.00            |
| 6286.00          | 0.00              | 5                  | 0                  | 0.00            |
| 6286.41          | 0.00              | 10                 | 0                  | 0.00            |
| 6286.71          | 0.00              | 15                 | 0                  | 0.00            |
| 6286.90          | 0.00              | 20                 | 0                  | 0.00            |
| 6287.15          | 0.00              | 25                 | 0                  | 0.00            |
| 6287.41          | 0.00              | 29                 | 0                  | 0.00            |
| 6287.68          | 0.00              | 34                 | 0                  | 0.00            |
| 6287.94          | 0.00              | 39                 | 0                  | 0.00            |
| 6288.20          | 0.00              | 44                 | 0                  | 0.00            |
| 6288.46          | 0.00              | 49                 | 0                  | 0.00            |

\*\*\*\*\*

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

\*\*\*\*\*

CURRENT DATE: 11-07-1997  
CURRENT TIME: 08:47:48

FILE DATE: 11-06-1997  
FILE NAME: 23

\*\*\*\*\*  
\*\*\*\*\* CULVERT # 1 \*\*\*\*\*  
\*\*\*\*\*

PERFORMANCE CURVE FOR 1 BARREL(S)

| Q<br>(cfs) | HWE<br>(ft) | TWE<br>(ft) | ICH<br>(ft) | OCH<br>(ft) | FLOW<br>TYPE | CCE<br>(ft) | FCE<br>(ft) | TCE<br>(ft) | VO<br>(fps) |
|------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|
| 0          | 6285.50     | 6268.00     | 0.00        | -17.50      | 0-NF         | 0.00        | 6285.50     | 6285.03     | 0.00        |
| 5          | 6286.00     | 6268.00     | 0.50        | -17.04      | 4-FF         | 0.00        | 6285.83     | 6286.00     | 0.69        |
| 10         | 6286.41     | 6268.00     | 0.91        | -16.97      | 4-FF         | 0.00        | 6286.00     | 6286.41     | 1.39        |
| 15         | 6286.71     | 6268.00     | 1.21        | -16.85      | 4-FF         | 0.00        | 6286.15     | 6286.71     | 2.08        |
| 20         | 6286.90     | 6268.00     | 1.40        | -16.69      | 4-FF         | 0.00        | 6285.50     | 6286.90     | 2.77        |
| 25         | 6287.15     | 6268.00     | 1.65        | -16.48      | 4-FF         | 0.00        | 6285.50     | 6287.15     | 3.47        |
| 29         | 6287.41     | 6268.00     | 1.91        | -16.23      | 4-FF         | 0.00        | 6285.50     | 6287.41     | 4.16        |
| 34         | 6287.68     | 6268.00     | 2.18        | -15.93      | 4-FF         | 0.00        | 6285.50     | 6287.68     | 4.85        |
| 39         | 6287.94     | 6268.00     | 2.44        | -15.58      | 4-FF         | 0.00        | 6285.50     | 6287.94     | 5.55        |
| 44         | 6288.20     | 6268.00     | 2.70        | -15.19      | 4-FF         | 0.00        | 6285.50     | 6288.20     | 6.24        |
| 49         | 6288.46     | 6268.00     | 2.96        | -14.75      | 4-FF         | 0.00        | 6285.50     | 6288.46     | 6.93        |

El. inlet face invert 6285.50 ft El. outlet invert 6265.00 ft  
El. inlet throat invert 6285.03 ft El. inlet crest 0.00 ft

\*\*\*\*\*

\*\*\*\*\* SITE DATA \*\*\*\*\* CULVERT INVERT \*\*\*\*\*  
INLET STATION (FT) 0.00  
INLET ELEVATION (FT) 6285.50  
OUTLET STATION (FT) 350.00  
OUTLET ELEVATION (FT) 6265.00  
NUMBER OF BARRELS 1.00  
SLOPE (V-FT/H-FT) 0.0586  
CULVERT LENGTH ALONG SLOPE (FT) 342.53

\*\*\*\*\* CULVERT DATA SUMMARY \*\*\*\*\*  
BARREL SHAPE CIRCULAR  
BARREL DIAMETER 3.00 FT  
BARREL MATERIAL CONCRETE  
BARREL MANNING'S N 0.012  
INLET TYPE IMPR SDT CIRC  
INLET EDGE AND WALL BEVELED EDGE TOP (15-26 DEG WINGWALL)  
INLET DEPRESSION NONE

\*\*\*\*\* SIDE-TAPERED CIRCULAR IMPROVED INLET \*\*\*\*\*  
FACE WIDTH 6.00 FT  
SIDE TAPER (4:1 TO 6:1) (X:1) 5.38  
FACE HEIGHT 3.00 FT

\*\*\*\*\*

CURRENT DATE: 11-07-1997  
CURRENT TIME: 08:47:48

FILE DATE: 11-06-1997  
FILE NAME: 23

\*\*\*\*\*  
\*\*\*\*\* TAILWATER \*\*\*\*\*  
\*\*\*\*\*

CONSTANT WATER SURFACE ELEVATION  
6268.00

\*\*\*\*\*  
\*\*\*\*\* ROADWAY OVERTOPPING DATA \*\*\*\*\*  
\*\*\*\*\*

|                                  |         |
|----------------------------------|---------|
| ROADWAY SURFACE                  | PAVED   |
| EMBANKMENT TOP WIDTH (FT)        | 50.00   |
| CREST LENGTH (FT)                | 20.00   |
| OVERTOPPING CREST ELEVATION (FT) | 6290.00 |

\*\*\*\*\*

CURRENT DATE: 11-07-1997  
 CURRENT TIME: 08:50:00

FILE DATE: 11-06-1997  
 FILE NAME: 24

\*\*\*\*\*  
 \*\*\*\*\* FHWA CULVERT ANALYSIS \*\*\*\*\*  
 \*\*\*\*\* HY-8, VERSION 3.2 \*\*\*\*\*  
 \*\*\*\*\*

| C<br>U<br>L<br>V<br># | SITE DATA              |                         |                           | CULVERT SHAPE, MATERIAL, INLET |              |              |              |               |
|-----------------------|------------------------|-------------------------|---------------------------|--------------------------------|--------------|--------------|--------------|---------------|
|                       | INLET<br>ELEV.<br>(FT) | OUTLET<br>ELEV.<br>(FT) | CULVERT<br>LENGTH<br>(FT) | BARRELS<br>SHAPE<br>MATERIAL   | SPAN<br>(FT) | RISE<br>(FT) | MANNING<br>n | INLET<br>TYPE |
| 1                     | 6277.00                | 6265.00                 | 195.86                    | 1 RCP                          | 1.50         | 1.50         | .012         | IMPR SDT CIR  |
| 2                     |                        |                         |                           |                                |              |              |              |               |
| 3                     |                        |                         |                           |                                |              |              |              |               |
| 4                     |                        |                         |                           |                                |              |              |              |               |
| 5                     |                        |                         |                           |                                |              |              |              |               |
| 6                     |                        |                         |                           |                                |              |              |              |               |

\*\*\*\*\*  
 \*\*\*\*\* SUMMARY OF CULVERT FLOWS (CFS) \*\*\*\*\*  
 \*\*\*\*\* FILE: 24 \*\*\*\*\*  
 \*\*\*\*\* DATE: 11-06-1997 \*\*\*\*\*

| ELEV (FT) | TOTAL | 1  | 2 | 3 | 4 | 5 | 6 | ROADWAY | ITR         |
|-----------|-------|----|---|---|---|---|---|---------|-------------|
| 6277.00   | 0     | 0  | 0 | 0 | 0 | 0 | 0 | 0       | 1           |
| 6279.00   | 12    | 12 | 0 | 0 | 0 | 0 | 0 | 0       | 1           |
| 6280.10   | 20    | 18 | 0 | 0 | 0 | 0 | 0 | 2       | 8           |
| 6280.43   | 37    | 19 | 0 | 0 | 0 | 0 | 0 | 17      | 4           |
| 6280.61   | 49    | 20 | 0 | 0 | 0 | 0 | 0 | 29      | 4           |
| 6280.76   | 61    | 21 | 0 | 0 | 0 | 0 | 0 | 40      | 3           |
| 6280.90   | 73    | 21 | 0 | 0 | 0 | 0 | 0 | 52      | 3           |
| 6281.03   | 85    | 22 | 0 | 0 | 0 | 0 | 0 | 63      | 3           |
| 6281.15   | 98    | 22 | 0 | 0 | 0 | 0 | 0 | 75      | 3           |
| 6281.27   | 110   | 23 | 0 | 0 | 0 | 0 | 0 | 87      | 3           |
| 6281.38   | 122   | 23 | 0 | 0 | 0 | 0 | 0 | 99      | 3           |
| 6280.00   | 17    | 17 | 0 | 0 | 0 | 0 | 0 | 0       | OVERTOPPING |

\*\*\*\*\*  
 \*\*\*\*\* SUMMARY OF ITERATIVE SOLUTION ERRORS \*\*\*\*\*  
 \*\*\*\*\* FILE: 24 \*\*\*\*\*  
 \*\*\*\*\* DATE: 11-06-1997 \*\*\*\*\*

| HEAD<br>ELEV (FT) | HEAD<br>ERROR (FT) | TOTAL<br>FLOW (CFS) | FLOW<br>ERROR (CFS) | % FLOW<br>ERROR |
|-------------------|--------------------|---------------------|---------------------|-----------------|
| 6277.00           | 0.00               | 0                   | 0                   | 0.00            |
| 6279.00           | 0.00               | 12                  | 0                   | 0.00            |
| 6280.10           | -0.00              | 20                  | 0                   | 0.59            |
| 6280.43           | -0.00              | 37                  | 0                   | 0.98            |
| 6280.61           | -0.01              | 49                  | 0                   | 0.28            |
| 6280.76           | -0.00              | 61                  | 1                   | 0.83            |
| 6280.90           | -0.00              | 73                  | 0                   | 0.61            |
| 6281.03           | -0.00              | 85                  | 0                   | 0.45            |
| 6281.15           | -0.00              | 98                  | 0                   | 0.29            |
| 6281.27           | -0.00              | 110                 | 0                   | 0.25            |
| 6281.38           | -0.00              | 122                 | 0                   | 0.19            |

\*\*\*\*\*  
 <1> TOLERANCE (FT) = 0.010  
 <2> TOLERANCE (%) = 1.000  
 \*\*\*\*\*

CURRENT DATE: 11-07-1997  
CURRENT TIME: 08:50:00

FILE DATE: 11-06-1997  
FILE NAME: 24

\*\*\*\*\*  
\*\*\*\*\* CULVERT # 1 \*\*\*\*\*  
\*\*\*\*\*

PERFORMANCE CURVE FOR 1 BARREL(S)

| Q<br>(cfs) | HWE<br>(ft) | TWE<br>(ft) | ICH<br>(ft) | OCH<br>(ft) | FLOW<br>TYPE | CCE<br>(ft) | FCE<br>(ft) | TCE<br>(ft) | VO<br>(fps) |
|------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|
| 0          | 6277.00     | 6268.00     | 0.00        | -9.00       | 0-NF         | 0.00        | 6277.00     | 6276.73     | 0.00        |
| 12         | 6279.00     | 6268.00     | 2.00        | -5.77       | 4-FF         | 0.00        | 6277.00     | 6279.00     | 6.90        |
| 18         | 6280.10     | 6268.00     | 3.10        | -2.31       | 4-FF         | 0.00        | 6277.00     | 6280.10     | 10.16       |
| 19         | 6280.43     | 6268.00     | 3.43        | -1.24       | 4-FF         | 0.00        | 6277.00     | 6280.43     | 10.96       |
| 20         | 6280.60     | 6268.00     | 3.60        | -0.69       | 4-FF         | 0.00        | 6277.00     | 6280.60     | 11.36       |
| 21         | 6280.75     | 6268.00     | 3.75        | -0.21       | 4-FF         | 0.00        | 6277.00     | 6280.75     | 11.69       |
| 21         | 6280.89     | 6268.00     | 3.89        | 0.26        | 4-FF         | 0.00        | 6277.00     | 6280.89     | 12.01       |
| 22         | 6281.02     | 6268.00     | 4.02        | 0.68        | 4-FF         | 0.00        | 6277.00     | 6281.02     | 12.29       |
| 22         | 6281.15     | 6268.00     | 4.15        | 1.09        | 4-FF         | 0.00        | 6277.00     | 6281.15     | 12.55       |
| 23         | 6281.26     | 6268.00     | 4.26        | 1.46        | 4-FF         | 0.00        | 6277.00     | 6281.26     | 12.79       |
| 23         | 6281.38     | 6268.00     | 4.38        | 1.83        | 4-FF         | 0.00        | 6277.00     | 6281.38     | 13.01       |

El. inlet face invert 6277.00 ft El. outlet invert 6265.00 ft  
El. inlet throat invert 6276.73 ft El. inlet crest 0.00 ft

\*\*\*\*\*

\*\*\*\*\* SITE DATA \*\*\*\*\* CULVERT INVERT \*\*\*\*\*  
INLET STATION (FT) 0.00  
INLET ELEVATION (FT) 6277.00  
OUTLET STATION (FT) 200.00  
OUTLET ELEVATION (FT) 6265.00  
NUMBER OF BARRELS 1.00  
SLOPE (V-FT/H-FT) 0.0600  
CULVERT LENGTH ALONG SLOPE (FT) 195.86

\*\*\*\*\* CULVERT DATA SUMMARY \*\*\*\*\*  
BARREL SHAPE CIRCULAR  
BARREL DIAMETER 1.50 FT  
BARREL MATERIAL CONCRETE  
BARREL MANNING'S N 0.012  
INLET TYPE IMPR SDT CIRC  
INLET EDGE AND WALL BEVELED EDGE TOP (15-26 DEG WINGWALL)  
INLET DEPRESSION NONE

\*\*\*\*\* SIDE-TAPERED CIRCULAR IMPROVED INLET \*\*\*\*\*  
FACE WIDTH 3.00 FT  
SIDE TAPER (4:1 TO 6:1) (X:1) 6.00  
FACE HEIGHT 1.50 FT

\*\*\*\*\*

CURRENT DATE: 11-07-1997  
CURRENT TIME: 08:50:00

FILE DATE: 11-06-1997  
FILE NAME: 24

```

*****
*****                                TAILWATER                                *****
*****
*****
*****

```

CONSTANT WATER SURFACE ELEVATION  
6268.00

```

*****
***** ROADWAY OVERTOPPING DATA *****
*****

```

|                                  |         |
|----------------------------------|---------|
| ROADWAY SURFACE                  | PAVED   |
| EMBANKMENT TOP WIDTH (FT)        | 50.00   |
| CREST LENGTH (FT)                | 20.00   |
| OVERTOPPING CREST ELEVATION (FT) | 6280.00 |

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*****

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CURRENT DATE: 11-07-1997  
CURRENT TIME: 08:51:26

FILE DATE: 11-06-1997  
FILE NAME: 28

\*\*\*\*\*  
\*\*\*\*\* FHWA CULVERT ANALYSIS \*\*\*\*\*  
\*\*\*\*\* HY-8, VERSION 3.2 \*\*\*\*\*  
\*\*\*\*\*

| C<br>U<br>L<br>V<br># | SITE DATA              |                         |                           | CULVERT SHAPE, MATERIAL, INLET |              |              |              |               |
|-----------------------|------------------------|-------------------------|---------------------------|--------------------------------|--------------|--------------|--------------|---------------|
|                       | INLET<br>ELEV.<br>(FT) | OUTLET<br>ELEV.<br>(FT) | CULVERT<br>LENGTH<br>(FT) | BARRELS<br>SHAPE<br>MATERIAL   | SPAN<br>(FT) | RISE<br>(FT) | MANNING<br>n | INLET<br>TYPE |
| 1                     | 6262.00                | 6258.00                 | 112.40                    | 1 RCP                          | 3.50         | 3.50         | .012         | IMPR SDT CIR  |
| 2                     |                        |                         |                           |                                |              |              |              |               |
| 3                     |                        |                         |                           |                                |              |              |              |               |
| 4                     |                        |                         |                           |                                |              |              |              |               |
| 5                     |                        |                         |                           |                                |              |              |              |               |
| 6                     |                        |                         |                           |                                |              |              |              |               |

\*\*\*\*\*  
\*\*\*\*\* SUMMARY OF CULVERT FLOWS (CFS) FILE: 28 DATE: 11-06-1997 \*\*\*\*\*

| ELEV (FT) | TOTAL | 1  | 2 | 3 | 4 | 5 | 6 | ROADWAY       | ITR |
|-----------|-------|----|---|---|---|---|---|---------------|-----|
| 6262.00   | 0     | 0  | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6262.93   | 8     | 8  | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6263.42   | 16    | 16 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6263.78   | 23    | 23 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6264.02   | 31    | 31 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6264.34   | 39    | 39 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6264.68   | 47    | 47 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6265.02   | 55    | 55 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6265.35   | 62    | 62 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6265.67   | 70    | 70 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6266.00   | 78    | 78 | 0 | 0 | 0 | 0 | 0 |               | 0 1 |
| 6266.00   | 78    | 78 | 0 | 0 | 0 | 0 | 0 | 0 OVERTOPPING |     |

\*\*\*\*\*  
\*\*\*\*\* SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: 28 DATE: 11-06-1997 \*\*\*\*\*

| HEAD<br>ELEV(FT) | HEAD<br>ERROR(FT) | TOTAL<br>FLOW(CFS) | FLOW<br>ERROR(CFS) | % FLOW<br>ERROR |
|------------------|-------------------|--------------------|--------------------|-----------------|
| 6262.00          | 0.00              | 0                  | 0                  | 0.00            |
| 6262.93          | 0.00              | 8                  | 0                  | 0.00            |
| 6263.42          | 0.00              | 16                 | 0                  | 0.00            |
| 6263.78          | 0.00              | 23                 | 0                  | 0.00            |
| 6264.02          | 0.00              | 31                 | 0                  | 0.00            |
| 6264.34          | 0.00              | 39                 | 0                  | 0.00            |
| 6264.68          | 0.00              | 47                 | 0                  | 0.00            |
| 6265.02          | 0.00              | 55                 | 0                  | 0.00            |
| 6265.35          | 0.00              | 62                 | 0                  | 0.00            |
| 6265.67          | 0.00              | 70                 | 0                  | 0.00            |
| 6266.00          | 0.00              | 78                 | 0                  | 0.00            |

\*\*\*\*\*  
<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000  
\*\*\*\*\*

CURRENT DATE: 11-07-1997  
CURRENT TIME: 08:51:26

FILE DATE: 11-06-1997  
FILE NAME: 28

\*\*\*\*\*  
\*\*\*\*\* CULVERT # 1 \*\*\*\*\*  
\*\*\*\*\*

PERFORMANCE CURVE FOR 1 BARREL(S)

| Q<br>(cfs) | HWE<br>(ft) | TWE<br>(ft) | ICH<br>(ft) | OCH<br>(ft) | FLOW<br>TYPE | CCE<br>(ft) | FCE<br>(ft) | TCE<br>(ft) | VO<br>(fps) |
|------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|
| 0          | 6262.00     | 6260.00     | 0.00        | -2.00       | 0-NF         | 0.00        | 6262.00     | 6261.74     | 0.00        |
| 8          | 6262.93     | 6260.00     | 0.93        | -1.57       | 6-FF         | 0.00        | 6262.36     | 6262.93     | 9.65        |
| 16         | 6263.42     | 6260.00     | 1.42        | -1.34       | 6-FF         | 0.00        | 6262.55     | 6263.42     | 12.50       |
| 23         | 6263.78     | 6260.00     | 1.78        | -1.11       | 6-FF         | 0.00        | 6262.00     | 6263.78     | 12.68       |
| 31         | 6264.02     | 6260.00     | 2.02        | -0.88       | 6-FF         | 0.00        | 6262.00     | 6264.02     | 13.74       |
| 39         | 6264.34     | 6260.00     | 2.34        | -0.63       | 6-FF         | 0.00        | 6262.00     | 6264.34     | 14.60       |
| 47         | 6264.68     | 6260.00     | 2.68        | -0.36       | 6-FF         | 0.00        | 6262.00     | 6264.68     | 15.26       |
| 55         | 6265.02     | 6260.00     | 3.02        | -0.06       | 6-FF         | 0.00        | 6262.00     | 6265.02     | 15.60       |
| 62         | 6265.35     | 6260.00     | 3.35        | 0.26        | 6-FF         | 0.00        | 6262.00     | 6265.35     | 16.16       |
| 70         | 6265.67     | 6260.00     | 3.67        | 0.60        | 6-FF         | 0.00        | 6262.00     | 6265.67     | 16.45       |
| 78         | 6266.00     | 6260.00     | 4.00        | 0.97        | 6-FF         | 0.00        | 6262.00     | 6266.00     | 16.81       |

El. inlet face invert 6262.00 ft El. outlet invert 6258.00 ft  
El. inlet throat invert 6261.74 ft El. inlet crest 0.00 ft

\*\*\*\*\*

\*\*\*\*\* SITE DATA \*\*\*\*\* CULVERT INVERT \*\*\*\*\*

INLET STATION (FT) 0.00  
INLET ELEVATION (FT) 6262.00  
OUTLET STATION (FT) 120.00  
OUTLET ELEVATION (FT) 6258.00  
NUMBER OF BARRELS 1.00  
SLOPE (V-FT/H-FT) 0.0333  
CULVERT LENGTH ALONG SLOPE (FT) 112.40

\*\*\*\*\* CULVERT DATA SUMMARY \*\*\*\*\*

BARREL SHAPE CIRCULAR  
BARREL DIAMETER 3.50 FT  
BARREL MATERIAL CONCRETE  
BARREL MANNING'S N 0.012  
INLET TYPE IMPR SDT CIRC  
INLET EDGE AND WALL BEVELED EDGE TOP (15-26 DEG WINGWALL)  
INLET DEPRESSION NONE

\*\*\*\*\* SIDE-TAPERED CIRCULAR IMPROVED INLET \*\*\*\*\*

FACE WIDTH 6.50 FT  
SIDE TAPER (4:1 TO 6:1) (X:1) 5.11  
FACE HEIGHT 3.50 FT

\*\*\*\*\*



CURRENT DATE: 11-07-1997  
CURRENT TIME: 08:51:26

FILE DATE: 11-06-1997  
FILE NAME: 28

\*\*\*\*\*  
\*\*\*\*\* TAILWATER \*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

CONSTANT WATER SURFACE ELEVATION  
6260.00

\*\*\*\*\*  
\*\*\*\*\* ROADWAY OVERTOPPING DATA \*\*\*\*\*  
\*\*\*\*\*

|                                  |         |
|----------------------------------|---------|
| ROADWAY SURFACE                  | PAVED   |
| EMBANKMENT TOP WIDTH (FT)        | 50.00   |
| CREST LENGTH (FT)                | 20.00   |
| OVERTOPPING CREST ELEVATION (FT) | 6266.00 |

\*\*\*\*\*

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

USER: Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-07-1997 AT TIME 08:53:08

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 30

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

|                             |           |      |
|-----------------------------|-----------|------|
| GIVEN CURB OPENING LENGTH   | (ft)=     | 5.00 |
| HEIGHT OF CURB OPENING      | (in)=     | 8.00 |
| INCLINED THROAT ANGLE       | (degree)= | 0.00 |
| LATERAL WIDTH OF DEPRESSION | (ft)=     | 2.00 |
| SUMP DEPTH                  | (ft)=     | 0.61 |

Note: The sump depth is additional depth to flow depth.

STREET GEOMETRIES:

|                               |   |       |
|-------------------------------|---|-------|
| STREET LONGITUDINAL SLOPE (%) | = | 5.00  |
| STREET CROSS SLOPE (%)        | = | 2.00  |
| STREET MANNING N              | = | 0.016 |
| GUTTER DEPRESSION (inch)      | = | 1.50  |
| GUTTER WIDTH (ft)             | = | 2.00  |

STREET FLOW HYDRAULICS:

|                                  |   |       |
|----------------------------------|---|-------|
| WATER SPREAD ON STREET (ft)      | = | 13.47 |
| GUTTER FLOW DEPTH (ft)           | = | 0.39  |
| FLOW VELOCITY ON STREET (fps)    | = | 7.08  |
| FLOW CROSS SECTION AREA (sq ft)  | = | 1.94  |
| GRATE CLOGGING FACTOR (%)        | = | 50.00 |
| CURB OPENING CLOGGING FACTOR (%) | = | 10.00 |

INLET INTERCEPTION CAPACITY:

|                                           |   |       |  |
|-------------------------------------------|---|-------|--|
| IDEAL INTERCEPTION CAPACITY (cfs)         | = | 17.92 |  |
| BY FAA HEC-12 METHOD: DESIGN FLOW (cfs)   | = | 13.70 |  |
| FLOW INTERCEPTED (cfs)                    | = | 13.70 |  |
| CARRY-OVER FLOW (cfs)                     | = | 0.00  |  |
| BY DENVER UDFCD METHOD: DESIGN FLOW (cfs) | = | 13.70 |  |
| FLOW INTERCEPTED (cfs)                    | = | 13.70 |  |
| CARRY-OVER FLOW (cfs)                     | = | 0.00  |  |

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

USER: Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-07-1997 AT TIME 08:55:17

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 32

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH (ft)= 5.00  
HEIGHT OF CURB OPENING (in)= 8.00  
INCLINED THROAT ANGLE (degree)= 0.00  
LATERAL WIDTH OF DEPRESSION (ft)= 2.00  
SUMP DEPTH (ft)= 0.77

Note: The sump depth is additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 5.00  
STREET CROSS SLOPE (%) = 2.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 5.09  
GUTTER FLOW DEPTH (ft) = 0.23  
FLOW VELOCITY ON STREET (fps)= 5.16  
FLOW CROSS SECTION AREA (sq ft)= 0.38  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY (cfs)= 17.92  
BY FAA HEC-12 METHOD: DESIGN FLOW (cfs)= 2.00  
FLOW INTERCEPTED (cfs)= 2.00  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD: DESIGN FLOW (cfs)= 2.00  
FLOW INTERCEPTED (cfs)= 2.00  
CARRY-OVER FLOW (cfs)= 0.00

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

USER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-07-1997 AT TIME 08:56:40

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 34

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH (ft)= 5.00  
HEIGHT OF CURB OPENING (in)= 8.00  
INCLINED THROAT ANGLE (degree)= 0.00  
LATERAL WIDTH OF DEPRESSION (ft)= 2.00  
SUMP DEPTH (ft)= 0.81

Note: The sump depth is additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 5.00  
STREET CROSS SLOPE (%) = 2.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 3.44  
GUTTER FLOW DEPTH (ft) = 0.19  
FLOW VELOCITY ON STREET (fps)= 4.97  
FLOW CROSS SECTION AREA (sq ft)= 0.24  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY (cfs)= 17.92  
BY FAA HEC-12 METHOD: DESIGN FLOW (cfs)= 1.20  
FLOW INTERCEPTED (cfs)= 1.20  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD: DESIGN FLOW (cfs)= 1.20  
FLOW INTERCEPTED (cfs)= 1.20  
CARRY-OVER FLOW (cfs)= 0.00

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FC  
-----

USER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-07-1997 AT TIME 08:59:25

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* GRATE INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 38

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

INLET GRATE WIDTH (ft)= 2.00  
INLET GRATE LENGTH (ft)= 4.00  
INLET GRATE TYPE =Type 16 Grate Inlet  
NUMBER OF GRATES = 1.00  
SUMP DEPTH ON GRATE (ft)= 1.00  
GRATE OPENING AREA RATIO (%) = 0.60  
IS THE INLET GRATE NEXT TO A CURB ?-- NO

Note: Sump is the additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 10.00  
STREET CROSS SLOPE (%) = 2.00  
STREET MANNING N = 0.020  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 13.66  
GUTTER FLOW DEPTH (ft) = 0.40  
FLOW VELOCITY ON STREET (fps)= 8.07  
FLOW CROSS SECTION AREA (sq ft)= 1.99  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENNING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

FOR 1 GRATE INLETS:

DESIGN DISCHARGE (cfs)= 16.10  
IDEAL GRATE INLET CAPACITY (cfs)= 30.52  
BY FAA HEC-12 METHOD:  
FLOW INTERCEPTED (cfs)= 15.26  
CARRY-OVER FLOW (cfs)= 0.84  
BY DENVER UDFCD METHOD:  
FLOW INTERCEPTED (cfs)= 15.26  
CARRY-OVER FLOW (cfs)= 0.84

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

USER: Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-07-1997 AT TIME 09:01:40

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 42

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH (ft)= 5.00  
HEIGHT OF CURB OPENING (in)= 8.00  
INCLINED THROAT ANGLE (degree)= 0.00  
LATERAL WIDTH OF DEPRESSION (ft)= 2.00  
SUMP DEPTH (ft)= 0.67

Note: The sump depth is additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 5.00  
STREET CROSS SLOPE (%) = 2.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 10.38  
GUTTER FLOW DEPTH (ft) = 0.33  
FLOW VELOCITY ON STREET (fps)= 6.27  
FLOW CROSS SECTION AREA (sq ft)= 1.20  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY (cfs)= 17.92  
BY FAA HEC-12 METHOD: DESIGN FLOW (cfs)= 7.60  
FLOW INTERCEPTED (cfs)= 7.60  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD: DESIGN FLOW (cfs)= 7.60  
FLOW INTERCEPTED (cfs)= 7.60  
CARRY-OVER FLOW (cfs)= 0.00

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

USER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-07-1997 AT TIME 09:02:31

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 44

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH (ft)= 5.00  
HEIGHT OF CURB OPENING (in)= 8.00  
INCLINED THROAT ANGLE (degree)= 0.00  
LATERAL WIDTH OF DEPRESSION (ft)= 2.00  
SUMP DEPTH (ft)= 0.80

Note: The sump depth is additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 5.00  
STREET CROSS SLOPE (%) = 2.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 3.91  
GUTTER FLOW DEPTH (ft) = 0.20  
FLOW VELOCITY ON STREET (fps)= 5.02  
FLOW CROSS SECTION AREA (sq ft)= 0.28  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY (cfs)= 17.92  
BY FAA HEC-12 METHOD: DESIGN FLOW (cfs)= 1.40  
FLOW INTERCEPTED (cfs)= 1.40  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD: DESIGN FLOW (cfs)= 1.40  
FLOW INTERCEPTED (cfs)= 1.40  
CARRY-OVER FLOW (cfs)= 0.00

-----  
UDINLET: INLET HYDRAULICS AND SIZING  
DEVELOPED BY  
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER  
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD  
-----

USER:Kiowa Engineering Corp-Denver Colorado.....  
ON DATE 11-07-1997 AT TIME 09:03:37

\*\*\* PROJECT TITLE: INLET DESIGN

\*\*\* CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 49

INLET HYDRAULICS: IN A SUMP.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH (ft)= 5.00  
HEIGHT OF CURB OPENING (in)= 8.00  
INCLINED THROAT ANGLE (degree)= 0.00  
LATERAL WIDTH OF DEPRESSION (ft)= 2.00  
SUMP DEPTH (ft)= 0.66

Note: The sump depth is additional depth to flow depth.

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE (%) = 6.00  
STREET CROSS SLOPE (%) = 2.00  
STREET MANNING N = 0.016  
GUTTER DEPRESSION (inch)= 1.50  
GUTTER WIDTH (ft) = 2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET (ft) = 10.56  
GUTTER FLOW DEPTH (ft) = 0.34  
FLOW VELOCITY ON STREET (fps)= 6.92  
FLOW CROSS SECTION AREA (sq ft)= 1.24  
GRATE CLOGGING FACTOR (%)= 50.00  
CURB OPENING CLOGGING FACTOR(%)= 10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY (cfs)= 17.92  
BY FAA HEC-12 METHOD: DESIGN FLOW (cfs)= 8.60  
FLOW INTERCEPTED (cfs)= 8.60  
CARRY-OVER FLOW (cfs)= 0.00  
BY DENVER UDFCD METHOD: DESIGN FLOW (cfs)= 8.60  
FLOW INTERCEPTED (cfs)= 8.60  
CARRY-OVER FLOW (cfs)= 0.00



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1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* SEPTEMBER 1990
* VERSION 4.0
*
* RUN DATE 11/04/1997 TIME 16:01:19
*
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*****
*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****

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X X X X X
X X X X X
X X XXXXXXX XXXX XXX

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

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

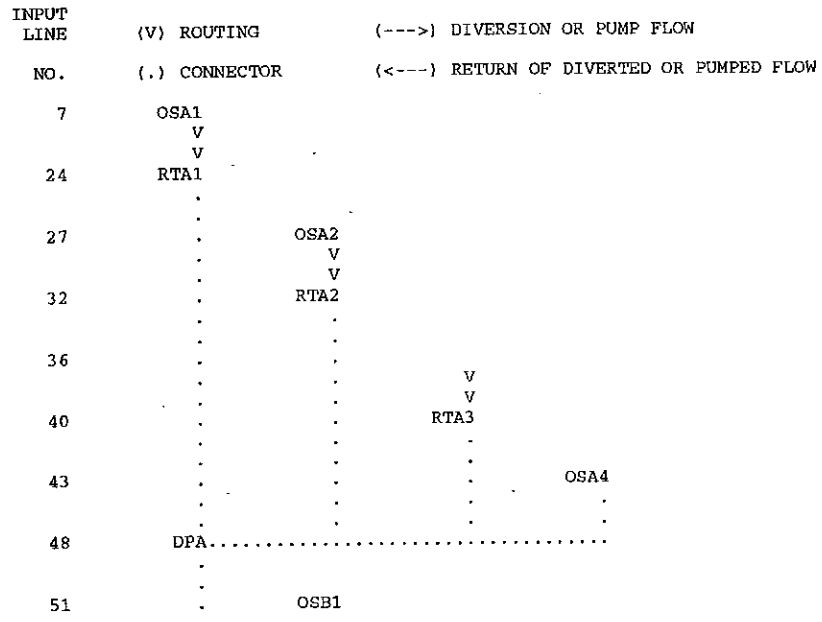
| LINE | ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10     |
|------|---------------------------------------------------------------------|
| 1    | ID CHEYENNE MOUNTAIN HIGH SCHOOL MDDP                               |
| 2    | ID BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MTN. SCHOOLS |
| 3    | ID EXISTING UPSTREAM 5-YR FLOWS NOV. 4, 1997                        |
|      | *DIAGRAM                                                            |
| 4    | IT 5 300                                                            |
| 5    | IO 0                                                                |
| 6    | IN 15                                                               |
| 7    | KK OSA1                                                             |
| 8    | KM CHEYENNE MTN. HS OFFSITE BASIN A1                                |
| 9    | KO 3                                                                |
| 10   | BA 0.159                                                            |
| 11   | PB 2.6                                                              |
| 12   | PC .002 .005 .008 .0011 .014 .017 .02 .023 .026 .029                |
| 13   | PC .032 .035 .038 .041 .044 .048 .052 .056 .06 .064                 |
| 14   | PC .068 .072 .076 .08 .085 .09 .095 .1 .105 .11                     |
| 15   | PC .115 .12 .126 .133 .14 .147 .155 .163 .172 .181                  |
| 16   | PC .191 .203 .218 .236 .257 .283 .387 .663 .707 .735                |
| 17   | PC .758 .776 .791 .804 .815 .825 .834 .842 .849 .856                |
| 18   | PC .863 .869 .875 .881 .887 .893 .898 .903 .908 .913                |
| 19   | PC .918 .922 .926 .93 .934 .938 .942 .946 .95 .953                  |
| 20   | PC .956 .959 .962 .965 .968 .971 .974 .977 .98 .983                 |
| 21   | PC .986 .989 .992 .995 .998 1                                       |
| 22   | LS 63                                                               |
| 23   | UD 0.308                                                            |
| 24   | KK RTA1                                                             |
| 25   | KM ROUTE OSA1 TO DPA                                                |
| 26   | RK 395 .0709 .035 TRAP 2 4                                          |
| 27   | KK OSA2                                                             |
| 28   | KM CHEYENNE MTN. HS OFFSITE BASIN A2                                |
| 29   | BA .026                                                             |
| 30   | LS 66                                                               |
| 31   | UD 0.292                                                            |
| 32   | KK RTA2                                                             |
| 33   | KM ROUTE OSA2 TO DPA                                                |
| 34   | RK 311 .0707 .035 TRAP 2 4                                          |
| 35   | KM OSA3                                                             |
| 36   | KK CHEYENNE MTN. HS OFFSITE BASIN A3                                |
| 37   | BA .009                                                             |
| 38   | LS 66                                                               |
| 39   | UD 0.255                                                            |

40 KK RTA3  
 41 KM ROUTE OSA3 TO DPA  
 42 RK 292 .0822 .035 TRAP 2 4  
 HEC-1 INPUT

1

| LINE | ID | 1                                 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|----|-----------------------------------|----|---|---|---|---|---|---|---|----|
| 43   | KK | OSA4                              |    |   |   |   |   |   |   |   |    |
| 44   | KM | CHEYENNE MTN. HS OFFSITE BASIN A4 |    |   |   |   |   |   |   |   |    |
| 45   | BA | .005                              |    |   |   |   |   |   |   |   |    |
| 46   | LS |                                   | 66 |   |   |   |   |   |   |   |    |
| 47   | UD | 0.142                             |    |   |   |   |   |   |   |   |    |
| 48   | KK | DPA                               |    |   |   |   |   |   |   |   |    |
| 49   | KM | DESIGN POINT A                    |    |   |   |   |   |   |   |   |    |
| 50   | HC | 4                                 |    |   |   |   |   |   |   |   |    |
| 51   | KK | OSB1                              |    |   |   |   |   |   |   |   |    |
| 52   | KM | CHEYENNE MTN. HS OFFSITE BASIN B1 |    |   |   |   |   |   |   |   |    |
| 53   | BA | 0.136                             |    |   |   |   |   |   |   |   |    |
| 54   | LS |                                   | 66 |   |   |   |   |   |   |   |    |
| 55   | UD | 0.288                             |    |   |   |   |   |   |   |   |    |
| 56   | ZZ |                                   |    |   |   |   |   |   |   |   |    |

SCHEMATIC DIAGRAM OF STREAM NETWORK



(\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION  
 \*\*\*\*\*  
 \* FLOOD HYDROGRAPH PACKAGE (HEC-1) \*  
 \* SEPTEMBER 1990 \*  
 \* VERSION 4.0 \*  
 \* RUN DATE 11/04/1997 TIME 16:01:19 \*  
 \*\*\*\*\*

\*\*\*\*\*  
 \* U.S. ARMY CORPS OF ENGINEERS \*  
 \* HYDROLOGIC ENGINEERING CENTER \*  
 \* 609 SECOND STREET \*  
 \* DAVIS, CALIFORNIA 95616 \*  
 \* (916) 756-1104 \*  
 \*\*\*\*\*

CHEYENNE MOUNTAIN HIGH SCHOOL MDDP  
 BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MTN. SCHOOLS  
 EXISTING UPSTREAM 5-YR FLOWS NOV: 4, 1997

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

IT HYDROGRAPH TIME DATA  
 NMIN 5 MINUTES IN COMPUTATION INTERVAL  
 IDATE 1 0 STARTING DATE

ITIME 0000 STARTING TIME  
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES  
 NDDATE 2 0 ENDING DATE  
 NDTIME 0055 ENDING TIME  
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .08 HOURS  
 TOTAL TIME BASE 24.92 HOURS

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

\*\*\* \*\*

7 KK

\*\*\*\*\*  
 \* \*  
 \* OSA1 \*  
 \* \*  
 \*\*\*\*\*

CHEYENNE MTN. HS OFFSITE BASIN A1

9 KO

OUTPUT CONTROL VARIABLES  
 IPRNT 3 PRINT CONTROL  
 IPLOT 0 PLOT CONTROL  
 QSCAL 0 HYDROGRAPH PLOT SCALE

6 IN

TIME DATA FOR INPUT TIME SERIES  
 JXMIN 15 TIME INTERVAL IN MINUTES  
 JXDATE 1 0 STARTING DATE  
 JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

10 BA

SUBBASIN CHARACTERISTICS  
 TAREA .16 SUBBASIN AREA

PRECIPITATION DATA

11 PB

STORM 2.60 BASIN TOTAL PRECIPITATION

12 PI

INCREMENTAL PRECIPITATION PATTERN

|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

22 LS

SCS LOSS RATE  
 STRTL 1.17 INITIAL ABSTRACTION  
 CRVNR 63.00 CURVE NUMBER  
 RTIMP .00 PERCENT IMPERVIOUS AREA

23 UD SCS DIMENSIONLESS UNITGRAPH  
TLAG .31 LAG

\*\*\*

UNIT HYDROGRAPH  
20 END-OF-PERIOD ORDINATES

30. 95. 184. 219. 206. 165. 108. 72. 50. 33.  
23. 15. 10. 7. 5. 3. 2. 2. 1. 1.

\*\*\* \*\*\* \*\*\* \*\*\* \*\*\*

HYDROGRAPH AT STATION OSA1

TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.32, TOTAL EXCESS = .28

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | 6-HR<br>(CFS) | 24-HR<br>(INCHES) | 72-HR<br>(INCHES) | 24.92-HR<br>(INCHES) |
|--------------------|--------------|---------------|-------------------|-------------------|----------------------|
| 13.                | 12.08        | 4.            | .209              | .285              | .285                 |
|                    |              | (AC-FT)       | 2.                | 2.                | 2.                   |

CUMULATIVE AREA = .16 SQ MI

\*\*\*\*\*

24 KK

\*\*\*\*\*  
\* RTA1 \*  
\* \*  
\*\*\*\*\*

ROUTE OSA1 TO DPA

HYDROGRAPH ROUTING DATA

26 RK

KINEMATIC WAVE STREAM ROUTING  
L 395. CHANNEL LENGTH  
S .0709 SLOPE  
N .035 CHANNEL ROUGHNESS COEFFICIENT  
CA .00 CONTRIBUTING AREA  
SHAPE TRAP CHANNEL SHAPE  
WD 2.00 BOTTOM WIDTH OR DIAMETER  
Z 4.00 SIDE SLOPE  
NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*

COMPUTED KINEMATIC PARAMETERS  
VARIABLE TIME STEP  
(DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .31         | 131.67     | 13.01         | 725.51                   | .28            | 7.57                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2415E+01 EXCESS= .0000E+00 OUTFLOW= .2415E+01 BASIN STORAGE= .6306E-04 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |       |        |     |
|------|------|------|------|-------|--------|-----|
| MAIN | 4.24 | 1.34 | 5.00 | 12.98 | 725.00 | .28 |
|------|------|------|------|-------|--------|-----|

HYDROGRAPH AT STATION RTA1

| DA | MON  | HRMN | ORD | FLOW | * | DA   | MON | HRMN | ORD | FLOW | *    | DA  | MON | HRMN | ORD | FLOW | *   | DA | MON | HRMN | ORD | FLOW | * |
|----|------|------|-----|------|---|------|-----|------|-----|------|------|-----|-----|------|-----|------|-----|----|-----|------|-----|------|---|
| 1  | 0000 | 1    | 0.  | *    | 1 | 0615 | 76  | 0.   | *   | 1    | 1230 | 151 | 8.  | *    | 1   | 1845 | 226 | 1. |     |      |     |      |   |
| 1  | 0005 | 2    | 0.  | *    | 1 | 0620 | 77  | 0.   | *   | 1    | 1235 | 152 | 7.  | *    | 1   | 1850 | 227 | 1. |     |      |     |      |   |
| 1  | 0010 | 3    | 0.  | *    | 1 | 0625 | 78  | 0.   | *   | 1    | 1240 | 153 | 6.  | *    | 1   | 1855 | 228 | 1. |     |      |     |      |   |
| 1  | 0015 | 4    | 0.  | *    | 1 | 0630 | 79  | 0.   | *   | 1    | 1245 | 154 | 6.  | *    | 1   | 1900 | 229 | 1. |     |      |     |      |   |

|   |      |    |    |   |   |      |     |     |   |   |      |     |    |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|-----|---|---|------|-----|----|---|---|------|-----|----|
| 1 | 0020 | 5  | 0. | * | 1 | 0635 | 80  | 0.  | * | 1 | 1250 | 155 | 6. | * | 1 | 1905 | 230 | 1. |
| 1 | 0025 | 6  | 0. | * | 1 | 0640 | 81  | 0.  | * | 1 | 1255 | 156 | 5. | * | 1 | 1910 | 231 | 1. |
| 1 | 0030 | 7  | 0. | * | 1 | 0645 | 82  | 0.  | * | 1 | 1300 | 157 | 5. | * | 1 | 1915 | 232 | 1. |
| 1 | 0035 | 8  | 0. | * | 1 | 0650 | 83  | 0.  | * | 1 | 1305 | 158 | 5. | * | 1 | 1920 | 233 | 1. |
| 1 | 0040 | 9  | 0. | * | 1 | 0655 | 84  | 0.  | * | 1 | 1310 | 159 | 4. | * | 1 | 1925 | 234 | 1. |
| 1 | 0045 | 10 | 0. | * | 1 | 0700 | 85  | 0.  | * | 1 | 1315 | 160 | 4. | * | 1 | 1930 | 235 | 1. |
| 1 | 0050 | 11 | 0. | * | 1 | 0705 | 86  | 0.  | * | 1 | 1320 | 161 | 4. | * | 1 | 1935 | 236 | 1. |
| 1 | 0055 | 12 | 0. | * | 1 | 0710 | 87  | 0.  | * | 1 | 1325 | 162 | 4. | * | 1 | 1940 | 237 | 1. |
| 1 | 0100 | 13 | 0. | * | 1 | 0715 | 88  | 0.  | * | 1 | 1330 | 163 | 4. | * | 1 | 1945 | 238 | 1. |
| 1 | 0105 | 14 | 0. | * | 1 | 0720 | 89  | 0.  | * | 1 | 1335 | 164 | 3. | * | 1 | 1950 | 239 | 1. |
| 1 | 0110 | 15 | 0. | * | 1 | 0725 | 90  | 0.  | * | 1 | 1340 | 165 | 3. | * | 1 | 1955 | 240 | 1. |
| 1 | 0115 | 16 | 0. | * | 1 | 0730 | 91  | 0.  | * | 1 | 1345 | 166 | 3. | * | 1 | 2000 | 241 | 1. |
| 1 | 0120 | 17 | 0. | * | 1 | 0735 | 92  | 0.  | * | 1 | 1350 | 167 | 3. | * | 1 | 2005 | 242 | 1. |
| 1 | 0125 | 18 | 0. | * | 1 | 0740 | 93  | 0.  | * | 1 | 1355 | 168 | 3. | * | 1 | 2010 | 243 | 1. |
| 1 | 0130 | 19 | 0. | * | 1 | 0745 | 94  | 0.  | * | 1 | 1400 | 169 | 3. | * | 1 | 2015 | 244 | 1. |
| 1 | 0135 | 20 | 0. | * | 1 | 0750 | 95  | 0.  | * | 1 | 1405 | 170 | 3. | * | 1 | 2020 | 245 | 1. |
| 1 | 0140 | 21 | 0. | * | 1 | 0755 | 96  | 0.  | * | 1 | 1410 | 171 | 3. | * | 1 | 2025 | 246 | 1. |
| 1 | 0145 | 22 | 0. | * | 1 | 0800 | 97  | 0.  | * | 1 | 1415 | 172 | 3. | * | 1 | 2030 | 247 | 1. |
| 1 | 0150 | 23 | 0. | * | 1 | 0805 | 98  | 0.  | * | 1 | 1420 | 173 | 3. | * | 1 | 2035 | 248 | 1. |
| 1 | 0155 | 24 | 0. | * | 1 | 0810 | 99  | 0.  | * | 1 | 1425 | 174 | 2. | * | 1 | 2040 | 249 | 1. |
| 1 | 0200 | 25 | 0. | * | 1 | 0815 | 100 | 0.  | * | 1 | 1430 | 175 | 2. | * | 1 | 2045 | 250 | 1. |
| 1 | 0205 | 26 | 0. | * | 1 | 0820 | 101 | 0.  | * | 1 | 1435 | 176 | 2. | * | 1 | 2050 | 251 | 1. |
| 1 | 0210 | 27 | 0. | * | 1 | 0825 | 102 | 0.  | * | 1 | 1440 | 177 | 2. | * | 1 | 2055 | 252 | 1. |
| 1 | 0215 | 28 | 0. | * | 1 | 0830 | 103 | 0.  | * | 1 | 1445 | 178 | 2. | * | 1 | 2100 | 253 | 1. |
| 1 | 0220 | 29 | 0. | * | 1 | 0835 | 104 | 0.  | * | 1 | 1450 | 179 | 2. | * | 1 | 2105 | 254 | 1. |
| 1 | 0225 | 30 | 0. | * | 1 | 0840 | 105 | 0.  | * | 1 | 1455 | 180 | 2. | * | 1 | 2110 | 255 | 1. |
| 1 | 0230 | 31 | 0. | * | 1 | 0845 | 106 | 0.  | * | 1 | 1500 | 181 | 2. | * | 1 | 2115 | 256 | 1. |
| 1 | 0235 | 32 | 0. | * | 1 | 0850 | 107 | 0.  | * | 1 | 1505 | 182 | 2. | * | 1 | 2120 | 257 | 1. |
| 1 | 0240 | 33 | 0. | * | 1 | 0855 | 108 | 0.  | * | 1 | 1510 | 183 | 2. | * | 1 | 2125 | 258 | 1. |
| 1 | 0245 | 34 | 0. | * | 1 | 0900 | 109 | 0.  | * | 1 | 1515 | 184 | 2. | * | 1 | 2130 | 259 | 1. |
| 1 | 0250 | 35 | 0. | * | 1 | 0905 | 110 | 0.  | * | 1 | 1520 | 185 | 2. | * | 1 | 2135 | 260 | 1. |
| 1 | 0255 | 36 | 0. | * | 1 | 0910 | 111 | 0.  | * | 1 | 1525 | 186 | 2. | * | 1 | 2140 | 261 | 1. |
| 1 | 0300 | 37 | 0. | * | 1 | 0915 | 112 | 0.  | * | 1 | 1530 | 187 | 2. | * | 1 | 2145 | 262 | 1. |
| 1 | 0305 | 38 | 0. | * | 1 | 0920 | 113 | 0.  | * | 1 | 1535 | 188 | 2. | * | 1 | 2150 | 263 | 1. |
| 1 | 0310 | 39 | 0. | * | 1 | 0925 | 114 | 0.  | * | 1 | 1540 | 189 | 2. | * | 1 | 2155 | 264 | 1. |
| 1 | 0315 | 40 | 0. | * | 1 | 0930 | 115 | 0.  | * | 1 | 1545 | 190 | 2. | * | 1 | 2200 | 265 | 1. |
| 1 | 0320 | 41 | 0. | * | 1 | 0935 | 116 | 0.  | * | 1 | 1550 | 191 | 2. | * | 1 | 2205 | 266 | 1. |
| 1 | 0325 | 42 | 0. | * | 1 | 0940 | 117 | 0.  | * | 1 | 1555 | 192 | 2. | * | 1 | 2210 | 267 | 1. |
| 1 | 0330 | 43 | 0. | * | 1 | 0945 | 118 | 0.  | * | 1 | 1600 | 193 | 2. | * | 1 | 2215 | 268 | 1. |
| 1 | 0335 | 44 | 0. | * | 1 | 0950 | 119 | 0.  | * | 1 | 1605 | 194 | 2. | * | 1 | 2220 | 269 | 1. |
| 1 | 0340 | 45 | 0. | * | 1 | 0955 | 120 | 0.  | * | 1 | 1610 | 195 | 2. | * | 1 | 2225 | 270 | 1. |
| 1 | 0345 | 46 | 0. | * | 1 | 1000 | 121 | 0.  | * | 1 | 1615 | 196 | 2. | * | 1 | 2230 | 271 | 1. |
| 1 | 0350 | 47 | 0. | * | 1 | 1005 | 122 | 0.  | * | 1 | 1620 | 197 | 2. | * | 1 | 2235 | 272 | 1. |
| 1 | 0355 | 48 | 0. | * | 1 | 1010 | 123 | 0.  | * | 1 | 1625 | 198 | 2. | * | 1 | 2240 | 273 | 1. |
| 1 | 0400 | 49 | 0. | * | 1 | 1015 | 124 | 0.  | * | 1 | 1630 | 199 | 2. | * | 1 | 2245 | 274 | 1. |
| 1 | 0405 | 50 | 0. | * | 1 | 1020 | 125 | 0.  | * | 1 | 1635 | 200 | 2. | * | 1 | 2250 | 275 | 1. |
| 1 | 0410 | 51 | 0. | * | 1 | 1025 | 126 | 0.  | * | 1 | 1640 | 201 | 2. | * | 1 | 2255 | 276 | 1. |
| 1 | 0415 | 52 | 0. | * | 1 | 1030 | 127 | 0.  | * | 1 | 1645 | 202 | 2. | * | 1 | 2300 | 277 | 1. |
| 1 | 0420 | 53 | 0. | * | 1 | 1035 | 128 | 0.  | * | 1 | 1650 | 203 | 2. | * | 1 | 2305 | 278 | 1. |
| 1 | 0425 | 54 | 0. | * | 1 | 1040 | 129 | 0.  | * | 1 | 1655 | 204 | 2. | * | 1 | 2310 | 279 | 1. |
| 1 | 0430 | 55 | 0. | * | 1 | 1045 | 130 | 0.  | * | 1 | 1700 | 205 | 2. | * | 1 | 2315 | 280 | 1. |
| 1 | 0435 | 56 | 0. | * | 1 | 1050 | 131 | 0.  | * | 1 | 1705 | 206 | 2. | * | 1 | 2320 | 281 | 1. |
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 0.  | * | 1 | 1710 | 207 | 2. | * | 1 | 2325 | 282 | 1. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 0.  | * | 1 | 1715 | 208 | 2. | * | 1 | 2330 | 283 | 1. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 0.  | * | 1 | 1720 | 209 | 2. | * | 1 | 2335 | 284 | 1. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 0.  | * | 1 | 1725 | 210 | 2. | * | 1 | 2340 | 285 | 1. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 0.  | * | 1 | 1730 | 211 | 2. | * | 1 | 2345 | 286 | 1. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 0.  | * | 1 | 1735 | 212 | 2. | * | 1 | 2350 | 287 | 1. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 0.  | * | 1 | 1740 | 213 | 2. | * | 1 | 2355 | 288 | 1. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 0.  | * | 1 | 1745 | 214 | 2. | * | 2 | 0000 | 289 | 1. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 0.  | * | 1 | 1750 | 215 | 2. | * | 2 | 0005 | 290 | 1. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 0.  | * | 1 | 1755 | 216 | 1. | * | 2 | 0010 | 291 | 0. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 2.  | * | 1 | 1800 | 217 | 1. | * | 2 | 0015 | 292 | 0. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 6.  | * | 1 | 1805 | 218 | 1. | * | 2 | 0020 | 293 | 0. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 10. | * | 1 | 1810 | 219 | 1. | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 12. | * | 1 | 1815 | 220 | 1. | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 13. | * | 1 | 1820 | 221 | 1. | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 12. | * | 1 | 1825 | 222 | 1. | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 11. | * | 1 | 1830 | 223 | 1. | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 9.  | * | 1 | 1835 | 224 | 1. | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 8.  | * | 1 | 1840 | 225 | 1. | * | 2 | 0055 | 300 | 0. |

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| PEAK FLOW | TIME | MAXIMUM AVERAGE FLOW |          |       |          |
|-----------|------|----------------------|----------|-------|----------|
| (CFS)     | (HR) | 6-HR                 | 24-HR    | 72-HR | 24.92-HR |
| +         | 13.  | 12.08                |          |       |          |
|           |      |                      | (CFS)    |       |          |
| +         |      |                      | 4.       | 1.    | 1.       |
|           |      |                      | (INCHES) | .209  | .285     |
|           |      |                      | (AC-FT)  | 2.    | 2.       |
|           |      |                      |          | 2.    | 2.       |

CUMULATIVE AREA = .16 SQ MI



|   |      |    |      |      |     |    |   |   |      |     |     |     |     |    |
|---|------|----|------|------|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0040 | 9  | -.01 | -.01 | .00 | 0. | * | 1 | 1310 | 159 | .01 | .01 | .00 | 1. |
| 1 | 0045 | 10 | -.01 | -.01 | .00 | 0. | * | 1 | 1315 | 160 | .01 | .01 | .00 | 1. |
| 1 | 0050 | 11 | .01  | .01  | .00 | 0. | * | 1 | 1320 | 161 | .01 | .01 | .00 | 1. |
| 1 | 0055 | 12 | .01  | .01  | .00 | 0. | * | 1 | 1325 | 162 | .01 | .01 | .00 | 1. |
| 1 | 0100 | 13 | .01  | .01  | .00 | 0. | * | 1 | 1330 | 163 | .01 | .01 | .00 | 1. |
| 1 | 0105 | 14 | .00  | .00  | .00 | 0. | * | 1 | 1335 | 164 | .01 | .01 | .00 | 1. |
| 1 | 0110 | 15 | .00  | .00  | .00 | 0. | * | 1 | 1340 | 165 | .01 | .01 | .00 | 1. |
| 1 | 0115 | 16 | .00  | .00  | .00 | 0. | * | 1 | 1345 | 166 | .01 | .01 | .00 | 1. |
| 1 | 0120 | 17 | .00  | .00  | .00 | 0. | * | 1 | 1350 | 167 | .01 | .01 | .00 | 1. |
| 1 | 0125 | 18 | .00  | .00  | .00 | 0. | * | 1 | 1355 | 168 | .01 | .01 | .00 | 1. |
| 1 | 0130 | 19 | .00  | .00  | .00 | 0. | * | 1 | 1400 | 169 | .01 | .01 | .00 | 1. |
| 1 | 0135 | 20 | .00  | .00  | .00 | 0. | * | 1 | 1405 | 170 | .01 | .00 | .00 | 1. |
| 1 | 0140 | 21 | .00  | .00  | .00 | 0. | * | 1 | 1410 | 171 | .01 | .00 | .00 | 1. |
| 1 | 0145 | 22 | .00  | .00  | .00 | 0. | * | 1 | 1415 | 172 | .01 | .00 | .00 | 1. |
| 1 | 0150 | 23 | .00  | .00  | .00 | 0. | * | 1 | 1420 | 173 | .01 | .00 | .00 | 1. |
| 1 | 0155 | 24 | .00  | .00  | .00 | 0. | * | 1 | 1425 | 174 | .01 | .00 | .00 | 0. |
| 1 | 0200 | 25 | .00  | .00  | .00 | 0. | * | 1 | 1430 | 175 | .01 | .00 | .00 | 0. |
| 1 | 0205 | 26 | .00  | .00  | .00 | 0. | * | 1 | 1435 | 176 | .01 | .00 | .00 | 0. |
| 1 | 0210 | 27 | .00  | .00  | .00 | 0. | * | 1 | 1440 | 177 | .01 | .00 | .00 | 0. |
| 1 | 0215 | 28 | .00  | .00  | .00 | 0. | * | 1 | 1445 | 178 | .01 | .00 | .00 | 0. |
| 1 | 0220 | 29 | .00  | .00  | .00 | 0. | * | 1 | 1450 | 179 | .01 | .00 | .00 | 0. |
| 1 | 0225 | 30 | .00  | .00  | .00 | 0. | * | 1 | 1455 | 180 | .01 | .00 | .00 | 0. |
| 1 | 0230 | 31 | .00  | .00  | .00 | 0. | * | 1 | 1500 | 181 | .01 | .00 | .00 | 0. |
| 1 | 0235 | 32 | .00  | .00  | .00 | 0. | * | 1 | 1505 | 182 | .01 | .00 | .00 | 0. |
| 1 | 0240 | 33 | .00  | .00  | .00 | 0. | * | 1 | 1510 | 183 | .01 | .00 | .00 | 0. |
| 1 | 0245 | 34 | .00  | .00  | .00 | 0. | * | 1 | 1515 | 184 | .01 | .00 | .00 | 0. |
| 1 | 0250 | 35 | .00  | .00  | .00 | 0. | * | 1 | 1520 | 185 | .01 | .00 | .00 | 0. |
| 1 | 0255 | 36 | .00  | .00  | .00 | 0. | * | 1 | 1525 | 186 | .01 | .00 | .00 | 0. |
| 1 | 0300 | 37 | .00  | .00  | .00 | 0. | * | 1 | 1530 | 187 | .01 | .00 | .00 | 0. |
| 1 | 0305 | 38 | .00  | .00  | .00 | 0. | * | 1 | 1535 | 188 | .01 | .00 | .00 | 0. |
| 1 | 0310 | 39 | .00  | .00  | .00 | 0. | * | 1 | 1540 | 189 | .01 | .00 | .00 | 0. |
| 1 | 0315 | 40 | .00  | .00  | .00 | 0. | * | 1 | 1545 | 190 | .01 | .00 | .00 | 0. |
| 1 | 0320 | 41 | .00  | .00  | .00 | 0. | * | 1 | 1550 | 191 | .01 | .00 | .00 | 0. |
| 1 | 0325 | 42 | .00  | .00  | .00 | 0. | * | 1 | 1555 | 192 | .01 | .00 | .00 | 0. |
| 1 | 0330 | 43 | .00  | .00  | .00 | 0. | * | 1 | 1600 | 193 | .01 | .00 | .00 | 0. |
| 1 | 0335 | 44 | .00  | .00  | .00 | 0. | * | 1 | 1605 | 194 | .01 | .00 | .00 | 0. |
| 1 | 0340 | 45 | .00  | .00  | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .00 | 0. |
| 1 | 0345 | 46 | .00  | .00  | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .00 | 0. |
| 1 | 0350 | 47 | .00  | .00  | .00 | 0. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48 | .00  | .00  | .00 | 0. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49 | .00  | .00  | .00 | 0. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50 | .00  | .00  | .00 | 0. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51 | .00  | .00  | .00 | 0. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52 | .00  | .00  | .00 | 0. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53 | .00  | .00  | .00 | 0. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54 | .00  | .00  | .00 | 0. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55 | .00  | .00  | .00 | 0. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56 | .00  | .00  | .00 | 0. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57 | .00  | .00  | .00 | 0. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58 | .00  | .00  | .00 | 0. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59 | .00  | .00  | .00 | 0. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60 | .00  | .00  | .00 | 0. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61 | .00  | .00  | .00 | 0. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62 | .00  | .00  | .00 | 0. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63 | .00  | .00  | .00 | 0. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64 | .00  | .00  | .00 | 0. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00  | .00  | .00 | 0. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00  | .00  | .00 | 0. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00  | .00  | .00 | 0. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00  | .00  | .00 | 0. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00  | .00  | .00 | 0. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00  | .00  | .00 | 0. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00  | .00  | .00 | 0. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00  | .00  | .00 | 0. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00  | .00  | .00 | 0. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00  | .00  | .00 | 0. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00  | .00  | .00 | 0. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00  | .00  | .00 | 0. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00  | .00  | .00 | 0. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00  | .00  | .00 | 0. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00  | .00  | .00 | 0. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00  | .00  | .00 | 0. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00  | .00  | .00 | 0. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00  | .00  | .00 | 0. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00  | .00  | .00 | 0. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00  | .00  | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00  | .00  | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00  | .00  | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00  | .00  | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00  | .00  | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00  | .00  | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00  | .00  | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91 | .00  | .00  | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92 | .00  | .00  | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0740 | 93  | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .01 | .01 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .09 | .09 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .09 | .09 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .09 | .09 | .00 | 0. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .24 | .23 | .01 | 0. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .24 | .21 | .03 | 0. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .24 | .19 | .05 | 1. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .03 | .01 | 2. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .03 | .01 | 3. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .03 | .01 | 4. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .02 | .01 | 3. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .02 | .01 | 3. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .02 | .01 | 2. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 2. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 2. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

\*\*\*\*\*  
TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.23, TOTAL EXCESS = .37

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |      |
|--------------------|--------------|----------------------|-------|-------|----------|------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |      |
| 4.                 | 12.00        | 1.                   | 0.    | 0.    | 0.       |      |
|                    |              | (INCHES)             | .284  | .374  | .374     | .374 |
|                    |              | (AC-FT)              | 0.    | 1.    | 1.       | 1.   |

CUMULATIVE AREA = .03 SQ MI

\*\*\* \*\*

\*\*\*\*\*  
\* \*  
32 KK RTA2 \*  
\* \*  
\*\*\*\*\*



ROUTE OSA2 TO DPA  
OSA3

HYDROGRAPH ROUTING DATA

34 RK KINEMATIC WAVE STREAM ROUTING  
 L 311. CHANNEL LENGTH  
 S .0707 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*

\*\*\* FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

\*\*\* FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

COMPUTED KINEMATIC PARAMETERS  
VARIABLE TIME STEP  
(DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .49         | 103.67     | 3.50          | 721.04                   | .37            | 5.42                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5187E+00 EXCESS= .0000E+00 OUTFLOW= .5186E+00 BASIN STORAGE= .1290E-04 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |  |      |        |     |  |
|------|------|------|------|--|------|--------|-----|--|
| MAIN | 4.24 | 1.34 | 5.00 |  | 3.47 | 720.00 | .37 |  |
|------|------|------|------|--|------|--------|-----|--|

HYDROGRAPH AT STATION RTA2

| DA | MON  | HRMN | ORD | FLOW | * | DA   | MON | HRMN | ORD | FLOW | *    | DA  | MON | HRMN | ORD | FLOW | *   | DA | MON | HRMN | ORD | FLOW | * |  |
|----|------|------|-----|------|---|------|-----|------|-----|------|------|-----|-----|------|-----|------|-----|----|-----|------|-----|------|---|--|
| 1  | 0000 | 1    | 0.  | *    | 1 | 0615 | 76  | 0.   | *   | 1    | 1230 | 151 | 2.  | *    | 1   | 1845 | 226 | 0. |     |      |     |      |   |  |
| 1  | 0005 | 2    | 0.  | *    | 1 | 0620 | 77  | 0.   | *   | 1    | 1235 | 152 | 1.  | *    | 1   | 1850 | 227 | 0. |     |      |     |      |   |  |
| 1  | 0010 | 3    | 0.  | *    | 1 | 0625 | 78  | 0.   | *   | 1    | 1240 | 153 | 1.  | *    | 1   | 1855 | 228 | 0. |     |      |     |      |   |  |
| 1  | 0015 | 4    | 0.  | *    | 1 | 0630 | 79  | 0.   | *   | 1    | 1245 | 154 | 1.  | *    | 1   | 1900 | 229 | 0. |     |      |     |      |   |  |
| 1  | 0020 | 5    | 0.  | *    | 1 | 0635 | 80  | 0.   | *   | 1    | 1250 | 155 | 1.  | *    | 1   | 1905 | 230 | 0. |     |      |     |      |   |  |
| 1  | 0025 | 6    | 0.  | *    | 1 | 0640 | 81  | 0.   | *   | 1    | 1255 | 156 | 1.  | *    | 1   | 1910 | 231 | 0. |     |      |     |      |   |  |
| 1  | 0030 | 7    | 0.  | *    | 1 | 0645 | 82  | 0.   | *   | 1    | 1300 | 157 | 1.  | *    | 1   | 1915 | 232 | 0. |     |      |     |      |   |  |
| 1  | 0035 | 8    | 0.  | *    | 1 | 0650 | 83  | 0.   | *   | 1    | 1305 | 158 | 1.  | *    | 1   | 1920 | 233 | 0. |     |      |     |      |   |  |
| 1  | 0040 | 9    | 0.  | *    | 1 | 0655 | 84  | 0.   | *   | 1    | 1310 | 159 | 1.  | *    | 1   | 1925 | 234 | 0. |     |      |     |      |   |  |
| 1  | 0045 | 10   | 0.  | *    | 1 | 0700 | 85  | 0.   | *   | 1    | 1315 | 160 | 1.  | *    | 1   | 1930 | 235 | 0. |     |      |     |      |   |  |
| 1  | 0050 | 11   | 0.  | *    | 1 | 0705 | 86  | 0.   | *   | 1    | 1320 | 161 | 1.  | *    | 1   | 1935 | 236 | 0. |     |      |     |      |   |  |
| 1  | 0055 | 12   | 0.  | *    | 1 | 0710 | 87  | 0.   | *   | 1    | 1325 | 162 | 1.  | *    | 1   | 1940 | 237 | 0. |     |      |     |      |   |  |
| 1  | 0100 | 13   | 0.  | *    | 1 | 0715 | 88  | 0.   | *   | 1    | 1330 | 163 | 1.  | *    | 1   | 1945 | 238 | 0. |     |      |     |      |   |  |
| 1  | 0105 | 14   | 0.  | *    | 1 | 0720 | 89  | 0.   | *   | 1    | 1335 | 164 | 1.  | *    | 1   | 1950 | 239 | 0. |     |      |     |      |   |  |
| 1  | 0110 | 15   | 0.  | *    | 1 | 0725 | 90  | 0.   | *   | 1    | 1340 | 165 | 1.  | *    | 1   | 1955 | 240 | 0. |     |      |     |      |   |  |
| 1  | 0115 | 16   | 0.  | *    | 1 | 0730 | 91  | 0.   | *   | 1    | 1345 | 166 | 1.  | *    | 1   | 2000 | 241 | 0. |     |      |     |      |   |  |
| 1  | 0120 | 17   | 0.  | *    | 1 | 0735 | 92  | 0.   | *   | 1    | 1350 | 167 | 1.  | *    | 1   | 2005 | 242 | 0. |     |      |     |      |   |  |
| 1  | 0125 | 18   | 0.  | *    | 1 | 0740 | 93  | 0.   | *   | 1    | 1355 | 168 | 1.  | *    | 1   | 2010 | 243 | 0. |     |      |     |      |   |  |
| 1  | 0130 | 19   | 0.  | *    | 1 | 0745 | 94  | 0.   | *   | 1    | 1400 | 169 | 1.  | *    | 1   | 2015 | 244 | 0. |     |      |     |      |   |  |
| 1  | 0135 | 20   | 0.  | *    | 1 | 0750 | 95  | 0.   | *   | 1    | 1405 | 170 | 1.  | *    | 1   | 2020 | 245 | 0. |     |      |     |      |   |  |
| 1  | 0140 | 21   | 0.  | *    | 1 | 0755 | 96  | 0.   | *   | 1    | 1410 | 171 | 1.  | *    | 1   | 2025 | 246 | 0. |     |      |     |      |   |  |
| 1  | 0145 | 22   | 0.  | *    | 1 | 0800 | 97  | 0.   | *   | 1    | 1415 | 172 | 1.  | *    | 1   | 2030 | 247 | 0. |     |      |     |      |   |  |
| 1  | 0150 | 23   | 0.  | *    | 1 | 0805 | 98  | 0.   | *   | 1    | 1420 | 173 | 1.  | *    | 1   | 2035 | 248 | 0. |     |      |     |      |   |  |
| 1  | 0155 | 24   | 0.  | *    | 1 | 0810 | 99  | 0.   | *   | 1    | 1425 | 174 | 0.  | *    | 1   | 2040 | 249 | 0. |     |      |     |      |   |  |
| 1  | 0200 | 25   | 0.  | *    | 1 | 0815 | 100 | 0.   | *   | 1    | 1430 | 175 | 0.  | *    | 1   | 2045 | 250 | 0. |     |      |     |      |   |  |
| 1  | 0205 | 26   | 0.  | *    | 1 | 0820 | 101 | 0.   | *   | 1    | 1435 | 176 | 0.  | *    | 1   | 2050 | 251 | 0. |     |      |     |      |   |  |
| 1  | 0210 | 27   | 0.  | *    | 1 | 0825 | 102 | 0.   | *   | 1    | 1440 | 177 | 0.  | *    | 1   | 2055 | 252 | 0. |     |      |     |      |   |  |
| 1  | 0215 | 28   | 0.  | *    | 1 | 0830 | 103 | 0.   | *   | 1    | 1445 | 178 | 0.  | *    | 1   | 2100 | 253 | 0. |     |      |     |      |   |  |
| 1  | 0220 | 29   | 0.  | *    | 1 | 0835 | 104 | 0.   | *   | 1    | 1450 | 179 | 0.  | *    | 1   | 2105 | 254 | 0. |     |      |     |      |   |  |
| 1  | 0225 | 30   | 0.  | *    | 1 | 0840 | 105 | 0.   | *   | 1    | 1455 | 180 | 0.  | *    | 1   | 2110 | 255 | 0. |     |      |     |      |   |  |
| 1  | 0230 | 31   | 0.  | *    | 1 | 0845 | 106 | 0.   | *   | 1    | 1500 | 181 | 0.  | *    | 1   | 2115 | 256 | 0. |     |      |     |      |   |  |
| 1  | 0235 | 32   | 0.  | *    | 1 | 0850 | 107 | 0.   | *   | 1    | 1505 | 182 | 0.  | *    | 1   | 2120 | 257 | 0. |     |      |     |      |   |  |
| 1  | 0240 | 33   | 0.  | *    | 1 | 0855 | 108 | 0.   | *   | 1    | 1510 | 183 | 0.  | *    | 1   | 2125 | 258 | 0. |     |      |     |      |   |  |

|   |      |    |    |   |   |      |     |    |   |   |      |     |    |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|----|---|---|------|-----|----|---|---|------|-----|----|
| 1 | 0245 | 34 | 0. | * | 1 | 0900 | 109 | 0. | * | 1 | 1515 | 184 | 0. | * | 1 | 2130 | 259 | 0. |
| 1 | 0250 | 35 | 0. | * | 1 | 0905 | 110 | 0. | * | 1 | 1520 | 185 | 0. | * | 1 | 2135 | 260 | 0. |
| 1 | 0255 | 36 | 0. | * | 1 | 0910 | 111 | 0. | * | 1 | 1525 | 186 | 0. | * | 1 | 2140 | 261 | 0. |
| 1 | 0300 | 37 | 0. | * | 1 | 0915 | 112 | 0. | * | 1 | 1530 | 187 | 0. | * | 1 | 2145 | 262 | 0. |
| 1 | 0305 | 38 | 0. | * | 1 | 0920 | 113 | 0. | * | 1 | 1535 | 188 | 0. | * | 1 | 2150 | 263 | 0. |
| 1 | 0310 | 39 | 0. | * | 1 | 0925 | 114 | 0. | * | 1 | 1540 | 189 | 0. | * | 1 | 2155 | 264 | 0. |
| 1 | 0315 | 40 | 0. | * | 1 | 0930 | 115 | 0. | * | 1 | 1545 | 190 | 0. | * | 1 | 2200 | 265 | 0. |
| 1 | 0320 | 41 | 0. | * | 1 | 0935 | 116 | 0. | * | 1 | 1550 | 191 | 0. | * | 1 | 2205 | 266 | 0. |
| 1 | 0325 | 42 | 0. | * | 1 | 0940 | 117 | 0. | * | 1 | 1555 | 192 | 0. | * | 1 | 2210 | 267 | 0. |
| 1 | 0330 | 43 | 0. | * | 1 | 0945 | 118 | 0. | * | 1 | 1600 | 193 | 0. | * | 1 | 2215 | 268 | 0. |
| 1 | 0335 | 44 | 0. | * | 1 | 0950 | 119 | 0. | * | 1 | 1605 | 194 | 0. | * | 1 | 2220 | 269 | 0. |
| 1 | 0340 | 45 | 0. | * | 1 | 0955 | 120 | 0. | * | 1 | 1610 | 195 | 0. | * | 1 | 2225 | 270 | 0. |
| 1 | 0345 | 46 | 0. | * | 1 | 1000 | 121 | 0. | * | 1 | 1615 | 196 | 0. | * | 1 | 2230 | 271 | 0. |
| 1 | 0350 | 47 | 0. | * | 1 | 1005 | 122 | 0. | * | 1 | 1620 | 197 | 0. | * | 1 | 2235 | 272 | 0. |
| 1 | 0355 | 48 | 0. | * | 1 | 1010 | 123 | 0. | * | 1 | 1625 | 198 | 0. | * | 1 | 2240 | 273 | 0. |
| 1 | 0400 | 49 | 0. | * | 1 | 1015 | 124 | 0. | * | 1 | 1630 | 199 | 0. | * | 1 | 2245 | 274 | 0. |
| 1 | 0405 | 50 | 0. | * | 1 | 1020 | 125 | 0. | * | 1 | 1635 | 200 | 0. | * | 1 | 2250 | 275 | 0. |
| 1 | 0410 | 51 | 0. | * | 1 | 1025 | 126 | 0. | * | 1 | 1640 | 201 | 0. | * | 1 | 2255 | 276 | 0. |
| 1 | 0415 | 52 | 0. | * | 1 | 1030 | 127 | 0. | * | 1 | 1645 | 202 | 0. | * | 1 | 2300 | 277 | 0. |
| 1 | 0420 | 53 | 0. | * | 1 | 1035 | 128 | 0. | * | 1 | 1650 | 203 | 0. | * | 1 | 2305 | 278 | 0. |
| 1 | 0425 | 54 | 0. | * | 1 | 1040 | 129 | 0. | * | 1 | 1655 | 204 | 0. | * | 1 | 2310 | 279 | 0. |
| 1 | 0430 | 55 | 0. | * | 1 | 1045 | 130 | 0. | * | 1 | 1700 | 205 | 0. | * | 1 | 2315 | 280 | 0. |
| 1 | 0435 | 56 | 0. | * | 1 | 1050 | 131 | 0. | * | 1 | 1705 | 206 | 0. | * | 1 | 2320 | 281 | 0. |
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 0. | * | 1 | 1710 | 207 | 0. | * | 1 | 2325 | 282 | 0. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 0. | * | 1 | 1715 | 208 | 0. | * | 1 | 2330 | 283 | 0. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 0. | * | 1 | 1720 | 209 | 0. | * | 1 | 2335 | 284 | 0. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 0. | * | 1 | 1725 | 210 | 0. | * | 1 | 2340 | 285 | 0. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 0. | * | 1 | 1730 | 211 | 0. | * | 1 | 2345 | 286 | 0. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 0. | * | 1 | 1735 | 212 | 0. | * | 1 | 2350 | 287 | 0. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 0. | * | 1 | 1740 | 213 | 0. | * | 1 | 2355 | 288 | 0. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 0. | * | 1 | 1745 | 214 | 0. | * | 2 | 0000 | 289 | 0. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 0. | * | 1 | 1750 | 215 | 0. | * | 2 | 0005 | 290 | 0. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 0. | * | 1 | 1755 | 216 | 0. | * | 2 | 0010 | 291 | 0. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 1. | * | 1 | 1800 | 217 | 0. | * | 2 | 0015 | 292 | 0. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 2. | * | 1 | 1805 | 218 | 0. | * | 2 | 0020 | 293 | 0. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 3. | * | 1 | 1810 | 219 | 0. | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 3. | * | 1 | 1815 | 220 | 0. | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 3. | * | 1 | 1820 | 221 | 0. | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 3. | * | 1 | 1825 | 222 | 0. | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 2. | * | 1 | 1830 | 223 | 0. | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 2. | * | 1 | 1835 | 224 | 0. | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 2. | * | 1 | 1840 | 225 | 0. | * | 2 | 0055 | 300 | 0. |

\*\*\*\*\*

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 3.                 | 12.00        | 1.                   | 0.    | 0.    | 0.       |
|                    |              | (INCHES)<br>.284     | .374  | .374  | .374     |
|                    |              | (AC-FT)<br>0.        | 1.    | 1.    | 1.       |
| CUMULATIVE AREA =  |              | .03 SQ MI            |       |       |          |

\*\*\* \*\*

36 KK \*\*\*\*\*  
\*  
\* CHEYENNE MTN. HS OFFSITE BASIN A3  
\*  
\*\*\*\*\*

SUBBASIN RUNOFF DATA

37 BA SUBBASIN CHARACTERISTICS  
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 2.60 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN

|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .01 | .01 | .01 | .01 | .01 | .01 | .03 | .03 | .03 | .09 | .09 |
| .09 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |
| .01 | .01 | .01 | .01 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

38 LS SCS LOSS RATE  
 STRTL 1.03 INITIAL ABSTRACTION  
 CRVNR 66.00 CURVE NUMBER  
 RTIMP .00 PERCENT IMPERVIOUS AREA

39 UD SCS DIMENSIONLESS UNITGRAPH  
 TLAG .25 LAG

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WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

| UNIT HYDROGRAPH            |    |     |     |     |    |    |    |    |    |
|----------------------------|----|-----|-----|-----|----|----|----|----|----|
| 17 END-OF-PERIOD ORDINATES |    |     |     |     |    |    |    |    |    |
| 3.                         | 9. | 14. | 14. | 11. | 7. | 4. | 3. | 2. | 1. |
| 1.                         | 0. | 0.  | 0.  | 0.  | 0. | 0. |    |    |    |

HYDROGRAPH AT STATION

| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|-----|------|-----|------|------|--------|--------|---|----|-----|------|-----|------|------|--------|--------|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.     | * | 1  |     | 1230 | 151 | .02  | .01  | .01    | 1.     |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.     | * | 1  |     | 1235 | 152 | .02  | .01  | .00    | 0.     |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.     | * | 1  |     | 1240 | 153 | .02  | .01  | .00    | 0.     |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.     | * | 1  |     | 1245 | 154 | .02  | .01  | .00    | 0.     |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.     | * | 1  |     | 1250 | 155 | .01  | .01  | .00    | 0.     |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.     | * | 1  |     | 1255 | 156 | .01  | .01  | .00    | 0.     |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.     | * | 1  |     | 1300 | 157 | .01  | .01  | .00    | 0.     |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1305 | 158 | .01  | .01  | .00    | 0.     |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1310 | 159 | .01  | .01  | .00    | 0.     |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1315 | 160 | .01  | .01  | .00    | 0.     |
| 1  |     | 0050 | 11  | .01  | .01  | .00    | 0.     | * | 1  |     | 1320 | 161 | .01  | .01  | .00    | 0.     |
| 1  |     | 0055 | 12  | .01  | .01  | .00    | 0.     | * | 1  |     | 1325 | 162 | .01  | .01  | .00    | 0.     |
| 1  |     | 0100 | 13  | .01  | .01  | .00    | 0.     | * | 1  |     | 1330 | 163 | .01  | .01  | .00    | 0.     |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.     | * | 1  |     | 1335 | 164 | .01  | .01  | .00    | 0.     |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.     | * | 1  |     | 1340 | 165 | .01  | .01  | .00    | 0.     |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.     | * | 1  |     | 1345 | 166 | .01  | .01  | .00    | 0.     |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.     | * | 1  |     | 1350 | 167 | .01  | .01  | .00    | 0.     |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.     | * | 1  |     | 1355 | 168 | .01  | .01  | .00    | 0.     |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.     | * | 1  |     | 1400 | 169 | .01  | .01  | .00    | 0.     |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.     | * | 1  |     | 1405 | 170 | .01  | .00  | .00    | 0.     |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.     | * | 1  |     | 1410 | 171 | .01  | .00  | .00    | 0.     |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.     | * | 1  |     | 1415 | 172 | .01  | .00  | .00    | 0.     |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.     | * | 1  |     | 1420 | 173 | .01  | .00  | .00    | 0.     |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.     | * | 1  |     | 1425 | 174 | .01  | .00  | .00    | 0.     |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.     | * | 1  |     | 1430 | 175 | .01  | .00  | .00    | 0.     |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.     | * | 1  |     | 1435 | 176 | .01  | .00  | .00    | 0.     |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.     | * | 1  |     | 1440 | 177 | .01  | .00  | .00    | 0.     |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.     | * | 1  |     | 1445 | 178 | .01  | .00  | .00    | 0.     |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.     | * | 1  |     | 1450 | 179 | .01  | .00  | .00    | 0.     |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.     | * | 1  |     | 1455 | 180 | .01  | .00  | .00    | 0.     |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.     | * | 1  |     | 1500 | 181 | .01  | .00  | .00    | 0.     |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.     | * | 1  |     | 1505 | 182 | .01  | .00  | .00    | 0.     |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.     | * | 1  |     | 1510 | 183 | .01  | .00  | .00    | 0.     |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.     | * | 1  |     | 1515 | 184 | .01  | .00  | .00    | 0.     |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.     | * | 1  |     | 1520 | 185 | .01  | .00  | .00    | 0.     |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.     | * | 1  |     | 1525 | 186 | .01  | .00  | .00    | 0.     |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0300 | 37  | .00 | .00 | .00 | 0. | * | 1 | 1530 | 187 | .01 | .00 | .00 | 0. |
| 1 | 0305 | 38  | .00 | .00 | .00 | 0. | * | 1 | 1535 | 188 | .01 | .00 | .00 | 0. |
| 1 | 0310 | 39  | .00 | .00 | .00 | 0. | * | 1 | 1540 | 189 | .01 | .00 | .00 | 0. |
| 1 | 0315 | 40  | .00 | .00 | .00 | 0. | * | 1 | 1545 | 190 | .01 | .00 | .00 | 0. |
| 1 | 0320 | 41  | .00 | .00 | .00 | 0. | * | 1 | 1550 | 191 | .01 | .00 | .00 | 0. |
| 1 | 0325 | 42  | .00 | .00 | .00 | 0. | * | 1 | 1555 | 192 | .01 | .00 | .00 | 0. |
| 1 | 0330 | 43  | .00 | .00 | .00 | 0. | * | 1 | 1600 | 193 | .01 | .00 | .00 | 0. |
| 1 | 0335 | 44  | .00 | .00 | .00 | 0. | * | 1 | 1605 | 194 | .01 | .00 | .00 | 0. |
| 1 | 0340 | 45  | .00 | .00 | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .00 | 0. |
| 1 | 0345 | 46  | .00 | .00 | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .00 | 0. |
| 1 | 0350 | 47  | .00 | .00 | .00 | 0. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48  | .00 | .00 | .00 | 0. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49  | .00 | .00 | .00 | 0. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50  | .00 | .00 | .00 | 0. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51  | .00 | .00 | .00 | 0. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52  | .00 | .00 | .00 | 0. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53  | .00 | .00 | .00 | 0. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54  | .00 | .00 | .00 | 0. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55  | .00 | .00 | .00 | 0. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56  | .00 | .00 | .00 | 0. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57  | .00 | .00 | .00 | 0. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58  | .00 | .00 | .00 | 0. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59  | .00 | .00 | .00 | 0. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60  | .00 | .00 | .00 | 0. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61  | .00 | .00 | .00 | 0. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62  | .00 | .00 | .00 | 0. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63  | .00 | .00 | .00 | 0. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64  | .00 | .00 | .00 | 0. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65  | .00 | .00 | .00 | 0. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66  | .00 | .00 | .00 | 0. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67  | .00 | .00 | .00 | 0. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68  | .00 | .00 | .00 | 0. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69  | .00 | .00 | .00 | 0. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70  | .00 | .00 | .00 | 0. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71  | .00 | .00 | .00 | 0. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72  | .00 | .00 | .00 | 0. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73  | .00 | .00 | .00 | 0. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74  | .00 | .00 | .00 | 0. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75  | .00 | .00 | .00 | 0. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76  | .00 | .00 | .00 | 0. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77  | .00 | .00 | .00 | 0. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78  | .00 | .00 | .00 | 0. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79  | .00 | .00 | .00 | 0. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80  | .00 | .00 | .00 | 0. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81  | .00 | .00 | .00 | 0. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .00 | .00 | .00 | 0. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .00 | .00 | .00 | 0. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .00 | .00 | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .00 | .00 | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .00 | .00 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .00 | .00 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .00 | .00 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .00 | .00 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .00 | .00 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .00 | .00 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .00 | .00 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .01 | .01 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .09 | .09 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .09 | .09 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .09 | .09 | .00 | 0. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .24 | .23 | .01 | 0. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .24 | .21 | .03 | 0. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .24 | .19 | .05 | 1. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .03 | .01 | 1. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .03 | .01 | 1. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .03 | .01 | 1. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .02 | .01 | 1. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .02 | .01 | 1. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .02 | .01 | 1. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 1. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 1. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.23, TOTAL EXCESS = .37

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| +                  | 1.           | 12.00                | 0.    | 0.    | 0.       |
|                    |              | (INCHES)             | .284  | .374  | .374     |
|                    |              | (AC-FT)              | 0.    | 0.    | 0.       |

CUMULATIVE AREA = .01 SQ MI

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40 KK \*\*\*\*\*  
\* RTA3 \*  
\* \*\*\*\*\*

ROUTE OSA3 TO DPA

HYDROGRAPH ROUTING DATA

|       |                               |                                    |
|-------|-------------------------------|------------------------------------|
| 42 RK | KINEMATIC WAVE STREAM ROUTING |                                    |
|       | L                             | 292. CHANNEL LENGTH                |
|       | S                             | .0822 SLOPE                        |
|       | N                             | .035 CHANNEL ROUGHNESS COEFFICIENT |
|       | CA                            | .00 CONTRIBUTING AREA              |
|       | SHAPE                         | TRAP CHANNEL SHAPE                 |
|       | WD                            | 2.00 BOTTOM WIDTH OR DIAMETER      |
|       | Z                             | 4.00 SIDE SLOPE                    |
|       | NDXMIN                        | 2 MINIMUM NUMBER OF DX INTERVALS   |

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COMPUTED KINEMATIC PARAMETERS  
VARIABLE TIME STEP  
(DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.57  | 1.34 | .53         | 97.33      | 1.30          | 720.35                   | .37            | 4.45                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1795E+00 EXCESS= .0000E+00 OUTFLOW= .1795E+00 BASIN STORAGE= .2875E-05 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN 4.57 1.34 5.00 1.30 720.00 .37

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HYDROGRAPH AT STATION RTA3  
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| *  |     |      |     | *    |   |    |     | *    |     |      |   | *  |     |      |      |      |   |    |     |      |      |      |
|----|-----|------|-----|------|---|----|-----|------|-----|------|---|----|-----|------|------|------|---|----|-----|------|------|------|
| DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD  | FLOW | * | DA | MON | HRMN | ORD  | FLOW |
| 1  |     | 0000 | 1   | 0.   | * | 1  |     | 0615 | 76  | 0.   | * | 1  |     | 1230 | 151  | 1.   | * | 1  |     | 1845 | 226  | 0.   |
| 1  |     | 0005 | 2   | 0.   | * | 1  |     | 0620 | 77  | 0.   | * | 1  |     | 1235 | 152  | 0.   | * | 1  |     | 1850 | 227. | 0.   |
| 1  |     | 0010 | 3   | 0.   | * | 1  |     | 0625 | 78  | 0.   | * | 1  |     | 1240 | 153  | 0.   | * | 1  |     | 1855 | 228  | 0.   |
| 1  |     | 0015 | 4   | 0.   | * | 1  |     | 0630 | 79  | 0.   | * | 1  |     | 1245 | 154  | 0.   | * | 1  |     | 1900 | 229  | 0.   |
| 1  |     | 0020 | 5   | 0.   | * | 1  |     | 0635 | 80  | 0.   | * | 1  |     | 1250 | 155  | 0.   | * | 1  |     | 1905 | 230  | 0.   |
| 1  |     | 0025 | 6   | 0.   | * | 1  |     | 0640 | 81  | 0.   | * | 1  |     | 1255 | 156  | 0.   | * | 1  |     | 1910 | 231  | 0.   |
| 1  |     | 0030 | 7   | 0.   | * | 1  |     | 0645 | 82  | 0.   | * | 1  |     | 1300 | 157  | 0.   | * | 1  |     | 1915 | 232  | 0.   |
| 1  |     | 0035 | 8   | 0.   | * | 1  |     | 0650 | 83  | 0.   | * | 1  |     | 1305 | 158  | 0.   | * | 1  |     | 1920 | 233  | 0.   |
| 1  |     | 0040 | 9   | 0.   | * | 1  |     | 0655 | 84  | 0.   | * | 1  |     | 1310 | 159  | 0.   | * | 1  |     | 1925 | 234  | 0.   |
| 1  |     | 0045 | 10  | 0.   | * | 1  |     | 0700 | 85  | 0.   | * | 1  |     | 1315 | 160  | 0.   | * | 1  |     | 1930 | 235  | 0.   |
| 1  |     | 0050 | 11  | 0.   | * | 1  |     | 0705 | 86  | 0.   | * | 1  |     | 1320 | 161  | 0.   | * | 1  |     | 1935 | 236  | 0.   |
| 1  |     | 0055 | 12  | 0.   | * | 1  |     | 0710 | 87  | 0.   | * | 1  |     | 1325 | 162  | 0.   | * | 1  |     | 1940 | 237  | 0.   |
| 1  |     | 0100 | 13  | 0.   | * | 1  |     | 0715 | 88  | 0.   | * | 1  |     | 1330 | 163  | 0.   | * | 1  |     | 1945 | 238  | 0.   |
| 1  |     | 0105 | 14  | 0.   | * | 1  |     | 0720 | 89  | 0.   | * | 1  |     | 1335 | 164  | 0.   | * | 1  |     | 1950 | 239  | 0.   |
| 1  |     | 0110 | 15  | 0.   | * | 1  |     | 0725 | 90  | 0.   | * | 1  |     | 1340 | 165  | 0.   | * | 1  |     | 1955 | 240  | 0.   |
| 1  |     | 0115 | 16  | 0.   | * | 1  |     | 0730 | 91  | 0.   | * | 1  |     | 1345 | 166  | 0.   | * | 1  |     | 2000 | 241  | 0.   |
| 1  |     | 0120 | 17  | 0.   | * | 1  |     | 0735 | 92  | 0.   | * | 1  |     | 1350 | 167  | 0.   | * | 1  |     | 2005 | 242  | 0.   |
| 1  |     | 0125 | 18  | 0.   | * | 1  |     | 0740 | 93  | 0.   | * | 1  |     | 1355 | 168  | 0.   | * | 1  |     | 2010 | 243  | 0.   |
| 1  |     | 0130 | 19  | 0.   | * | 1  |     | 0745 | 94  | 0.   | * | 1  |     | 1400 | 169  | 0.   | * | 1  |     | 2015 | 244  | 0.   |
| 1  |     | 0135 | 20  | 0.   | * | 1  |     | 0750 | 95  | 0.   | * | 1  |     | 1405 | 170  | 0.   | * | 1  |     | 2020 | 245  | 0.   |
| 1  |     | 0140 | 21  | 0.   | * | 1  |     | 0755 | 96  | 0.   | * | 1  |     | 1410 | 171  | 0.   | * | 1  |     | 2025 | 246  | 0.   |
| 1  |     | 0145 | 22  | 0.   | * | 1  |     | 0800 | 97  | 0.   | * | 1  |     | 1415 | 172  | 0.   | * | 1  |     | 2030 | 247  | 0.   |
| 1  |     | 0150 | 23  | 0.   | * | 1  |     | 0805 | 98  | 0.   | * | 1  |     | 1420 | 173  | 0.   | * | 1  |     | 2035 | 248  | 0.   |
| 1  |     | 0155 | 24  | 0.   | * | 1  |     | 0810 | 99  | 0.   | * | 1  |     | 1425 | 174  | 0.   | * | 1  |     | 2040 | 249  | 0.   |
| 1  |     | 0200 | 25  | 0.   | * | 1  |     | 0815 | 100 | 0.   | * | 1  |     | 1430 | 175  | 0.   | * | 1  |     | 2045 | 250  | 0.   |
| 1  |     | 0205 | 26  | 0.   | * | 1  |     | 0820 | 101 | 0.   | * | 1  |     | 1435 | 176  | 0.   | * | 1  |     | 2050 | 251  | 0.   |
| 1  |     | 0210 | 27  | 0.   | * | 1  |     | 0825 | 102 | 0.   | * | 1  |     | 1440 | 177  | 0.   | * | 1  |     | 2055 | 252  | 0.   |
| 1  |     | 0215 | 28  | 0.   | * | 1  |     | 0830 | 103 | 0.   | * | 1  |     | 1445 | 178  | 0.   | * | 1  |     | 2100 | 253  | 0.   |
| 1  |     | 0220 | 29  | 0.   | * | 1  |     | 0835 | 104 | 0.   | * | 1  |     | 1450 | 179  | 0.   | * | 1  |     | 2105 | 254  | 0.   |
| 1  |     | 0225 | 30  | 0.   | * | 1  |     | 0840 | 105 | 0.   | * | 1  |     | 1455 | 180  | 0.   | * | 1  |     | 2110 | 255  | 0.   |
| 1  |     | 0230 | 31  | 0.   | * | 1  |     | 0845 | 106 | 0.   | * | 1  |     | 1500 | 181  | 0.   | * | 1  |     | 2115 | 256  | 0.   |
| 1  |     | 0235 | 32  | 0.   | * | 1  |     | 0850 | 107 | 0.   | * | 1  |     | 1505 | 182  | 0.   | * | 1  |     | 2120 | 257  | 0.   |
| 1  |     | 0240 | 33  | 0.   | * | 1  |     | 0855 | 108 | 0.   | * | 1  |     | 1510 | 183  | 0.   | * | 1  |     | 2125 | 258  | 0.   |
| 1  |     | 0245 | 34  | 0.   | * | 1  |     | 0900 | 109 | 0.   | * | 1  |     | 1515 | 184  | 0.   | * | 1  |     | 2130 | 259  | 0.   |
| 1  |     | 0250 | 35  | 0.   | * | 1  |     | 0905 | 110 | 0.   | * | 1  |     | 1520 | 185  | 0.   | * | 1  |     | 2135 | 260  | 0.   |
| 1  |     | 0255 | 36  | 0.   | * | 1  |     | 0910 | 111 | 0.   | * | 1  |     | 1525 | 186  | 0.   | * | 1  |     | 2140 | 261  | 0.   |
| 1  |     | 0300 | 37  | 0.   | * | 1  |     | 0915 | 112 | 0.   | * | 1  |     | 1530 | 187. | 0.   | * | 1  |     | 2145 | 262  | 0.   |
| 1  |     | 0305 | 38  | 0.   | * | 1  |     | 0920 | 113 | 0.   | * | 1  |     | 1535 | 188  | 0.   | * | 1  |     | 2150 | 263  | 0.   |
| 1  |     | 0310 | 39  | 0.   | * | 1  |     | 0925 | 114 | 0.   | * | 1  |     | 1540 | 189  | 0.   | * | 1  |     | 2155 | 264  | 0.   |
| 1  |     | 0315 | 40  | 0.   | * | 1  |     | 0930 | 115 | 0.   | * | 1  |     | 1545 | 190  | 0.   | * | 1  |     | 2200 | 265  | 0.   |
| 1  |     | 0320 | 41  | 0.   | * | 1  |     | 0935 | 116 | 0.   | * | 1  |     | 1550 | 191  | 0.   | * | 1  |     | 2205 | 266  | 0.   |
| 1  |     | 0325 | 42  | 0.   | * | 1  |     | 0940 | 117 | 0.   | * | 1  |     | 1555 | 192  | 0.   | * | 1  |     | 2210 | 267  | 0.   |
| 1  |     | 0330 | 43  | 0.   | * | 1  |     | 0945 | 118 | 0.   | * | 1  |     | 1600 | 193  | 0.   | * | 1  |     | 2215 | 268  | 0.   |
| 1  |     | 0335 | 44  | 0.   | * | 1  |     | 0950 | 119 | 0.   | * | 1  |     | 1605 | 194  | 0.   | * | 1  |     | 2220 | 269  | 0.   |
| 1  |     | 0340 | 45  | 0.   | * | 1  |     | 0955 | 120 | 0.   | * | 1  |     | 1610 | 195  | 0.   | * | 1  |     | 2225 | 270  | 0.   |
| 1  |     | 0345 | 46  | 0.   | * | 1  |     | 1000 | 121 | 0.   | * | 1  |     | 1615 | 196  | 0.   | * | 1  |     | 2230 | 271  | 0.   |
| 1  |     | 0350 | 47  | 0.   | * | 1  |     | 1005 | 122 | 0.   | * | 1  |     | 1620 | 197  | 0.   | * | 1  |     | 2235 | 272  | 0.   |
| 1  |     | 0355 | 48  | 0.   | * | 1  |     | 1010 | 123 | 0.   | * | 1  |     | 1625 | 198  | 0.   | * | 1  |     | 2240 | 273  | 0.   |
| 1  |     | 0400 | 49  | 0.   | * | 1  |     | 1015 | 124 | 0.   | * | 1  |     | 1630 | 199  | 0.   | * | 1  |     | 2245 | 274  | 0.   |
| 1  |     | 0405 | 50  | 0.   | * | 1  |     | 1020 | 125 | 0.   | * | 1  |     | 1635 | 200  | 0.   | * | 1  |     | 2250 | 275  | 0.   |
| 1  |     | 0410 | 51  | 0.   | * | 1  |     | 1025 | 126 | 0.   | * | 1  |     | 1640 | 201  | 0.   | * | 1  |     | 2255 | 276  | 0.   |
| 1  |     | 0415 | 52  | 0.   | * | 1  |     | 1030 | 127 | 0.   | * | 1  |     | 1645 | 202  | 0.   | * | 1  |     | 2300 | 277  | 0.   |
| 1  |     | 0420 | 53  | 0.   | * | 1  |     | 1035 | 128 | 0.   | * | 1  |     | 1650 | 203  | 0.   | * | 1  |     | 2305 | 278  | 0.   |
| 1  |     | 0425 | 54  | 0.   | * | 1  |     | 1040 | 129 | 0.   | * | 1  |     | 1655 | 204  | 0.   | * | 1  |     | 2310 | 279  | 0.   |
| 1  |     | 0430 | 55  | 0.   | * | 1  |     | 1045 | 130 | 0.   | * | 1  |     | 1700 | 205  | 0.   | * | 1  |     | 2315 | 280  | 0.   |
| 1  |     | 0435 | 56  | 0.   | * | 1  |     | 1050 | 131 | 0.   | * | 1  |     | 1705 | 206  | 0.   | * | 1  |     | 2320 | 281  | 0.   |
| 1  |     | 0440 | 57  | 0.   | * | 1  |     | 1055 | 132 | 0.   | * | 1  |     | 1710 | 207  | 0.   | * | 1  |     | 2325 | 282  | 0.   |
| 1  |     | 0445 | 58  | 0.   | * | 1  |     | 1100 | 133 | 0.   | * | 1  |     | 1715 | 208  | 0.   | * | 1  |     | 2330 | 283  | 0.   |
| 1  |     | 0450 | 59  | 0.   | * | 1  |     | 1105 | 134 | 0.   | * | 1  |     | 1720 | 209  | 0.   | * | 1  |     | 2335 | 284  | 0.   |
| 1  |     | 0455 | 60  | 0.   | * | 1  |     | 1110 | 135 | 0.   | * | 1  |     | 1725 | 210  | 0.   | * | 1  |     | 2340 | 285  | 0.   |
| 1  |     | 0500 | 61  | 0.   | * | 1  |     | 1115 | 136 | 0.   | * | 1  |     | 1730 | 211  | 0.   | * | 1  |     | 2345 | 286  | 0.   |
| 1  |     | 0505 | 62  | 0.   | * | 1  |     | 1120 | 137 | 0.   | * | 1  |     | 1735 | 212  | 0.   | * | 1  |     | 2350 | 287  | 0.   |
| 1  |     | 0510 | 63  | 0.   | * | 1  |     | 1125 | 138 | 0.   | * | 1  |     | 1740 | 213  | 0.   | * | 1  |     | 2355 | 288  | 0.   |
| 1  |     | 0515 | 64  | 0.   | * | 1  |     | 1130 | 139 | 0.   | * | 1  |     | 1745 | 214  | 0.   | * | 2  |     | 0000 | 289  | 0.   |
| 1  |     | 0520 | 65  | 0.   | * | 1  |     | 1135 | 140 | 0.   | * | 1  |     | 1750 | 215  | 0.   | * | 2  |     | 0005 | 290  | 0.   |
| 1  |     | 0525 | 66  | 0.   | * | 1  |     | 1140 | 141 | 0.   | * | 1  |     | 1755 | 216  | 0.   | * | 2  |     | 0010 | 291  | 0.   |
| 1  |     | 0530 | 67  | 0.   | * | 1  |     | 1145 | 142 | 0.   | * | 1  |     | 1800 | 217  | 0.   | * | 2  |     | 0015 | 292  | 0.   |
| 1  |     | 0535 | 68  | 0.   | * | 1  |     | 1150 | 143 | 1.   | * | 1  |     | 1805 | 218  | 0.   | * | 2  |     | 0020 | 293  | 0.   |
| 1  |     | 0540 | 69  | 0.   | * | 1  |     | 1155 | 144 | 1.   | * | 1  |     | 1810 | 219  | 0.   | * | 2  |     | 0025 | 294  | 0.   |
| 1  |     | 0545 | 70  | 0.   | * | 1  |     | 1200 | 145 | 1.   | * | 1  |     | 1815 | 220  | 0.   | * | 2  |     | 0030 | 295  | 0.   |



11 END-OF-PERIOD ORDINATES

5. 13. 11. 5. 2. 1. 1. 0. 0. 0.  
0.

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HYDROGRAPH AT STATION OSA4

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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|-----|------|-----|------|------|--------|--------|---|----|-----|------|-----|------|------|--------|--------|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.     | * | 1  |     | 1230 | 151 | .02  | .01  | .01    | 0.     |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.     | * | 1  |     | 1235 | 152 | .02  | .01  | .00    | 0.     |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.     | * | 1  |     | 1240 | 153 | .02  | .01  | .00    | 0.     |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.     | * | 1  |     | 1245 | 154 | .02  | .01  | .00    | 0.     |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.     | * | 1  |     | 1250 | 155 | .01  | .01  | .00    | 0.     |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.     | * | 1  |     | 1255 | 156 | .01  | .01  | .00    | 0.     |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.     | * | 1  |     | 1300 | 157 | .01  | .01  | .00    | 0.     |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1305 | 158 | .01  | .01  | .00    | 0.     |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1310 | 159 | .01  | .01  | .00    | 0.     |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1315 | 160 | .01  | .01  | .00    | 0.     |
| 1  |     | 0050 | 11  | .01  | .01  | .00    | 0.     | * | 1  |     | 1320 | 161 | .01  | .01  | .00    | 0.     |
| 1  |     | 0055 | 12  | .01  | .01  | .00    | 0.     | * | 1  |     | 1325 | 162 | .01  | .01  | .00    | 0.     |
| 1  |     | 0100 | 13  | .01  | .01  | .00    | 0.     | * | 1  |     | 1330 | 163 | .01  | .01  | .00    | 0.     |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.     | * | 1  |     | 1335 | 164 | .01  | .01  | .00    | 0.     |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.     | * | 1  |     | 1340 | 165 | .01  | .01  | .00    | 0.     |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.     | * | 1  |     | 1345 | 166 | .01  | .01  | .00    | 0.     |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.     | * | 1  |     | 1350 | 167 | .01  | .01  | .00    | 0.     |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.     | * | 1  |     | 1355 | 168 | .01  | .01  | .00    | 0.     |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.     | * | 1  |     | 1400 | 169 | .01  | .01  | .00    | 0.     |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.     | * | 1  |     | 1405 | 170 | .01  | .00  | .00    | 0.     |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.     | * | 1  |     | 1410 | 171 | .01  | .00  | .00    | 0.     |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.     | * | 1  |     | 1415 | 172 | .01  | .00  | .00    | 0.     |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.     | * | 1  |     | 1420 | 173 | .01  | .00  | .00    | 0.     |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.     | * | 1  |     | 1425 | 174 | .01  | .00  | .00    | 0.     |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.     | * | 1  |     | 1430 | 175 | .01  | .00  | .00    | 0.     |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.     | * | 1  |     | 1435 | 176 | .01  | .00  | .00    | 0.     |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.     | * | 1  |     | 1440 | 177 | .01  | .00  | .00    | 0.     |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.     | * | 1  |     | 1445 | 178 | .01  | .00  | .00    | 0.     |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.     | * | 1  |     | 1450 | 179 | .01  | .00  | .00    | 0.     |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.     | * | 1  |     | 1455 | 180 | .01  | .00  | .00    | 0.     |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.     | * | 1  |     | 1500 | 181 | .01  | .00  | .00    | 0.     |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.     | * | 1  |     | 1505 | 182 | .01  | .00  | .00    | 0.     |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.     | * | 1  |     | 1510 | 183 | .01  | .00  | .00    | 0.     |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.     | * | 1  |     | 1515 | 184 | .01  | .00  | .00    | 0.     |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.     | * | 1  |     | 1520 | 185 | .01  | .00  | .00    | 0.     |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.     | * | 1  |     | 1525 | 186 | .01  | .00  | .00    | 0.     |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.     | * | 1  |     | 1530 | 187 | .01  | .00  | .00    | 0.     |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.     | * | 1  |     | 1535 | 188 | .01  | .00  | .00    | 0.     |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.     | * | 1  |     | 1540 | 189 | .01  | .00  | .00    | 0.     |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.     | * | 1  |     | 1545 | 190 | .01  | .00  | .00    | 0.     |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.     | * | 1  |     | 1550 | 191 | .01  | .00  | .00    | 0.     |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.     | * | 1  |     | 1555 | 192 | .01  | .00  | .00    | 0.     |
| 1  |     | 0330 | 43  | .00  | .00  | .00    | 0.     | * | 1  |     | 1600 | 193 | .01  | .00  | .00    | 0.     |
| 1  |     | 0335 | 44  | .00  | .00  | .00    | 0.     | * | 1  |     | 1605 | 194 | .01  | .00  | .00    | 0.     |
| 1  |     | 0340 | 45  | .00  | .00  | .00    | 0.     | * | 1  |     | 1610 | 195 | .01  | .00  | .00    | 0.     |
| 1  |     | 0345 | 46  | .00  | .00  | .00    | 0.     | * | 1  |     | 1615 | 196 | .01  | .00  | .00    | 0.     |
| 1  |     | 0350 | 47  | .00  | .00  | .00    | 0.     | * | 1  |     | 1620 | 197 | .00  | .00  | .00    | 0.     |
| 1  |     | 0355 | 48  | .00  | .00  | .00    | 0.     | * | 1  |     | 1625 | 198 | .00  | .00  | .00    | 0.     |
| 1  |     | 0400 | 49  | .00  | .00  | .00    | 0.     | * | 1  |     | 1630 | 199 | .00  | .00  | .00    | 0.     |
| 1  |     | 0405 | 50  | .00  | .00  | .00    | 0.     | * | 1  |     | 1635 | 200 | .00  | .00  | .00    | 0.     |
| 1  |     | 0410 | 51  | .00  | .00  | .00    | 0.     | * | 1  |     | 1640 | 201 | .00  | .00  | .00    | 0.     |
| 1  |     | 0415 | 52  | .00  | .00  | .00    | 0.     | * | 1  |     | 1645 | 202 | .00  | .00  | .00    | 0.     |
| 1  |     | 0420 | 53  | .00  | .00  | .00    | 0.     | * | 1  |     | 1650 | 203 | .00  | .00  | .00    | 0.     |
| 1  |     | 0425 | 54  | .00  | .00  | .00    | 0.     | * | 1  |     | 1655 | 204 | .00  | .00  | .00    | 0.     |
| 1  |     | 0430 | 55  | .00  | .00  | .00    | 0.     | * | 1  |     | 1700 | 205 | .00  | .00  | .00    | 0.     |
| 1  |     | 0435 | 56  | .00  | .00  | .00    | 0.     | * | 1  |     | 1705 | 206 | .00  | .00  | .00    | 0.     |
| 1  |     | 0440 | 57  | .00  | .00  | .00    | 0.     | * | 1  |     | 1710 | 207 | .00  | .00  | .00    | 0.     |
| 1  |     | 0445 | 58  | .00  | .00  | .00    | 0.     | * | 1  |     | 1715 | 208 | .00  | .00  | .00    | 0.     |
| 1  |     | 0450 | 59  | .00  | .00  | .00    | 0.     | * | 1  |     | 1720 | 209 | .00  | .00  | .00    | 0.     |
| 1  |     | 0455 | 60  | .00  | .00  | .00    | 0.     | * | 1  |     | 1725 | 210 | .00  | .00  | .00    | 0.     |
| 1  |     | 0500 | 61  | .00  | .00  | .00    | 0.     | * | 1  |     | 1730 | 211 | .00  | .00  | .00    | 0.     |
| 1  |     | 0505 | 62  | .00  | .00  | .00    | 0.     | * | 1  |     | 1735 | 212 | .00  | .00  | .00    | 0.     |
| 1  |     | 0510 | 63  | .00  | .00  | .00    | 0.     | * | 1  |     | 1740 | 213 | .00  | .00  | .00    | 0.     |
| 1  |     | 0515 | 64  | .00  | .00  | .00    | 0.     | * | 1  |     | 1745 | 214 | .00  | .00  | .00    | 0.     |
| 1  |     | 0520 | 65  | .00  | .00  | .00    | 0.     | * | 1  |     | 1750 | 215 | .00  | .00  | .00    | 0.     |
| 1  |     | 0525 | 66  | .00  | .00  | .00    | 0.     | * | 1  |     | 1755 | 216 | .00  | .00  | .00    | 0.     |
| 1  |     | 0530 | 67  | .00  | .00  | .00    | 0.     | * | 1  |     | 1800 | 217 | .00  | .00  | .00    | 0.     |
| 1  |     | 0535 | 68  | .00  | .00  | .00    | 0.     | * | 1  |     | 1805 | 218 | .00  | .00  | .00    | 0.     |
| 1  |     | 0540 | 69  | .00  | .00  | .00    | 0.     | * | 1  |     | 1810 | 219 | .00  | .00  | .00    | 0.     |
| 1  |     | 0545 | 70  | .00  | .00  | .00    | 0.     | * | 1  |     | 1815 | 220 | .00  | .00  | .00    | 0.     |
| 1  |     | 0550 | 71  | .00  | .00  | .00    | 0.     | * | 1  |     | 1820 | 221 | .00  | .00  | .00    | 0.     |
| 1  |     | 0555 | 72  | .00  | .00  | .00    | 0.     | * | 1  |     | 1825 | 222 | .00  | .00  | .00    | 0.     |



|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0600 | 73  | .00 | .00 | .00 | 0. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74  | .00 | .00 | .00 | 0. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75  | .00 | .00 | .00 | 0. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76  | .00 | .00 | .00 | 0. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77  | .00 | .00 | .00 | 0. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78  | .00 | .00 | .00 | 0. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79  | .00 | .00 | .00 | 0. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80  | .00 | .00 | .00 | 0. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81  | .00 | .00 | .00 | 0. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .00 | .00 | .00 | 0. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .00 | .00 | .00 | 0. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .00 | .00 | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .00 | .00 | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .00 | .00 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .00 | .00 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .00 | .00 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .00 | .00 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .00 | .00 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .00 | .00 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .00 | .00 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .01 | .01 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .09 | .09 | .00 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .09 | .09 | .00 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .09 | .09 | .00 | 0. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .24 | .23 | .01 | 0. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .24 | .21 | .03 | 0. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .24 | .19 | .05 | 1. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .03 | .01 | 1. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .03 | .01 | 1. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .03 | .01 | 1. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .02 | .01 | 0. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .02 | .01 | 0. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .02 | .01 | 0. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 0. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 0. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.23, TOTAL EXCESS = .37

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

|   |       |                   |           |       |       |          |
|---|-------|-------------------|-----------|-------|-------|----------|
|   |       |                   | 6-HR      | 24-HR | 72-HR | 24.92-HR |
| + | (CFS) | (HR)              |           |       |       |          |
|   |       | (CFS)             | 0.        | 0.    | 0.    | 0.       |
| + | 1.    | 11.83             | .286      | .374  | .374  | .374     |
|   |       | (INCHES)          |           |       |       |          |
|   |       | (AC-FT)           | 0.        | 0.    | 0.    | 0.       |
|   |       | CUMULATIVE AREA = | .00 SQ MI |       |       |          |

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48 KK \*\*\*\*\*  
 \* \*  
 \* DPA \*  
 \* \*  
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DESIGN POINT A

50 HC HYDROGRAPH COMBINATION  
 ICOMP 4 NUMBER OF HYDROGRAPHS TO COMBINE

\*\*\*

HYDROGRAPH AT STATION DPA  
 SUM OF 4 HYDROGRAPHS

\*\*\*\*\*

| DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD | FLOW |
|----|-----|------|-----|------|---|----|-----|------|-----|------|---|----|-----|------|-----|------|---|----|-----|------|-----|------|
| 1  |     | 0000 | 1   | 0.   | * | 1  |     | 0615 | 76  | 0.   | * | 1  |     | 1230 | 151 | 10.  | * | 1  |     | 1845 | 226 | 2.   |
| 1  |     | 0005 | 2   | 0.   | * | 1  |     | 0620 | 77  | 0.   | * | 1  |     | 1235 | 152 | 9.   | * | 1  |     | 1850 | 227 | 2.   |
| 1  |     | 0010 | 3   | 0.   | * | 1  |     | 0625 | 78  | 0.   | * | 1  |     | 1240 | 153 | 8.   | * | 1  |     | 1855 | 228 | 2.   |
| 1  |     | 0015 | 4   | 0.   | * | 1  |     | 0630 | 79  | 0.   | * | 1  |     | 1245 | 154 | 8.   | * | 1  |     | 1900 | 229 | 2.   |
| 1  |     | 0020 | 5   | 0.   | * | 1  |     | 0635 | 80  | 0.   | * | 1  |     | 1250 | 155 | 7.   | * | 1  |     | 1905 | 230 | 2.   |
| 1  |     | 0025 | 6   | 0.   | * | 1  |     | 0640 | 81  | 0.   | * | 1  |     | 1255 | 156 | 7.   | * | 1  |     | 1910 | 231 | 2.   |
| 1  |     | 0030 | 7   | 0.   | * | 1  |     | 0645 | 82  | 0.   | * | 1  |     | 1300 | 157 | 6.   | * | 1  |     | 1915 | 232 | 2.   |
| 1  |     | 0035 | 8   | 0.   | * | 1  |     | 0650 | 83  | 0.   | * | 1  |     | 1305 | 158 | 6.   | * | 1  |     | 1920 | 233 | 2.   |
| 1  |     | 0040 | 9   | 0.   | * | 1  |     | 0655 | 84  | 0.   | * | 1  |     | 1310 | 159 | 6.   | * | 1  |     | 1925 | 234 | 2.   |
| 1  |     | 0045 | 10  | 0.   | * | 1  |     | 0700 | 85  | 0.   | * | 1  |     | 1315 | 160 | 5.   | * | 1  |     | 1930 | 235 | 2.   |
| 1  |     | 0050 | 11  | 0.   | * | 1  |     | 0705 | 86  | 0.   | * | 1  |     | 1320 | 161 | 5.   | * | 1  |     | 1935 | 236 | 2.   |
| 1  |     | 0055 | 12  | 0.   | * | 1  |     | 0710 | 87  | 0.   | * | 1  |     | 1325 | 162 | 5.   | * | 1  |     | 1940 | 237 | 2.   |
| 1  |     | 0100 | 13  | 0.   | * | 1  |     | 0715 | 88  | 0.   | * | 1  |     | 1330 | 163 | 5.   | * | 1  |     | 1945 | 238 | 2.   |
| 1  |     | 0105 | 14  | 0.   | * | 1  |     | 0720 | 89  | 0.   | * | 1  |     | 1335 | 164 | 4.   | * | 1  |     | 1950 | 239 | 2.   |
| 1  |     | 0110 | 15  | 0.   | * | 1  |     | 0725 | 90  | 0.   | * | 1  |     | 1340 | 165 | 4.   | * | 1  |     | 1955 | 240 | 2.   |
| 1  |     | 0115 | 16  | 0.   | * | 1  |     | 0730 | 91  | 0.   | * | 1  |     | 1345 | 166 | 4.   | * | 1  |     | 2000 | 241 | 2.   |
| 1  |     | 0120 | 17  | 0.   | * | 1  |     | 0735 | 92  | 0.   | * | 1  |     | 1350 | 167 | 4.   | * | 1  |     | 2005 | 242 | 1.   |
| 1  |     | 0125 | 18  | 0.   | * | 1  |     | 0740 | 93  | 0.   | * | 1  |     | 1355 | 168 | 4.   | * | 1  |     | 2010 | 243 | 1.   |
| 1  |     | 0130 | 19  | 0.   | * | 1  |     | 0745 | 94  | 0.   | * | 1  |     | 1400 | 169 | 4.   | * | 1  |     | 2015 | 244 | 1.   |
| 1  |     | 0135 | 20  | 0.   | * | 1  |     | 0750 | 95  | 0.   | * | 1  |     | 1405 | 170 | 4.   | * | 1  |     | 2020 | 245 | 1.   |
| 1  |     | 0140 | 21  | 0.   | * | 1  |     | 0755 | 96  | 0.   | * | 1  |     | 1410 | 171 | 4.   | * | 1  |     | 2025 | 246 | 1.   |
| 1  |     | 0145 | 22  | 0.   | * | 1  |     | 0800 | 97  | 0.   | * | 1  |     | 1415 | 172 | 3.   | * | 1  |     | 2030 | 247 | 1.   |
| 1  |     | 0150 | 23  | 0.   | * | 1  |     | 0805 | 98  | 0.   | * | 1  |     | 1420 | 173 | 3.   | * | 1  |     | 2035 | 248 | 1.   |
| 1  |     | 0155 | 24  | 0.   | * | 1  |     | 0810 | 99  | 0.   | * | 1  |     | 1425 | 174 | 3.   | * | 1  |     | 2040 | 249 | 1.   |
| 1  |     | 0200 | 25  | 0.   | * | 1  |     | 0815 | 100 | 0.   | * | 1  |     | 1430 | 175 | 3.   | * | 1  |     | 2045 | 250 | 1.   |
| 1  |     | 0205 | 26  | 0.   | * | 1  |     | 0820 | 101 | 0.   | * | 1  |     | 1435 | 176 | 3.   | * | 1  |     | 2050 | 251 | 1.   |
| 1  |     | 0210 | 27  | 0.   | * | 1  |     | 0825 | 102 | 0.   | * | 1  |     | 1440 | 177 | 3.   | * | 1  |     | 2055 | 252 | 1.   |
| 1  |     | 0215 | 28  | 0.   | * | 1  |     | 0830 | 103 | 0.   | * | 1  |     | 1445 | 178 | 3.   | * | 1  |     | 2100 | 253 | 1.   |
| 1  |     | 0220 | 29  | 0.   | * | 1  |     | 0835 | 104 | 0.   | * | 1  |     | 1450 | 179 | 3.   | * | 1  |     | 2105 | 254 | 1.   |
| 1  |     | 0225 | 30  | 0.   | * | 1  |     | 0840 | 105 | 0.   | * | 1  |     | 1455 | 180 | 3.   | * | 1  |     | 2110 | 255 | 1.   |
| 1  |     | 0230 | 31  | 0.   | * | 1  |     | 0845 | 106 | 0.   | * | 1  |     | 1500 | 181 | 3.   | * | 1  |     | 2115 | 256 | 1.   |
| 1  |     | 0235 | 32  | 0.   | * | 1  |     | 0850 | 107 | 0.   | * | 1  |     | 1505 | 182 | 3.   | * | 1  |     | 2120 | 257 | 1.   |
| 1  |     | 0240 | 33  | 0.   | * | 1  |     | 0855 | 108 | 0.   | * | 1  |     | 1510 | 183 | 3.   | * | 1  |     | 2125 | 258 | 1.   |
| 1  |     | 0245 | 34  | 0.   | * | 1  |     | 0900 | 109 | 0.   | * | 1  |     | 1515 | 184 | 3.   | * | 1  |     | 2130 | 259 | 1.   |
| 1  |     | 0250 | 35  | 0.   | * | 1  |     | 0905 | 110 | 0.   | * | 1  |     | 1520 | 185 | 3.   | * | 1  |     | 2135 | 260 | 1.   |
| 1  |     | 0255 | 36  | 0.   | * | 1  |     | 0910 | 111 | 0.   | * | 1  |     | 1525 | 186 | 3.   | * | 1  |     | 2140 | 261 | 1.   |
| 1  |     | 0300 | 37  | 0.   | * | 1  |     | 0915 | 112 | 0.   | * | 1  |     | 1530 | 187 | 3.   | * | 1  |     | 2145 | 262 | 1.   |
| 1  |     | 0305 | 38  | 0.   | * | 1  |     | 0920 | 113 | 0.   | * | 1  |     | 1535 | 188 | 3.   | * | 1  |     | 2150 | 263 | 1.   |
| 1  |     | 0310 | 39  | 0.   | * | 1  |     | 0925 | 114 | 0.   | * | 1  |     | 1540 | 189 | 2.   | * | 1  |     | 2155 | 264 | 1.   |
| 1  |     | 0315 | 40  | 0.   | * | 1  |     | 0930 | 115 | 0.   | * | 1  |     | 1545 | 190 | 2.   | * | 1  |     | 2200 | 265 | 1.   |
| 1  |     | 0320 | 41  | 0.   | * | 1  |     | 0935 | 116 | 0.   | * | 1  |     | 1550 | 191 | 2.   | * | 1  |     | 2205 | 266 | 1.   |
| 1  |     | 0325 | 42  | 0.   | * | 1  |     | 0940 | 117 | 0.   | * | 1  |     | 1555 | 192 | 2.   | * | 1  |     | 2210 | 267 | 1.   |
| 1  |     | 0330 | 43  | 0.   | * | 1  |     | 0945 | 118 | 0.   | * | 1  |     | 1600 | 193 | 2.   | * | 1  |     | 2215 | 268 | 1.   |
| 1  |     | 0335 | 44  | 0.   | * | 1  |     | 0950 | 119 | 0.   | * | 1  |     | 1605 | 194 | 2.   | * | 1  |     | 2220 | 269 | 1.   |
| 1  |     | 0340 | 45  | 0.   | * | 1  |     | 0955 | 120 | 0.   | * | 1  |     | 1610 | 195 | 2.   | * | 1  |     | 2225 | 270 | 1.   |
| 1  |     | 0345 | 46  | 0.   | * | 1  |     | 1000 | 121 | 0.   | * | 1  |     | 1615 | 196 | 2.   | * | 1  |     | 2230 | 271 | 1.   |
| 1  |     | 0350 | 47  | 0.   | * | 1  |     | 1005 | 122 | 0.   | * | 1  |     | 1620 | 197 | 2.   | * | 1  |     | 2235 | 272 | 1.   |
| 1  |     | 0355 | 48  | 0.   | * | 1  |     | 1010 | 123 | 0.   | * | 1  |     | 1625 | 198 | 2.   | * | 1  |     | 2240 | 273 | 1.   |



|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

54 LS           SCS LOSS RATE  
                   STRTL           1.03 INITIAL ABSTRACTION  
                   CRVNER       66.00 CURVE NUMBER  
                   RTIMP         .00 PERCENT IMPERVIOUS AREA

55 UD           SCS DIMENSIONLESS UNITGRAPH  
                   TLAG           .29 LAG

\*\*\*

UNIT HYDROGRAPH  
 19 END-OF-PERIOD ORDINATES

|     |     |      |      |      |      |     |     |     |     |
|-----|-----|------|------|------|------|-----|-----|-----|-----|
| 29. | 96. | 176. | 199. | 177. | 132. | 82. | 54. | 37. | 24. |
| 16. | 10. | 7.   | 5.   | 3.   | 2.   | 1.  | 1.  | 0.  |     |

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HYDROGRAPH AT STATION    OSB1

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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q | * | DA | MON  | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q  | * |
|----|-----|------|-----|------|------|--------|------|---|---|----|------|------|-----|------|------|--------|------|----|---|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.   |   | * | 1  | 1230 | 151  | .02 | .01  | .01  |        |      | 8. | * |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.   |   | * | 1  | 1235 | 152  | .02 | .01  | .00  |        |      | 8. | * |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.   |   | * | 1  | 1240 | 153  | .02 | .01  | .00  |        |      | 7. | * |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.   |   | * | 1  | 1245 | 154  | .02 | .01  | .00  |        |      | 6. | * |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.   |   | * | 1  | 1250 | 155  | .01 | .01  | .00  |        |      | 6. | * |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.   |   | * | 1  | 1255 | 156  | .01 | .01  | .00  |        |      | 5. | * |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.   |   | * | 1  | 1300 | 157  | .01 | .01  | .00  |        |      | 5. | * |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.   |   | * | 1  | 1305 | 158  | .01 | .01  | .00  |        |      | 5. | * |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.   |   | * | 1  | 1310 | 159  | .01 | .01  | .00  |        |      | 5. | * |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.   |   | * | 1  | 1315 | 160  | .01 | .01  | .00  |        |      | 4. | * |
| 1  |     | 0050 | 11  | .01  | .01  | .00    | 0.   |   | * | 1  | 1320 | 161  | .01 | .01  | .00  |        |      | 4. | * |
| 1  |     | 0055 | 12  | .01  | .01  | .00    | 0.   |   | * | 1  | 1325 | 162  | .01 | .01  | .00  |        |      | 4. | * |
| 1  |     | 0100 | 13  | .01  | .01  | .00    | 0.   |   | * | 1  | 1330 | 163  | .01 | .01  | .00  |        |      | 4. | * |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.   |   | * | 1  | 1335 | 164  | .01 | .01  | .00  |        |      | 4. | * |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.   |   | * | 1  | 1340 | 165  | .01 | .01  | .00  |        |      | 3. | * |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.   |   | * | 1  | 1345 | 166  | .01 | .01  | .00  |        |      | 3. | * |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.   |   | * | 1  | 1350 | 167  | .01 | .01  | .00  |        |      | 3. | * |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.   |   | * | 1  | 1355 | 168  | .01 | .01  | .00  |        |      | 3. | * |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.   |   | * | 1  | 1400 | 169  | .01 | .01  | .00  |        |      | 3. | * |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.   |   | * | 1  | 1405 | 170  | .01 | .00  | .00  |        |      | 3. | * |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.   |   | * | 1  | 1410 | 171  | .01 | .00  | .00  |        |      | 3. | * |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.   |   | * | 1  | 1415 | 172  | .01 | .00  | .00  |        |      | 3. | * |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.   |   | * | 1  | 1420 | 173  | .01 | .00  | .00  |        |      | 3. | * |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.   |   | * | 1  | 1425 | 174  | .01 | .00  | .00  |        |      | 3. | * |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.   |   | * | 1  | 1430 | 175  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.   |   | * | 1  | 1435 | 176  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.   |   | * | 1  | 1440 | 177  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.   |   | * | 1  | 1445 | 178  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.   |   | * | 1  | 1450 | 179  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.   |   | * | 1  | 1455 | 180  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.   |   | * | 1  | 1500 | 181  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.   |   | * | 1  | 1505 | 182  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.   |   | * | 1  | 1510 | 183  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.   |   | * | 1  | 1515 | 184  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.   |   | * | 1  | 1520 | 185  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.   |   | * | 1  | 1525 | 186  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.   |   | * | 1  | 1530 | 187  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.   |   | * | 1  | 1535 | 188  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.   |   | * | 1  | 1540 | 189  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.   |   | * | 1  | 1545 | 190  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.   |   | * | 1  | 1550 | 191  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.   |   | * | 1  | 1555 | 192  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0330 | 43  | .00  | .00  | .00    | 0.   |   | * | 1  | 1600 | 193  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0335 | 44  | .00  | .00  | .00    | 0.   |   | * | 1  | 1605 | 194  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0340 | 45  | .00  | .00  | .00    | 0.   |   | * | 1  | 1610 | 195  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0345 | 46  | .00  | .00  | .00    | 0.   |   | * | 1  | 1615 | 196  | .01 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0350 | 47  | .00  | .00  | .00    | 0.   |   | * | 1  | 1620 | 197  | .00 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0355 | 48  | .00  | .00  | .00    | 0.   |   | * | 1  | 1625 | 198  | .00 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0400 | 49  | .00  | .00  | .00    | 0.   |   | * | 1  | 1630 | 199  | .00 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0405 | 50  | .00  | .00  | .00    | 0.   |   | * | 1  | 1635 | 200  | .00 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0410 | 51  | .00  | .00  | .00    | 0.   |   | * | 1  | 1640 | 201  | .00 | .00  | .00  |        |      | 2. | * |
| 1  |     | 0415 | 52  | .00  | .00  | .00    | 0.   |   | * | 1  | 1645 | 202  | .00 | .00  | .00  |        |      | 2. | * |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0420 | 53  | .00 | .00 | .00 | 0. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 2. |
| 1 | 0425 | 54  | .00 | .00 | .00 | 0. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 2. |
| 1 | 0430 | 55  | .00 | .00 | .00 | 0. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 2. |
| 1 | 0435 | 56  | .00 | .00 | .00 | 0. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 2. |
| 1 | 0440 | 57  | .00 | .00 | .00 | 0. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 2. |
| 1 | 0445 | 58  | .00 | .00 | .00 | 0. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 2. |
| 1 | 0450 | 59  | .00 | .00 | .00 | 0. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 2. |
| 1 | 0455 | 60  | .00 | .00 | .00 | 0. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 2. |
| 1 | 0500 | 61  | .00 | .00 | .00 | 0. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 2. |
| 1 | 0505 | 62  | .00 | .00 | .00 | 0. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 2. |
| 1 | 0510 | 63  | .00 | .00 | .00 | 0. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 2. |
| 1 | 0515 | 64  | .00 | .00 | .00 | 0. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 2. |
| 1 | 0520 | 65  | .00 | .00 | .00 | 0. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 2. |
| 1 | 0525 | 66  | .00 | .00 | .00 | 0. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 2. |
| 1 | 0530 | 67  | .00 | .00 | .00 | 0. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 1. |
| 1 | 0535 | 68  | .00 | .00 | .00 | 0. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 1. |
| 1 | 0540 | 69  | .00 | .00 | .00 | 0. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 1. |
| 1 | 0545 | 70  | .00 | .00 | .00 | 0. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 1. |
| 1 | 0550 | 71  | .00 | .00 | .00 | 0. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 1. |
| 1 | 0555 | 72  | .00 | .00 | .00 | 0. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 1. |
| 1 | 0600 | 73  | .00 | .00 | .00 | 0. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 1. |
| 1 | 0605 | 74  | .00 | .00 | .00 | 0. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 1. |
| 1 | 0610 | 75  | .00 | .00 | .00 | 0. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 1. |
| 1 | 0615 | 76  | .00 | .00 | .00 | 0. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 1. |
| 1 | 0620 | 77  | .00 | .00 | .00 | 0. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 1. |
| 1 | 0625 | 78  | .00 | .00 | .00 | 0. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 1. |
| 1 | 0630 | 79  | .00 | .00 | .00 | 0. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 1. |
| 1 | 0635 | 80  | .00 | .00 | .00 | 0. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 1. |
| 1 | 0640 | 81  | .00 | .00 | .00 | 0. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 1. |
| 1 | 0645 | 82  | .00 | .00 | .00 | 0. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 1. |
| 1 | 0650 | 83  | .00 | .00 | .00 | 0. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 1. |
| 1 | 0655 | 84  | .00 | .00 | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 1. |
| 1 | 0700 | 85  | .00 | .00 | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 1. |
| 1 | 0705 | 86  | .00 | .00 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 1. |
| 1 | 0710 | 87  | .00 | .00 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 1. |
| 1 | 0715 | 88  | .00 | .00 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 1. |
| 1 | 0720 | 89  | .00 | .00 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 1. |
| 1 | 0725 | 90  | .00 | .00 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 1. |
| 1 | 0730 | 91  | .00 | .00 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 1. |
| 1 | 0735 | 92  | .00 | .00 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 1. |
| 1 | 0740 | 93  | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 1. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 1. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 1. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 1. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 1. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 1. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 1. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 1. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 1. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 1. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 1. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 1. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 1. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 1. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 1. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 1. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 1. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 1. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 1. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 1. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 1. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 1. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 1. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 1. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 1. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 1. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 1. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 1. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 1. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 1. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 1. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 1. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 1. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 1. |
| 1 | 1030 | 127 | .01 | .01 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 1. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 1. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 1. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 1. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 1. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 1. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 1. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 1. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 1. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 1. |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 1120 | 137 | .09 | .09 | .00 | 0.  | * | 1 | 2350 | 287 | .00 | .00 | .00 | 1. |
| 1 | 1125 | 138 | .09 | .09 | .00 | 0.  | * | 1 | 2355 | 288 | .00 | .00 | .00 | 1. |
| 1 | 1130 | 139 | .09 | .09 | .00 | 0.  | * | 2 | 0000 | 289 | .00 | .00 | .00 | 1. |
| 1 | 1135 | 140 | .24 | .23 | .01 | 0.  | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .24 | .21 | .03 | 2.  | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .24 | .19 | .05 | 6.  | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .03 | .01 | 12. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .03 | .01 | 17. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .03 | .01 | 19. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .02 | .01 | 17. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .02 | .01 | 15. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .02 | .01 | 12. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 11. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 9.  | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.23, TOTAL EXCESS = .37

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | (CFS)    | 6-HR | 24-HR | 72-HR | 24.92-HR |
|--------------------|--------------|----------|------|-------|-------|----------|
| 19.                | 12.00        | 4.       | 4.   | 1.    | 1.    | 1.       |
|                    |              | (INCHES) | .284 | .374  | .374  | .374     |
|                    |              | (AC-FT)  | 2.   | 3.    | 3.    | 3.       |

CUMULATIVE AREA = .14 SQ MI

1

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

| OPERATION     | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD |         |         | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---------------|---------|-----------|--------------|---------------------------------|---------|---------|------------|---------------|-------------------|
|               |         |           |              | 6-HOUR                          | 24-HOUR | 72-HOUR |            |               |                   |
| HYDROGRAPH AT | OSA1    | 13.       | 12.08        | 4.                              | 1.      | 1.      | .16        |               |                   |
| ROUTED TO     | RTA1    | 13.       | 12.08        | 4.                              | 1.      | 1.      | .16        |               |                   |
| HYDROGRAPH AT | OSA2    | 4.        | 12.00        | 1.                              | 0.      | 0.      | .03        |               |                   |
| ROUTED TO     | RTA2    | 3.        | 12.00        | 1.                              | 0.      | 0.      | .03        |               |                   |
| HYDROGRAPH AT |         | 1.        | 12.00        | 0.                              | 0.      | 0.      | .01        |               |                   |
| ROUTED TO     | RTA3    | 1.        | 12.00        | 0.                              | 0.      | 0.      | .01        |               |                   |
| HYDROGRAPH AT | OSA4    | 1.        | 11.83        | 0.                              | 0.      | 0.      | .00        |               |                   |
| 4 COMBINED AT | DPA     | 18.       | 12.08        | 5.                              | 2.      | 2.      | .20        |               |                   |
| HYDROGRAPH AT | OSB1    | 19.       | 12.00        | 4.                              | 1.      | 1.      | .14        |               |                   |

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING  
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

| ISTAQ | ELEMENT | DT    | PEAK  | TIME TO PEAK | VOLUME | DT    | INTERPOLATED TO COMPUTATION INTERVAL |              |        |
|-------|---------|-------|-------|--------------|--------|-------|--------------------------------------|--------------|--------|
|       |         |       |       |              |        |       | PEAK                                 | TIME TO PEAK | VOLUME |
|       |         | (MIN) | (CFS) | (MIN)        | (IN)   | (MIN) | (CFS)                                | (MIN)        | (IN)   |
| RTA1  | MANE    | .31   | 13.01 | 725.51       | .28    | 5.00  | 12.98                                | 725.00       | .28    |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2415E+01 EXCESS= .0000E+00 OUTFLOW= .2415E+01 BASIN STORAGE= .6306E-04 PERCENT ERROR= .0

RTA2 MANE .49 3.50 721.04 .37 5.00 3.47 720.00 .37

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5187E+00 EXCESS= .0000E+00 OUTFLOW= .5186E+00 BASIN STORAGE= .1290E-04 PERCENT ERROR= .0

RTA3 MANE .53 1.30 720.35 .37 5.00 1.30 720.00 .37

CONTINUITY SUMMARY (AC-F'T) - INFLOW= .1795E+00 EXCESS= .0000E+00 OUTFLOW= .1795E+00 BASIN STORAGE= .2875E-05 PERCENT ERROR= .0

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

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*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 11/04/1997 TIME 16:02:24 *
*****

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*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*****

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

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

1 HEC-1 INPUT PAGE 1

| LINE | ID       | 1                                                                | 2     | 3    | 4     | 5    | 6    | 7    | 8    | 9    | 10   |
|------|----------|------------------------------------------------------------------|-------|------|-------|------|------|------|------|------|------|
| 1    | ID       | CHEYENNE MOUNTAIN HIGH SCHOOL MDDP                               |       |      |       |      |      |      |      |      |      |
| 2    | ID       | BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MTN. SCHOOLS |       |      |       |      |      |      |      |      |      |
| 3    | ID       | EXISTING UPSTREAM 100-YR FLOWS NOV. 4, 1997                      |       |      |       |      |      |      |      |      |      |
|      | *DIAGRAM |                                                                  |       |      |       |      |      |      |      |      |      |
| 4    | IT       | 5                                                                |       |      | 300   |      |      |      |      |      |      |
| 5    | IO       | 0                                                                |       |      |       |      |      |      |      |      |      |
| 6    | IN       | 15                                                               |       |      |       |      |      |      |      |      |      |
| 7    | KK       | OSA1                                                             |       |      |       |      |      |      |      |      |      |
| 8    | KM       | CHEYENNE MTN. HS OFFSITE BASIN A1                                |       |      |       |      |      |      |      |      |      |
| 9    | KO       | 3                                                                |       |      |       |      |      |      |      |      |      |
| 10   | BA       | 0.159                                                            |       |      |       |      |      |      |      |      |      |
| 11   | PB       | 4.4                                                              |       |      |       |      |      |      |      |      |      |
| 12   | PC       | .002                                                             | .005  | .008 | .0011 | .014 | .017 | .02  | .023 | .026 | .029 |
| 13   | PC       | .032                                                             | .035  | .038 | .041  | .044 | .048 | .052 | .056 | .06  | .064 |
| 14   | PC       | .068                                                             | .072  | .076 | .08   | .085 | .09  | .095 | .1   | .105 | .11  |
| 15   | PC       | .115                                                             | .12   | .126 | .133  | .14  | .147 | .155 | .163 | .172 | .181 |
| 16   | PC       | .191                                                             | .203  | .218 | .236  | .257 | .283 | .387 | .663 | .707 | .735 |
| 17   | PC       | .758                                                             | .776  | .791 | .804  | .815 | .825 | .834 | .842 | .849 | .856 |
| 18   | PC       | .863                                                             | .869  | .875 | .881  | .887 | .893 | .898 | .903 | .908 | .913 |
| 19   | PC       | .918                                                             | .922  | .926 | .93   | .934 | .938 | .942 | .946 | .95  | .953 |
| 20   | PC       | .956                                                             | .959  | .962 | .965  | .968 | .971 | .974 | .977 | .98  | .983 |
| 21   | PC       | .986                                                             | .989  | .992 | .995  | .998 | 1    |      |      |      |      |
| 22   | LS       |                                                                  | 63    |      |       |      |      |      |      |      |      |
| 23   | UD       | 0.308                                                            |       |      |       |      |      |      |      |      |      |
| 24   | KK       | RTA1                                                             |       |      |       |      |      |      |      |      |      |
| 25   | KM       | ROUTE OSA1 TO DPA                                                |       |      |       |      |      |      |      |      |      |
| 26   | RK       | 395                                                              | .0709 | .035 |       | TRAP | 2    |      | 4    |      |      |
| 27   | KK       | OSA2                                                             |       |      |       |      |      |      |      |      |      |
| 28   | KM       | CHEYENNE MTN. HS OFFSITE BASIN A2                                |       |      |       |      |      |      |      |      |      |
| 29   | BA       | .026                                                             |       |      |       |      |      |      |      |      |      |
| 30   | LS       |                                                                  | 66    |      |       |      |      |      |      |      |      |
| 31   | UD       | 0.292                                                            |       |      |       |      |      |      |      |      |      |
| 32   | KK       | RTA2                                                             |       |      |       |      |      |      |      |      |      |
| 33   | KM       | ROUTE OSA2 TO DPA                                                |       |      |       |      |      |      |      |      |      |
| 34   | RK       | 311                                                              | .0707 | .035 |       | TRAP | 2    |      | 4    |      |      |
| 35   | KM       | OSA3                                                             |       |      |       |      |      |      |      |      |      |
| 36   | KK       | CHEYENNE MTN. HS OFFSITE BASIN A3                                |       |      |       |      |      |      |      |      |      |
| 37   | BA       | .009                                                             |       |      |       |      |      |      |      |      |      |
| 38   | LS       |                                                                  | 66    |      |       |      |      |      |      |      |      |
| 39   | UD       | 0.255                                                            |       |      |       |      |      |      |      |      |      |



```

40      KK      RTA3
41      KM      ROUTE OSA3 TO DPA
42      RK      292 .0822 .035          TRAP          2          4

```

HEC-1 INPUT

PAGE 2

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

```

43      KK      OSA4
44      KM      CHEYENNE MTN. HS OFFSITE BASIN A4
45      BA      .005
46      LS      66
47      UD      0.142

48      KK      DPA
49      KM      DESIGN POINT A
50      HC      4

51      KK      OSB1
52      KM      CHEYENNE MTN. HS OFFSITE BASIN B1
53      BA      0.136
54      LS      66
55      UD      0.288
56      ZZ

```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

7      OSA1
      V
      V
24     RTA1
      .
27     .      OSA2
      .      V
      .      V
32     .      RTA2
      .
36     .
      .      V
      .      V
40     .      RTA3
      .
43     .      OSA4
      .
48     DPA.....
      .
51     .      OSB1

```

(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 11/04/1997 TIME 16:02:24 *
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*****

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CHEYENNE MOUNTAIN HIGH SCHOOL MDDP  
 BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MIN. SCHOOLS  
 EXISTING UPSTREAM 100-YR FLOWS NOV. 4, 1997

```

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

```

```

IT        HYDROGRAPH TIME DATA
          NMIN      5 MINUTES IN COMPUTATION INTERVAL
          IDATE     1 0 STARTING DATE

```

ITIME 0000 STARTING TIME  
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES  
 NDDATE 2 0 ENDING DATE  
 NQTIME 0055 ENDING TIME  
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .08 HOURS  
 TOTAL TIME BASE 24.92 HOURS

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

\*\*\* \*\*

\*\*\*\*\*  
 \* \*  
 7 KK \* OSA1 \*  
 \* \*  
 \*\*\*\*\*

CHEYENNE MIN. HS OFFSITE BASIN A1

9 KO OUTPUT CONTROL VARIABLES  
 IPRNT 3 PRINT CONTROL  
 IPLOT 0 PLOT CONTROL  
 QSCAL 0. HYDROGRAPH PLOT SCALE

6 IN TIME DATA FOR INPUT TIME SERIES  
 JXMIN 15 TIME INTERVAL IN MINUTES  
 JXDATE 1 0 STARTING DATE  
 JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS  
 TAREA .16 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 4.40 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN  
 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00  
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22 LS SCS LOSS RATE  
 STRTL 1.17 INITIAL ABSTRACTION  
 CRVNBR 63.00 CURVE NUMBER  
 RTIMP .00 PERCENT IMPERVIOUS AREA

23 UD SCS DIMENSIONLESS UNITGRAPH  
 TLAG .31 LAG

\*\*\*

UNIT HYDROGRAPH  
 20 END-OF-PERIOD ORDINATES

30. 95. 184. 219. 206. 165. 108. 72. 50. 33.  
 23. 15. 10. 7. 5. 3. 2. 2. 1. 1.

\*\*\* \*\*\* \*\*\* \*\*\* \*\*\*

HYDROGRAPH AT STATION OSA1

TOTAL RAINFALL = 4.40, TOTAL LOSS = 3.24, TOTAL EXCESS = 1.16

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | 6-HR<br>(CFS) | 24-HR<br>(INCHES) | 72-HR<br>(AC-FT) | 24.92-HR<br>(INCHES) |
|--------------------|--------------|---------------|-------------------|------------------|----------------------|
| 85.                | 12.00        | 16.           | .932              | 8.               | 1.161                |
|                    |              | 5.            | 1.161             | 10.              | 1.161                |
|                    |              | 5.            | 1.161             | 10.              | 1.161                |
|                    |              | 5.            | 1.161             | 10.              | 1.161                |

CUMULATIVE AREA = .16 SQ MI

\*\*\*\*\*

24 KK

\*\*\*\*\*  
 \* RTA1 \*  
 \* \*  
 \*\*\*\*\*

ROUTE OSA1 TO DPA

HYDROGRAPH ROUTING DATA

26 RK

KINEMATIC WAVE STREAM ROUTING  
 L 395. CHANNEL LENGTH  
 S .0709 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*

COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .35         | 131.67     | 85.15         | 720.21                   | 1.16           | 12.22                        |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9847E+01 EXCESS= .0000E+00 OUTFLOW= .9846E+01 BASIN STORAGE= .1300E-03 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |       |        |      |
|------|------|------|------|-------|--------|------|
| MAIN | 4.24 | 1.34 | 5.00 | 85.08 | 720.00 | 1.16 |
|------|------|------|------|-------|--------|------|

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HYDROGRAPH AT STATION RTA1

| DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW |
|----|------|------|-----|------|----|------|------|-----|------|----|------|------|-----|------|----|------|------|-----|------|
| 1  | 0000 | 1    | 0.  | *    | 1  | 0615 | 76   | 0.  | *    | 1  | 1230 | 151  | 32. | *    | 1  | 1845 | 226  | 4.  |      |
| 1  | 0005 | 2    | 0.  | *    | 1  | 0620 | 77   | 0.  | *    | 1  | 1235 | 152  | 28. | *    | 1  | 1850 | 227  | 4.  |      |
| 1  | 0010 | 3    | 0.  | *    | 1  | 0625 | 78   | 0.  | *    | 1  | 1240 | 153  | 25. | *    | 1  | 1855 | 228  | 4.  |      |
| 1  | 0015 | 4    | 0.  | *    | 1  | 0630 | 79   | 0.  | *    | 1  | 1245 | 154  | 23. | *    | 1  | 1900 | 229  | 4.  |      |





|   |      |    |      |      |     |    |   |   |      |     |     |     |     |    |
|---|------|----|------|------|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0040 | 9  | -.01 | -.01 | .00 | 0. | * | 1 | 1310 | 159 | .02 | .01 | .01 | 3. |
| 1 | 0045 | 10 | -.01 | -.01 | .00 | 0. | * | 1 | 1315 | 160 | .02 | .01 | .01 | 3. |
| 1 | 0050 | 11 | .02  | .02  | .00 | 0. | * | 1 | 1320 | 161 | .02 | .01 | .01 | 2. |
| 1 | 0055 | 12 | .02  | .02  | .00 | 0. | * | 1 | 1325 | 162 | .02 | .01 | .01 | 2. |
| 1 | 0100 | 13 | .02  | .02  | .00 | 0. | * | 1 | 1330 | 163 | .02 | .01 | .01 | 2. |
| 1 | 0105 | 14 | .00  | .00  | .00 | 0. | * | 1 | 1335 | 164 | .01 | .01 | .01 | 2. |
| 1 | 0110 | 15 | .00  | .00  | .00 | 0. | * | 1 | 1340 | 165 | .01 | .01 | .01 | 2. |
| 1 | 0115 | 16 | .00  | .00  | .00 | 0. | * | 1 | 1345 | 166 | .01 | .01 | .01 | 2. |
| 1 | 0120 | 17 | .00  | .00  | .00 | 0. | * | 1 | 1350 | 167 | .01 | .01 | .01 | 2. |
| 1 | 0125 | 18 | .00  | .00  | .00 | 0. | * | 1 | 1355 | 168 | .01 | .01 | .01 | 2. |
| 1 | 0130 | 19 | .00  | .00  | .00 | 0. | * | 1 | 1400 | 169 | .01 | .01 | .01 | 2. |
| 1 | 0135 | 20 | .00  | .00  | .00 | 0. | * | 1 | 1405 | 170 | .01 | .01 | .01 | 2. |
| 1 | 0140 | 21 | .00  | .00  | .00 | 0. | * | 1 | 1410 | 171 | .01 | .01 | .01 | 2. |
| 1 | 0145 | 22 | .00  | .00  | .00 | 0. | * | 1 | 1415 | 172 | .01 | .01 | .01 | 2. |
| 1 | 0150 | 23 | .00  | .00  | .00 | 0. | * | 1 | 1420 | 173 | .01 | .00 | .01 | 1. |
| 1 | 0155 | 24 | .00  | .00  | .00 | 0. | * | 1 | 1425 | 174 | .01 | .00 | .01 | 1. |
| 1 | 0200 | 25 | .00  | .00  | .00 | 0. | * | 1 | 1430 | 175 | .01 | .00 | .01 | 1. |
| 1 | 0205 | 26 | .00  | .00  | .00 | 0. | * | 1 | 1435 | 176 | .01 | .00 | .01 | 1. |
| 1 | 0210 | 27 | .00  | .00  | .00 | 0. | * | 1 | 1440 | 177 | .01 | .00 | .01 | 1. |
| 1 | 0215 | 28 | .00  | .00  | .00 | 0. | * | 1 | 1445 | 178 | .01 | .00 | .01 | 1. |
| 1 | 0220 | 29 | .00  | .00  | .00 | 0. | * | 1 | 1450 | 179 | .01 | .00 | .01 | 1. |
| 1 | 0225 | 30 | .00  | .00  | .00 | 0. | * | 1 | 1455 | 180 | .01 | .00 | .01 | 1. |
| 1 | 0230 | 31 | .00  | .00  | .00 | 0. | * | 1 | 1500 | 181 | .01 | .00 | .01 | 1. |
| 1 | 0235 | 32 | .00  | .00  | .00 | 0. | * | 1 | 1505 | 182 | .01 | .00 | .01 | 1. |
| 1 | 0240 | 33 | .00  | .00  | .00 | 0. | * | 1 | 1510 | 183 | .01 | .00 | .01 | 1. |
| 1 | 0245 | 34 | .00  | .00  | .00 | 0. | * | 1 | 1515 | 184 | .01 | .00 | .01 | 1. |
| 1 | 0250 | 35 | .00  | .00  | .00 | 0. | * | 1 | 1520 | 185 | .01 | .00 | .01 | 1. |
| 1 | 0255 | 36 | .00  | .00  | .00 | 0. | * | 1 | 1525 | 186 | .01 | .00 | .01 | 1. |
| 1 | 0300 | 37 | .00  | .00  | .00 | 0. | * | 1 | 1530 | 187 | .01 | .00 | .01 | 1. |
| 1 | 0305 | 38 | .00  | .00  | .00 | 0. | * | 1 | 1535 | 188 | .01 | .00 | .01 | 1. |
| 1 | 0310 | 39 | .00  | .00  | .00 | 0. | * | 1 | 1540 | 189 | .01 | .00 | .01 | 1. |
| 1 | 0315 | 40 | .00  | .00  | .00 | 0. | * | 1 | 1545 | 190 | .01 | .00 | .01 | 1. |
| 1 | 0320 | 41 | .00  | .00  | .00 | 0. | * | 1 | 1550 | 191 | .01 | .00 | .01 | 1. |
| 1 | 0325 | 42 | .00  | .00  | .00 | 0. | * | 1 | 1555 | 192 | .01 | .00 | .01 | 1. |
| 1 | 0330 | 43 | .00  | .00  | .00 | 0. | * | 1 | 1600 | 193 | .01 | .00 | .01 | 1. |
| 1 | 0335 | 44 | .01  | .01  | .00 | 0. | * | 1 | 1605 | 194 | .01 | .00 | .01 | 1. |
| 1 | 0340 | 45 | .01  | .01  | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .01 | 1. |
| 1 | 0345 | 46 | .01  | .01  | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .01 | 1. |
| 1 | 0350 | 47 | .01  | .01  | .00 | 0. | * | 1 | 1620 | 197 | .01 | .00 | .00 | 1. |
| 1 | 0355 | 48 | .01  | .01  | .00 | 0. | * | 1 | 1625 | 198 | .01 | .00 | .00 | 1. |
| 1 | 0400 | 49 | .01  | .01  | .00 | 0. | * | 1 | 1630 | 199 | .01 | .00 | .00 | 1. |
| 1 | 0405 | 50 | .01  | .01  | .00 | 0. | * | 1 | 1635 | 200 | .01 | .00 | .00 | 1. |
| 1 | 0410 | 51 | .01  | .01  | .00 | 0. | * | 1 | 1640 | 201 | .01 | .00 | .00 | 1. |
| 1 | 0415 | 52 | .01  | .01  | .00 | 0. | * | 1 | 1645 | 202 | .01 | .00 | .00 | 1. |
| 1 | 0420 | 53 | .01  | .01  | .00 | 0. | * | 1 | 1650 | 203 | .01 | .00 | .00 | 1. |
| 1 | 0425 | 54 | .01  | .01  | .00 | 0. | * | 1 | 1655 | 204 | .01 | .00 | .00 | 1. |
| 1 | 0430 | 55 | .01  | .01  | .00 | 0. | * | 1 | 1700 | 205 | .01 | .00 | .00 | 1. |
| 1 | 0435 | 56 | .01  | .01  | .00 | 0. | * | 1 | 1705 | 206 | .01 | .00 | .00 | 1. |
| 1 | 0440 | 57 | .01  | .01  | .00 | 0. | * | 1 | 1710 | 207 | .01 | .00 | .00 | 1. |
| 1 | 0445 | 58 | .01  | .01  | .00 | 0. | * | 1 | 1715 | 208 | .01 | .00 | .00 | 1. |
| 1 | 0450 | 59 | .01  | .01  | .00 | 0. | * | 1 | 1720 | 209 | .01 | .00 | .00 | 1. |
| 1 | 0455 | 60 | .01  | .01  | .00 | 0. | * | 1 | 1725 | 210 | .01 | .00 | .00 | 1. |
| 1 | 0500 | 61 | .01  | .01  | .00 | 0. | * | 1 | 1730 | 211 | .01 | .00 | .00 | 1. |
| 1 | 0505 | 62 | .01  | .01  | .00 | 0. | * | 1 | 1735 | 212 | .01 | .00 | .00 | 1. |
| 1 | 0510 | 63 | .01  | .01  | .00 | 0. | * | 1 | 1740 | 213 | .01 | .00 | .00 | 1. |
| 1 | 0515 | 64 | .01  | .01  | .00 | 0. | * | 1 | 1745 | 214 | .01 | .00 | .00 | 1. |
| 1 | 0520 | 65 | .01  | .01  | .00 | 0. | * | 1 | 1750 | 215 | .01 | .00 | .00 | 1. |
| 1 | 0525 | 66 | .01  | .01  | .00 | 0. | * | 1 | 1755 | 216 | .01 | .00 | .00 | 1. |
| 1 | 0530 | 67 | .01  | .01  | .00 | 0. | * | 1 | 1800 | 217 | .01 | .00 | .00 | 1. |
| 1 | 0535 | 68 | .01  | .01  | .00 | 0. | * | 1 | 1805 | 218 | .01 | .00 | .00 | 1. |
| 1 | 0540 | 69 | .01  | .01  | .00 | 0. | * | 1 | 1810 | 219 | .01 | .00 | .00 | 1. |
| 1 | 0545 | 70 | .01  | .01  | .00 | 0. | * | 1 | 1815 | 220 | .01 | .00 | .00 | 1. |
| 1 | 0550 | 71 | .01  | .01  | .00 | 0. | * | 1 | 1820 | 221 | .01 | .00 | .00 | 1. |
| 1 | 0555 | 72 | .01  | .01  | .00 | 0. | * | 1 | 1825 | 222 | .01 | .00 | .00 | 1. |
| 1 | 0600 | 73 | .01  | .01  | .00 | 0. | * | 1 | 1830 | 223 | .01 | .00 | .00 | 1. |
| 1 | 0605 | 74 | .01  | .01  | .00 | 0. | * | 1 | 1835 | 224 | .01 | .00 | .00 | 1. |
| 1 | 0610 | 75 | .01  | .01  | .00 | 0. | * | 1 | 1840 | 225 | .01 | .00 | .00 | 1. |
| 1 | 0615 | 76 | .01  | .01  | .00 | 0. | * | 1 | 1845 | 226 | .01 | .00 | .00 | 1. |
| 1 | 0620 | 77 | .01  | .01  | .00 | 0. | * | 1 | 1850 | 227 | .01 | .00 | .00 | 1. |
| 1 | 0625 | 78 | .01  | .01  | .00 | 0. | * | 1 | 1855 | 228 | .01 | .00 | .00 | 1. |
| 1 | 0630 | 79 | .01  | .01  | .00 | 0. | * | 1 | 1900 | 229 | .01 | .00 | .00 | 1. |
| 1 | 0635 | 80 | .01  | .01  | .00 | 0. | * | 1 | 1905 | 230 | .01 | .00 | .00 | 1. |
| 1 | 0640 | 81 | .01  | .01  | .00 | 0. | * | 1 | 1910 | 231 | .01 | .00 | .00 | 1. |
| 1 | 0645 | 82 | .01  | .01  | .00 | 0. | * | 1 | 1915 | 232 | .01 | .00 | .00 | 1. |
| 1 | 0650 | 83 | .01  | .01  | .00 | 0. | * | 1 | 1920 | 233 | .01 | .00 | .00 | 1. |
| 1 | 0655 | 84 | .01  | .01  | .00 | 0. | * | 1 | 1925 | 234 | .01 | .00 | .00 | 1. |
| 1 | 0700 | 85 | .01  | .01  | .00 | 0. | * | 1 | 1930 | 235 | .01 | .00 | .00 | 1. |
| 1 | 0705 | 86 | .01  | .01  | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 1. |
| 1 | 0710 | 87 | .01  | .01  | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 1. |
| 1 | 0715 | 88 | .01  | .01  | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 1. |
| 1 | 0720 | 89 | .01  | .01  | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 1. |
| 1 | 0725 | 90 | .01  | .01  | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 1. |
| 1 | 0730 | 91 | .01  | .01  | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 1. |
| 1 | 0735 | 92 | .01  | .01  | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 1. |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0740 | 93  | .01 | .01 | .00 | 0.  | * | 1 | 2010 | 243 | .00 | .00 | .00 | 1. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0.  | * | 1 | 2015 | 244 | .00 | .00 | .00 | 1. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0.  | * | 1 | 2020 | 245 | .00 | .00 | .00 | 1. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0.  | * | 1 | 2025 | 246 | .00 | .00 | .00 | 1. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0.  | * | 1 | 2030 | 247 | .00 | .00 | .00 | 1. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0.  | * | 1 | 2035 | 248 | .00 | .00 | .00 | 1. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0.  | * | 1 | 2040 | 249 | .00 | .00 | .00 | 1. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0.  | * | 1 | 2045 | 250 | .00 | .00 | .00 | 1. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0.  | * | 1 | 2050 | 251 | .00 | .00 | .00 | 1. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0.  | * | 1 | 2055 | 252 | .00 | .00 | .00 | 1. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0.  | * | 1 | 2100 | 253 | .00 | .00 | .00 | 1. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0.  | * | 1 | 2105 | 254 | .00 | .00 | .00 | 1. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0.  | * | 1 | 2110 | 255 | .00 | .00 | .00 | 1. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0.  | * | 1 | 2115 | 256 | .00 | .00 | .00 | 1. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0.  | * | 1 | 2120 | 257 | .00 | .00 | .00 | 1. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0.  | * | 1 | 2125 | 258 | .00 | .00 | .00 | 1. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0.  | * | 1 | 2130 | 259 | .00 | .00 | .00 | 1. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0.  | * | 1 | 2135 | 260 | .00 | .00 | .00 | 1. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0.  | * | 1 | 2140 | 261 | .00 | .00 | .00 | 1. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0.  | * | 1 | 2145 | 262 | .00 | .00 | .00 | 1. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0.  | * | 1 | 2150 | 263 | .00 | .00 | .00 | 1. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0.  | * | 1 | 2155 | 264 | .00 | .00 | .00 | 1. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0.  | * | 1 | 2200 | 265 | .00 | .00 | .00 | 1. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0.  | * | 1 | 2205 | 266 | .00 | .00 | .00 | 1. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0.  | * | 1 | 2210 | 267 | .00 | .00 | .00 | 1. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0.  | * | 1 | 2215 | 268 | .00 | .00 | .00 | 1. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0.  | * | 1 | 2220 | 269 | .00 | .00 | .00 | 1. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0.  | * | 1 | 2225 | 270 | .00 | .00 | .00 | 1. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0.  | * | 1 | 2230 | 271 | .00 | .00 | .00 | 1. |
| 1 | 1005 | 122 | .02 | .02 | .00 | 0.  | * | 1 | 2235 | 272 | .00 | .00 | .00 | 1. |
| 1 | 1010 | 123 | .02 | .02 | .00 | 0.  | * | 1 | 2240 | 273 | .00 | .00 | .00 | 1. |
| 1 | 1015 | 124 | .02 | .02 | .00 | 0.  | * | 1 | 2245 | 274 | .00 | .00 | .00 | 1. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 0.  | * | 1 | 2250 | 275 | .00 | .00 | .00 | 1. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 0.  | * | 1 | 2255 | 276 | .00 | .00 | .00 | 1. |
| 1 | 1030 | 127 | .02 | .02 | .00 | 0.  | * | 1 | 2300 | 277 | .00 | .00 | .00 | 1. |
| 1 | 1035 | 128 | .03 | .03 | .00 | 0.  | * | 1 | 2305 | 278 | .00 | .00 | .00 | 1. |
| 1 | 1040 | 129 | .03 | .03 | .00 | 0.  | * | 1 | 2310 | 279 | .00 | .00 | .00 | 1. |
| 1 | 1045 | 130 | .03 | .03 | .00 | 0.  | * | 1 | 2315 | 280 | .00 | .00 | .00 | 1. |
| 1 | 1050 | 131 | .03 | .03 | .00 | 0.  | * | 1 | 2320 | 281 | .00 | .00 | .00 | 1. |
| 1 | 1055 | 132 | .03 | .03 | .00 | 0.  | * | 1 | 2325 | 282 | .00 | .00 | .00 | 1. |
| 1 | 1100 | 133 | .03 | .03 | .00 | 0.  | * | 1 | 2330 | 283 | .00 | .00 | .00 | 1. |
| 1 | 1105 | 134 | .04 | .04 | .00 | 0.  | * | 1 | 2335 | 284 | .00 | .00 | .00 | 1. |
| 1 | 1110 | 135 | .04 | .04 | .00 | 0.  | * | 1 | 2340 | 285 | .00 | .00 | .00 | 1. |
| 1 | 1115 | 136 | .04 | .04 | .00 | 0.  | * | 1 | 2345 | 286 | .00 | .00 | .00 | 1. |
| 1 | 1120 | 137 | .15 | .14 | .02 | 0.  | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .15 | .13 | .02 | 1.  | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .15 | .12 | .03 | 1.  | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .41 | .29 | .11 | 3.  | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .41 | .26 | .15 | 5.  | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .41 | .23 | .18 | 10. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .06 | .03 | .03 | 14. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .03 | .03 | 17. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .06 | .03 | .03 | 17. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .02 | .02 | 15. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .02 | .02 | 12. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .02 | .02 | 10. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .02 | .02 | 8.  | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .02 | .02 | 7.  | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 3.05, TOTAL EXCESS = 1.35

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |       |
|--------------------|--------------|----------------------|-------|-------|----------|-------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |       |
| 17.                | 11.92        | 3.                   | 1.    | 1.    | 1.       |       |
|                    |              | (INCHES)             | 1.096 | 1.352 | 1.352    | 1.352 |
|                    |              | (AC-FT)              | 2.    | 2.    | 2.       | 2.    |

CUMULATIVE AREA = .03 SQ MI

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*****
*
32 KK * RTA2 *
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ROUTE OSA2 TO DPA  
OSA3

HYDROGRAPH ROUTING DATA

34 RK KINEMATIC WAVE STREAM ROUTING  
 L 311. CHANNEL LENGTH  
 S .0707 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

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 COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .27         | 103.67     | 17.27         | 715.56                   | 1.35           | 8.13                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1875E+01 EXCESS= .0000E+00 OUTFLOW= .1875E+01 BASIN STORAGE= .2380E-04 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

| ELEMENT | ALPHA | M    | DT   | DX | PEAK  | TIME TO<br>PEAK | VOLUME |
|---------|-------|------|------|----|-------|-----------------|--------|
| MAIN    | 4.24  | 1.34 | 5.00 |    | 17.16 | 720.00          | 1.35   |

HYDROGRAPH AT STATION RTA2

| DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW |
|----|------|------|-----|------|----|------|------|-----|------|----|------|------|-----|------|----|------|------|-----|------|
| 1  | 0000 | 1    | 0.  | *    | 1  | 0615 | 76   | 0.  | *    | 1  | 1230 | 151  | 6.  | *    | 1  | 1845 | 226  | 1.  |      |
| 1  | 0005 | 2    | 0.  | *    | 1  | 0620 | 77   | 0.  | *    | 1  | 1235 | 152  | 5.  | *    | 1  | 1850 | 227  | 1.  |      |
| 1  | 0010 | 3    | 0.  | *    | 1  | 0625 | 78   | 0.  | *    | 1  | 1240 | 153  | 5.  | *    | 1  | 1855 | 228  | 1.  |      |
| 1  | 0015 | 4    | 0.  | *    | 1  | 0630 | 79   | 0.  | *    | 1  | 1245 | 154  | 4.  | *    | 1  | 1900 | 229  | 1.  |      |
| 1  | 0020 | 5    | 0.  | *    | 1  | 0635 | 80   | 0.  | *    | 1  | 1250 | 155  | 4.  | *    | 1  | 1905 | 230  | 1.  |      |
| 1  | 0025 | 6    | 0.  | *    | 1  | 0640 | 81   | 0.  | *    | 1  | 1255 | 156  | 3.  | *    | 1  | 1910 | 231  | 1.  |      |
| 1  | 0030 | 7    | 0.  | *    | 1  | 0645 | 82   | 0.  | *    | 1  | 1300 | 157  | 3.  | *    | 1  | 1915 | 232  | 1.  |      |
| 1  | 0035 | 8    | 0.  | *    | 1  | 0650 | 83   | 0.  | *    | 1  | 1305 | 158  | 3.  | *    | 1  | 1920 | 233  | 1.  |      |
| 1  | 0040 | 9    | 0.  | *    | 1  | 0655 | 84   | 0.  | *    | 1  | 1310 | 159  | 3.  | *    | 1  | 1925 | 234  | 1.  |      |
| 1  | 0045 | 10   | 0.  | *    | 1  | 0700 | 85   | 0.  | *    | 1  | 1315 | 160  | 3.  | *    | 1  | 1930 | 235  | 1.  |      |
| 1  | 0050 | 11   | 0.  | *    | 1  | 0705 | 86   | 0.  | *    | 1  | 1320 | 161  | 2.  | *    | 1  | 1935 | 236  | 1.  |      |
| 1  | 0055 | 12   | 0.  | *    | 1  | 0710 | 87   | 0.  | *    | 1  | 1325 | 162  | 2.  | *    | 1  | 1940 | 237  | 1.  |      |
| 1  | 0100 | 13   | 0.  | *    | 1  | 0715 | 88   | 0.  | *    | 1  | 1330 | 163  | 2.  | *    | 1  | 1945 | 238  | 1.  |      |
| 1  | 0105 | 14   | 0.  | *    | 1  | 0720 | 89   | 0.  | *    | 1  | 1335 | 164  | 2.  | *    | 1  | 1950 | 239  | 1.  |      |
| 1  | 0110 | 15   | 0.  | *    | 1  | 0725 | 90   | 0.  | *    | 1  | 1340 | 165  | 2.  | *    | 1  | 1955 | 240  | 1.  |      |
| 1  | 0115 | 16   | 0.  | *    | 1  | 0730 | 91   | 0.  | *    | 1  | 1345 | 166  | 2.  | *    | 1  | 2000 | 241  | 1.  |      |
| 1  | 0120 | 17   | 0.  | *    | 1  | 0735 | 92   | 0.  | *    | 1  | 1350 | 167  | 2.  | *    | 1  | 2005 | 242  | 1.  |      |
| 1  | 0125 | 18   | 0.  | *    | 1  | 0740 | 93   | 0.  | *    | 1  | 1355 | 168  | 2.  | *    | 1  | 2010 | 243  | 1.  |      |
| 1  | 0130 | 19   | 0.  | *    | 1  | 0745 | 94   | 0.  | *    | 1  | 1400 | 169  | 2.  | *    | 1  | 2015 | 244  | 1.  |      |
| 1  | 0135 | 20   | 0.  | *    | 1  | 0750 | 95   | 0.  | *    | 1  | 1405 | 170  | 2.  | *    | 1  | 2020 | 245  | 1.  |      |
| 1  | 0140 | 21   | 0.  | *    | 1  | 0755 | 96   | 0.  | *    | 1  | 1410 | 171  | 2.  | *    | 1  | 2025 | 246  | 1.  |      |
| 1  | 0145 | 22   | 0.  | *    | 1  | 0800 | 97   | 0.  | *    | 1  | 1415 | 172  | 2.  | *    | 1  | 2030 | 247  | 1.  |      |
| 1  | 0150 | 23   | 0.  | *    | 1  | 0805 | 98   | 0.  | *    | 1  | 1420 | 173  | 1.  | *    | 1  | 2035 | 248  | 1.  |      |
| 1  | 0155 | 24   | 0.  | *    | 1  | 0810 | 99   | 0.  | *    | 1  | 1425 | 174  | 1.  | *    | 1  | 2040 | 249  | 1.  |      |
| 1  | 0200 | 25   | 0.  | *    | 1  | 0815 | 100  | 0.  | *    | 1  | 1430 | 175  | 1.  | *    | 1  | 2045 | 250  | 1.  |      |
| 1  | 0205 | 26   | 0.  | *    | 1  | 0820 | 101  | 0.  | *    | 1  | 1435 | 176  | 1.  | *    | 1  | 2050 | 251  | 1.  |      |
| 1  | 0210 | 27   | 0.  | *    | 1  | 0825 | 102  | 0.  | *    | 1  | 1440 | 177  | 1.  | *    | 1  | 2055 | 252  | 1.  |      |
| 1  | 0215 | 28   | 0.  | *    | 1  | 0830 | 103  | 0.  | *    | 1  | 1445 | 178  | 1.  | *    | 1  | 2100 | 253  | 1.  |      |
| 1  | 0220 | 29   | 0.  | *    | 1  | 0835 | 104  | 0.  | *    | 1  | 1450 | 179  | 1.  | *    | 1  | 2105 | 254  | 1.  |      |
| 1  | 0225 | 30   | 0.  | *    | 1  | 0840 | 105  | 0.  | *    | 1  | 1455 | 180  | 1.  | *    | 1  | 2110 | 255  | 1.  |      |
| 1  | 0230 | 31   | 0.  | *    | 1  | 0845 | 106  | 0.  | *    | 1  | 1500 | 181  | 1.  | *    | 1  | 2115 | 256  | 1.  |      |
| 1  | 0235 | 32   | 0.  | *    | 1  | 0850 | 107  | 0.  | *    | 1  | 1505 | 182  | 1.  | *    | 1  | 2120 | 257  | 1.  |      |
| 1  | 0240 | 33   | 0.  | *    | 1  | 0855 | 108  | 0.  | *    | 1  | 1510 | 183  | 1.  | *    | 1  | 2125 | 258  | 1.  |      |
| 1  | 0245 | 34   | 0.  | *    | 1  | 0900 | 109  | 0.  | *    | 1  | 1515 | 184  | 1.  | *    | 1  | 2130 | 259  | 1.  |      |
| 1  | 0250 | 35   | 0.  | *    | 1  | 0905 | 110  | 0.  | *    | 1  | 1520 | 185  | 1.  | *    | 1  | 2135 | 260  | 1.  |      |
| 1  | 0255 | 36   | 0.  | *    | 1  | 0910 | 111  | 0.  | *    | 1  | 1525 | 186  | 1.  | *    | 1  | 2140 | 261  | 1.  |      |
| 1  | 0300 | 37   | 0.  | *    | 1  | 0915 | 112  | 0.  | *    | 1  | 1530 | 187  | 1.  | *    | 1  | 2145 | 262  | 1.  |      |
| 1  | 0305 | 38   | 0.  | *    | 1  | 0920 | 113  | 0.  | *    | 1  | 1535 | 188  | 1.  | *    | 1  | 2150 | 263  | 1.  |      |
| 1  | 0310 | 39   | 0.  | *    | 1  | 0925 | 114  | 0.  | *    | 1  | 1540 | 189  | 1.  | *    | 1  | 2155 | 264  | 1.  |      |
| 1  | 0315 | 40   | 0.  | *    | 1  | 0930 | 115  | 0.  | *    | 1  | 1545 | 190  | 1.  | *    | 1  | 2200 | 265  | 1.  |      |
| 1  | 0320 | 41   | 0.  | *    | 1  | 0935 | 116  | 0.  | *    | 1  | 1550 | 191  | 1.  | *    | 1  | 2205 | 266  | 1.  |      |



|   |      |    |    |   |   |      |     |     |   |   |      |     |    |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|-----|---|---|------|-----|----|---|---|------|-----|----|
| 1 | 0325 | 42 | 0. | * | 1 | 0940 | 117 | 0.  | * | 1 | 1555 | 192 | 1. | * | 1 | 2210 | 267 | 1. |
| 1 | 0330 | 43 | 0. | * | 1 | 0945 | 118 | 0.  | * | 1 | 1600 | 193 | 1. | * | 1 | 2215 | 268 | 1. |
| 1 | 0335 | 44 | 0. | * | 1 | 0950 | 119 | 0.  | * | 1 | 1605 | 194 | 1. | * | 1 | 2220 | 269 | 1. |
| 1 | 0340 | 45 | 0. | * | 1 | 0955 | 120 | 0.  | * | 1 | 1610 | 195 | 1. | * | 1 | 2225 | 270 | 1. |
| 1 | 0345 | 46 | 0. | * | 1 | 1000 | 121 | 0.  | * | 1 | 1615 | 196 | 1. | * | 1 | 2230 | 271 | 1. |
| 1 | 0350 | 47 | 0. | * | 1 | 1005 | 122 | 0.  | * | 1 | 1620 | 197 | 1. | * | 1 | 2235 | 272 | 1. |
| 1 | 0355 | 48 | 0. | * | 1 | 1010 | 123 | 0.  | * | 1 | 1625 | 198 | 1. | * | 1 | 2240 | 273 | 1. |
| 1 | 0400 | 49 | 0. | * | 1 | 1015 | 124 | 0.  | * | 1 | 1630 | 199 | 1. | * | 1 | 2245 | 274 | 1. |
| 1 | 0405 | 50 | 0. | * | 1 | 1020 | 125 | 0.  | * | 1 | 1635 | 200 | 1. | * | 1 | 2250 | 275 | 1. |
| 1 | 0410 | 51 | 0. | * | 1 | 1025 | 126 | 0.  | * | 1 | 1640 | 201 | 1. | * | 1 | 2255 | 276 | 1. |
| 1 | 0415 | 52 | 0. | * | 1 | 1030 | 127 | 0.  | * | 1 | 1645 | 202 | 1. | * | 1 | 2300 | 277 | 1. |
| 1 | 0420 | 53 | 0. | * | 1 | 1035 | 128 | 0.  | * | 1 | 1650 | 203 | 1. | * | 1 | 2305 | 278 | 1. |
| 1 | 0425 | 54 | 0. | * | 1 | 1040 | 129 | 0.  | * | 1 | 1655 | 204 | 1. | * | 1 | 2310 | 279 | 1. |
| 1 | 0430 | 55 | 0. | * | 1 | 1045 | 130 | 0.  | * | 1 | 1700 | 205 | 1. | * | 1 | 2315 | 280 | 1. |
| 1 | 0435 | 56 | 0. | * | 1 | 1050 | 131 | 0.  | * | 1 | 1705 | 206 | 1. | * | 1 | 2320 | 281 | 1. |
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 0.  | * | 1 | 1710 | 207 | 1. | * | 1 | 2325 | 282 | 1. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 0.  | * | 1 | 1715 | 208 | 1. | * | 1 | 2330 | 283 | 1. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 0.  | * | 1 | 1720 | 209 | 1. | * | 1 | 2335 | 284 | 1. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 0.  | * | 1 | 1725 | 210 | 1. | * | 1 | 2340 | 285 | 1. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 0.  | * | 1 | 1730 | 211 | 1. | * | 1 | 2345 | 286 | 1. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 0.  | * | 1 | 1735 | 212 | 1. | * | 1 | 2350 | 287 | 0. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 1.  | * | 1 | 1740 | 213 | 1. | * | 1 | 2355 | 288 | 0. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 1.  | * | 1 | 1745 | 214 | 1. | * | 2 | 0000 | 289 | 0. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 3.  | * | 1 | 1750 | 215 | 1. | * | 2 | 0005 | 290 | 0. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 5.  | * | 1 | 1755 | 216 | 1. | * | 2 | 0010 | 291 | 0. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 9.  | * | 1 | 1800 | 217 | 1. | * | 2 | 0015 | 292 | 0. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 14. | * | 1 | 1805 | 218 | 1. | * | 2 | 0020 | 293 | 0. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 17. | * | 1 | 1810 | 219 | 1. | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 17. | * | 1 | 1815 | 220 | 1. | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 15. | * | 1 | 1820 | 221 | 1. | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 12. | * | 1 | 1825 | 222 | 1. | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 10. | * | 1 | 1830 | 223 | 1. | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 8.  | * | 1 | 1835 | 224 | 1. | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 7.  | * | 1 | 1840 | 225 | 1. | * | 2 | 0055 | 300 | 0. |

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| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 17.                | 12.00        | 3.                   | 1.    | 1.    | 1.       |
|                    | (INCHES)     | 1.096                | 1.353 | 1.353 | 1.353    |
|                    | (AC-FT)      | 2.                   | 2.    | 2.    | 2.       |
| CUMULATIVE AREA =  |              | .03 SQ MI            |       |       |          |

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*
36 KK      *          CHEYENNE MTN. HS OFFSITE BASIN A3
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SUBBASIN RUNOFF DATA

37 BA SUBBASIN CHARACTERISTICS  
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 4.40 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN

|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |
| .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |
| .09 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .01 | .01 | .01 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

38 LS SCS LOSS RATE  
 STRTL 1.03 INITIAL ABSTRACTION  
 CRVNER 66.00 CURVE NUMBER  
 RTIMP .00 PERCENT IMPERVIOUS AREA

39 UD SCS DIMENSIONLESS UNITGRAPH  
 TLAG .25 LAG

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WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

UNIT HYDROGRAPH  
 17 END-OF-PERIOD ORDINATES

|    |    |     |     |     |    |    |    |    |    |
|----|----|-----|-----|-----|----|----|----|----|----|
| 3. | 9. | 14. | 14. | 11. | 7. | 4. | 3. | 2. | 1. |
| 1. | 0. | 0.  | 0.  | 0.  | 0. | 0. |    |    |    |

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 HYDROGRAPH AT STATION  
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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q  |
|----|-----|------|-----|------|------|--------|------|---|---|----|-----|------|-----|------|------|--------|------|----|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1230 | 151 | .03  | .02  | .02    |      | 2. |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1235 | 152 | .03  | .01  | .01    |      | 2. |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1240 | 153 | .03  | .01  | .01    |      | 1. |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1245 | 154 | .03  | .01  | .01    |      | 1. |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1250 | 155 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1255 | 156 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1300 | 157 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.   | * |   | 1  |     | 1305 | 158 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.   | * |   | 1  |     | 1310 | 159 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.   | * |   | 1  |     | 1315 | 160 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0050 | 11  | .02  | .02  | .00    | 0.   | * |   | 1  |     | 1320 | 161 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0055 | 12  | .02  | .02  | .00    | 0.   | * |   | 1  |     | 1325 | 162 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0100 | 13  | .02  | .02  | .00    | 0.   | * |   | 1  |     | 1330 | 163 | .02  | .01  | .01    |      | 1. |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1335 | 164 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1340 | 165 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1345 | 166 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1350 | 167 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1355 | 168 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1400 | 169 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1405 | 170 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1410 | 171 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1415 | 172 | .01  | .01  | .01    |      | 1. |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1420 | 173 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1425 | 174 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1430 | 175 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1435 | 176 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1440 | 177 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1445 | 178 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1450 | 179 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1455 | 180 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1500 | 181 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1505 | 182 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1510 | 183 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1515 | 184 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1520 | 185 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1525 | 186 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1530 | 187 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1535 | 188 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1540 | 189 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1545 | 190 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1550 | 191 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1555 | 192 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0330 | 43  | .00  | .00  | .00    | 0.   | * |   | 1  |     | 1600 | 193 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0335 | 44  | .01  | .01  | .00    | 0.   | * |   | 1  |     | 1605 | 194 | .01  | .00  | .01    |      | 0. |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0340 | 45  | .01 | .01 | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .01 | 0. |
| 1 | 0345 | 46  | .01 | .01 | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .01 | 0. |
| 1 | 0350 | 47  | .01 | .01 | .00 | 0. | * | 1 | 1620 | 197 | .01 | .00 | .00 | 0. |
| 1 | 0355 | 48  | .01 | .01 | .00 | 0. | * | 1 | 1625 | 198 | .01 | .00 | .00 | 0. |
| 1 | 0400 | 49  | .01 | .01 | .00 | 0. | * | 1 | 1630 | 199 | .01 | .00 | .00 | 0. |
| 1 | 0405 | 50  | .01 | .01 | .00 | 0. | * | 1 | 1635 | 200 | .01 | .00 | .00 | 0. |
| 1 | 0410 | 51  | .01 | .01 | .00 | 0. | * | 1 | 1640 | 201 | .01 | .00 | .00 | 0. |
| 1 | 0415 | 52  | .01 | .01 | .00 | 0. | * | 1 | 1645 | 202 | .01 | .00 | .00 | 0. |
| 1 | 0420 | 53  | .01 | .01 | .00 | 0. | * | 1 | 1650 | 203 | .01 | .00 | .00 | 0. |
| 1 | 0425 | 54  | .01 | .01 | .00 | 0. | * | 1 | 1655 | 204 | .01 | .00 | .00 | 0. |
| 1 | 0430 | 55  | .01 | .01 | .00 | 0. | * | 1 | 1700 | 205 | .01 | .00 | .00 | 0. |
| 1 | 0435 | 56  | .01 | .01 | .00 | 0. | * | 1 | 1705 | 206 | .01 | .00 | .00 | 0. |
| 1 | 0440 | 57  | .01 | .01 | .00 | 0. | * | 1 | 1710 | 207 | .01 | .00 | .00 | 0. |
| 1 | 0445 | 58  | .01 | .01 | .00 | 0. | * | 1 | 1715 | 208 | .01 | .00 | .00 | 0. |
| 1 | 0450 | 59  | .01 | .01 | .00 | 0. | * | 1 | 1720 | 209 | .01 | .00 | .00 | 0. |
| 1 | 0455 | 60  | .01 | .01 | .00 | 0. | * | 1 | 1725 | 210 | .01 | .00 | .00 | 0. |
| 1 | 0500 | 61  | .01 | .01 | .00 | 0. | * | 1 | 1730 | 211 | .01 | .00 | .00 | 0. |
| 1 | 0505 | 62  | .01 | .01 | .00 | 0. | * | 1 | 1735 | 212 | .01 | .00 | .00 | 0. |
| 1 | 0510 | 63  | .01 | .01 | .00 | 0. | * | 1 | 1740 | 213 | .01 | .00 | .00 | 0. |
| 1 | 0515 | 64  | .01 | .01 | .00 | 0. | * | 1 | 1745 | 214 | .01 | .00 | .00 | 0. |
| 1 | 0520 | 65  | .01 | .01 | .00 | 0. | * | 1 | 1750 | 215 | .01 | .00 | .00 | 0. |
| 1 | 0525 | 66  | .01 | .01 | .00 | 0. | * | 1 | 1755 | 216 | .01 | .00 | .00 | 0. |
| 1 | 0530 | 67  | .01 | .01 | .00 | 0. | * | 1 | 1800 | 217 | .01 | .00 | .00 | 0. |
| 1 | 0535 | 68  | .01 | .01 | .00 | 0. | * | 1 | 1805 | 218 | .01 | .00 | .00 | 0. |
| 1 | 0540 | 69  | .01 | .01 | .00 | 0. | * | 1 | 1810 | 219 | .01 | .00 | .00 | 0. |
| 1 | 0545 | 70  | .01 | .01 | .00 | 0. | * | 1 | 1815 | 220 | .01 | .00 | .00 | 0. |
| 1 | 0550 | 71  | .01 | .01 | .00 | 0. | * | 1 | 1820 | 221 | .01 | .00 | .00 | 0. |
| 1 | 0555 | 72  | .01 | .01 | .00 | 0. | * | 1 | 1825 | 222 | .01 | .00 | .00 | 0. |
| 1 | 0600 | 73  | .01 | .01 | .00 | 0. | * | 1 | 1830 | 223 | .01 | .00 | .00 | 0. |
| 1 | 0605 | 74  | .01 | .01 | .00 | 0. | * | 1 | 1835 | 224 | .01 | .00 | .00 | 0. |
| 1 | 0610 | 75  | .01 | .01 | .00 | 0. | * | 1 | 1840 | 225 | .01 | .00 | .00 | 0. |
| 1 | 0615 | 76  | .01 | .01 | .00 | 0. | * | 1 | 1845 | 226 | .01 | .00 | .00 | 0. |
| 1 | 0620 | 77  | .01 | .01 | .00 | 0. | * | 1 | 1850 | 227 | .01 | .00 | .00 | 0. |
| 1 | 0625 | 78  | .01 | .01 | .00 | 0. | * | 1 | 1855 | 228 | .01 | .00 | .00 | 0. |
| 1 | 0630 | 79  | .01 | .01 | .00 | 0. | * | 1 | 1900 | 229 | .01 | .00 | .00 | 0. |
| 1 | 0635 | 80  | .01 | .01 | .00 | 0. | * | 1 | 1905 | 230 | .01 | .00 | .00 | 0. |
| 1 | 0640 | 81  | .01 | .01 | .00 | 0. | * | 1 | 1910 | 231 | .01 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .01 | .01 | .00 | 0. | * | 1 | 1915 | 232 | .01 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .01 | .01 | .00 | 0. | * | 1 | 1920 | 233 | .01 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .01 | .01 | .00 | 0. | * | 1 | 1925 | 234 | .01 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .01 | .01 | .00 | 0. | * | 1 | 1930 | 235 | .01 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .01 | .01 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .01 | .01 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .01 | .01 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .01 | .01 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .01 | .01 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .01 | .01 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .01 | .01 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .01 | .01 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .02 | .02 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .02 | .02 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .02 | .02 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .02 | .02 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .03 | .03 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 1040 | 129 | .03 | .03 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .03 | .03 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .03 | .03 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .03 | .03 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .03 | .03 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .04 | .04 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .04 | .04 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .04 | .04 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .15 | .14 | .02 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .15 | .13 | .02 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .15 | .12 | .03 | 1. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .41 | .29 | .11 | 1. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .41 | .26 | .15 | 2. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .41 | .23 | .18 | 4. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .06 | .03 | .03 | 6. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .03 | .03 | 7. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .06 | .03 | .03 | 6. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .02 | .02 | 5. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .02 | .02 | 4. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .02 | .02 | 3. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .02 | .02 | 2. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .02 | .02 | 2. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 3.05, TOTAL EXCESS = 1.35

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 7.                 | 11.92        | 1.                   | 0.    | 0.    | 0.       |
|                    |              | (INCHES) 1.097       | 1.352 | 1.352 | 1.352    |
|                    |              | (AC-FT) 1.           | 1.    | 1.    | 1.       |

CUMULATIVE AREA = .01 SQ MI

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40 KK \*\*\*\*\*  
\* RTA3 \*  
\* \*\*\*\*\*

ROUTE OSA3 TO DPA

HYDROGRAPH ROUTING DATA

42 RK KINEMATIC WAVE STREAM ROUTING  
 L 292. CHANNEL LENGTH  
 S .0822 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*  
 COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.57  | 1.34 | .36         | 97.33      | 6.55          | 715.47                   | 1.35           | 6.72                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6489E+00 EXCESS= .0000E+00 OUTFLOW= .6489E+00 BASIN STORAGE= .5781E-05 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |      |        |      |
|------|------|------|------|------|--------|------|
| MAIN | 4.57 | 1.34 | 5.00 | 6.50 | 715.00 | 1.35 |
|------|------|------|------|------|--------|------|

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HYDROGRAPH AT STATION RTA3

Table with 18 columns: DA, MON, HRMN, ORD, FLOW, \*, DA, MON, HRMN, ORD, FLOW, \*, DA, MON, HRMN, ORD, FLOW, \*. Contains two columns of hydrograph data points.

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PEAK FLOW      TIME      MAXIMUM AVERAGE FLOW
+ (CFS)        (HR)         6-HR      24-HR      72-HR      24.92-HR
+   7.        11.92      (CFS)
                      (INCHES)  1.      0.      0.      0.
                      (AC-FT)   1.097  1.353  1.353  1.353
                      CUMULATIVE AREA = .01 SQ MI

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*           *
43 KK      *   OSA4 *
*           *
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CHEYENNE MTN. HS OFFSITE BASIN A4

SUBBASIN RUNOFF DATA

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45 BA      SUBBASIN CHARACTERISTICS
          TAREA      .00 SUBBASIN AREA

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PRECIPITATION DATA

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11 PB      STORM      4.40 BASIN TOTAL PRECIPITATION

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12 PI      INCREMENTAL PRECIPITATION PATTERN
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
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          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .01 .01 .01 .01 .01 .01 .03 .03 .03 .03 .09
          .09 .01 .01 .01 .01 .01 .01 .01 .01 .01 .01
          .01 .01 .01 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
          .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00

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46 LS      SCS LOSS RATE
          STRTL      1.03 INITIAL ABSTRACTION
          CRVNER     66.00 CURVE NUMBER
          RTIMP      .00 PERCENT IMPERVIOUS AREA

```

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47 UD      SCS DIMENSIONLESS UNITGRAPH
          TLAG      .14 LAG

```

\*\*\*

WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

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UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES
          5.      13.      11.      5.      2.      1.      1.      0.      0.      0.
          0.

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HYDROGRAPH AT STATION OSA4

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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q  | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q  |
|----|-----|------|-----|------|------|--------|------|----|---|----|-----|------|-----|------|------|--------|------|----|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1230 | 151 | .03  | .02  | .02    | 1.   | 1. |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1235 | 152 | .03  | .01  | .01    | 1.   | 1. |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1240 | 153 | .03  | .01  | .01    | 1.   | 1. |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1245 | 154 | .03  | .01  | .01    | 1.   | 1. |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1250 | 155 | .02  | .01  | .01    | 1.   | 1. |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1255 | 156 | .02  | .01  | .01    | 1.   | 1. |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1300 | 157 | .02  | .01  | .01    | 0.   | 0. |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.   | 0. | * | 1  |     | 1305 | 158 | .02  | .01  | .01    | 0.   | 0. |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.   | 0. | * | 1  |     | 1310 | 159 | .02  | .01  | .01    | 0.   | 0. |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.   | 0. | * | 1  |     | 1315 | 160 | .02  | .01  | .01    | 0.   | 0. |
| 1  |     | 0050 | 11  | .02  | .02  | .00    | 0.   | 0. | * | 1  |     | 1320 | 161 | .02  | .01  | .01    | 0.   | 0. |
| 1  |     | 0055 | 12  | .02  | .02  | .00    | 0.   | 0. | * | 1  |     | 1325 | 162 | .02  | .01  | .01    | 0.   | 0. |
| 1  |     | 0100 | 13  | .02  | .02  | .00    | 0.   | 0. | * | 1  |     | 1330 | 163 | .02  | .01  | .01    | 0.   | 0. |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1335 | 164 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1340 | 165 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1345 | 166 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1350 | 167 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1355 | 168 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1400 | 169 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1405 | 170 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1410 | 171 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1415 | 172 | .01  | .01  | .01    | 0.   | 0. |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1420 | 173 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1425 | 174 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1430 | 175 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1435 | 176 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1440 | 177 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1445 | 178 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1450 | 179 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1455 | 180 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1500 | 181 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1505 | 182 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1510 | 183 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1515 | 184 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1520 | 185 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1525 | 186 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1530 | 187 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1535 | 188 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1540 | 189 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1545 | 190 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1550 | 191 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1555 | 192 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0330 | 43  | .00  | .00  | .00    | 0.   | 0. | * | 1  |     | 1600 | 193 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0335 | 44  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1605 | 194 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0340 | 45  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1610 | 195 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0345 | 46  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1615 | 196 | .01  | .00  | .01    | 0.   | 0. |
| 1  |     | 0350 | 47  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1620 | 197 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0355 | 48  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1625 | 198 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0400 | 49  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1630 | 199 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0405 | 50  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1635 | 200 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0410 | 51  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1640 | 201 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0415 | 52  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1645 | 202 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0420 | 53  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1650 | 203 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0425 | 54  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1655 | 204 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0430 | 55  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1700 | 205 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0435 | 56  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1705 | 206 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0440 | 57  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1710 | 207 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0445 | 58  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1715 | 208 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0450 | 59  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1720 | 209 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0455 | 60  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1725 | 210 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0500 | 61  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1730 | 211 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0505 | 62  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1735 | 212 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0510 | 63  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1740 | 213 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0515 | 64  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1745 | 214 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0520 | 65  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1750 | 215 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0525 | 66  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1755 | 216 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0530 | 67  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1800 | 217 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0535 | 68  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1805 | 218 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0540 | 69  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1810 | 219 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0545 | 70  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1815 | 220 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0550 | 71  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1820 | 221 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0555 | 72  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1825 | 222 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0600 | 73  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1830 | 223 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0605 | 74  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1835 | 224 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0610 | 75  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1840 | 225 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0615 | 76  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1845 | 226 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0620 | 77  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1850 | 227 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0625 | 78  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1855 | 228 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0630 | 79  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1900 | 229 | .01  | .00  | .00    | 0.   | 0. |
| 1  |     | 0635 | 80  | .01  | .01  | .00    | 0.   | 0. | * | 1  |     | 1905 | 230 | .01  | .00  | .00    | 0.   | 0. |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0640 | 81  | .01 | .01 | .00 | 0. | * | 1 | 1910 | 231 | .01 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .01 | .01 | .00 | 0. | * | 1 | 1915 | 232 | .01 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .01 | .01 | .00 | 0. | * | 1 | 1920 | 233 | .01 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .01 | .01 | .00 | 0. | * | 1 | 1925 | 234 | .01 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .01 | .01 | .00 | 0. | * | 1 | 1930 | 235 | .01 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .01 | .01 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .01 | .01 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .01 | .01 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .01 | .01 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .01 | .01 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .01 | .01 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .01 | .01 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .01 | .01 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .02 | .02 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .02 | .02 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .02 | .02 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .02 | .02 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .03 | .03 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .03 | .03 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .03 | .03 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .03 | .03 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .03 | .03 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .03 | .03 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .04 | .04 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .04 | .04 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .04 | .04 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .15 | .14 | .02 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .15 | .13 | .02 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .15 | .12 | .03 | 1. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .41 | .29 | .11 | 1. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .41 | .26 | .15 | 3. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .41 | .23 | .18 | 4. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .06 | .03 | .03 | 5. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .03 | .03 | 4. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .06 | .03 | .03 | 2. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .02 | .02 | 2. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .02 | .02 | 1. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .02 | .02 | 1. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .02 | .02 | 1. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .02 | .02 | 1. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 3.05, TOTAL EXCESS = 1.35

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| +                  | 5.           | 1.100                | 1.352 | 1.352 | 1.352    |
| +                  | 11.83        | 0.                   | 0.    | 0.    | 0.       |
|                    |              | (INCHES)             |       |       |          |
|                    |              | (AC-FT)              |       |       |          |

CUMULATIVE AREA = .00 SQ MI



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48 KK \*\*\*\*\*  
 \* \*  
 \* DPA \*  
 \* \*  
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DESIGN POINT A

50 HC HYDROGRAPH COMBINATION  
 ICOMP 4 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION DPA  
 SUM OF 4 HYDROGRAPHS

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| DA | MON  | HRMN | ORD | FLOW | * | DA   | MON | HRMN | ORD | FLOW | *    | DA  | MON | HRMN | ORD | FLOW | *   | DA | MON | HRMN | ORD | FLOW |
|----|------|------|-----|------|---|------|-----|------|-----|------|------|-----|-----|------|-----|------|-----|----|-----|------|-----|------|
| 1  | 0000 | 1    | 0.  | *    | 1 | 0615 | 76  | 0.   | *   | 1    | 1230 | 151 | 40. | *    | 1   | 1845 | 226 | 5. |     |      |     |      |
| 1  | 0005 | 2    | 0.  | *    | 1 | 0620 | 77  | 0.   | *   | 1    | 1235 | 152 | 36. | *    | 1   | 1850 | 227 | 5. |     |      |     |      |
| 1  | 0010 | 3    | 0.  | *    | 1 | 0625 | 78  | 0.   | *   | 1    | 1240 | 153 | 32. | *    | 1   | 1855 | 228 | 5. |     |      |     |      |
| 1  | 0015 | 4    | 0.  | *    | 1 | 0630 | 79  | 0.   | *   | 1    | 1245 | 154 | 29. | *    | 1   | 1900 | 229 | 5. |     |      |     |      |
| 1  | 0020 | 5    | 0.  | *    | 1 | 0635 | 80  | 0.   | *   | 1    | 1250 | 155 | 26. | *    | 1   | 1905 | 230 | 5. |     |      |     |      |
| 1  | 0025 | 6    | 0.  | *    | 1 | 0640 | 81  | 0.   | *   | 1    | 1255 | 156 | 24. | *    | 1   | 1910 | 231 | 5. |     |      |     |      |
| 1  | 0030 | 7    | 0.  | *    | 1 | 0645 | 82  | 0.   | *   | 1    | 1300 | 157 | 22. | *    | 1   | 1915 | 232 | 5. |     |      |     |      |
| 1  | 0035 | 8    | 0.  | *    | 1 | 0650 | 83  | 0.   | *   | 1    | 1305 | 158 | 20. | *    | 1   | 1920 | 233 | 5. |     |      |     |      |
| 1  | 0040 | 9    | 0.  | *    | 1 | 0655 | 84  | 0.   | *   | 1    | 1310 | 159 | 19. | *    | 1   | 1925 | 234 | 5. |     |      |     |      |
| 1  | 0045 | 10   | 0.  | *    | 1 | 0700 | 85  | 0.   | *   | 1    | 1315 | 160 | 18. | *    | 1   | 1930 | 235 | 5. |     |      |     |      |
| 1  | 0050 | 11   | 0.  | *    | 1 | 0705 | 86  | 0.   | *   | 1    | 1320 | 161 | 17. | *    | 1   | 1935 | 236 | 5. |     |      |     |      |
| 1  | 0055 | 12   | 0.  | *    | 1 | 0710 | 87  | 0.   | *   | 1    | 1325 | 162 | 16. | *    | 1   | 1940 | 237 | 5. |     |      |     |      |
| 1  | 0100 | 13   | 0.  | *    | 1 | 0715 | 88  | 0.   | *   | 1    | 1330 | 163 | 15. | *    | 1   | 1945 | 238 | 5. |     |      |     |      |
| 1  | 0105 | 14   | 0.  | *    | 1 | 0720 | 89  | 0.   | *   | 1    | 1335 | 164 | 15. | *    | 1   | 1950 | 239 | 5. |     |      |     |      |
| 1  | 0110 | 15   | 0.  | *    | 1 | 0725 | 90  | 0.   | *   | 1    | 1340 | 165 | 14. | *    | 1   | 1955 | 240 | 4. |     |      |     |      |
| 1  | 0115 | 16   | 0.  | *    | 1 | 0730 | 91  | 0.   | *   | 1    | 1345 | 166 | 13. | *    | 1   | 2000 | 241 | 4. |     |      |     |      |
| 1  | 0120 | 17   | 0.  | *    | 1 | 0735 | 92  | 0.   | *   | 1    | 1350 | 167 | 13. | *    | 1   | 2005 | 242 | 4. |     |      |     |      |
| 1  | 0125 | 18   | 0.  | *    | 1 | 0740 | 93  | 0.   | *   | 1    | 1355 | 168 | 12. | *    | 1   | 2010 | 243 | 4. |     |      |     |      |
| 1  | 0130 | 19   | 0.  | *    | 1 | 0745 | 94  | 0.   | *   | 1    | 1400 | 169 | 12. | *    | 1   | 2015 | 244 | 4. |     |      |     |      |
| 1  | 0135 | 20   | 0.  | *    | 1 | 0750 | 95  | 0.   | *   | 1    | 1405 | 170 | 12. | *    | 1   | 2020 | 245 | 4. |     |      |     |      |
| 1  | 0140 | 21   | 0.  | *    | 1 | 0755 | 96  | 0.   | *   | 1    | 1410 | 171 | 11. | *    | 1   | 2025 | 246 | 4. |     |      |     |      |
| 1  | 0145 | 22   | 0.  | *    | 1 | 0800 | 97  | 0.   | *   | 1    | 1415 | 172 | 11. | *    | 1   | 2030 | 247 | 4. |     |      |     |      |
| 1  | 0150 | 23   | 0.  | *    | 1 | 0805 | 98  | 0.   | *   | 1    | 1420 | 173 | 10. | *    | 1   | 2035 | 248 | 4. |     |      |     |      |
| 1  | 0155 | 24   | 0.  | *    | 1 | 0810 | 99  | 0.   | *   | 1    | 1425 | 174 | 10. | *    | 1   | 2040 | 249 | 4. |     |      |     |      |
| 1  | 0200 | 25   | 0.  | *    | 1 | 0815 | 100 | 0.   | *   | 1    | 1430 | 175 | 10. | *    | 1   | 2045 | 250 | 4. |     |      |     |      |
| 1  | 0205 | 26   | 0.  | *    | 1 | 0820 | 101 | 0.   | *   | 1    | 1435 | 176 | 9.  | *    | 1   | 2050 | 251 | 4. |     |      |     |      |
| 1  | 0210 | 27   | 0.  | *    | 1 | 0825 | 102 | 0.   | *   | 1    | 1440 | 177 | 9.  | *    | 1   | 2055 | 252 | 4. |     |      |     |      |
| 1  | 0215 | 28   | 0.  | *    | 1 | 0830 | 103 | 0.   | *   | 1    | 1445 | 178 | 9.  | *    | 1   | 2100 | 253 | 4. |     |      |     |      |
| 1  | 0220 | 29   | 0.  | *    | 1 | 0835 | 104 | 0.   | *   | 1    | 1450 | 179 | 9.  | *    | 1   | 2105 | 254 | 4. |     |      |     |      |
| 1  | 0225 | 30   | 0.  | *    | 1 | 0840 | 105 | 0.   | *   | 1    | 1455 | 180 | 9.  | *    | 1   | 2110 | 255 | 4. |     |      |     |      |
| 1  | 0230 | 31   | 0.  | *    | 1 | 0845 | 106 | 0.   | *   | 1    | 1500 | 181 | 9.  | *    | 1   | 2115 | 256 | 4. |     |      |     |      |
| 1  | 0235 | 32   | 0.  | *    | 1 | 0850 | 107 | 0.   | *   | 1    | 1505 | 182 | 8.  | *    | 1   | 2120 | 257 | 4. |     |      |     |      |
| 1  | 0240 | 33   | 0.  | *    | 1 | 0855 | 108 | 0.   | *   | 1    | 1510 | 183 | 8.  | *    | 1   | 2125 | 258 | 4. |     |      |     |      |
| 1  | 0245 | 34   | 0.  | *    | 1 | 0900 | 109 | 0.   | *   | 1    | 1515 | 184 | 8.  | *    | 1   | 2130 | 259 | 4. |     |      |     |      |
| 1  | 0250 | 35   | 0.  | *    | 1 | 0905 | 110 | 0.   | *   | 1    | 1520 | 185 | 8.  | *    | 1   | 2135 | 260 | 4. |     |      |     |      |
| 1  | 0255 | 36   | 0.  | *    | 1 | 0910 | 111 | 0.   | *   | 1    | 1525 | 186 | 8.  | *    | 1   | 2140 | 261 | 4. |     |      |     |      |
| 1  | 0300 | 37   | 0.  | *    | 1 | 0915 | 112 | 0.   | *   | 1    | 1530 | 187 | 8.  | *    | 1   | 2145 | 262 | 4. |     |      |     |      |
| 1  | 0305 | 38   | 0.  | *    | 1 | 0920 | 113 | 0.   | *   | 1    | 1535 | 188 | 8.  | *    | 1   | 2150 | 263 | 4. |     |      |     |      |
| 1  | 0310 | 39   | 0.  | *    | 1 | 0925 | 114 | 0.   | *   | 1    | 1540 | 189 | 7.  | *    | 1   | 2155 | 264 | 4. |     |      |     |      |
| 1  | 0315 | 40   | 0.  | *    | 1 | 0930 | 115 | 0.   | *   | 1    | 1545 | 190 | 7.  | *    | 1   | 2200 | 265 | 4. |     |      |     |      |
| 1  | 0320 | 41   | 0.  | *    | 1 | 0935 | 116 | 0.   | *   | 1    | 1550 | 191 | 7.  | *    | 1   | 2205 | 266 | 4. |     |      |     |      |
| 1  | 0325 | 42   | 0.  | *    | 1 | 0940 | 117 | 0.   | *   | 1    | 1555 | 192 | 7.  | *    | 1   | 2210 | 267 | 4. |     |      |     |      |
| 1  | 0330 | 43   | 0.  | *    | 1 | 0945 | 118 | 0.   | *   | 1    | 1600 | 193 | 7.  | *    | 1   | 2215 | 268 | 4. |     |      |     |      |
| 1  | 0335 | 44   | 0.  | *    | 1 | 0950 | 119 | 0.   | *   | 1    | 1605 | 194 | 7.  | *    | 1   | 2220 | 269 | 4. |     |      |     |      |
| 1  | 0340 | 45   | 0.  | *    | 1 | 0955 | 120 | 0.   | *   | 1    | 1610 | 195 | 7.  | *    | 1   | 2225 | 270 | 4. |     |      |     |      |
| 1  | 0345 | 46   | 0.  | *    | 1 | 1000 | 121 | 0.   | *   | 1    | 1615 | 196 | 7.  | *    | 1   | 2230 | 271 | 4. |     |      |     |      |
| 1  | 0350 | 47   | 0.  | *    | 1 | 1005 | 122 | 0.   | *   | 1    | 1620 | 197 | 7.  | *    | 1   | 2235 | 272 | 4. |     |      |     |      |
| 1  | 0355 | 48   | 0.  | *    | 1 | 1010 | 123 | 0.   | *   | 1    | 1625 | 198 | 7.  | *    | 1   | 2240 | 273 | 4. |     |      |     |      |
| 1  | 0400 | 49   | 0.  | *    | 1 | 1015 | 124 | 0.   | *   | 1    | 1630 | 199 | 7.  | *    | 1   | 2245 | 274 | 4. |     |      |     |      |
| 1  | 0405 | 50   | 0.  | *    | 1 | 1020 | 125 | 0.   | *   | 1    | 1635 | 200 | 7.  | *    | 1   | 2250 | 275 | 4. |     |      |     |      |
| 1  | 0410 | 51   | 0.  | *    | 1 | 1025 | 126 | 0.   | *   | 1    | 1640 | 201 | 7.  | *    | 1   | 2255 | 276 | 4. |     |      |     |      |
| 1  | 0415 | 52   | 0.  | *    | 1 | 1030 | 127 | 0.   | *   | 1    | 1645 | 202 | 7.  | *    | 1   | 2300 | 277 | 4. |     |      |     |      |
| 1  | 0420 | 53   | 0.  | *    | 1 | 1035 | 128 | 0.   | *   | 1    | 1650 | 203 | 6.  | *    | 1   | 2305 | 278 | 4. |     |      |     |      |
| 1  | 0425 | 54   | 0.  | *    | 1 | 1040 | 129 | 0.   | *   | 1    | 1655 | 204 | 6.  | *    | 1   | 2310 | 279 | 4. |     |      |     |      |
| 1  | 0430 | 55   | 0.  | *    | 1 | 1045 | 130 | 0.   | *   | 1    | 1700 | 205 | 6.  | *    | 1   | 2315 | 280 | 4. |     |      |     |      |
| 1  | 0435 | 56   | 0.  | *    | 1 | 1050 | 131 | 0.   | *   | 1    | 1705 | 206 | 6.  | *    | 1   | 2320 | 281 | 4. |     |      |     |      |

|   |      |    |    |   |   |      |     |      |   |   |      |     |    |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|------|---|---|------|-----|----|---|---|------|-----|----|
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 0.   | * | 1 | 1710 | 207 | 6. | * | 1 | 2325 | 282 | 4. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 0.   | * | 1 | 1715 | 208 | 6. | * | 1 | 2330 | 283 | 4. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 0.   | * | 1 | 1720 | 209 | 6. | * | 1 | 2335 | 284 | 4. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 0.   | * | 1 | 1725 | 210 | 6. | * | 1 | 2340 | 285 | 4. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 0.   | * | 1 | 1730 | 211 | 6. | * | 1 | 2345 | 286 | 4. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 1.   | * | 1 | 1735 | 212 | 6. | * | 1 | 2350 | 287 | 3. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 3.   | * | 1 | 1740 | 213 | 6. | * | 1 | 2355 | 288 | 3. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 6.   | * | 1 | 1745 | 214 | 6. | * | 2 | 0000 | 289 | 2. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 14.  | * | 1 | 1750 | 215 | 6. | * | 2 | 0005 | 290 | 2. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 30.  | * | 1 | 1755 | 216 | 6. | * | 2 | 0010 | 291 | 1. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 58.  | * | 1 | 1800 | 217 | 5. | * | 2 | 0015 | 292 | 1. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 88.  | * | 1 | 1805 | 218 | 5. | * | 2 | 0020 | 293 | 1. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 108. | * | 1 | 1810 | 219 | 5. | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 111. | * | 1 | 1815 | 220 | 5. | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 100. | * | 1 | 1820 | 221 | 5. | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 84.  | * | 1 | 1825 | 222 | 5. | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 68.  | * | 1 | 1830 | 223 | 5. | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 56.  | * | 1 | 1835 | 224 | 5. | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 47.  | * | 1 | 1840 | 225 | 5. | * | 2 | 0055 | 300 | 0. |

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| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 111.               | 12.00        | 21.                  | 6.    | 6.    | 6.       |
|                    |              | (INCHES)<br>9.65     | 1.200 | 1.200 | 1.200    |
|                    |              | (AC-FT)<br>10.       | 13.   | 13.   | 13.      |

CUMULATIVE AREA = .20 SQ MI

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*
*  OSB1  *
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CHEYENNE MIN. HS OFFSITE BASIN B1

SUBBASIN RUNOFF DATA

53 BA           SUBBASIN CHARACTERISTICS  
TAREA           .14   SUBBASIN AREA

PRECIPITATION DATA

11 PB           STORM           4.40   BASIN TOTAL PRECIPITATION

12 PI           INCREMENTAL PRECIPITATION PATTERN

|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

54 LS            SCS LOSS RATE  
                  STRFL            1.03 INITIAL ABSTRACTION  
                  CRVNER          66.00 CURVE NUMBER  
                  RTIMP            .00 PERCENT IMPERVIOUS AREA

55 UD            SCS DIMENSIONLESS UNITGRAPH  
                  TLAG            .29 LAG

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UNIT HYDROGRAPH  
 19 END-OF-PERIOD ORDINATES

29.            96.            176.            199.            177.            132.            82.            54.            37.            24.  
 16.            10.            7.            5.            3.            2.            1.            1.            0.

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HYDROGRAPH AT STATION      OSB1

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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON  | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|-----|------|-----|------|------|--------|--------|---|----|------|------|-----|------|------|--------|--------|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.     | * | 1  | 1230 | 151  | .03 | .02  | .02  | 29.    |        |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.     | * | 1  | 1235 | 152  | .03 | .01  | .01  | 26.    |        |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.     | * | 1  | 1240 | 153  | .03 | .01  | .01  | 23.    |        |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.     | * | 1  | 1245 | 154  | .03 | .01  | .01  | 21.    |        |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.     | * | 1  | 1250 | 155  | .02 | .01  | .01  | 19.    |        |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.     | * | 1  | 1255 | 156  | .02 | .01  | .01  | 17.    |        |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.     | * | 1  | 1300 | 157  | .02 | .01  | .01  | 16.    |        |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.     | * | 1  | 1305 | 158  | .02 | .01  | .01  | 15.    |        |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.     | * | 1  | 1310 | 159  | .02 | .01  | .01  | 14.    |        |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.     | * | 1  | 1315 | 160  | .02 | .01  | .01  | 13.    |        |
| 1  |     | 0050 | 11  | .02  | .02  | .00    | 0.     | * | 1  | 1320 | 161  | .02 | .01  | .01  | 12.    |        |
| 1  |     | 0055 | 12  | .02  | .02  | .00    | 0.     | * | 1  | 1325 | 162  | .02 | .01  | .01  | 12.    |        |
| 1  |     | 0100 | 13  | .02  | .02  | .00    | 0.     | * | 1  | 1330 | 163  | .02 | .01  | .01  | 11.    |        |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.     | * | 1  | 1335 | 164  | .01 | .01  | .01  | 11.    |        |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.     | * | 1  | 1340 | 165  | .01 | .01  | .01  | 10.    |        |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.     | * | 1  | 1345 | 166  | .01 | .01  | .01  | 10.    |        |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.     | * | 1  | 1350 | 167  | .01 | .01  | .01  | 9.     |        |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.     | * | 1  | 1355 | 168  | .01 | .01  | .01  | 9.     |        |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.     | * | 1  | 1400 | 169  | .01 | .01  | .01  | 9.     |        |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.     | * | 1  | 1405 | 170  | .01 | .01  | .01  | 8.     |        |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.     | * | 1  | 1410 | 171  | .01 | .01  | .01  | 8.     |        |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.     | * | 1  | 1415 | 172  | .01 | .01  | .01  | 8.     |        |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.     | * | 1  | 1420 | 173  | .01 | .00  | .01  | 8.     |        |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.     | * | 1  | 1425 | 174  | .01 | .00  | .01  | 7.     |        |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.     | * | 1  | 1430 | 175  | .01 | .00  | .01  | 7.     |        |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.     | * | 1  | 1435 | 176  | .01 | .00  | .01  | 7.     |        |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.     | * | 1  | 1440 | 177  | .01 | .00  | .01  | 7.     |        |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.     | * | 1  | 1445 | 178  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.     | * | 1  | 1450 | 179  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.     | * | 1  | 1455 | 180  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.     | * | 1  | 1500 | 181  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.     | * | 1  | 1505 | 182  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.     | * | 1  | 1510 | 183  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.     | * | 1  | 1515 | 184  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.     | * | 1  | 1520 | 185  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.     | * | 1  | 1525 | 186  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.     | * | 1  | 1530 | 187  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.     | * | 1  | 1535 | 188  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.     | * | 1  | 1540 | 189  | .01 | .00  | .01  | 6.     |        |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.     | * | 1  | 1545 | 190  | .01 | .00  | .01  | 5.     |        |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.     | * | 1  | 1550 | 191  | .01 | .00  | .01  | 5.     |        |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.     | * | 1  | 1555 | 192  | .01 | .00  | .01  | 5.     |        |
| 1  |     | 0330 | 43  | .00  | .00  | .00    | 0.     | * | 1  | 1600 | 193  | .01 | .00  | .01  | 5.     |        |
| 1  |     | 0335 | 44  | .01  | .01  | .00    | 0.     | * | 1  | 1605 | 194  | .01 | .00  | .01  | 5.     |        |
| 1  |     | 0340 | 45  | .01  | .01  | .00    | 0.     | * | 1  | 1610 | 195  | .01 | .00  | .01  | 5.     |        |
| 1  |     | 0345 | 46  | .01  | .01  | .00    | 0.     | * | 1  | 1615 | 196  | .01 | .00  | .01  | 5.     |        |
| 1  |     | 0350 | 47  | .01  | .01  | .00    | 0.     | * | 1  | 1620 | 197  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0355 | 48  | .01  | .01  | .00    | 0.     | * | 1  | 1625 | 198  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0400 | 49  | .01  | .01  | .00    | 0.     | * | 1  | 1630 | 199  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0405 | 50  | .01  | .01  | .00    | 0.     | * | 1  | 1635 | 200  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0410 | 51  | .01  | .01  | .00    | 0.     | * | 1  | 1640 | 201  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0415 | 52  | .01  | .01  | .00    | 0.     | * | 1  | 1645 | 202  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0420 | 53  | .01  | .01  | .00    | 0.     | * | 1  | 1650 | 203  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0425 | 54  | .01  | .01  | .00    | 0.     | * | 1  | 1655 | 204  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0430 | 55  | .01  | .01  | .00    | 0.     | * | 1  | 1700 | 205  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0435 | 56  | .01  | .01  | .00    | 0.     | * | 1  | 1705 | 206  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0440 | 57  | .01  | .01  | .00    | 0.     | * | 1  | 1710 | 207  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0445 | 58  | .01  | .01  | .00    | 0.     | * | 1  | 1715 | 208  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0450 | 59  | .01  | .01  | .00    | 0.     | * | 1  | 1720 | 209  | .01 | .00  | .00  | 5.     |        |
| 1  |     | 0455 | 60  | .01  | .01  | .00    | 0.     | * | 1  | 1725 | 210  | .01 | .00  | .00  | 5.     |        |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0500 | 61  | .01 | .01 | .00 | 0.  | * | 1 | 1730 | 211 | .01 | .00 | .00 | 5. |
| 1 | 0505 | 62  | .01 | .01 | .00 | 0.  | * | 1 | 1735 | 212 | .01 | .00 | .00 | 5. |
| 1 | 0510 | 63  | .01 | .01 | .00 | 0.  | * | 1 | 1740 | 213 | .01 | .00 | .00 | 5. |
| 1 | 0515 | 64  | .01 | .01 | .00 | 0.  | * | 1 | 1745 | 214 | .01 | .00 | .00 | 4. |
| 1 | 0520 | 65  | .01 | .01 | .00 | 0.  | * | 1 | 1750 | 215 | .01 | .00 | .00 | 4. |
| 1 | 0525 | 66  | .01 | .01 | .00 | 0.  | * | 1 | 1755 | 216 | .01 | .00 | .00 | 4. |
| 1 | 0530 | 67  | .01 | .01 | .00 | 0.  | * | 1 | 1800 | 217 | .01 | .00 | .00 | 4. |
| 1 | 0535 | 68  | .01 | .01 | .00 | 0.  | * | 1 | 1805 | 218 | .01 | .00 | .00 | 4. |
| 1 | 0540 | 69  | .01 | .01 | .00 | 0.  | * | 1 | 1810 | 219 | .01 | .00 | .00 | 4. |
| 1 | 0545 | 70  | .01 | .01 | .00 | 0.  | * | 1 | 1815 | 220 | .01 | .00 | .00 | 4. |
| 1 | 0550 | 71  | .01 | .01 | .00 | 0.  | * | 1 | 1820 | 221 | .01 | .00 | .00 | 4. |
| 1 | 0555 | 72  | .01 | .01 | .00 | 0.  | * | 1 | 1825 | 222 | .01 | .00 | .00 | 4. |
| 1 | 0600 | 73  | .01 | .01 | .00 | 0.  | * | 1 | 1830 | 223 | .01 | .00 | .00 | 4. |
| 1 | 0605 | 74  | .01 | .01 | .00 | 0.  | * | 1 | 1835 | 224 | .01 | .00 | .00 | 4. |
| 1 | 0610 | 75  | .01 | .01 | .00 | 0.  | * | 1 | 1840 | 225 | .01 | .00 | .00 | 4. |
| 1 | 0615 | 76  | .01 | .01 | .00 | 0.  | * | 1 | 1845 | 226 | .01 | .00 | .00 | 4. |
| 1 | 0620 | 77  | .01 | .01 | .00 | 0.  | * | 1 | 1850 | 227 | .01 | .00 | .00 | 4. |
| 1 | 0625 | 78  | .01 | .01 | .00 | 0.  | * | 1 | 1855 | 228 | .01 | .00 | .00 | 4. |
| 1 | 0630 | 79  | .01 | .01 | .00 | 0.  | * | 1 | 1900 | 229 | .01 | .00 | .00 | 4. |
| 1 | 0635 | 80  | .01 | .01 | .00 | 0.  | * | 1 | 1905 | 230 | .01 | .00 | .00 | 4. |
| 1 | 0640 | 81  | .01 | .01 | .00 | 0.  | * | 1 | 1910 | 231 | .01 | .00 | .00 | 4. |
| 1 | 0645 | 82  | .01 | .01 | .00 | 0.  | * | 1 | 1915 | 232 | .01 | .00 | .00 | 4. |
| 1 | 0650 | 83  | .01 | .01 | .00 | 0.  | * | 1 | 1920 | 233 | .01 | .00 | .00 | 4. |
| 1 | 0655 | 84  | .01 | .01 | .00 | 0.  | * | 1 | 1925 | 234 | .01 | .00 | .00 | 4. |
| 1 | 0700 | 85  | .01 | .01 | .00 | 0.  | * | 1 | 1930 | 235 | .01 | .00 | .00 | 4. |
| 1 | 0705 | 86  | .01 | .01 | .00 | 0.  | * | 1 | 1935 | 236 | .00 | .00 | .00 | 4. |
| 1 | 0710 | 87  | .01 | .01 | .00 | 0.  | * | 1 | 1940 | 237 | .00 | .00 | .00 | 4. |
| 1 | 0715 | 88  | .01 | .01 | .00 | 0.  | * | 1 | 1945 | 238 | .00 | .00 | .00 | 4. |
| 1 | 0720 | 89  | .01 | .01 | .00 | 0.  | * | 1 | 1950 | 239 | .00 | .00 | .00 | 3. |
| 1 | 0725 | 90  | .01 | .01 | .00 | 0.  | * | 1 | 1955 | 240 | .00 | .00 | .00 | 3. |
| 1 | 0730 | 91  | .01 | .01 | .00 | 0.  | * | 1 | 2000 | 241 | .00 | .00 | .00 | 3. |
| 1 | 0735 | 92  | .01 | .01 | .00 | 0.  | * | 1 | 2005 | 242 | .00 | .00 | .00 | 3. |
| 1 | 0740 | 93  | .01 | .01 | .00 | 0.  | * | 1 | 2010 | 243 | .00 | .00 | .00 | 3. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0.  | * | 1 | 2015 | 244 | .00 | .00 | .00 | 3. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0.  | * | 1 | 2020 | 245 | .00 | .00 | .00 | 3. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0.  | * | 1 | 2025 | 246 | .00 | .00 | .00 | 3. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0.  | * | 1 | 2030 | 247 | .00 | .00 | .00 | 3. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0.  | * | 1 | 2035 | 248 | .00 | .00 | .00 | 3. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0.  | * | 1 | 2040 | 249 | .00 | .00 | .00 | 3. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0.  | * | 1 | 2045 | 250 | .00 | .00 | .00 | 3. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0.  | * | 1 | 2050 | 251 | .00 | .00 | .00 | 3. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0.  | * | 1 | 2055 | 252 | .00 | .00 | .00 | 3. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0.  | * | 1 | 2100 | 253 | .00 | .00 | .00 | 3. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0.  | * | 1 | 2105 | 254 | .00 | .00 | .00 | 3. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0.  | * | 1 | 2110 | 255 | .00 | .00 | .00 | 3. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0.  | * | 1 | 2115 | 256 | .00 | .00 | .00 | 3. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0.  | * | 1 | 2120 | 257 | .00 | .00 | .00 | 3. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0.  | * | 1 | 2125 | 258 | .00 | .00 | .00 | 3. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0.  | * | 1 | 2130 | 259 | .00 | .00 | .00 | 3. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0.  | * | 1 | 2135 | 260 | .00 | .00 | .00 | 3. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0.  | * | 1 | 2140 | 261 | .00 | .00 | .00 | 3. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0.  | * | 1 | 2145 | 262 | .00 | .00 | .00 | 3. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0.  | * | 1 | 2150 | 263 | .00 | .00 | .00 | 3. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0.  | * | 1 | 2155 | 264 | .00 | .00 | .00 | 3. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0.  | * | 1 | 2200 | 265 | .00 | .00 | .00 | 3. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0.  | * | 1 | 2205 | 266 | .00 | .00 | .00 | 3. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0.  | * | 1 | 2210 | 267 | .00 | .00 | .00 | 3. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0.  | * | 1 | 2215 | 268 | .00 | .00 | .00 | 3. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0.  | * | 1 | 2220 | 269 | .00 | .00 | .00 | 3. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0.  | * | 1 | 2225 | 270 | .00 | .00 | .00 | 3. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0.  | * | 1 | 2230 | 271 | .00 | .00 | .00 | 3. |
| 1 | 1005 | 122 | .02 | .02 | .00 | 0.  | * | 1 | 2235 | 272 | .00 | .00 | .00 | 3. |
| 1 | 1010 | 123 | .02 | .02 | .00 | 0.  | * | 1 | 2240 | 273 | .00 | .00 | .00 | 3. |
| 1 | 1015 | 124 | .02 | .02 | .00 | 0.  | * | 1 | 2245 | 274 | .00 | .00 | .00 | 3. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 0.  | * | 1 | 2250 | 275 | .00 | .00 | .00 | 3. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 0.  | * | 1 | 2255 | 276 | .00 | .00 | .00 | 3. |
| 1 | 1030 | 127 | .02 | .02 | .00 | 0.  | * | 1 | 2300 | 277 | .00 | .00 | .00 | 3. |
| 1 | 1035 | 128 | .03 | .03 | .00 | 0.  | * | 1 | 2305 | 278 | .00 | .00 | .00 | 3. |
| 1 | 1040 | 129 | .03 | .03 | .00 | 0.  | * | 1 | 2310 | 279 | .00 | .00 | .00 | 3. |
| 1 | 1045 | 130 | .03 | .03 | .00 | 0.  | * | 1 | 2315 | 280 | .00 | .00 | .00 | 3. |
| 1 | 1050 | 131 | .03 | .03 | .00 | 0.  | * | 1 | 2320 | 281 | .00 | .00 | .00 | 3. |
| 1 | 1055 | 132 | .03 | .03 | .00 | 0.  | * | 1 | 2325 | 282 | .00 | .00 | .00 | 3. |
| 1 | 1100 | 133 | .03 | .03 | .00 | 0.  | * | 1 | 2330 | 283 | .00 | .00 | .00 | 3. |
| 1 | 1105 | 134 | .04 | .04 | .00 | 0.  | * | 1 | 2335 | 284 | .00 | .00 | .00 | 3. |
| 1 | 1110 | 135 | .04 | .04 | .00 | 1.  | * | 1 | 2340 | 285 | .00 | .00 | .00 | 3. |
| 1 | 1115 | 136 | .04 | .04 | .00 | 1.  | * | 1 | 2345 | 286 | .00 | .00 | .00 | 3. |
| 1 | 1120 | 137 | .15 | .14 | .02 | 2.  | * | 1 | 2350 | 287 | .00 | .00 | .00 | 2. |
| 1 | 1125 | 138 | .15 | .13 | .02 | 4.  | * | 1 | 2355 | 288 | .00 | .00 | .00 | 2. |
| 1 | 1130 | 139 | .15 | .12 | .03 | 8.  | * | 2 | 0000 | 289 | .00 | .00 | .00 | 2. |
| 1 | 1135 | 140 | .41 | .29 | .11 | 15. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 1. |
| 1 | 1140 | 141 | .41 | .26 | .15 | 29. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 1. |
| 1 | 1145 | 142 | .41 | .23 | .18 | 52. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 1. |
| 1 | 1150 | 143 | .06 | .03 | .03 | 77. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .03 | .03 | 91. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 1200 | 145 | .06 | .03 | .03 | 90. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .02 | .02 | 78. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .02 | .02 | 63. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .02 | .02 | 50. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .02 | .02 | 41. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .02 | .02 | 35. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 3.05, TOTAL EXCESS = 1.35

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | (CFS) | 6-HR<br>(INCHES)<br>(AC-FT) | MAXIMUM AVERAGE FLOW<br>24-HR | 72-HR | 24.92-HR |
|--------------------|--------------|-------|-----------------------------|-------------------------------|-------|----------|
| 91.                | 11.92        | 16.   | 1.096                       | 5.                            | 5.    | 5.       |
|                    |              | 8.    | 10.                         | 1.352                         | 1.352 | 1.352    |
|                    |              |       | 10.                         | 10.                           | 10.   | 10.      |

CUMULATIVE AREA = .14 SQ MI

1

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

| OPERATION | STATION       | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD |         |         | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|-----------|---------------|-----------|--------------|---------------------------------|---------|---------|------------|---------------|-------------------|
|           |               |           |              | 6-HOUR                          | 24-HOUR | 72-HOUR |            |               |                   |
| +         | HYDROGRAPH AT |           |              |                                 |         |         |            |               |                   |
| +         |               | OSA1      | 85.          | 12.00                           | 16.     | 5.      | 5.         | .16           |                   |
| +         | ROUTED TO     |           |              |                                 |         |         |            |               |                   |
| +         |               | RTA1      | 85.          | 12.00                           | 16.     | 5.      | 5.         | .16           |                   |
| +         | HYDROGRAPH AT |           |              |                                 |         |         |            |               |                   |
| +         |               | OSA2      | 17.          | 11.92                           | 3.      | 1.      | 1.         | .03           |                   |
| +         | ROUTED TO     |           |              |                                 |         |         |            |               |                   |
| +         |               | RTA2      | 17.          | 12.00                           | 3.      | 1.      | 1.         | .03           |                   |
| +         | HYDROGRAPH AT |           |              |                                 |         |         |            |               |                   |
| +         |               |           | 7.           | 11.92                           | 1.      | 0.      | 0.         | .01           |                   |
| +         | ROUTED TO     |           |              |                                 |         |         |            |               |                   |
| +         |               | RTA3      | 7.           | 11.92                           | 1.      | 0.      | 0.         | .01           |                   |
| +         | HYDROGRAPH AT |           |              |                                 |         |         |            |               |                   |
| +         |               | OSA4      | 5.           | 11.83                           | 1.      | 0.      | 0.         | .00           |                   |
| +         | 4 COMBINED AT |           |              |                                 |         |         |            |               |                   |
| +         |               | DPA       | 111.         | 12.00                           | 21.     | 6.      | 6.         | .20           |                   |
| +         | HYDROGRAPH AT |           |              |                                 |         |         |            |               |                   |
| +         |               | OSB1      | 91.          | 11.92                           | 16.     | 5.      | 5.         | .14           |                   |

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING  
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

| ISTAQ | ELEMENT | DT<br>(MIN) | PEAK<br>(CFS) | TIME TO PEAK<br>(MIN) | VOLUME<br>(IN) | DT<br>(MIN) | INTERPOLATED TO<br>COMPUTATION INTERVAL |                       | VOLUME<br>(IN) |
|-------|---------|-------------|---------------|-----------------------|----------------|-------------|-----------------------------------------|-----------------------|----------------|
|       |         |             |               |                       |                |             | PEAK<br>(CFS)                           | TIME TO PEAK<br>(MIN) |                |
| RTA1  | MANE    | .35         | 85.15         | 720.21                | 1.16           | 5.00        | 85.08                                   | 720.00                | 1.16           |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9847E+01 EXCESS= .0000E+00 OUTFLOW= .9846E+01 BASIN STORAGE= .1300E-03 PERCENT ERROR= .0

RTA2 MANE .27 17.27 715.56 1.35 5.00 17.16 720.00 1.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1875E+01 EXCESS= .0000E+00 OUTFLOW= .1875E+01 BASIN STORAGE= .2380E-04 PERCENT ERROR= .0

RTA3 MANE .36 6.55 715.47 1.35 5.00 6.50 715.00 1.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6489E+00 EXCESS= .0000E+00 OUTFLOW= .6489E+00 BASIN STORAGE= .5781E-05 PERCENT ERROR= .0

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

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 11/04/1997 TIME 15:17:53 *
*****

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*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*****

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

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

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

| LINE | ID       | 1                                                                | 2     | 3    | 4     | 5    | 6    | 7    | 8    | 9    | 10   |
|------|----------|------------------------------------------------------------------|-------|------|-------|------|------|------|------|------|------|
| 1    | ID       | CHEYENNE MOUNTAIN HIGH SCHOOL MDDP                               |       |      |       |      |      |      |      |      |      |
| 2    | ID       | BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MTN. SCHOOLS |       |      |       |      |      |      |      |      |      |
| 3    | ID       | FUTURE UPSTREAM 5-YR FLOWS NOV. 4, 1997                          |       |      |       |      |      |      |      |      |      |
|      | *DIAGRAM |                                                                  |       |      |       |      |      |      |      |      |      |
| 4    | IT       | 5                                                                |       |      | 300   |      |      |      |      |      |      |
| 5    | IO       | 0                                                                |       |      |       |      |      |      |      |      |      |
| 6    | IN       | 15                                                               |       |      |       |      |      |      |      |      |      |
| 7    | KK       | OSA1                                                             |       |      |       |      |      |      |      |      |      |
| 8    | KM       | CHEYENNE MTN. HS OFFSITE BASIN A1                                |       |      |       |      |      |      |      |      |      |
| 9    | KO       | 3                                                                |       |      |       |      |      |      |      |      |      |
| 10   | BA       | 0.159                                                            |       |      |       |      |      |      |      |      |      |
| 11   | PB       | 2.6                                                              |       |      |       |      |      |      |      |      |      |
| 12   | PC       | .002                                                             | .005  | .008 | .0011 | .014 | .017 | .02  | .023 | .026 | .029 |
| 13   | PC       | .032                                                             | .035  | .038 | .041  | .044 | .048 | .052 | .056 | .06  | .064 |
| 14   | PC       | .068                                                             | .072  | .076 | .08   | .085 | .09  | .095 | .1   | .105 | .11  |
| 15   | PC       | .115                                                             | .12   | .126 | .133  | .14  | .147 | .155 | .163 | .172 | .181 |
| 16   | PC       | .191                                                             | .203  | .218 | .236  | .257 | .283 | .387 | .663 | .707 | .735 |
| 17   | PC       | .758                                                             | .776  | .791 | .804  | .815 | .825 | .834 | .842 | .849 | .856 |
| 18   | PC       | .863                                                             | .869  | .875 | .881  | .887 | .893 | .898 | .903 | .908 | .913 |
| 19   | PC       | .918                                                             | .922  | .926 | .93   | .934 | .938 | .942 | .946 | .95  | .953 |
| 20   | PC       | .956                                                             | .959  | .962 | .965  | .968 | .971 | .974 | .977 | .98  | .983 |
| 21   | PC       | .986                                                             | .989  | .992 | .995  | .998 | 1    |      |      |      |      |
| 22   | LS       | 70                                                               |       |      |       |      |      |      |      |      |      |
| 23   | UD       | 0.292                                                            |       |      |       |      |      |      |      |      |      |
| 24   | KK       | RTA1                                                             |       |      |       |      |      |      |      |      |      |
| 25   | KM       | ROUTE OSA1 TO DPA                                                |       |      |       |      |      |      |      |      |      |
| 26   | RK       | 395                                                              | .0709 | .035 |       |      | TRAP | 2    | 4    |      |      |
| 27   | KK       | OSA2                                                             |       |      |       |      |      |      |      |      |      |
| 28   | KM       | CHEYENNE MTN. HS OFFSITE BASIN A2                                |       |      |       |      |      |      |      |      |      |
| 29   | BA       | .026                                                             |       |      |       |      |      |      |      |      |      |
| 30   | LS       | 77                                                               |       |      |       |      |      |      |      |      |      |
| 31   | UD       | 0.266                                                            |       |      |       |      |      |      |      |      |      |
| 32   | KK       | RTA2                                                             |       |      |       |      |      |      |      |      |      |
| 33   | KM       | ROUTE OSA2 TO DPA                                                |       |      |       |      |      |      |      |      |      |
| 34   | RK       | 311                                                              | .0707 | .035 |       |      | TRAP | 2    | 4    |      |      |
| 35   | KM       | OSA3                                                             |       |      |       |      |      |      |      |      |      |
| 36   | KK       | CHEYENNE MTN. HS OFFSITE BASIN A3                                |       |      |       |      |      |      |      |      |      |
| 37   | BA       | .009                                                             |       |      |       |      |      |      |      |      |      |
| 38   | LS       | 77                                                               |       |      |       |      |      |      |      |      |      |
| 39   | UD       | 0.227                                                            |       |      |       |      |      |      |      |      |      |

40 KK RTA3  
 41 KM ROUTE OSA3 TO DPA  
 42 RK 292 .0822 .035 TRAP 2 4  
 HEC-1 INPUT

1

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

43 KK OSA4  
 44 KM CHEYENNE MTN. HS OFFSITE BASIN A4  
 45 BA .005  
 46 LS 77  
 47 UD 0.127

48 KK DPA  
 49 KM DESIGN POINT A  
 50 HC 4

51 KK OSB1  
 52 KM CHEYENNE MTN. HS OFFSITE BASIN B1  
 53 BA 0.136  
 54 LS 77  
 55 UD 0.277  
 56 ZZ

SCHEMATIC DIAGRAM OF STREAM NETWORK

1

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW  
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

```

  7 OSA1
    V
    V
  24 RTA1
    .
    .
  27 . OSA2
    . V
    . V
  32 . RTA2
    .
    .
  36 .
    .
    . V
    . V
  40 . RTA3
    .
    .
  43 . OSA4
    .
    .
  48 DPA.....
    .
  51 . OSB1
  
```

(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

1\*\*\*\*\*  
 \* FLOOD HYDROGRAPH PACKAGE (HEC-1) \*  
 \* SEPTEMBER 1990 \*  
 \* VERSION 4.0 \*  
 \* RUN DATE 11/04/1997 TIME 15:17:53 \*  
 \*\*\*\*\*

\*\*\*\*\*  
 \* U.S. ARMY CORPS OF ENGINEERS \*  
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 \*\*\*\*\*

CHEYENNE MOUNTAIN HIGH SCHOOL MDDP  
 BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MTN. SCHOOLS  
 FUTURE UPSTREAM 5-YR FLOWS NOV. 4, 1997

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

IT HYDROGRAPH TIME DATA  
 NMIN 5 MINUTES IN COMPUTATION INTERVAL  
 IDATE 1 0 STARTING DATE



```

      ITIME      0000  STARTING TIME
      NO         300  NUMBER OF HYDROGRAPH ORDINATES
      NDDATE     2    0  ENDING DATE
      NDTIME     0055  ENDING TIME
      ICENT      19   CENTURY MARK

```

```

      COMPUTATION INTERVAL .08 HOURS
      TOTAL TIME BASE     24.92 HOURS

```

```

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

```

\*\*\* \*\*

```

*****
*
7 KK *     OSA1 *
*
*****

```

CHEYENNE MTN. HS OFFSITE BASIN A1

```

9 KO     OUTPUT CONTROL VARIABLES
      IPRINT      3  PRINT CONTROL
      IPLOT       0  PLOT CONTROL
      QSCAL       0.  HYDROGRAPH PLOT SCALE

```

```

6 IN     TIME DATA FOR INPUT TIME SERIES
      JXMIN      15  TIME INTERVAL IN MINUTES
      JXDATE     1   0  STARTING DATE
      JXTIME     0   0  STARTING TIME

```

SUBBASIN RUNOFF DATA

```

10 BA    SUBBASIN CHARACTERISTICS
      TAREA      .16  SUBBASIN AREA

```

PRECIPITATION DATA

```

11 PB    STORM      2.60  BASIN TOTAL PRECIPITATION

```

```

12 PI    INCREMENTAL PRECIPITATION PATTERN
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
      .00     .00     .00     .00     .00     .00     .00     .00     .00     .00

```

```

22 LS    SCS LOSS RATE
      STRTL      .86  INITIAL ABSTRACTION
      CRVNBR     70.00  CURVE NUMBER
      RTIMP      .00  PERCENT IMPERVIOUS AREA

```

23 UD SCS DIMENSIONLESS UNITGRAPH  
 TLAG .29 LAG

\*\*\*

UNIT HYDROGRAPH  
 20 END-OF-PERIOD ORDINATES

33. 108. 202. 231. 207. 157. 98. 65. 44. 29.  
 20. 13. 9. 6. 4. 3. 2. 1. 1. 0.

\*\*\* \*\*\* \*\*\* \*\*\* \*\*\*

HYDROGRAPH AT STATION OSA1

TOTAL RAINFALL = 2.60, TOTAL LOSS = 2.09, TOTAL EXCESS = .51

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 35.                | 12.00        | 7.                   | 2.    | 2.    | 2.       |
|                    |              | (INCHES)<br>.402     | .513  | .513  | .513     |
|                    |              | (AC-FT)<br>3.        | 4.    | 4.    | 4.       |

CUMULATIVE AREA = .16 SQ MI

\*\*\*\*\*

24 KK

\*\*\*\*\*  
 \* \*  
 \* RTA1 \*  
 \* \*  
 \*\*\*\*\*

ROUTE OSA1 TO DPA

HYDROGRAPH ROUTING DATA

26 RK

KINEMATIC WAVE STREAM ROUTING  
 L 395. CHANNEL LENGTH  
 S .0709 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*

COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .28         | 131.67     | 34.81         | 720.43                   | .51            | 9.73                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4348E+01 EXCESS= .0000E+00 OUTFLOW= .4348E+01 BASIN STORAGE= .6211E-04 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |       |        |     |
|------|------|------|------|-------|--------|-----|
| MAIN | 4.24 | 1.34 | 5.00 | 34.74 | 720.00 | .51 |
|------|------|------|------|-------|--------|-----|

\*\*\*\*\*

HYDROGRAPH AT STATION RTA1

\*\*\*\*\*

| DA | MON  | HRMN | ORD | FLOW | * | DA   | MON | HRMN | ORD | FLOW | *    | DA  | MON | HRMN | ORD | FLOW | *   | DA | MON | HRMN | ORD | FLOW | * |
|----|------|------|-----|------|---|------|-----|------|-----|------|------|-----|-----|------|-----|------|-----|----|-----|------|-----|------|---|
| 1  | 0000 | 1    | 0.  | *    | 1 | 0615 | 76  | 0.   | *   | 1    | 1230 | 151 | 14. | *    | 1   | 1845 | 226 | 2. |     |      |     |      |   |
| 1  | 0005 | 2    | 0.  | *    | 1 | 0620 | 77  | 0.   | *   | 1    | 1235 | 152 | 12. | *    | 1   | 1850 | 227 | 2. |     |      |     |      |   |
| 1  | 0010 | 3    | 0.  | *    | 1 | 0625 | 78  | 0.   | *   | 1    | 1240 | 153 | 11. | *    | 1   | 1855 | 228 | 2. |     |      |     |      |   |
| 1  | 0015 | 4    | 0.  | *    | 1 | 0630 | 79  | 0.   | *   | 1    | 1245 | 154 | 10. | *    | 1   | 1900 | 229 | 2. |     |      |     |      |   |

|   |      |    |    |   |   |      |     |     |   |   |      |     |    |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|-----|---|---|------|-----|----|---|---|------|-----|----|
| 1 | 0020 | 5  | 0. | * | 1 | 0635 | 80  | 0.  | * | 1 | 1250 | 155 | 9. | * | 1 | 1905 | 230 | 2. |
| 1 | 0025 | 6  | 0. | * | 1 | 0640 | 81  | 0.  | * | 1 | 1255 | 156 | 9. | * | 1 | 1910 | 231 | 2. |
| 1 | 0030 | 7  | 0. | * | 1 | 0645 | 82  | 0.  | * | 1 | 1300 | 157 | 8. | * | 1 | 1915 | 232 | 2. |
| 1 | 0035 | 8  | 0. | * | 1 | 0650 | 83  | 0.  | * | 1 | 1305 | 158 | 7. | * | 1 | 1920 | 233 | 2. |
| 1 | 0040 | 9  | 0. | * | 1 | 0655 | 84  | 0.  | * | 1 | 1310 | 159 | 7. | * | 1 | 1925 | 234 | 2. |
| 1 | 0045 | 10 | 0. | * | 1 | 0700 | 85  | 0.  | * | 1 | 1315 | 160 | 7. | * | 1 | 1930 | 235 | 2. |
| 1 | 0050 | 11 | 0. | * | 1 | 0705 | 86  | 0.  | * | 1 | 1320 | 161 | 6. | * | 1 | 1935 | 236 | 2. |
| 1 | 0055 | 12 | 0. | * | 1 | 0710 | 87  | 0.  | * | 1 | 1325 | 162 | 6. | * | 1 | 1940 | 237 | 2. |
| 1 | 0100 | 13 | 0. | * | 1 | 0715 | 88  | 0.  | * | 1 | 1330 | 163 | 6. | * | 1 | 1945 | 238 | 2. |
| 1 | 0105 | 14 | 0. | * | 1 | 0720 | 89  | 0.  | * | 1 | 1335 | 164 | 5. | * | 1 | 1950 | 239 | 2. |
| 1 | 0110 | 15 | 0. | * | 1 | 0725 | 90  | 0.  | * | 1 | 1340 | 165 | 5. | * | 1 | 1955 | 240 | 2. |
| 1 | 0115 | 16 | 0. | * | 1 | 0730 | 91  | 0.  | * | 1 | 1345 | 166 | 5. | * | 1 | 2000 | 241 | 2. |
| 1 | 0120 | 17 | 0. | * | 1 | 0735 | 92  | 0.  | * | 1 | 1350 | 167 | 5. | * | 1 | 2005 | 242 | 2. |
| 1 | 0125 | 18 | 0. | * | 1 | 0740 | 93  | 0.  | * | 1 | 1355 | 168 | 5. | * | 1 | 2010 | 243 | 2. |
| 1 | 0130 | 19 | 0. | * | 1 | 0745 | 94  | 0.  | * | 1 | 1400 | 169 | 4. | * | 1 | 2015 | 244 | 2. |
| 1 | 0135 | 20 | 0. | * | 1 | 0750 | 95  | 0.  | * | 1 | 1405 | 170 | 4. | * | 1 | 2020 | 245 | 2. |
| 1 | 0140 | 21 | 0. | * | 1 | 0755 | 96  | 0.  | * | 1 | 1410 | 171 | 4. | * | 1 | 2025 | 246 | 2. |
| 1 | 0145 | 22 | 0. | * | 1 | 0800 | 97  | 0.  | * | 1 | 1415 | 172 | 4. | * | 1 | 2030 | 247 | 2. |
| 1 | 0150 | 23 | 0. | * | 1 | 0805 | 98  | 0.  | * | 1 | 1420 | 173 | 4. | * | 1 | 2035 | 248 | 2. |
| 1 | 0155 | 24 | 0. | * | 1 | 0810 | 99  | 0.  | * | 1 | 1425 | 174 | 4. | * | 1 | 2040 | 249 | 2. |
| 1 | 0200 | 25 | 0. | * | 1 | 0815 | 100 | 0.  | * | 1 | 1430 | 175 | 4. | * | 1 | 2045 | 250 | 2. |
| 1 | 0205 | 26 | 0. | * | 1 | 0820 | 101 | 0.  | * | 1 | 1435 | 176 | 4. | * | 1 | 2050 | 251 | 2. |
| 1 | 0210 | 27 | 0. | * | 1 | 0825 | 102 | 0.  | * | 1 | 1440 | 177 | 3. | * | 1 | 2055 | 252 | 2. |
| 1 | 0215 | 28 | 0. | * | 1 | 0830 | 103 | 0.  | * | 1 | 1445 | 178 | 3. | * | 1 | 2100 | 253 | 2. |
| 1 | 0220 | 29 | 0. | * | 1 | 0835 | 104 | 0.  | * | 1 | 1450 | 179 | 3. | * | 1 | 2105 | 254 | 2. |
| 1 | 0225 | 30 | 0. | * | 1 | 0840 | 105 | 0.  | * | 1 | 1455 | 180 | 3. | * | 1 | 2110 | 255 | 2. |
| 1 | 0230 | 31 | 0. | * | 1 | 0845 | 106 | 0.  | * | 1 | 1500 | 181 | 3. | * | 1 | 2115 | 256 | 2. |
| 1 | 0235 | 32 | 0. | * | 1 | 0850 | 107 | 0.  | * | 1 | 1505 | 182 | 3. | * | 1 | 2120 | 257 | 2. |
| 1 | 0240 | 33 | 0. | * | 1 | 0855 | 108 | 0.  | * | 1 | 1510 | 183 | 3. | * | 1 | 2125 | 258 | 2. |
| 1 | 0245 | 34 | 0. | * | 1 | 0900 | 109 | 0.  | * | 1 | 1515 | 184 | 3. | * | 1 | 2130 | 259 | 2. |
| 1 | 0250 | 35 | 0. | * | 1 | 0905 | 110 | 0.  | * | 1 | 1520 | 185 | 3. | * | 1 | 2135 | 260 | 2. |
| 1 | 0255 | 36 | 0. | * | 1 | 0910 | 111 | 0.  | * | 1 | 1525 | 186 | 3. | * | 1 | 2140 | 261 | 2. |
| 1 | 0300 | 37 | 0. | * | 1 | 0915 | 112 | 0.  | * | 1 | 1530 | 187 | 3. | * | 1 | 2145 | 262 | 2. |
| 1 | 0305 | 38 | 0. | * | 1 | 0920 | 113 | 0.  | * | 1 | 1535 | 188 | 3. | * | 1 | 2150 | 263 | 2. |
| 1 | 0310 | 39 | 0. | * | 1 | 0925 | 114 | 0.  | * | 1 | 1540 | 189 | 3. | * | 1 | 2155 | 264 | 2. |
| 1 | 0315 | 40 | 0. | * | 1 | 0930 | 115 | 0.  | * | 1 | 1545 | 190 | 3. | * | 1 | 2200 | 265 | 2. |
| 1 | 0320 | 41 | 0. | * | 1 | 0935 | 116 | 0.  | * | 1 | 1550 | 191 | 3. | * | 1 | 2205 | 266 | 2. |
| 1 | 0325 | 42 | 0. | * | 1 | 0940 | 117 | 0.  | * | 1 | 1555 | 192 | 3. | * | 1 | 2210 | 267 | 2. |
| 1 | 0330 | 43 | 0. | * | 1 | 0945 | 118 | 0.  | * | 1 | 1600 | 193 | 3. | * | 1 | 2215 | 268 | 2. |
| 1 | 0335 | 44 | 0. | * | 1 | 0950 | 119 | 0.  | * | 1 | 1605 | 194 | 3. | * | 1 | 2220 | 269 | 2. |
| 1 | 0340 | 45 | 0. | * | 1 | 0955 | 120 | 0.  | * | 1 | 1610 | 195 | 3. | * | 1 | 2225 | 270 | 2. |
| 1 | 0345 | 46 | 0. | * | 1 | 1000 | 121 | 0.  | * | 1 | 1615 | 196 | 3. | * | 1 | 2230 | 271 | 2. |
| 1 | 0350 | 47 | 0. | * | 1 | 1005 | 122 | 0.  | * | 1 | 1620 | 197 | 3. | * | 1 | 2235 | 272 | 2. |
| 1 | 0355 | 48 | 0. | * | 1 | 1010 | 123 | 0.  | * | 1 | 1625 | 198 | 3. | * | 1 | 2240 | 273 | 2. |
| 1 | 0400 | 49 | 0. | * | 1 | 1015 | 124 | 0.  | * | 1 | 1630 | 199 | 3. | * | 1 | 2245 | 274 | 2. |
| 1 | 0405 | 50 | 0. | * | 1 | 1020 | 125 | 0.  | * | 1 | 1635 | 200 | 3. | * | 1 | 2250 | 275 | 2. |
| 1 | 0410 | 51 | 0. | * | 1 | 1025 | 126 | 0.  | * | 1 | 1640 | 201 | 3. | * | 1 | 2255 | 276 | 2. |
| 1 | 0415 | 52 | 0. | * | 1 | 1030 | 127 | 0.  | * | 1 | 1645 | 202 | 3. | * | 1 | 2300 | 277 | 2. |
| 1 | 0420 | 53 | 0. | * | 1 | 1035 | 128 | 0.  | * | 1 | 1650 | 203 | 2. | * | 1 | 2305 | 278 | 2. |
| 1 | 0425 | 54 | 0. | * | 1 | 1040 | 129 | 0.  | * | 1 | 1655 | 204 | 2. | * | 1 | 2310 | 279 | 2. |
| 1 | 0430 | 55 | 0. | * | 1 | 1045 | 130 | 0.  | * | 1 | 1700 | 205 | 2. | * | 1 | 2315 | 280 | 2. |
| 1 | 0435 | 56 | 0. | * | 1 | 1050 | 131 | 0.  | * | 1 | 1705 | 206 | 2. | * | 1 | 2320 | 281 | 2. |
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 0.  | * | 1 | 1710 | 207 | 2. | * | 1 | 2325 | 282 | 2. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 0.  | * | 1 | 1715 | 208 | 2. | * | 1 | 2330 | 283 | 2. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 0.  | * | 1 | 1720 | 209 | 2. | * | 1 | 2335 | 284 | 2. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 0.  | * | 1 | 1725 | 210 | 2. | * | 1 | 2340 | 285 | 2. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 0.  | * | 1 | 1730 | 211 | 2. | * | 1 | 2345 | 286 | 1. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 0.  | * | 1 | 1735 | 212 | 2. | * | 1 | 2350 | 287 | 1. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 0.  | * | 1 | 1740 | 213 | 2. | * | 1 | 2355 | 288 | 1. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 0.  | * | 1 | 1745 | 214 | 2. | * | 2 | 0000 | 289 | 1. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 1.  | * | 1 | 1750 | 215 | 2. | * | 2 | 0005 | 290 | 1. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 5.  | * | 1 | 1755 | 216 | 2. | * | 2 | 0010 | 291 | 1. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 14. | * | 1 | 1800 | 217 | 2. | * | 2 | 0015 | 292 | 0. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 24. | * | 1 | 1805 | 218 | 2. | * | 2 | 0020 | 293 | 0. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 33. | * | 1 | 1810 | 219 | 2. | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 35. | * | 1 | 1815 | 220 | 2. | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 32. | * | 1 | 1820 | 221 | 2. | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 27. | * | 1 | 1825 | 222 | 2. | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 22. | * | 1 | 1830 | 223 | 2. | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 18. | * | 1 | 1835 | 224 | 2. | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 16. | * | 1 | 1840 | 225 | 2. | * | 2 | 0055 | 300 | 0. |

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| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 35.                | 12.00        | 7.                   | 2.    | 2.    | 2.       |
|                    |              | (INCHES)             | .402  | .513  | .513     |
|                    |              | (AC-F'T)             | 3.    | 4.    | 4.       |
| CUMULATIVE AREA =  |              | .16 SQ MI            |       |       |          |



|   |      |    |      |      |     |    |   |   |      |     |     |     |     |    |
|---|------|----|------|------|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0030 | 7  | .00  | .00  | .00 | 0. | * | 1 | 1300 | 157 | .01 | .01 | .01 | 2. |
| 1 | 0035 | 8  | -.01 | -.01 | .00 | 0. | * | 1 | 1305 | 158 | .01 | .01 | .01 | 2. |
| 1 | 0040 | 9  | -.01 | -.01 | .00 | 0. | * | 1 | 1310 | 159 | .01 | .01 | .01 | 2. |
| 1 | 0045 | 10 | -.01 | -.01 | .00 | 0. | * | 1 | 1315 | 160 | .01 | .00 | .01 | 1. |
| 1 | 0050 | 11 | .01  | .01  | .00 | 0. | * | 1 | 1320 | 161 | .01 | .00 | .01 | 1. |
| 1 | 0055 | 12 | .01  | .01  | .00 | 0. | * | 1 | 1325 | 162 | .01 | .00 | .01 | 1. |
| 1 | 0100 | 13 | .01  | .01  | .00 | 0. | * | 1 | 1330 | 163 | .01 | .00 | .01 | 1. |
| 1 | 0105 | 14 | .00  | .00  | .00 | 0. | * | 1 | 1335 | 164 | .01 | .00 | .00 | 1. |
| 1 | 0110 | 15 | .00  | .00  | .00 | 0. | * | 1 | 1340 | 165 | .01 | .00 | .00 | 1. |
| 1 | 0115 | 16 | .00  | .00  | .00 | 0. | * | 1 | 1345 | 166 | .01 | .00 | .00 | 1. |
| 1 | 0120 | 17 | .00  | .00  | .00 | 0. | * | 1 | 1350 | 167 | .01 | .00 | .00 | 1. |
| 1 | 0125 | 18 | .00  | .00  | .00 | 0. | * | 1 | 1355 | 168 | .01 | .00 | .00 | 1. |
| 1 | 0130 | 19 | .00  | .00  | .00 | 0. | * | 1 | 1400 | 169 | .01 | .00 | .00 | 1. |
| 1 | 0135 | 20 | .00  | .00  | .00 | 0. | * | 1 | 1405 | 170 | .01 | .00 | .00 | 1. |
| 1 | 0140 | 21 | .00  | .00  | .00 | 0. | * | 1 | 1410 | 171 | .01 | .00 | .00 | 1. |
| 1 | 0145 | 22 | .00  | .00  | .00 | 0. | * | 1 | 1415 | 172 | .01 | .00 | .00 | 1. |
| 1 | 0150 | 23 | .00  | .00  | .00 | 0. | * | 1 | 1420 | 173 | .01 | .00 | .00 | 1. |
| 1 | 0155 | 24 | .00  | .00  | .00 | 0. | * | 1 | 1425 | 174 | .01 | .00 | .00 | 1. |
| 1 | 0200 | 25 | .00  | .00  | .00 | 0. | * | 1 | 1430 | 175 | .01 | .00 | .00 | 1. |
| 1 | 0205 | 26 | .00  | .00  | .00 | 0. | * | 1 | 1435 | 176 | .01 | .00 | .00 | 1. |
| 1 | 0210 | 27 | .00  | .00  | .00 | 0. | * | 1 | 1440 | 177 | .01 | .00 | .00 | 1. |
| 1 | 0215 | 28 | .00  | .00  | .00 | 0. | * | 1 | 1445 | 178 | .01 | .00 | .00 | 1. |
| 1 | 0220 | 29 | .00  | .00  | .00 | 0. | * | 1 | 1450 | 179 | .01 | .00 | .00 | 1. |
| 1 | 0225 | 30 | .00  | .00  | .00 | 0. | * | 1 | 1455 | 180 | .01 | .00 | .00 | 1. |
| 1 | 0230 | 31 | .00  | .00  | .00 | 0. | * | 1 | 1500 | 181 | .01 | .00 | .00 | 1. |
| 1 | 0235 | 32 | .00  | .00  | .00 | 0. | * | 1 | 1505 | 182 | .01 | .00 | .00 | 1. |
| 1 | 0240 | 33 | .00  | .00  | .00 | 0. | * | 1 | 1510 | 183 | .01 | .00 | .00 | 1. |
| 1 | 0245 | 34 | .00  | .00  | .00 | 0. | * | 1 | 1515 | 184 | .01 | .00 | .00 | 1. |
| 1 | 0250 | 35 | .00  | .00  | .00 | 0. | * | 1 | 1520 | 185 | .01 | .00 | .00 | 1. |
| 1 | 0255 | 36 | .00  | .00  | .00 | 0. | * | 1 | 1525 | 186 | .01 | .00 | .00 | 1. |
| 1 | 0300 | 37 | .00  | .00  | .00 | 0. | * | 1 | 1530 | 187 | .01 | .00 | .00 | 1. |
| 1 | 0305 | 38 | .00  | .00  | .00 | 0. | * | 1 | 1535 | 188 | .01 | .00 | .00 | 1. |
| 1 | 0310 | 39 | .00  | .00  | .00 | 0. | * | 1 | 1540 | 189 | .01 | .00 | .00 | 1. |
| 1 | 0315 | 40 | .00  | .00  | .00 | 0. | * | 1 | 1545 | 190 | .01 | .00 | .00 | 1. |
| 1 | 0320 | 41 | .00  | .00  | .00 | 0. | * | 1 | 1550 | 191 | .01 | .00 | .00 | 1. |
| 1 | 0325 | 42 | .00  | .00  | .00 | 0. | * | 1 | 1555 | 192 | .01 | .00 | .00 | 1. |
| 1 | 0330 | 43 | .00  | .00  | .00 | 0. | * | 1 | 1600 | 193 | .01 | .00 | .00 | 1. |
| 1 | 0335 | 44 | .00  | .00  | .00 | 0. | * | 1 | 1605 | 194 | .01 | .00 | .00 | 1. |
| 1 | 0340 | 45 | .00  | .00  | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .00 | 1. |
| 1 | 0345 | 46 | .00  | .00  | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .00 | 1. |
| 1 | 0350 | 47 | .00  | .00  | .00 | 0. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 1. |
| 1 | 0355 | 48 | .00  | .00  | .00 | 0. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 1. |
| 1 | 0400 | 49 | .00  | .00  | .00 | 0. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 1. |
| 1 | 0405 | 50 | .00  | .00  | .00 | 0. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 1. |
| 1 | 0410 | 51 | .00  | .00  | .00 | 0. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 1. |
| 1 | 0415 | 52 | .00  | .00  | .00 | 0. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 1. |
| 1 | 0420 | 53 | .00  | .00  | .00 | 0. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 1. |
| 1 | 0425 | 54 | .00  | .00  | .00 | 0. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 1. |
| 1 | 0430 | 55 | .00  | .00  | .00 | 0. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 1. |
| 1 | 0435 | 56 | .00  | .00  | .00 | 0. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 1. |
| 1 | 0440 | 57 | .00  | .00  | .00 | 0. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 1. |
| 1 | 0445 | 58 | .00  | .00  | .00 | 0. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 1. |
| 1 | 0450 | 59 | .00  | .00  | .00 | 0. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 1. |
| 1 | 0455 | 60 | .00  | .00  | .00 | 0. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 1. |
| 1 | 0500 | 61 | .00  | .00  | .00 | 0. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 1. |
| 1 | 0505 | 62 | .00  | .00  | .00 | 0. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 1. |
| 1 | 0510 | 63 | .00  | .00  | .00 | 0. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 1. |
| 1 | 0515 | 64 | .00  | .00  | .00 | 0. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65 | .00  | .00  | .00 | 0. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66 | .00  | .00  | .00 | 0. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67 | .00  | .00  | .00 | 0. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68 | .00  | .00  | .00 | 0. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69 | .00  | .00  | .00 | 0. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70 | .00  | .00  | .00 | 0. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71 | .00  | .00  | .00 | 0. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72 | .00  | .00  | .00 | 0. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73 | .00  | .00  | .00 | 0. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74 | .00  | .00  | .00 | 0. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75 | .00  | .00  | .00 | 0. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76 | .00  | .00  | .00 | 0. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77 | .00  | .00  | .00 | 0. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78 | .00  | .00  | .00 | 0. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79 | .00  | .00  | .00 | 0. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80 | .00  | .00  | .00 | 0. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81 | .00  | .00  | .00 | 0. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82 | .00  | .00  | .00 | 0. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83 | .00  | .00  | .00 | 0. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84 | .00  | .00  | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85 | .00  | .00  | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86 | .00  | .00  | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87 | .00  | .00  | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88 | .00  | .00  | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89 | .00  | .00  | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90 | .00  | .00  | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0730 | 91  | .00 | .00 | .00 | 0.  | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .00 | .00 | .00 | 0.  | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .00 | .00 | .00 | 0.  | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0.  | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0.  | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0.  | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0.  | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0.  | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0.  | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0.  | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0.  | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0.  | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0.  | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0.  | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0.  | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0.  | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0.  | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0.  | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0.  | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0.  | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0.  | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0.  | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0.  | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0.  | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0.  | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0.  | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0.  | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0.  | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0.  | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0.  | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0.  | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0.  | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0.  | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0.  | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0.  | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0.  | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .01 | .01 | .00 | 0.  | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0.  | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0.  | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0.  | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0.  | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0.  | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0.  | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0.  | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 0.  | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 0.  | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .09 | .08 | .01 | 0.  | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .09 | .08 | .02 | 1.  | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .09 | .07 | .02 | 1.  | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .24 | .17 | .07 | 2.  | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .24 | .15 | .09 | 4.  | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .24 | .13 | .11 | 7.  | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .02 | .02 | 10. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .02 | .02 | 11. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .02 | .02 | 10. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .01 | .01 | 9.  | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .01 | .01 | 7.  | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .01 | .01 | 5.  | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 4.  | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 4.  | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 1.78, TOTAL EXCESS = .82

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 11.                | 11.92        | 2.                   | 1.    | 1.    | 1.       |
|                    |              | (INCHES)<br>1.       | .662  | .815  | .815     |
|                    |              | (AC-FT)              | 1.    | 1.    | 1.       |

CUMULATIVE AREA = .03 SQ MI

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\* \*  
32 KK \* RTA2 \*

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ROUTE OSA2 TO DPA  
OSA3

HYDROGRAPH ROUTING DATA

34 RK KINEMATIC WAVE STREAM ROUTING  
 L 311. CHANNEL LENGTH  
 S .0707 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*  
 COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .31         | 103.67     | 11.21         | 715.61                   | .82            | 7.29                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1131E+01 EXCESS= .0000E+00 OUTFLOW= .1131E+01 BASIN STORAGE= .1175E-04 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |       |        |     |
|------|------|------|------|-------|--------|-----|
| MAIN | 4.24 | 1.34 | 5.00 | 11.10 | 715.00 | .82 |
|------|------|------|------|-------|--------|-----|

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 HYDROGRAPH AT STATION RTA2  
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| DA | MON  | HRMN | ORD | FLOW | * | DA   | MON | HRMN | ORD | FLOW | *    | DA  | MON | HRMN | ORD | FLOW | *   | DA | MON | HRMN | ORD | FLOW |    |
|----|------|------|-----|------|---|------|-----|------|-----|------|------|-----|-----|------|-----|------|-----|----|-----|------|-----|------|----|
| 1  | 0000 | 1    | 0.  | *    | 1 | 0615 | 76  | 0.   | *   | 1    | 1230 | 151 | 3.  | *    | 1   | 1845 | 226 | 0. |     |      |     |      | 0. |
| 1  | 0005 | 2    | 0.  | *    | 1 | 0620 | 77  | 0.   | *   | 1    | 1235 | 152 | 3.  | *    | 1   | 1850 | 227 | 0. |     |      |     |      | 0. |
| 1  | 0010 | 3    | 0.  | *    | 1 | 0625 | 78  | 0.   | *   | 1    | 1240 | 153 | 3.  | *    | 1   | 1855 | 228 | 0. |     |      |     |      | 0. |
| 1  | 0015 | 4    | 0.  | *    | 1 | 0630 | 79  | 0.   | *   | 1    | 1245 | 154 | 2.  | *    | 1   | 1900 | 229 | 0. |     |      |     |      | 0. |
| 1  | 0020 | 5    | 0.  | *    | 1 | 0635 | 80  | 0.   | *   | 1    | 1250 | 155 | 2.  | *    | 1   | 1905 | 230 | 0. |     |      |     |      | 0. |
| 1  | 0025 | 6    | 0.  | *    | 1 | 0640 | 81  | 0.   | *   | 1    | 1255 | 156 | 2.  | *    | 1   | 1910 | 231 | 0. |     |      |     |      | 0. |
| 1  | 0030 | 7    | 0.  | *    | 1 | 0645 | 82  | 0.   | *   | 1    | 1300 | 157 | 2.  | *    | 1   | 1915 | 232 | 0. |     |      |     |      | 0. |
| 1  | 0035 | 8    | 0.  | *    | 1 | 0650 | 83  | 0.   | *   | 1    | 1305 | 158 | 2.  | *    | 1   | 1920 | 233 | 0. |     |      |     |      | 0. |
| 1  | 0040 | 9    | 0.  | *    | 1 | 0655 | 84  | 0.   | *   | 1    | 1310 | 159 | 2.  | *    | 1   | 1925 | 234 | 0. |     |      |     |      | 0. |
| 1  | 0045 | 10   | 0.  | *    | 1 | 0700 | 85  | 0.   | *   | 1    | 1315 | 160 | 1.  | *    | 1   | 1930 | 235 | 0. |     |      |     |      | 0. |
| 1  | 0050 | 11   | 0.  | *    | 1 | 0705 | 86  | 0.   | *   | 1    | 1320 | 161 | 1.  | *    | 1   | 1935 | 236 | 0. |     |      |     |      | 0. |
| 1  | 0055 | 12   | 0.  | *    | 1 | 0710 | 87  | 0.   | *   | 1    | 1325 | 162 | 1.  | *    | 1   | 1940 | 237 | 0. |     |      |     |      | 0. |
| 1  | 0100 | 13   | 0.  | *    | 1 | 0715 | 88  | 0.   | *   | 1    | 1330 | 163 | 1.  | *    | 1   | 1945 | 238 | 0. |     |      |     |      | 0. |
| 1  | 0105 | 14   | 0.  | *    | 1 | 0720 | 89  | 0.   | *   | 1    | 1335 | 164 | 1.  | *    | 1   | 1950 | 239 | 0. |     |      |     |      | 0. |
| 1  | 0110 | 15   | 0.  | *    | 1 | 0725 | 90  | 0.   | *   | 1    | 1340 | 165 | 1.  | *    | 1   | 1955 | 240 | 0. |     |      |     |      | 0. |
| 1  | 0115 | 16   | 0.  | *    | 1 | 0730 | 91  | 0.   | *   | 1    | 1345 | 166 | 1.  | *    | 1   | 2000 | 241 | 0. |     |      |     |      | 0. |
| 1  | 0120 | 17   | 0.  | *    | 1 | 0735 | 92  | 0.   | *   | 1    | 1350 | 167 | 1.  | *    | 1   | 2005 | 242 | 0. |     |      |     |      | 0. |
| 1  | 0125 | 18   | 0.  | *    | 1 | 0740 | 93  | 0.   | *   | 1    | 1355 | 168 | 1.  | *    | 1   | 2010 | 243 | 0. |     |      |     |      | 0. |
| 1  | 0130 | 19   | 0.  | *    | 1 | 0745 | 94  | 0.   | *   | 1    | 1400 | 169 | 1.  | *    | 1   | 2015 | 244 | 0. |     |      |     |      | 0. |
| 1  | 0135 | 20   | 0.  | *    | 1 | 0750 | 95  | 0.   | *   | 1    | 1405 | 170 | 1.  | *    | 1   | 2020 | 245 | 0. |     |      |     |      | 0. |
| 1  | 0140 | 21   | 0.  | *    | 1 | 0755 | 96  | 0.   | *   | 1    | 1410 | 171 | 1.  | *    | 1   | 2025 | 246 | 0. |     |      |     |      | 0. |
| 1  | 0145 | 22   | 0.  | *    | 1 | 0800 | 97  | 0.   | *   | 1    | 1415 | 172 | 1.  | *    | 1   | 2030 | 247 | 0. |     |      |     |      | 0. |
| 1  | 0150 | 23   | 0.  | *    | 1 | 0805 | 98  | 0.   | *   | 1    | 1420 | 173 | 1.  | *    | 1   | 2035 | 248 | 0. |     |      |     |      | 0. |
| 1  | 0155 | 24   | 0.  | *    | 1 | 0810 | 99  | 0.   | *   | 1    | 1425 | 174 | 1.  | *    | 1   | 2040 | 249 | 0. |     |      |     |      | 0. |
| 1  | 0200 | 25   | 0.  | *    | 1 | 0815 | 100 | 0.   | *   | 1    | 1430 | 175 | 1.  | *    | 1   | 2045 | 250 | 0. |     |      |     |      | 0. |
| 1  | 0205 | 26   | 0.  | *    | 1 | 0820 | 101 | 0.   | *   | 1    | 1435 | 176 | 1.  | *    | 1   | 2050 | 251 | 0. |     |      |     |      | 0. |
| 1  | 0210 | 27   | 0.  | *    | 1 | 0825 | 102 | 0.   | *   | 1    | 1440 | 177 | 1.  | *    | 1   | 2055 | 252 | 0. |     |      |     |      | 0. |
| 1  | 0215 | 28   | 0.  | *    | 1 | 0830 | 103 | 0.   | *   | 1    | 1445 | 178 | 1.  | *    | 1   | 2100 | 253 | 0. |     |      |     |      | 0. |
| 1  | 0220 | 29   | 0.  | *    | 1 | 0835 | 104 | 0.   | *   | 1    | 1450 | 179 | 1.  | *    | 1   | 2105 | 254 | 0. |     |      |     |      | 0. |
| 1  | 0225 | 30   | 0.  | *    | 1 | 0840 | 105 | 0.   | *   | 1    | 1455 | 180 | 1.  | *    | 1   | 2110 | 255 | 0. |     |      |     |      | 0. |
| 1  | 0230 | 31   | 0.  | *    | 1 | 0845 | 106 | 0.   | *   | 1    | 1500 | 181 | 1.  | *    | 1   | 2115 | 256 | 0. |     |      |     |      | 0. |
| 1  | 0235 | 32   | 0.  | *    | 1 | 0850 | 107 | 0.   | *   | 1    | 1505 | 182 | 1.  | *    | 1   | 2120 | 257 | 0. |     |      |     |      | 0. |
| 1  | 0240 | 33   | 0.  | *    | 1 | 0855 | 108 | 0.   | *   | 1    | 1510 | 183 | 1.  | *    | 1   | 2125 | 258 | 0. |     |      |     |      | 0. |
| 1  | 0245 | 34   | 0.  | *    | 1 | 0900 | 109 | 0.   | *   | 1    | 1515 | 184 | 1.  | *    | 1   | 2130 | 259 | 0. |     |      |     |      | 0. |
| 1  | 0250 | 35   | 0.  | *    | 1 | 0905 | 110 | 0.   | *   | 1    | 1520 | 185 | 1.  | *    | 1   | 2135 | 260 | 0. |     |      |     |      | 0. |
| 1  | 0255 | 36   | 0.  | *    | 1 | 0910 | 111 | 0.   | *   | 1    | 1525 | 186 | 1.  | *    | 1   | 2140 | 261 | 0. |     |      |     |      | 0. |
| 1  | 0300 | 37   | 0.  | *    | 1 | 0915 | 112 | 0.   | *   | 1    | 1530 | 187 | 1.  | *    | 1   | 2145 | 262 | 0. |     |      |     |      | 0. |
| 1  | 0305 | 38   | 0.  | *    | 1 | 0920 | 113 | 0.   | *   | 1    | 1535 | 188 | 1.  | *    | 1   | 2150 | 263 | 0. |     |      |     |      | 0. |
| 1  | 0310 | 39   | 0.  | *    | 1 | 0925 | 114 | 0.   | *   | 1    | 1540 | 189 | 1.  | *    | 1   | 2155 | 264 | 0. |     |      |     |      | 0. |





|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .01 | .01 | .01 | .01 | .01 | .03 | .03 | .03 | .09 | .09 |
| .09 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |
| .01 | .01 | .01 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

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38 LS      SCS LOSS RATE
           STRTL      .60 INITIAL ABSTRACTION
           CRVNER     77.00 CURVE NUMBER
           RTIMP      .00 PERCENT IMPERVIOUS AREA

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39 UD      SCS DIMENSIONLESS UNITGRAPH
           TLAG       .23 LAG

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WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

UNIT HYDROGRAPH  
16 END-OF-PERIOD ORDINATES

|    |     |     |     |     |    |    |    |    |    |
|----|-----|-----|-----|-----|----|----|----|----|----|
| 3. | 11. | 16. | 15. | 10. | 6. | 4. | 2. | 1. | 1. |
| 0. | 0.  | 0.  | 0.  | 0.  | 0. | 0. | 0. | 0. | 0. |

HYDROGRAPH AT STATION

| DA | MON  | HRMN | ORD  | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON  | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|------|------|------|------|------|--------|--------|---|----|------|------|-----|------|------|--------|--------|
| 1  | 0000 | 1    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1230 | 151  | .02 | .01  | .01  | 1.     |        |
| 1  | 0005 | 2    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1235 | 152  | .02 | .01  | .01  | 1.     |        |
| 1  | 0010 | 3    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1240 | 153  | .02 | .01  | .01  | 1.     |        |
| 1  | 0015 | 4    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1245 | 154  | .02 | .01  | .01  | 1.     |        |
| 1  | 0020 | 5    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1250 | 155  | .01 | .01  | .01  | 1.     |        |
| 1  | 0025 | 6    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1255 | 156  | .01 | .01  | .01  | 1.     |        |
| 1  | 0030 | 7    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1300 | 157  | .01 | .01  | .01  | 1.     |        |
| 1  | 0035 | 8    | -.01 | -.01 | .00  | .00    | 0.     | * | 1  | 1305 | 158  | .01 | .01  | .01  | 1.     |        |
| 1  | 0040 | 9    | -.01 | -.01 | .00  | .00    | 0.     | * | 1  | 1310 | 159  | .01 | .01  | .01  | 1.     |        |
| 1  | 0045 | 10   | -.01 | -.01 | .00  | .00    | 0.     | * | 1  | 1315 | 160  | .01 | .00  | .01  | 0.     |        |
| 1  | 0050 | 11   | .01  | .01  | .00  | .00    | 0.     | * | 1  | 1320 | 161  | .01 | .00  | .01  | 0.     |        |
| 1  | 0055 | 12   | .01  | .01  | .00  | .00    | 0.     | * | 1  | 1325 | 162  | .01 | .00  | .01  | 0.     |        |
| 1  | 0100 | 13   | .01  | .01  | .00  | .00    | 0.     | * | 1  | 1330 | 163  | .01 | .00  | .01  | 0.     |        |
| 1  | 0105 | 14   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1335 | 164  | .01 | .00  | .00  | 0.     |        |
| 1  | 0110 | 15   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1340 | 165  | .01 | .00  | .00  | 0.     |        |
| 1  | 0115 | 16   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1345 | 166  | .01 | .00  | .00  | 0.     |        |
| 1  | 0120 | 17   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1350 | 167  | .01 | .00  | .00  | 0.     |        |
| 1  | 0125 | 18   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1355 | 168  | .01 | .00  | .00  | 0.     |        |
| 1  | 0130 | 19   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1400 | 169  | .01 | .00  | .00  | 0.     |        |
| 1  | 0135 | 20   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1405 | 170  | .01 | .00  | .00  | 0.     |        |
| 1  | 0140 | 21   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1410 | 171  | .01 | .00  | .00  | 0.     |        |
| 1  | 0145 | 22   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1415 | 172  | .01 | .00  | .00  | 0.     |        |
| 1  | 0150 | 23   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1420 | 173  | .01 | .00  | .00  | 0.     |        |
| 1  | 0155 | 24   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1425 | 174  | .01 | .00  | .00  | 0.     |        |
| 1  | 0200 | 25   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1430 | 175  | .01 | .00  | .00  | 0.     |        |
| 1  | 0205 | 26   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1435 | 176  | .01 | .00  | .00  | 0.     |        |
| 1  | 0210 | 27   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1440 | 177  | .01 | .00  | .00  | 0.     |        |
| 1  | 0215 | 28   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1445 | 178  | .01 | .00  | .00  | 0.     |        |
| 1  | 0220 | 29   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1450 | 179  | .01 | .00  | .00  | 0.     |        |
| 1  | 0225 | 30   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1455 | 180  | .01 | .00  | .00  | 0.     |        |
| 1  | 0230 | 31   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1500 | 181  | .01 | .00  | .00  | 0.     |        |
| 1  | 0235 | 32   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1505 | 182  | .01 | .00  | .00  | 0.     |        |
| 1  | 0240 | 33   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1510 | 183  | .01 | .00  | .00  | 0.     |        |
| 1  | 0245 | 34   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1515 | 184  | .01 | .00  | .00  | 0.     |        |
| 1  | 0250 | 35   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1520 | 185  | .01 | .00  | .00  | 0.     |        |
| 1  | 0255 | 36   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1525 | 186  | .01 | .00  | .00  | 0.     |        |
| 1  | 0300 | 37   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1530 | 187  | .01 | .00  | .00  | 0.     |        |
| 1  | 0305 | 38   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1535 | 188  | .01 | .00  | .00  | 0.     |        |
| 1  | 0310 | 39   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1540 | 189  | .01 | .00  | .00  | 0.     |        |
| 1  | 0315 | 40   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1545 | 190  | .01 | .00  | .00  | 0.     |        |
| 1  | 0320 | 41   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1550 | 191  | .01 | .00  | .00  | 0.     |        |
| 1  | 0325 | 42   | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1555 | 192  | .01 | .00  | .00  | 0.     |        |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0330 | 43  | .00 | .00 | .00 | 0. | * | 1 | 1600 | 193 | .01 | .00 | .00 | 0. |
| 1 | 0335 | 44  | .00 | .00 | .00 | 0. | * | 1 | 1605 | 194 | .01 | .00 | .00 | 0. |
| 1 | 0340 | 45  | .00 | .00 | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .00 | 0. |
| 1 | 0345 | 46  | .00 | .00 | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .00 | 0. |
| 1 | 0350 | 47  | .00 | .00 | .00 | 0. | * | 1 | 1620 | 197 | .00 | .00 | .00 | 0. |
| 1 | 0355 | 48  | .00 | .00 | .00 | 0. | * | 1 | 1625 | 198 | .00 | .00 | .00 | 0. |
| 1 | 0400 | 49  | .00 | .00 | .00 | 0. | * | 1 | 1630 | 199 | .00 | .00 | .00 | 0. |
| 1 | 0405 | 50  | .00 | .00 | .00 | 0. | * | 1 | 1635 | 200 | .00 | .00 | .00 | 0. |
| 1 | 0410 | 51  | .00 | .00 | .00 | 0. | * | 1 | 1640 | 201 | .00 | .00 | .00 | 0. |
| 1 | 0415 | 52  | .00 | .00 | .00 | 0. | * | 1 | 1645 | 202 | .00 | .00 | .00 | 0. |
| 1 | 0420 | 53  | .00 | .00 | .00 | 0. | * | 1 | 1650 | 203 | .00 | .00 | .00 | 0. |
| 1 | 0425 | 54  | .00 | .00 | .00 | 0. | * | 1 | 1655 | 204 | .00 | .00 | .00 | 0. |
| 1 | 0430 | 55  | .00 | .00 | .00 | 0. | * | 1 | 1700 | 205 | .00 | .00 | .00 | 0. |
| 1 | 0435 | 56  | .00 | .00 | .00 | 0. | * | 1 | 1705 | 206 | .00 | .00 | .00 | 0. |
| 1 | 0440 | 57  | .00 | .00 | .00 | 0. | * | 1 | 1710 | 207 | .00 | .00 | .00 | 0. |
| 1 | 0445 | 58  | .00 | .00 | .00 | 0. | * | 1 | 1715 | 208 | .00 | .00 | .00 | 0. |
| 1 | 0450 | 59  | .00 | .00 | .00 | 0. | * | 1 | 1720 | 209 | .00 | .00 | .00 | 0. |
| 1 | 0455 | 60  | .00 | .00 | .00 | 0. | * | 1 | 1725 | 210 | .00 | .00 | .00 | 0. |
| 1 | 0500 | 61  | .00 | .00 | .00 | 0. | * | 1 | 1730 | 211 | .00 | .00 | .00 | 0. |
| 1 | 0505 | 62  | .00 | .00 | .00 | 0. | * | 1 | 1735 | 212 | .00 | .00 | .00 | 0. |
| 1 | 0510 | 63  | .00 | .00 | .00 | 0. | * | 1 | 1740 | 213 | .00 | .00 | .00 | 0. |
| 1 | 0515 | 64  | .00 | .00 | .00 | 0. | * | 1 | 1745 | 214 | .00 | .00 | .00 | 0. |
| 1 | 0520 | 65  | .00 | .00 | .00 | 0. | * | 1 | 1750 | 215 | .00 | .00 | .00 | 0. |
| 1 | 0525 | 66  | .00 | .00 | .00 | 0. | * | 1 | 1755 | 216 | .00 | .00 | .00 | 0. |
| 1 | 0530 | 67  | .00 | .00 | .00 | 0. | * | 1 | 1800 | 217 | .00 | .00 | .00 | 0. |
| 1 | 0535 | 68  | .00 | .00 | .00 | 0. | * | 1 | 1805 | 218 | .00 | .00 | .00 | 0. |
| 1 | 0540 | 69  | .00 | .00 | .00 | 0. | * | 1 | 1810 | 219 | .00 | .00 | .00 | 0. |
| 1 | 0545 | 70  | .00 | .00 | .00 | 0. | * | 1 | 1815 | 220 | .00 | .00 | .00 | 0. |
| 1 | 0550 | 71  | .00 | .00 | .00 | 0. | * | 1 | 1820 | 221 | .00 | .00 | .00 | 0. |
| 1 | 0555 | 72  | .00 | .00 | .00 | 0. | * | 1 | 1825 | 222 | .00 | .00 | .00 | 0. |
| 1 | 0600 | 73  | .00 | .00 | .00 | 0. | * | 1 | 1830 | 223 | .00 | .00 | .00 | 0. |
| 1 | 0605 | 74  | .00 | .00 | .00 | 0. | * | 1 | 1835 | 224 | .00 | .00 | .00 | 0. |
| 1 | 0610 | 75  | .00 | .00 | .00 | 0. | * | 1 | 1840 | 225 | .00 | .00 | .00 | 0. |
| 1 | 0615 | 76  | .00 | .00 | .00 | 0. | * | 1 | 1845 | 226 | .00 | .00 | .00 | 0. |
| 1 | 0620 | 77  | .00 | .00 | .00 | 0. | * | 1 | 1850 | 227 | .00 | .00 | .00 | 0. |
| 1 | 0625 | 78  | .00 | .00 | .00 | 0. | * | 1 | 1855 | 228 | .00 | .00 | .00 | 0. |
| 1 | 0630 | 79  | .00 | .00 | .00 | 0. | * | 1 | 1900 | 229 | .00 | .00 | .00 | 0. |
| 1 | 0635 | 80  | .00 | .00 | .00 | 0. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81  | .00 | .00 | .00 | 0. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .00 | .00 | .00 | 0. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .00 | .00 | .00 | 0. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .00 | .00 | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .00 | .00 | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .00 | .00 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .00 | .00 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .00 | .00 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .00 | .00 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .00 | .00 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .00 | .00 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .00 | .00 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 1030 | 127 | .01 | .01 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .09 | .08 | .01 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .09 | .08 | .02 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .09 | .07 | .02 | 0. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .24 | .17 | .07 | 1. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .24 | .15 | .09 | 2. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .24 | .13 | .11 | 3. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .02 | .02 | 4. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .02 | .02 | 4. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .02 | .02 | 4. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .01 | .01 | 3. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .01 | .01 | 2. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .01 | .01 | 2. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 1. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 1. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 1.78, TOTAL EXCESS = .82

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 4.                 | 11.92        | 1.                   | 0.    | 0.    | 0.       |
|                    |              | (INCHES)             | .662  | .815  | .815     |
|                    |              | (AC-FT)              | 0.    | 0.    | 0.       |

CUMULATIVE AREA = .01 SQ MI

\*\*\* \*\*

40 KK \*\*\*\*\*  
 \* RTA3 \*  
 \* \*  
 \*\*\*\*\*  
 ROUTE OSA3 TO DPA

HYDROGRAPH ROUTING DATA

42 RK KINEMATIC WAVE STREAM ROUTING  
 L 292. CHANNEL LENGTH  
 S .0822 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*  
 COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.57  | 1.34 | .28         | 97.33      | 4.15          | 715.35                   | .82            | 5.98                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3913E+00 EXCESS= .0000E+00 OUTFLOW= .3914E+00 BASIN STORAGE= .1960E-05 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |  |      |        |     |  |
|------|------|------|------|--|------|--------|-----|--|
| MAIN | 4.57 | 1.34 | 5.00 |  | 4.14 | 715.00 | .82 |  |
|------|------|------|------|--|------|--------|-----|--|





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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|-----|------|-----|------|------|--------|--------|---|----|-----|------|-----|------|------|--------|--------|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.     | * | 1  |     | 1230 | 151 | .02  | .01  | .01    | 0.     |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.     | * | 1  |     | 1235 | 152 | .02  | .01  | .01    | 0.     |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.     | * | 1  |     | 1240 | 153 | .02  | .01  | .01    | 0.     |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.     | * | 1  |     | 1245 | 154 | .02  | .01  | .01    | 0.     |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.     | * | 1  |     | 1250 | 155 | .01  | .01  | .01    | 0.     |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.     | * | 1  |     | 1255 | 156 | .01  | .01  | .01    | 0.     |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.     | * | 1  |     | 1300 | 157 | .01  | .01  | .01    | 0.     |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1305 | 158 | .01  | .01  | .01    | 0.     |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1310 | 159 | .01  | .01  | .01    | 0.     |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1315 | 160 | .01  | .00  | .01    | 0.     |
| 1  |     | 0050 | 11  | .01  | .01  | .00    | 0.     | * | 1  |     | 1320 | 161 | .01  | .00  | .01    | 0.     |
| 1  |     | 0055 | 12  | .01  | .01  | .00    | 0.     | * | 1  |     | 1325 | 162 | .01  | .00  | .01    | 0.     |
| 1  |     | 0100 | 13  | .01  | .01  | .00    | 0.     | * | 1  |     | 1330 | 163 | .01  | .00  | .01    | 0.     |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.     | * | 1  |     | 1335 | 164 | .01  | .00  | .00    | 0.     |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.     | * | 1  |     | 1340 | 165 | .01  | .00  | .00    | 0.     |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.     | * | 1  |     | 1345 | 166 | .01  | .00  | .00    | 0.     |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.     | * | 1  |     | 1350 | 167 | .01  | .00  | .00    | 0.     |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.     | * | 1  |     | 1355 | 168 | .01  | .00  | .00    | 0.     |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.     | * | 1  |     | 1400 | 169 | .01  | .00  | .00    | 0.     |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.     | * | 1  |     | 1405 | 170 | .01  | .00  | .00    | 0.     |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.     | * | 1  |     | 1410 | 171 | .01  | .00  | .00    | 0.     |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.     | * | 1  |     | 1415 | 172 | .01  | .00  | .00    | 0.     |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.     | * | 1  |     | 1420 | 173 | .01  | .00  | .00    | 0.     |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.     | * | 1  |     | 1425 | 174 | .01  | .00  | .00    | 0.     |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.     | * | 1  |     | 1430 | 175 | .01  | .00  | .00    | 0.     |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.     | * | 1  |     | 1435 | 176 | .01  | .00  | .00    | 0.     |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.     | * | 1  |     | 1440 | 177 | .01  | .00  | .00    | 0.     |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.     | * | 1  |     | 1445 | 178 | .01  | .00  | .00    | 0.     |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.     | * | 1  |     | 1450 | 179 | .01  | .00  | .00    | 0.     |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.     | * | 1  |     | 1455 | 180 | .01  | .00  | .00    | 0.     |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.     | * | 1  |     | 1500 | 181 | .01  | .00  | .00    | 0.     |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.     | * | 1  |     | 1505 | 182 | .01  | .00  | .00    | 0.     |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.     | * | 1  |     | 1510 | 183 | .01  | .00  | .00    | 0.     |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.     | * | 1  |     | 1515 | 184 | .01  | .00  | .00    | 0.     |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.     | * | 1  |     | 1520 | 185 | .01  | .00  | .00    | 0.     |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.     | * | 1  |     | 1525 | 186 | .01  | .00  | .00    | 0.     |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.     | * | 1  |     | 1530 | 187 | .01  | .00  | .00    | 0.     |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.     | * | 1  |     | 1535 | 188 | .01  | .00  | .00    | 0.     |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.     | * | 1  |     | 1540 | 189 | .01  | .00  | .00    | 0.     |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.     | * | 1  |     | 1545 | 190 | .01  | .00  | .00    | 0.     |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.     | * | 1  |     | 1550 | 191 | .01  | .00  | .00    | 0.     |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.     | * | 1  |     | 1555 | 192 | .01  | .00  | .00    | 0.     |
| 1  |     | 0330 | 43  | .00  | .00  | .00    | 0.     | * | 1  |     | 1600 | 193 | .01  | .00  | .00    | 0.     |
| 1  |     | 0335 | 44  | .00  | .00  | .00    | 0.     | * | 1  |     | 1605 | 194 | .01  | .00  | .00    | 0.     |
| 1  |     | 0340 | 45  | .00  | .00  | .00    | 0.     | * | 1  |     | 1610 | 195 | .01  | .00  | .00    | 0.     |
| 1  |     | 0345 | 46  | .00  | .00  | .00    | 0.     | * | 1  |     | 1615 | 196 | .01  | .00  | .00    | 0.     |
| 1  |     | 0350 | 47  | .00  | .00  | .00    | 0.     | * | 1  |     | 1620 | 197 | .00  | .00  | .00    | 0.     |
| 1  |     | 0355 | 48  | .00  | .00  | .00    | 0.     | * | 1  |     | 1625 | 198 | .00  | .00  | .00    | 0.     |
| 1  |     | 0400 | 49  | .00  | .00  | .00    | 0.     | * | 1  |     | 1630 | 199 | .00  | .00  | .00    | 0.     |
| 1  |     | 0405 | 50  | .00  | .00  | .00    | 0.     | * | 1  |     | 1635 | 200 | .00  | .00  | .00    | 0.     |
| 1  |     | 0410 | 51  | .00  | .00  | .00    | 0.     | * | 1  |     | 1640 | 201 | .00  | .00  | .00    | 0.     |
| 1  |     | 0415 | 52  | .00  | .00  | .00    | 0.     | * | 1  |     | 1645 | 202 | .00  | .00  | .00    | 0.     |
| 1  |     | 0420 | 53  | .00  | .00  | .00    | 0.     | * | 1  |     | 1650 | 203 | .00  | .00  | .00    | 0.     |
| 1  |     | 0425 | 54  | .00  | .00  | .00    | 0.     | * | 1  |     | 1655 | 204 | .00  | .00  | .00    | 0.     |
| 1  |     | 0430 | 55  | .00  | .00  | .00    | 0.     | * | 1  |     | 1700 | 205 | .00  | .00  | .00    | 0.     |
| 1  |     | 0435 | 56  | .00  | .00  | .00    | 0.     | * | 1  |     | 1705 | 206 | .00  | .00  | .00    | 0.     |
| 1  |     | 0440 | 57  | .00  | .00  | .00    | 0.     | * | 1  |     | 1710 | 207 | .00  | .00  | .00    | 0.     |
| 1  |     | 0445 | 58  | .00  | .00  | .00    | 0.     | * | 1  |     | 1715 | 208 | .00  | .00  | .00    | 0.     |
| 1  |     | 0450 | 59  | .00  | .00  | .00    | 0.     | * | 1  |     | 1720 | 209 | .00  | .00  | .00    | 0.     |
| 1  |     | 0455 | 60  | .00  | .00  | .00    | 0.     | * | 1  |     | 1725 | 210 | .00  | .00  | .00    | 0.     |
| 1  |     | 0500 | 61  | .00  | .00  | .00    | 0.     | * | 1  |     | 1730 | 211 | .00  | .00  | .00    | 0.     |
| 1  |     | 0505 | 62  | .00  | .00  | .00    | 0.     | * | 1  |     | 1735 | 212 | .00  | .00  | .00    | 0.     |
| 1  |     | 0510 | 63  | .00  | .00  | .00    | 0.     | * | 1  |     | 1740 | 213 | .00  | .00  | .00    | 0.     |
| 1  |     | 0515 | 64  | .00  | .00  | .00    | 0.     | * | 1  |     | 1745 | 214 | .00  | .00  | .00    | 0.     |
| 1  |     | 0520 | 65  | .00  | .00  | .00    | 0.     | * | 1  |     | 1750 | 215 | .00  | .00  | .00    | 0.     |
| 1  |     | 0525 | 66  | .00  | .00  | .00    | 0.     | * | 1  |     | 1755 | 216 | .00  | .00  | .00    | 0.     |
| 1  |     | 0530 | 67  | .00  | .00  | .00    | 0.     | * | 1  |     | 1800 | 217 | .00  | .00  | .00    | 0.     |
| 1  |     | 0535 | 68  | .00  | .00  | .00    | 0.     | * | 1  |     | 1805 | 218 | .00  | .00  | .00    | 0.     |
| 1  |     | 0540 | 69  | .00  | .00  | .00    | 0.     | * | 1  |     | 1810 | 219 | .00  | .00  | .00    | 0.     |
| 1  |     | 0545 | 70  | .00  | .00  | .00    | 0.     | * | 1  |     | 1815 | 220 | .00  | .00  | .00    | 0.     |
| 1  |     | 0550 | 71  | .00  | .00  | .00    | 0.     | * | 1  |     | 1820 | 221 | .00  | .00  | .00    | 0.     |
| 1  |     | 0555 | 72  | .00  | .00  | .00    | 0.     | * | 1  |     | 1825 | 222 | .00  | .00  | .00    | 0.     |
| 1  |     | 0600 | 73  | .00  | .00  | .00    | 0.     | * | 1  |     | 1830 | 223 | .00  | .00  | .00    | 0.     |
| 1  |     | 0605 | 74  | .00  | .00  | .00    | 0.     | * | 1  |     | 1835 | 224 | .00  | .00  | .00    | 0.     |
| 1  |     | 0610 | 75  | .00  | .00  | .00    | 0.     | * | 1  |     | 1840 | 225 | .00  | .00  | .00    | 0.     |
| 1  |     | 0615 | 76  | .00  | .00  | .00    | 0.     | * | 1  |     | 1845 | 226 | .00  | .00  | .00    | 0.     |
| 1  |     | 0620 | 77  | .00  | .00  | .00    | 0.     | * | 1  |     | 1850 | 227 | .00  | .00  | .00    | 0.     |
| 1  |     | 0625 | 78  | .00  | .00  | .00    | 0.     | * | 1  |     | 1855 | 228 | .00  | .00  | .00    | 0.     |
| 1  |     | 0630 | 79  | .00  | .00  | .00    | 0.     | * | 1  |     | 1900 | 229 | .00  | .00  | .00    | 0.     |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0635 | 80  | .00 | .00 | .00 | 0. | * | 1 | 1905 | 230 | .00 | .00 | .00 | 0. |
| 1 | 0640 | 81  | .00 | .00 | .00 | 0. | * | 1 | 1910 | 231 | .00 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .00 | .00 | .00 | 0. | * | 1 | 1915 | 232 | .00 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .00 | .00 | .00 | 0. | * | 1 | 1920 | 233 | .00 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .00 | .00 | .00 | 0. | * | 1 | 1925 | 234 | .00 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .00 | .00 | .00 | 0. | * | 1 | 1930 | 235 | .00 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .00 | .00 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .00 | .00 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .00 | .00 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .00 | .00 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .00 | .00 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .00 | .00 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .00 | .00 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .00 | .00 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .01 | .01 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .09 | .08 | .01 | 0. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .09 | .08 | .02 | 0. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .09 | .07 | .02 | 0. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .24 | .17 | .07 | 1. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .24 | .15 | .09 | 2. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .24 | .13 | .11 | 3. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .02 | .02 | 3. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .02 | .02 | 2. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .02 | .02 | 1. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .01 | .01 | 1. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .01 | .01 | 1. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .01 | .01 | 1. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 1. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 0. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 1.78, TOTAL EXCESS = .82

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | (CFS) | 6-HR<br>(INCHES) | MAXIMUM AVERAGE FLOW<br>24-HR<br>(AC-FT) | 72-HR | 24.92-HR |
|--------------------|--------------|-------|------------------|------------------------------------------|-------|----------|
| + 3.               | 11.83        |       | .664             | .815                                     | .815  | .815     |
|                    |              |       | 0.               | 0.                                       | 0.    | 0.       |

CUMULATIVE AREA = .00 SQ MI

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48 KK \*\*\*\*\*
\*
\* DPA \*
\*
\*\*\*\*\*

DESIGN POINT A

50 HC HYDROGRAPH COMBINATION
ICOMP 4 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION DPA
SUM OF 4 HYDROGRAPHS

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Table with 18 columns: DA, MON, HRMN, ORD, FLOW, \* (repeated 4 times), DA, MON, HRMN, ORD, FLOW, \* (repeated 4 times). Rows contain numerical data for hydrograph combinations.



|   |      |    |    |   |   |      |     |     |   |   |      |     |    |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|-----|---|---|------|-----|----|---|---|------|-----|----|
| 1 | 0435 | 56 | 0. | * | 1 | 1050 | 131 | 0.  | * | 1 | 1705 | 206 | 3. | * | 1 | 2320 | 281 | 2. |
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 0.  | * | 1 | 1710 | 207 | 3. | * | 1 | 2325 | 282 | 2. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 0.  | * | 1 | 1715 | 208 | 3. | * | 1 | 2330 | 283 | 2. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 0.  | * | 1 | 1720 | 209 | 3. | * | 1 | 2335 | 284 | 2. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 0.  | * | 1 | 1725 | 210 | 3. | * | 1 | 2340 | 285 | 2. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 0.  | * | 1 | 1730 | 211 | 3. | * | 1 | 2345 | 286 | 2. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 0.  | * | 1 | 1735 | 212 | 3. | * | 1 | 2350 | 287 | 2. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 1.  | * | 1 | 1740 | 213 | 3. | * | 1 | 2355 | 288 | 2. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 2.  | * | 1 | 1745 | 214 | 3. | * | 2 | 0000 | 289 | 1. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 5.  | * | 1 | 1750 | 215 | 3. | * | 2 | 0005 | 290 | 1. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 13. | * | 1 | 1755 | 216 | 3. | * | 2 | 0010 | 291 | 1. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 26. | * | 1 | 1800 | 217 | 3. | * | 2 | 0015 | 292 | 0. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 41. | * | 1 | 1805 | 218 | 3. | * | 2 | 0020 | 293 | 0. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 50. | * | 1 | 1810 | 219 | 3. | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 50. | * | 1 | 1815 | 220 | 3. | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 45. | * | 1 | 1820 | 221 | 3. | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 37. | * | 1 | 1825 | 222 | 3. | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 30. | * | 1 | 1830 | 223 | 3. | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 25. | * | 1 | 1835 | 224 | 3. | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 21. | * | 1 | 1840 | 225 | 3. | * | 2 | 0055 | 300 | 0. |

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| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |      |
|--------------------|--------------|----------------------|-------|-------|----------|------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |      |
| 50.                | 12.00        | 10.                  | 3.    | 3.    | 3.       |      |
|                    |              | (INCHES)             | .453  | .574  | .574     | .574 |
|                    |              | (AC-FT)              | 5.    | 6.    | 6.       | 6.   |

CUMULATIVE AREA = .20 SQ MI

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51 KK \* OSB1 \*  
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CHEYENNE MTN. HS OFFSITE BASIN B1

SUBBASIN RUNOFF DATA

53 BA SUBBASIN CHARACTERISTICS  
TAREA .14 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 2.60 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN

|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

.00 .00 .00 .00 .00

54 LS SCS LOSS RATE  
STRTL .60 INITIAL ABSTRACTION  
CRVNER 77.00 CURVE NUMBER  
RTIMP .00 PERCENT IMPERVIOUS AREA

55 UD SCS DIMENSIONLESS UNITGRAPH  
TLAG .28 LAG

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WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

UNIT HYDROGRAPH  
19 END-OF-PERIOD ORDINATES

32. 106. 188. 205. 176. 123. 77. 51. 33. 22.  
14. 9. 6. 4. 3. 2. 1. 1. 0.

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HYDROGRAPH AT STATION OSB1

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| DA | MON  | HRMN | ORD  | RAIN | LOSS | EXCESS | COMP Q | * | DA   | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|------|------|------|------|------|--------|--------|---|------|-----|------|-----|------|------|--------|--------|
| 1  | 0000 | 1    | .00  | .00  | .00  | 0.     | *      | 1 | 1230 | 151 | .02  | .01 | .01  | 17.  |        |        |
| 1  | 0005 | 2    | .00  | .00  | .00  | 0.     | *      | 1 | 1235 | 152 | .02  | .01 | .01  | 15.  |        |        |
| 1  | 0010 | 3    | .00  | .00  | .00  | 0.     | *      | 1 | 1240 | 153 | .02  | .01 | .01  | 13.  |        |        |
| 1  | 0015 | 4    | .00  | .00  | .00  | 0.     | *      | 1 | 1245 | 154 | .02  | .01 | .01  | 12.  |        |        |
| 1  | 0020 | 5    | .00  | .00  | .00  | 0.     | *      | 1 | 1250 | 155 | .01  | .01 | .01  | 11.  |        |        |
| 1  | 0025 | 6    | .00  | .00  | .00  | 0.     | *      | 1 | 1255 | 156 | .01  | .01 | .01  | 10.  |        |        |
| 1  | 0030 | 7    | .00  | .00  | .00  | 0.     | *      | 1 | 1300 | 157 | .01  | .01 | .01  | 9.   |        |        |
| 1  | 0035 | 8    | -.01 | -.01 | .00  | 0.     | *      | 1 | 1305 | 158 | .01  | .01 | .01  | 9.   |        |        |
| 1  | 0040 | 9    | -.01 | -.01 | .00  | 0.     | *      | 1 | 1310 | 159 | .01  | .01 | .01  | 8.   |        |        |
| 1  | 0045 | 10   | -.01 | -.01 | .00  | 0.     | *      | 1 | 1315 | 160 | .01  | .00 | .01  | 8.   |        |        |
| 1  | 0050 | 11   | .01  | .01  | .00  | 0.     | *      | 1 | 1320 | 161 | .01  | .00 | .01  | 7.   |        |        |
| 1  | 0055 | 12   | .01  | .01  | .00  | 0.     | *      | 1 | 1325 | 162 | .01  | .00 | .01  | 7.   |        |        |
| 1  | 0100 | 13   | .01  | .01  | .00  | 0.     | *      | 1 | 1330 | 163 | .01  | .00 | .01  | 7.   |        |        |
| 1  | 0105 | 14   | .00  | .00  | .00  | 0.     | *      | 1 | 1335 | 164 | .01  | .00 | .00  | 6.   |        |        |
| 1  | 0110 | 15   | .00  | .00  | .00  | 0.     | *      | 1 | 1340 | 165 | .01  | .00 | .00  | 6.   |        |        |
| 1  | 0115 | 16   | .00  | .00  | .00  | 0.     | *      | 1 | 1345 | 166 | .01  | .00 | .00  | 6.   |        |        |
| 1  | 0120 | 17   | .00  | .00  | .00  | 0.     | *      | 1 | 1350 | 167 | .01  | .00 | .00  | 6.   |        |        |
| 1  | 0125 | 18   | .00  | .00  | .00  | 0.     | *      | 1 | 1355 | 168 | .01  | .00 | .00  | 5.   |        |        |
| 1  | 0130 | 19   | .00  | .00  | .00  | 0.     | *      | 1 | 1400 | 169 | .01  | .00 | .00  | 5.   |        |        |
| 1  | 0135 | 20   | .00  | .00  | .00  | 0.     | *      | 1 | 1405 | 170 | .01  | .00 | .00  | 5.   |        |        |
| 1  | 0140 | 21   | .00  | .00  | .00  | 0.     | *      | 1 | 1410 | 171 | .01  | .00 | .00  | 5.   |        |        |
| 1  | 0145 | 22   | .00  | .00  | .00  | 0.     | *      | 1 | 1415 | 172 | .01  | .00 | .00  | 5.   |        |        |
| 1  | 0150 | 23   | .00  | .00  | .00  | 0.     | *      | 1 | 1420 | 173 | .01  | .00 | .00  | 5.   |        |        |
| 1  | 0155 | 24   | .00  | .00  | .00  | 0.     | *      | 1 | 1425 | 174 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0200 | 25   | .00  | .00  | .00  | 0.     | *      | 1 | 1430 | 175 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0205 | 26   | .00  | .00  | .00  | 0.     | *      | 1 | 1435 | 176 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0210 | 27   | .00  | .00  | .00  | 0.     | *      | 1 | 1440 | 177 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0215 | 28   | .00  | .00  | .00  | 0.     | *      | 1 | 1445 | 178 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0220 | 29   | .00  | .00  | .00  | 0.     | *      | 1 | 1450 | 179 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0225 | 30   | .00  | .00  | .00  | 0.     | *      | 1 | 1455 | 180 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0230 | 31   | .00  | .00  | .00  | 0.     | *      | 1 | 1500 | 181 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0235 | 32   | .00  | .00  | .00  | 0.     | *      | 1 | 1505 | 182 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0240 | 33   | .00  | .00  | .00  | 0.     | *      | 1 | 1510 | 183 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0245 | 34   | .00  | .00  | .00  | 0.     | *      | 1 | 1515 | 184 | .01  | .00 | .00  | 4.   |        |        |
| 1  | 0250 | 35   | .00  | .00  | .00  | 0.     | *      | 1 | 1520 | 185 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0255 | 36   | .00  | .00  | .00  | 0.     | *      | 1 | 1525 | 186 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0300 | 37   | .00  | .00  | .00  | 0.     | *      | 1 | 1530 | 187 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0305 | 38   | .00  | .00  | .00  | 0.     | *      | 1 | 1535 | 188 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0310 | 39   | .00  | .00  | .00  | 0.     | *      | 1 | 1540 | 189 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0315 | 40   | .00  | .00  | .00  | 0.     | *      | 1 | 1545 | 190 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0320 | 41   | .00  | .00  | .00  | 0.     | *      | 1 | 1550 | 191 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0325 | 42   | .00  | .00  | .00  | 0.     | *      | 1 | 1555 | 192 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0330 | 43   | .00  | .00  | .00  | 0.     | *      | 1 | 1600 | 193 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0335 | 44   | .00  | .00  | .00  | 0.     | *      | 1 | 1605 | 194 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0340 | 45   | .00  | .00  | .00  | 0.     | *      | 1 | 1610 | 195 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0345 | 46   | .00  | .00  | .00  | 0.     | *      | 1 | 1615 | 196 | .01  | .00 | .00  | 3.   |        |        |
| 1  | 0350 | 47   | .00  | .00  | .00  | 0.     | *      | 1 | 1620 | 197 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0355 | 48   | .00  | .00  | .00  | 0.     | *      | 1 | 1625 | 198 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0400 | 49   | .00  | .00  | .00  | 0.     | *      | 1 | 1630 | 199 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0405 | 50   | .00  | .00  | .00  | 0.     | *      | 1 | 1635 | 200 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0410 | 51   | .00  | .00  | .00  | 0.     | *      | 1 | 1640 | 201 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0415 | 52   | .00  | .00  | .00  | 0.     | *      | 1 | 1645 | 202 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0420 | 53   | .00  | .00  | .00  | 0.     | *      | 1 | 1650 | 203 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0425 | 54   | .00  | .00  | .00  | 0.     | *      | 1 | 1655 | 204 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0430 | 55   | .00  | .00  | .00  | 0.     | *      | 1 | 1700 | 205 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0435 | 56   | .00  | .00  | .00  | 0.     | *      | 1 | 1705 | 206 | .00  | .00 | .00  | 3.   |        |        |
| 1  | 0440 | 57   | .00  | .00  | .00  | 0.     | *      | 1 | 1710 | 207 | .00  | .00 | .00  | 3.   |        |        |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0445 | 58  | .00 | .00 | .00 | 0.  | * | 1 | 1715 | 208 | .00 | .00 | .00 | 3. |
| 1 | 0450 | 59  | .00 | .00 | .00 | 0.  | * | 1 | 1720 | 209 | .00 | .00 | .00 | 3. |
| 1 | 0455 | 60  | .00 | .00 | .00 | 0.  | * | 1 | 1725 | 210 | .00 | .00 | .00 | 3. |
| 1 | 0500 | 61  | .00 | .00 | .00 | 0.  | * | 1 | 1730 | 211 | .00 | .00 | .00 | 3. |
| 1 | 0505 | 62  | .00 | .00 | .00 | 0.  | * | 1 | 1735 | 212 | .00 | .00 | .00 | 3. |
| 1 | 0510 | 63  | .00 | .00 | .00 | 0.  | * | 1 | 1740 | 213 | .00 | .00 | .00 | 3. |
| 1 | 0515 | 64  | .00 | .00 | .00 | 0.  | * | 1 | 1745 | 214 | .00 | .00 | .00 | 3. |
| 1 | 0520 | 65  | .00 | .00 | .00 | 0.  | * | 1 | 1750 | 215 | .00 | .00 | .00 | 3. |
| 1 | 0525 | 66  | .00 | .00 | .00 | 0.  | * | 1 | 1755 | 216 | .00 | .00 | .00 | 2. |
| 1 | 0530 | 67  | .00 | .00 | .00 | 0.  | * | 1 | 1800 | 217 | .00 | .00 | .00 | 2. |
| 1 | 0535 | 68  | .00 | .00 | .00 | 0.  | * | 1 | 1805 | 218 | .00 | .00 | .00 | 2. |
| 1 | 0540 | 69  | .00 | .00 | .00 | 0.  | * | 1 | 1810 | 219 | .00 | .00 | .00 | 2. |
| 1 | 0545 | 70  | .00 | .00 | .00 | 0.  | * | 1 | 1815 | 220 | .00 | .00 | .00 | 2. |
| 1 | 0550 | 71  | .00 | .00 | .00 | 0.  | * | 1 | 1820 | 221 | .00 | .00 | .00 | 2. |
| 1 | 0555 | 72  | .00 | .00 | .00 | 0.  | * | 1 | 1825 | 222 | .00 | .00 | .00 | 2. |
| 1 | 0600 | 73  | .00 | .00 | .00 | 0.  | * | 1 | 1830 | 223 | .00 | .00 | .00 | 2. |
| 1 | 0605 | 74  | .00 | .00 | .00 | 0.  | * | 1 | 1835 | 224 | .00 | .00 | .00 | 2. |
| 1 | 0610 | 75  | .00 | .00 | .00 | 0.  | * | 1 | 1840 | 225 | .00 | .00 | .00 | 2. |
| 1 | 0615 | 76  | .00 | .00 | .00 | 0.  | * | 1 | 1845 | 226 | .00 | .00 | .00 | 2. |
| 1 | 0620 | 77  | .00 | .00 | .00 | 0.  | * | 1 | 1850 | 227 | .00 | .00 | .00 | 2. |
| 1 | 0625 | 78  | .00 | .00 | .00 | 0.  | * | 1 | 1855 | 228 | .00 | .00 | .00 | 2. |
| 1 | 0630 | 79  | .00 | .00 | .00 | 0.  | * | 1 | 1900 | 229 | .00 | .00 | .00 | 2. |
| 1 | 0635 | 80  | .00 | .00 | .00 | 0.  | * | 1 | 1905 | 230 | .00 | .00 | .00 | 2. |
| 1 | 0640 | 81  | .00 | .00 | .00 | 0.  | * | 1 | 1910 | 231 | .00 | .00 | .00 | 2. |
| 1 | 0645 | 82  | .00 | .00 | .00 | 0.  | * | 1 | 1915 | 232 | .00 | .00 | .00 | 2. |
| 1 | 0650 | 83  | .00 | .00 | .00 | 0.  | * | 1 | 1920 | 233 | .00 | .00 | .00 | 2. |
| 1 | 0655 | 84  | .00 | .00 | .00 | 0.  | * | 1 | 1925 | 234 | .00 | .00 | .00 | 2. |
| 1 | 0700 | 85  | .00 | .00 | .00 | 0.  | * | 1 | 1930 | 235 | .00 | .00 | .00 | 2. |
| 1 | 0705 | 86  | .00 | .00 | .00 | 0.  | * | 1 | 1935 | 236 | .00 | .00 | .00 | 2. |
| 1 | 0710 | 87  | .00 | .00 | .00 | 0.  | * | 1 | 1940 | 237 | .00 | .00 | .00 | 2. |
| 1 | 0715 | 88  | .00 | .00 | .00 | 0.  | * | 1 | 1945 | 238 | .00 | .00 | .00 | 2. |
| 1 | 0720 | 89  | .00 | .00 | .00 | 0.  | * | 1 | 1950 | 239 | .00 | .00 | .00 | 2. |
| 1 | 0725 | 90  | .00 | .00 | .00 | 0.  | * | 1 | 1955 | 240 | .00 | .00 | .00 | 2. |
| 1 | 0730 | 91  | .00 | .00 | .00 | 0.  | * | 1 | 2000 | 241 | .00 | .00 | .00 | 2. |
| 1 | 0735 | 92  | .00 | .00 | .00 | 0.  | * | 1 | 2005 | 242 | .00 | .00 | .00 | 2. |
| 1 | 0740 | 93  | .00 | .00 | .00 | 0.  | * | 1 | 2010 | 243 | .00 | .00 | .00 | 2. |
| 1 | 0745 | 94  | .00 | .00 | .00 | 0.  | * | 1 | 2015 | 244 | .00 | .00 | .00 | 2. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0.  | * | 1 | 2020 | 245 | .00 | .00 | .00 | 2. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0.  | * | 1 | 2025 | 246 | .00 | .00 | .00 | 2. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0.  | * | 1 | 2030 | 247 | .00 | .00 | .00 | 2. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0.  | * | 1 | 2035 | 248 | .00 | .00 | .00 | 2. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0.  | * | 1 | 2040 | 249 | .00 | .00 | .00 | 2. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0.  | * | 1 | 2045 | 250 | .00 | .00 | .00 | 2. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0.  | * | 1 | 2050 | 251 | .00 | .00 | .00 | 2. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0.  | * | 1 | 2055 | 252 | .00 | .00 | .00 | 2. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0.  | * | 1 | 2100 | 253 | .00 | .00 | .00 | 2. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0.  | * | 1 | 2105 | 254 | .00 | .00 | .00 | 2. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0.  | * | 1 | 2110 | 255 | .00 | .00 | .00 | 2. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0.  | * | 1 | 2115 | 256 | .00 | .00 | .00 | 2. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0.  | * | 1 | 2120 | 257 | .00 | .00 | .00 | 2. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0.  | * | 1 | 2125 | 258 | .00 | .00 | .00 | 2. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0.  | * | 1 | 2130 | 259 | .00 | .00 | .00 | 2. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0.  | * | 1 | 2135 | 260 | .00 | .00 | .00 | 2. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0.  | * | 1 | 2140 | 261 | .00 | .00 | .00 | 2. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0.  | * | 1 | 2145 | 262 | .00 | .00 | .00 | 2. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0.  | * | 1 | 2150 | 263 | .00 | .00 | .00 | 2. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0.  | * | 1 | 2155 | 264 | .00 | .00 | .00 | 2. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0.  | * | 1 | 2200 | 265 | .00 | .00 | .00 | 2. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0.  | * | 1 | 2205 | 266 | .00 | .00 | .00 | 2. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0.  | * | 1 | 2210 | 267 | .00 | .00 | .00 | 2. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0.  | * | 1 | 2215 | 268 | .00 | .00 | .00 | 2. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0.  | * | 1 | 2220 | 269 | .00 | .00 | .00 | 2. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0.  | * | 1 | 2225 | 270 | .00 | .00 | .00 | 2. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0.  | * | 1 | 2230 | 271 | .00 | .00 | .00 | 2. |
| 1 | 1005 | 122 | .01 | .01 | .00 | 0.  | * | 1 | 2235 | 272 | .00 | .00 | .00 | 2. |
| 1 | 1010 | 123 | .01 | .01 | .00 | 0.  | * | 1 | 2240 | 273 | .00 | .00 | .00 | 2. |
| 1 | 1015 | 124 | .01 | .01 | .00 | 0.  | * | 1 | 2245 | 274 | .00 | .00 | .00 | 2. |
| 1 | 1020 | 125 | .01 | .01 | .00 | 0.  | * | 1 | 2250 | 275 | .00 | .00 | .00 | 2. |
| 1 | 1025 | 126 | .01 | .01 | .00 | 0.  | * | 1 | 2255 | 276 | .00 | .00 | .00 | 2. |
| 1 | 1030 | 127 | .01 | .01 | .00 | 0.  | * | 1 | 2300 | 277 | .00 | .00 | .00 | 2. |
| 1 | 1035 | 128 | .02 | .02 | .00 | 0.  | * | 1 | 2305 | 278 | .00 | .00 | .00 | 2. |
| 1 | 1040 | 129 | .02 | .02 | .00 | 0.  | * | 1 | 2310 | 279 | .00 | .00 | .00 | 2. |
| 1 | 1045 | 130 | .02 | .02 | .00 | 0.  | * | 1 | 2315 | 280 | .00 | .00 | .00 | 2. |
| 1 | 1050 | 131 | .02 | .02 | .00 | 0.  | * | 1 | 2320 | 281 | .00 | .00 | .00 | 2. |
| 1 | 1055 | 132 | .02 | .02 | .00 | 0.  | * | 1 | 2325 | 282 | .00 | .00 | .00 | 2. |
| 1 | 1100 | 133 | .02 | .02 | .00 | 0.  | * | 1 | 2330 | 283 | .00 | .00 | .00 | 2. |
| 1 | 1105 | 134 | .02 | .02 | .00 | 0.  | * | 1 | 2335 | 284 | .00 | .00 | .00 | 2. |
| 1 | 1110 | 135 | .02 | .02 | .00 | 1.  | * | 1 | 2340 | 285 | .00 | .00 | .00 | 2. |
| 1 | 1115 | 136 | .02 | .02 | .00 | 1.  | * | 1 | 2345 | 286 | .00 | .00 | .00 | 2. |
| 1 | 1120 | 137 | .09 | .08 | .01 | 1.  | * | 1 | 2350 | 287 | .00 | .00 | .00 | 1. |
| 1 | 1125 | 138 | .09 | .08 | .02 | 3.  | * | 1 | 2355 | 288 | .00 | .00 | .00 | 1. |
| 1 | 1130 | 139 | .09 | .07 | .02 | 5.  | * | 2 | 0000 | 289 | .00 | .00 | .00 | 1. |
| 1 | 1135 | 140 | .24 | .17 | .07 | 10. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 1. |
| 1 | 1140 | 141 | .24 | .15 | .09 | 19. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 1145 | 142 | .24 | .13 | .11 | 34. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .04 | .02 | .02 | 49. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .04 | .02 | .02 | 57. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .04 | .02 | .02 | 55. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .02 | .01 | .01 | 46. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .02 | .01 | .01 | 37. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .02 | .01 | .01 | 29. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .02 | .01 | .01 | 24. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .02 | .01 | .01 | 20. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 2.60, TOTAL LOSS = 1.78, TOTAL EXCESS = .82

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |            |            |            |            |
|--------------------|--------------|----------------------|------------|------------|------------|------------|
|                    |              | 6-HR                 | 24-HR      | 72-HR      | 24.92-HR   |            |
| 57.                | 11.92        | 10.                  | 3.         | 3.         | 3.         |            |
|                    |              | (INCHES)<br>(AC-FT)  | .662<br>5. | .815<br>6. | .815<br>6. | .815<br>6. |

CUMULATIVE AREA = .14 SQ MI

1

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

| OPERATION     | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD |         |         | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---------------|---------|-----------|--------------|---------------------------------|---------|---------|------------|---------------|-------------------|
|               |         |           |              | 6-HOUR                          | 24-HOUR | 72-HOUR |            |               |                   |
| HYDROGRAPH AT | OSA1    | 35.       | 12.00        | 7.                              | 2.      | 2.      | .16        |               |                   |
| ROUTED TO     | RTA1    | 35.       | 12.00        | 7.                              | 2.      | 2.      | .16        |               |                   |
| HYDROGRAPH AT | OSA2    | 11.       | 11.92        | 2.                              | 1.      | 1.      | .03        |               |                   |
| ROUTED TO     | RTA2    | 11.       | 11.92        | 2.                              | 1.      | 1.      | .03        |               |                   |
| HYDROGRAPH AT |         | 4.        | 11.92        | 1.                              | 0.      | 0.      | .01        |               |                   |
| ROUTED TO     | RTA3    | 4.        | 11.92        | 1.                              | 0.      | 0.      | .01        |               |                   |
| HYDROGRAPH AT | OSA4    | 3.        | 11.83        | 0.                              | 0.      | 0.      | .00        |               |                   |
| 4 COMBINED AT | DPA     | 50.       | 12.00        | 10.                             | 3.      | 3.      | .20        |               |                   |
| HYDROGRAPH AT | OSB1    | 57.       | 11.92        | 10.                             | 3.      | 3.      | .14        |               |                   |

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING  
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

| ISTAQ | ELEMENT | DT    | PEAK  | TIME TO PEAK | VOLUME | DT    | INTERPOLATED TO COMPUTATION INTERVAL |              | VOLUME |
|-------|---------|-------|-------|--------------|--------|-------|--------------------------------------|--------------|--------|
|       |         |       |       |              |        |       | PEAK                                 | TIME TO PEAK |        |
|       |         | (MIN) | (CFS) | (MIN)        | (IN)   | (MIN) | (CFS)                                | (MIN)        | (IN)   |
| RTA1  | MANE    | .28   | 34.81 | 720.43       | .51    | 5.00  | 34.74                                | 720.00       | .51    |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4348E+01 EXCESS= .0000E+00 OUTFLOW= .4348E+01 BASIN STORAGE= .6211E-04 PERCENT ERROR= .0

|      |      |     |       |        |     |      |       |        |     |
|------|------|-----|-------|--------|-----|------|-------|--------|-----|
| RTA2 | MANE | .31 | 11.21 | 715.61 | .82 | 5.00 | 11.10 | 715.00 | .82 |
|------|------|-----|-------|--------|-----|------|-------|--------|-----|

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1131E+01 EXCESS= .0000E+00 OUTFLOW= .1131E+01 BASIN STORAGE= .1175E-04 PERCENT ERROR= .0

|      |      |     |      |        |     |      |      |        |     |
|------|------|-----|------|--------|-----|------|------|--------|-----|
| RTA3 | MANE | .28 | 4.15 | 715.35 | .82 | 5.00 | 4.14 | 715.00 | .82 |
|------|------|-----|------|--------|-----|------|------|--------|-----|

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3913E+00 EXCESS= .0000E+00 OUTFLOW= .3914E+00 BASIN STORAGE= .1960E-05 PERCENT ERROR= .0

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

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1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* SEPTEMBER 1990
* VERSION 4.0
*
* RUN DATE 11/04/1997 TIME 15:14:12
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*****
*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

1 HEC-1 INPUT PAGE 1

| LINE | ID       | 1                                                                | 2     | 3    | 4     | 5    | 6    | 7    | 8    | 9    | 10   |
|------|----------|------------------------------------------------------------------|-------|------|-------|------|------|------|------|------|------|
| 1    | ID       | CHEYENNE MOUNTAIN HIGH SCHOOL MDDP                               |       |      |       |      |      |      |      |      |      |
| 2    | ID       | BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MTN. SCHOOLS |       |      |       |      |      |      |      |      |      |
| 3    | ID       | FUTURE UPSTREAM 100-YR FLOWS NOV. 4, 1997                        |       |      |       |      |      |      |      |      |      |
|      | *DIAGRAM |                                                                  |       |      |       |      |      |      |      |      |      |
| 4    | IT       | 5                                                                | 300   |      |       |      |      |      |      |      |      |
| 5    | IO       | 0                                                                |       |      |       |      |      |      |      |      |      |
| 6    | IN       | 15                                                               |       |      |       |      |      |      |      |      |      |
| 7    | KK       | OSA1                                                             |       |      |       |      |      |      |      |      |      |
| 8    | KM       | CHEYENNE MTN. HS OFFSITE BASIN A1                                |       |      |       |      |      |      |      |      |      |
| 9    | KO       | 3                                                                |       |      |       |      |      |      |      |      |      |
| 10   | BA       | 0.159                                                            |       |      |       |      |      |      |      |      |      |
| 11   | PB       | 4.4                                                              |       |      |       |      |      |      |      |      |      |
| 12   | PC       | .002                                                             | .005  | .008 | .0011 | .014 | .017 | .02  | .023 | .026 | .029 |
| 13   | PC       | .032                                                             | .035  | .038 | .041  | .044 | .048 | .052 | .056 | .06  | .064 |
| 14   | PC       | .068                                                             | .072  | .076 | .08   | .085 | .09  | .095 | .1   | .105 | .11  |
| 15   | PC       | .115                                                             | .12   | .126 | .133  | .14  | .147 | .155 | .163 | .172 | .181 |
| 16   | PC       | .191                                                             | .203  | .218 | .236  | .257 | .283 | .387 | .663 | .707 | .735 |
| 17   | PC       | .758                                                             | .776  | .791 | .804  | .815 | .825 | .834 | .842 | .849 | .856 |
| 18   | PC       | .863                                                             | .869  | .875 | .881  | .887 | .893 | .898 | .903 | .908 | .913 |
| 19   | PC       | .918                                                             | .922  | .926 | .93   | .934 | .938 | .942 | .946 | .95  | .953 |
| 20   | PC       | .956                                                             | .959  | .962 | .965  | .968 | .971 | .974 | .977 | .98  | .983 |
| 21   | PC       | .986                                                             | .989  | .992 | .995  | .998 | 1    |      |      |      |      |
| 22   | LS       | 70                                                               |       |      |       |      |      |      |      |      |      |
| 23   | UD       | 0.292                                                            |       |      |       |      |      |      |      |      |      |
| 24   | KK       | RTA1                                                             |       |      |       |      |      |      |      |      |      |
| 25   | KM       | ROUTE OSA1 TO DPA                                                |       |      |       |      |      |      |      |      |      |
| 26   | RK       | 395                                                              | .0709 | .035 |       | TRAP | 2    | 4    |      |      |      |
| 27   | KK       | OSA2                                                             |       |      |       |      |      |      |      |      |      |
| 28   | KM       | CHEYENNE MTN. HS OFFSITE BASIN A2                                |       |      |       |      |      |      |      |      |      |
| 29   | BA       | .026                                                             |       |      |       |      |      |      |      |      |      |
| 30   | LS       | 77                                                               |       |      |       |      |      |      |      |      |      |
| 31   | UD       | 0.266                                                            |       |      |       |      |      |      |      |      |      |
| 32   | KK       | RTA2                                                             |       |      |       |      |      |      |      |      |      |
| 33   | KM       | ROUTE OSA2 TO DPA                                                |       |      |       |      |      |      |      |      |      |
| 34   | RK       | 311                                                              | .0707 | .035 |       | TRAP | 2    | 4    |      |      |      |
| 35   | KM       | OSA3                                                             |       |      |       |      |      |      |      |      |      |
| 36   | KK       | CHEYENNE MTN. HS OFFSITE BASIN A3                                |       |      |       |      |      |      |      |      |      |
| 37   | BA       | .009                                                             |       |      |       |      |      |      |      |      |      |
| 38   | LS       | 77                                                               |       |      |       |      |      |      |      |      |      |
| 39   | UD       | 0.227                                                            |       |      |       |      |      |      |      |      |      |

40 KK RTA3  
 41 KM ROUTE OSA3 TO DPA  
 42 RK 292 .0822 .035 TRAP 2 4

HEC-1 INPUT

PAGE 2

1

| LINE | ID | 1                                 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|----|-----------------------------------|---|---|---|---|---|---|---|---|----|
| 43   | KK | OSA4                              |   |   |   |   |   |   |   |   |    |
| 44   | KM | CHEYENNE MTN. HS OFFSITE BASIN A4 |   |   |   |   |   |   |   |   |    |
| 45   | BA | .005                              |   |   |   |   |   |   |   |   |    |
| 46   | LS | 77                                |   |   |   |   |   |   |   |   |    |
| 47   | UD | 0.127                             |   |   |   |   |   |   |   |   |    |
| 48   | KK | DPA                               |   |   |   |   |   |   |   |   |    |
| 49   | KM | DESIGN POINT A                    |   |   |   |   |   |   |   |   |    |
| 50   | HC | 4                                 |   |   |   |   |   |   |   |   |    |
| 51   | KK | OSB1                              |   |   |   |   |   |   |   |   |    |
| 52   | KM | CHEYENNE MTN. HS OFFSITE BASIN B1 |   |   |   |   |   |   |   |   |    |
| 53   | BA | 0.136                             |   |   |   |   |   |   |   |   |    |
| 54   | LS | 77                                |   |   |   |   |   |   |   |   |    |
| 55   | UD | 0.277                             |   |   |   |   |   |   |   |   |    |
| 56   | ZZ |                                   |   |   |   |   |   |   |   |   |    |

SCHEMATIC DIAGRAM OF STREAM NETWORK

1

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW  
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

```

  7  OSA1
     V
     V
  24 RTA1
     .
     .
  27 .   OSA2
     .   V
     .   V
  32 .   RTA2
     .
     .
  36 .
     .
     .   V
     .   V
  40 .   RTA3
     .
     .
  43 .   OSA4
     .
     .
  48 DPA.....
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     .
  51 .   OSB1
  
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(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 11/04/1997 TIME 15:14:12 *
*****
  
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```

*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
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CHEYENNE MOUNTAIN HIGH SCHOOL MDDP  
 BY: KIOWA ENGINEERING CORP. JOB# 9787 FOR: CHEYENNE MTN. SCHOOLS  
 FUTURE UPSTREAM 100-YR FLOWS NOV. 4, 1997

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

IT HYDROGRAPH TIME DATA  
 NMIN 5 MINUTES IN COMPUTATION INTERVAL  
 IDATE 1 0 STARTING DATE

ITIME 0000 STARTING TIME  
NQ 300 NUMBER OF HYDROGRAPH ORDINATES  
NDDATE 2 0 ENDING DATE  
NDTIME 0055 ENDING TIME  
ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .08 HOURS  
TOTAL TIME BASE 24.92 HOURS

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

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\* \*  
7 KK \* OSA1 \*  
\* \*  
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CHEYENNE MTN. HS OFFSITE BASIN A1

9 KO OUTPUT CONTROL VARIABLES  
IPRNT 3 PRINT CONTROL  
IPLOT 0 PLOT CONTROL  
QSCAL 0. HYDROGRAPH PLOT SCALE

6 IN TIME DATA FOR INPUT TIME SERIES  
JXMIN 15 TIME INTERVAL IN MINUTES  
JXDATE 1 0 STARTING DATE  
JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS  
TAREA .16 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 4.40 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN  
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22 LS SCS LOSS RATE  
STRTL .86 INITIAL ABSTRACTION  
CRVNBR 70.00 CURVE NUMBER  
RTIMP .00 PERCENT IMPERVIOUS AREA



23 UD SCS DIMENSIONLESS UNITGRAPH  
TLAG .29 LAG

\*\*\*

UNIT HYDROGRAPH  
20 END-OF-PERIOD ORDINATES

33. 108. 202. 231. 207. 157. 98. 65. 44. 29.  
20. 13. 9. 6. 4. 3. 2. 1. 1. 0.

\*\*\* \*\*\* \*\*\* \*\*\* \*\*\*

HYDROGRAPH AT STATION OSA1

TOTAL RAINFALL = 4.40, TOTAL LOSS = 2.78, TOTAL EXCESS = 1.62

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW       |                    |                    |                    |
|--------------------|--------------|----------------------------|--------------------|--------------------|--------------------|
|                    |              | 6-HR                       | 24-HR              | 72-HR              | 24.92-HR           |
| 132.               | 11.92        | 23.<br>(INCHES)<br>(AC-FT) | 7.<br>1.324<br>11. | 7.<br>1.625<br>14. | 7.<br>1.625<br>14. |
| CUMULATIVE AREA =  |              | .16 SQ MI                  |                    |                    |                    |

\*\*\* \*\*

\*\*\*\*\*  
\* RTA1 \*  
\* \*  
\*\*\*\*\*

ROUTE OSA1 TO DPA

HYDROGRAPH ROUTING DATA

26 RK KINEMATIC WAVE STREAM ROUTING  
L 395. CHANNEL LENGTH  
S .0709 SLOPE  
N .035 CHANNEL ROUGHNESS COEFFICIENT  
CA .00 CONTRIBUTING AREA  
SHAPE TRAP CHANNEL SHAPE  
WD 2.00 BOTTOM WIDTH OR DIAMETER  
Z 4.00 SIDE SLOPE  
NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*

COMPUTED KINEMATIC PARAMETERS  
VARIABLE TIME STEP  
(DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .27         | 131.67     | 132.27        | 715.57                   | 1.62           | 13.67                        |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1378E+02 EXCESS= .0000E+00 OUTFLOW= .1378E+02 BASIN STORAGE= .1241E-03 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |        |        |      |
|------|------|------|------|--------|--------|------|
| MAIN | 4.24 | 1.34 | 5.00 | 131.14 | 715.00 | 1.63 |
|------|------|------|------|--------|--------|------|

\*\*\*\*\*

HYDROGRAPH AT STATION RTA1

| DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW | DA | MON  | HRMN | ORD | FLOW |
|----|------|------|-----|------|----|------|------|-----|------|----|------|------|-----|------|----|------|------|-----|------|
| 1  | 0000 | 1    | 0.  | *    | 1  | 0615 | 76   | 0.  | *    | 1  | 1230 | 151  | 42. | *    | 1  | 1845 | 226  | 5.  |      |
| 1  | 0005 | 2    | 0.  | *    | 1  | 0620 | 77   | 0.  | *    | 1  | 1235 | 152  | 36. | *    | 1  | 1850 | 227  | 5.  |      |
| 1  | 0010 | 3    | 0.  | *    | 1  | 0625 | 78   | 0.  | *    | 1  | 1240 | 153  | 32. | *    | 1  | 1855 | 228  | 5.  |      |
| 1  | 0015 | 4    | 0.  | *    | 1  | 0630 | 79   | 0.  | *    | 1  | 1245 | 154  | 29. | *    | 1  | 1900 | 229  | 5.  |      |

|   |      |    |    |   |   |      |     |      |   |   |      |     |     |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|------|---|---|------|-----|-----|---|---|------|-----|----|
| 1 | 0020 | 5  | 0. | * | 1 | 0635 | 80  | 0.   | * | 1 | 1250 | 155 | 26. | * | 1 | 1905 | 230 | 5. |
| 1 | 0025 | 6  | 0. | * | 1 | 0640 | 81  | 0.   | * | 1 | 1255 | 156 | 24. | * | 1 | 1910 | 231 | 5. |
| 1 | 0030 | 7  | 0. | * | 1 | 0645 | 82  | 0.   | * | 1 | 1300 | 157 | 22. | * | 1 | 1915 | 232 | 5. |
| 1 | 0035 | 8  | 0. | * | 1 | 0650 | 83  | 0.   | * | 1 | 1305 | 158 | 20. | * | 1 | 1920 | 233 | 5. |
| 1 | 0040 | 9  | 0. | * | 1 | 0655 | 84  | 0.   | * | 1 | 1310 | 159 | 19. | * | 1 | 1925 | 234 | 5. |
| 1 | 0045 | 10 | 0. | * | 1 | 0700 | 85  | 0.   | * | 1 | 1315 | 160 | 18. | * | 1 | 1930 | 235 | 5. |
| 1 | 0050 | 11 | 0. | * | 1 | 0705 | 86  | 0.   | * | 1 | 1320 | 161 | 17. | * | 1 | 1935 | 236 | 5. |
| 1 | 0055 | 12 | 0. | * | 1 | 0710 | 87  | 0.   | * | 1 | 1325 | 162 | 16. | * | 1 | 1940 | 237 | 5. |
| 1 | 0100 | 13 | 0. | * | 1 | 0715 | 88  | 0.   | * | 1 | 1330 | 163 | 15. | * | 1 | 1945 | 238 | 5. |
| 1 | 0105 | 14 | 0. | * | 1 | 0720 | 89  | 0.   | * | 1 | 1335 | 164 | 14. | * | 1 | 1950 | 239 | 4. |
| 1 | 0110 | 15 | 0. | * | 1 | 0725 | 90  | 0.   | * | 1 | 1340 | 165 | 14. | * | 1 | 1955 | 240 | 4. |
| 1 | 0115 | 16 | 0. | * | 1 | 0730 | 91  | 0.   | * | 1 | 1345 | 166 | 13. | * | 1 | 2000 | 241 | 4. |
| 1 | 0120 | 17 | 0. | * | 1 | 0735 | 92  | 0.   | * | 1 | 1350 | 167 | 13. | * | 1 | 2005 | 242 | 4. |
| 1 | 0125 | 18 | 0. | * | 1 | 0740 | 93  | 0.   | * | 1 | 1355 | 168 | 12. | * | 1 | 2010 | 243 | 4. |
| 1 | 0130 | 19 | 0. | * | 1 | 0745 | 94  | 0.   | * | 1 | 1400 | 169 | 12. | * | 1 | 2015 | 244 | 4. |
| 1 | 0135 | 20 | 0. | * | 1 | 0750 | 95  | 0.   | * | 1 | 1405 | 170 | 11. | * | 1 | 2020 | 245 | 4. |
| 1 | 0140 | 21 | 0. | * | 1 | 0755 | 96  | 0.   | * | 1 | 1410 | 171 | 11. | * | 1 | 2025 | 246 | 4. |
| 1 | 0145 | 22 | 0. | * | 1 | 0800 | 97  | 0.   | * | 1 | 1415 | 172 | 10. | * | 1 | 2030 | 247 | 4. |
| 1 | 0150 | 23 | 0. | * | 1 | 0805 | 98  | 0.   | * | 1 | 1420 | 173 | 10. | * | 1 | 2035 | 248 | 4. |
| 1 | 0155 | 24 | 0. | * | 1 | 0810 | 99  | 0.   | * | 1 | 1425 | 174 | 10. | * | 1 | 2040 | 249 | 4. |
| 1 | 0200 | 25 | 0. | * | 1 | 0815 | 100 | 0.   | * | 1 | 1430 | 175 | 9.  | * | 1 | 2045 | 250 | 4. |
| 1 | 0205 | 26 | 0. | * | 1 | 0820 | 101 | 0.   | * | 1 | 1435 | 176 | 9.  | * | 1 | 2050 | 251 | 4. |
| 1 | 0210 | 27 | 0. | * | 1 | 0825 | 102 | 0.   | * | 1 | 1440 | 177 | 9.  | * | 1 | 2055 | 252 | 4. |
| 1 | 0215 | 28 | 0. | * | 1 | 0830 | 103 | 0.   | * | 1 | 1445 | 178 | 9.  | * | 1 | 2100 | 253 | 4. |
| 1 | 0220 | 29 | 0. | * | 1 | 0835 | 104 | 0.   | * | 1 | 1450 | 179 | 8.  | * | 1 | 2105 | 254 | 4. |
| 1 | 0225 | 30 | 0. | * | 1 | 0840 | 105 | 0.   | * | 1 | 1455 | 180 | 8.  | * | 1 | 2110 | 255 | 4. |
| 1 | 0230 | 31 | 0. | * | 1 | 0845 | 106 | 0.   | * | 1 | 1500 | 181 | 8.  | * | 1 | 2115 | 256 | 4. |
| 1 | 0235 | 32 | 0. | * | 1 | 0850 | 107 | 0.   | * | 1 | 1505 | 182 | 8.  | * | 1 | 2120 | 257 | 4. |
| 1 | 0240 | 33 | 0. | * | 1 | 0855 | 108 | 0.   | * | 1 | 1510 | 183 | 8.  | * | 1 | 2125 | 258 | 4. |
| 1 | 0245 | 34 | 0. | * | 1 | 0900 | 109 | 0.   | * | 1 | 1515 | 184 | 8.  | * | 1 | 2130 | 259 | 4. |
| 1 | 0250 | 35 | 0. | * | 1 | 0905 | 110 | 0.   | * | 1 | 1520 | 185 | 8.  | * | 1 | 2135 | 260 | 4. |
| 1 | 0255 | 36 | 0. | * | 1 | 0910 | 111 | 0.   | * | 1 | 1525 | 186 | 8.  | * | 1 | 2140 | 261 | 4. |
| 1 | 0300 | 37 | 0. | * | 1 | 0915 | 112 | 0.   | * | 1 | 1530 | 187 | 7.  | * | 1 | 2145 | 262 | 4. |
| 1 | 0305 | 38 | 0. | * | 1 | 0920 | 113 | 0.   | * | 1 | 1535 | 188 | 7.  | * | 1 | 2150 | 263 | 4. |
| 1 | 0310 | 39 | 0. | * | 1 | 0925 | 114 | 0.   | * | 1 | 1540 | 189 | 7.  | * | 1 | 2155 | 264 | 4. |
| 1 | 0315 | 40 | 0. | * | 1 | 0930 | 115 | 0.   | * | 1 | 1545 | 190 | 7.  | * | 1 | 2200 | 265 | 4. |
| 1 | 0320 | 41 | 0. | * | 1 | 0935 | 116 | 0.   | * | 1 | 1550 | 191 | 7.  | * | 1 | 2205 | 266 | 4. |
| 1 | 0325 | 42 | 0. | * | 1 | 0940 | 117 | 0.   | * | 1 | 1555 | 192 | 7.  | * | 1 | 2210 | 267 | 4. |
| 1 | 0330 | 43 | 0. | * | 1 | 0945 | 118 | 0.   | * | 1 | 1600 | 193 | 7.  | * | 1 | 2215 | 268 | 4. |
| 1 | 0335 | 44 | 0. | * | 1 | 0950 | 119 | 0.   | * | 1 | 1605 | 194 | 7.  | * | 1 | 2220 | 269 | 4. |
| 1 | 0340 | 45 | 0. | * | 1 | 0955 | 120 | 0.   | * | 1 | 1610 | 195 | 7.  | * | 1 | 2225 | 270 | 4. |
| 1 | 0345 | 46 | 0. | * | 1 | 1000 | 121 | 0.   | * | 1 | 1615 | 196 | 7.  | * | 1 | 2230 | 271 | 4. |
| 1 | 0350 | 47 | 0. | * | 1 | 1005 | 122 | 0.   | * | 1 | 1620 | 197 | 7.  | * | 1 | 2235 | 272 | 4. |
| 1 | 0355 | 48 | 0. | * | 1 | 1010 | 123 | 0.   | * | 1 | 1625 | 198 | 7.  | * | 1 | 2240 | 273 | 4. |
| 1 | 0400 | 49 | 0. | * | 1 | 1015 | 124 | 0.   | * | 1 | 1630 | 199 | 7.  | * | 1 | 2245 | 274 | 4. |
| 1 | 0405 | 50 | 0. | * | 1 | 1020 | 125 | 0.   | * | 1 | 1635 | 200 | 7.  | * | 1 | 2250 | 275 | 4. |
| 1 | 0410 | 51 | 0. | * | 1 | 1025 | 126 | 0.   | * | 1 | 1640 | 201 | 6.  | * | 1 | 2255 | 276 | 4. |
| 1 | 0415 | 52 | 0. | * | 1 | 1030 | 127 | 0.   | * | 1 | 1645 | 202 | 6.  | * | 1 | 2300 | 277 | 4. |
| 1 | 0420 | 53 | 0. | * | 1 | 1035 | 128 | 1.   | * | 1 | 1650 | 203 | 6.  | * | 1 | 2305 | 278 | 4. |
| 1 | 0425 | 54 | 0. | * | 1 | 1040 | 129 | 1.   | * | 1 | 1655 | 204 | 6.  | * | 1 | 2310 | 279 | 4. |
| 1 | 0430 | 55 | 0. | * | 1 | 1045 | 130 | 1.   | * | 1 | 1700 | 205 | 6.  | * | 1 | 2315 | 280 | 4. |
| 1 | 0435 | 56 | 0. | * | 1 | 1050 | 131 | 2.   | * | 1 | 1705 | 206 | 6.  | * | 1 | 2320 | 281 | 4. |
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 2.   | * | 1 | 1710 | 207 | 6.  | * | 1 | 2325 | 282 | 4. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 2.   | * | 1 | 1715 | 208 | 6.  | * | 1 | 2330 | 283 | 4. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 3.   | * | 1 | 1720 | 209 | 6.  | * | 1 | 2335 | 284 | 4. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 4.   | * | 1 | 1725 | 210 | 6.  | * | 1 | 2340 | 285 | 4. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 4.   | * | 1 | 1730 | 211 | 6.  | * | 1 | 2345 | 286 | 3. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 6.   | * | 1 | 1735 | 212 | 6.  | * | 1 | 2350 | 287 | 3. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 9.   | * | 1 | 1740 | 213 | 6.  | * | 1 | 2355 | 288 | 3. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 15.  | * | 1 | 1745 | 214 | 6.  | * | 2 | 0000 | 289 | 2. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 26.  | * | 1 | 1750 | 215 | 6.  | * | 2 | 0005 | 290 | 2. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 46.  | * | 1 | 1755 | 216 | 5.  | * | 2 | 0010 | 291 | 1. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 78.  | * | 1 | 1800 | 217 | 5.  | * | 2 | 0015 | 292 | 1. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 111. | * | 1 | 1805 | 218 | 5.  | * | 2 | 0020 | 293 | 1. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 131. | * | 1 | 1810 | 219 | 5.  | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 130. | * | 1 | 1815 | 220 | 5.  | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 113. | * | 1 | 1820 | 221 | 5.  | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 92.  | * | 1 | 1825 | 222 | 5.  | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 73.  | * | 1 | 1830 | 223 | 5.  | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 59.  | * | 1 | 1835 | 224 | 5.  | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 49.  | * | 1 | 1840 | 225 | 5.  | * | 2 | 0055 | 300 | 0. |

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| PEAK FLOW<br>+ (CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|----------------------|--------------|----------------------|-------|-------|----------|
|                      |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 131.                 | 11.92        | 23.                  | 7.    | 7.    | 7.       |
|                      |              | (INCHES)             | 1.324 | 1.625 | 1.625    |
|                      |              | (AC-FT)              | 11.   | 14.   | 14.      |
| CUMULATIVE AREA =    |              | .16 SQ MI            |       |       |          |

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27 KK OSA2

CHEYENNE MTN. HS OFFSITE BASIN A2

SUBBASIN RUNOFF DATA

29 BA SUBBASIN CHARACTERISTICS TAREA .03 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 4.40 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN

Table with 11 columns of precipitation data values ranging from .00 to .09.

30 LS SCS LOSS RATE STRTL .60 INITIAL ABSTRACTION CRVNER 77.00 CURVE NUMBER RTIMP .00 PERCENT IMPERVIOUS AREA

31 UD SCS DIMENSIONLESS UNITGRAPH TLAG .27 LAG

\*\*\*

WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

UNIT HYDROGRAPH 18 END-OF-PERIOD ORDINATES

Table with 10 columns of ordinates: 7., 22., 38., 40., 33., 22., 14., 9., 6., 4.

HYDROGRAPH AT STATION OSA2

Table with 14 columns: DA, MON, HRMN, ORD, RAIN, LOSS, EXCESS, COMP Q, and repeated columns for the same variables.

|   |      |    |      |      |     |    |   |   |      |     |     |     |     |    |
|---|------|----|------|------|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0030 | 7  | .00  | .00  | .00 | 0. | * | 1 | 1300 | 157 | .02 | .01 | .02 | 4. |
| 1 | 0035 | 8  | -.01 | -.01 | .00 | 0. | * | 1 | 1305 | 158 | .02 | .00 | .01 | 4. |
| 1 | 0040 | 9  | -.01 | -.01 | .00 | 0. | * | 1 | 1310 | 159 | .02 | .00 | .01 | 4. |
| 1 | 0045 | 10 | -.01 | -.01 | .00 | 0. | * | 1 | 1315 | 160 | .02 | .00 | .01 | 3. |
| 1 | 0050 | 11 | .02  | .02  | .00 | 0. | * | 1 | 1320 | 161 | .02 | .00 | .01 | 3. |
| 1 | 0055 | 12 | .02  | .02  | .00 | 0. | * | 1 | 1325 | 162 | .02 | .00 | .01 | 3. |
| 1 | 0100 | 13 | .02  | .02  | .00 | 0. | * | 1 | 1330 | 163 | .02 | .00 | .01 | 3. |
| 1 | 0105 | 14 | .00  | .00  | .00 | 0. | * | 1 | 1335 | 164 | .01 | .00 | .01 | 3. |
| 1 | 0110 | 15 | .00  | .00  | .00 | 0. | * | 1 | 1340 | 165 | .01 | .00 | .01 | 3. |
| 1 | 0115 | 16 | .00  | .00  | .00 | 0. | * | 1 | 1345 | 166 | .01 | .00 | .01 | 2. |
| 1 | 0120 | 17 | .00  | .00  | .00 | 0. | * | 1 | 1350 | 167 | .01 | .00 | .01 | 2. |
| 1 | 0125 | 18 | .00  | .00  | .00 | 0. | * | 1 | 1355 | 168 | .01 | .00 | .01 | 2. |
| 1 | 0130 | 19 | .00  | .00  | .00 | 0. | * | 1 | 1400 | 169 | .01 | .00 | .01 | 2. |
| 1 | 0135 | 20 | .00  | .00  | .00 | 0. | * | 1 | 1405 | 170 | .01 | .00 | .01 | 2. |
| 1 | 0140 | 21 | .00  | .00  | .00 | 0. | * | 1 | 1410 | 171 | .01 | .00 | .01 | 2. |
| 1 | 0145 | 22 | .00  | .00  | .00 | 0. | * | 1 | 1415 | 172 | .01 | .00 | .01 | 2. |
| 1 | 0150 | 23 | .00  | .00  | .00 | 0. | * | 1 | 1420 | 173 | .01 | .00 | .01 | 2. |
| 1 | 0155 | 24 | .00  | .00  | .00 | 0. | * | 1 | 1425 | 174 | .01 | .00 | .01 | 2. |
| 1 | 0200 | 25 | .00  | .00  | .00 | 0. | * | 1 | 1430 | 175 | .01 | .00 | .01 | 2. |
| 1 | 0205 | 26 | .00  | .00  | .00 | 0. | * | 1 | 1435 | 176 | .01 | .00 | .01 | 2. |
| 1 | 0210 | 27 | .00  | .00  | .00 | 0. | * | 1 | 1440 | 177 | .01 | .00 | .01 | 2. |
| 1 | 0215 | 28 | .00  | .00  | .00 | 0. | * | 1 | 1445 | 178 | .01 | .00 | .01 | 2. |
| 1 | 0220 | 29 | .00  | .00  | .00 | 0. | * | 1 | 1450 | 179 | .01 | .00 | .01 | 2. |
| 1 | 0225 | 30 | .00  | .00  | .00 | 0. | * | 1 | 1455 | 180 | .01 | .00 | .01 | 2. |
| 1 | 0230 | 31 | .00  | .00  | .00 | 0. | * | 1 | 1500 | 181 | .01 | .00 | .01 | 2. |
| 1 | 0235 | 32 | .00  | .00  | .00 | 0. | * | 1 | 1505 | 182 | .01 | .00 | .01 | 2. |
| 1 | 0240 | 33 | .00  | .00  | .00 | 0. | * | 1 | 1510 | 183 | .01 | .00 | .01 | 2. |
| 1 | 0245 | 34 | .00  | .00  | .00 | 0. | * | 1 | 1515 | 184 | .01 | .00 | .01 | 2. |
| 1 | 0250 | 35 | .00  | .00  | .00 | 0. | * | 1 | 1520 | 185 | .01 | .00 | .01 | 1. |
| 1 | 0255 | 36 | .00  | .00  | .00 | 0. | * | 1 | 1525 | 186 | .01 | .00 | .01 | 1. |
| 1 | 0300 | 37 | .00  | .00  | .00 | 0. | * | 1 | 1530 | 187 | .01 | .00 | .01 | 1. |
| 1 | 0305 | 38 | .00  | .00  | .00 | 0. | * | 1 | 1535 | 188 | .01 | .00 | .01 | 1. |
| 1 | 0310 | 39 | .00  | .00  | .00 | 0. | * | 1 | 1540 | 189 | .01 | .00 | .01 | 1. |
| 1 | 0315 | 40 | .00  | .00  | .00 | 0. | * | 1 | 1545 | 190 | .01 | .00 | .01 | 1. |
| 1 | 0320 | 41 | .00  | .00  | .00 | 0. | * | 1 | 1550 | 191 | .01 | .00 | .01 | 1. |
| 1 | 0325 | 42 | .00  | .00  | .00 | 0. | * | 1 | 1555 | 192 | .01 | .00 | .01 | 1. |
| 1 | 0330 | 43 | .00  | .00  | .00 | 0. | * | 1 | 1600 | 193 | .01 | .00 | .01 | 1. |
| 1 | 0335 | 44 | .01  | .01  | .00 | 0. | * | 1 | 1605 | 194 | .01 | .00 | .01 | 1. |
| 1 | 0340 | 45 | .01  | .01  | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .01 | 1. |
| 1 | 0345 | 46 | .01  | .01  | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .01 | 1. |
| 1 | 0350 | 47 | .01  | .01  | .00 | 0. | * | 1 | 1620 | 197 | .01 | .00 | .01 | 1. |
| 1 | 0355 | 48 | .01  | .01  | .00 | 0. | * | 1 | 1625 | 198 | .01 | .00 | .01 | 1. |
| 1 | 0400 | 49 | .01  | .01  | .00 | 0. | * | 1 | 1630 | 199 | .01 | .00 | .01 | 1. |
| 1 | 0405 | 50 | .01  | .01  | .00 | 0. | * | 1 | 1635 | 200 | .01 | .00 | .01 | 1. |
| 1 | 0410 | 51 | .01  | .01  | .00 | 0. | * | 1 | 1640 | 201 | .01 | .00 | .01 | 1. |
| 1 | 0415 | 52 | .01  | .01  | .00 | 0. | * | 1 | 1645 | 202 | .01 | .00 | .01 | 1. |
| 1 | 0420 | 53 | .01  | .01  | .00 | 0. | * | 1 | 1650 | 203 | .01 | .00 | .01 | 1. |
| 1 | 0425 | 54 | .01  | .01  | .00 | 0. | * | 1 | 1655 | 204 | .01 | .00 | .01 | 1. |
| 1 | 0430 | 55 | .01  | .01  | .00 | 0. | * | 1 | 1700 | 205 | .01 | .00 | .01 | 1. |
| 1 | 0435 | 56 | .01  | .01  | .00 | 0. | * | 1 | 1705 | 206 | .01 | .00 | .01 | 1. |
| 1 | 0440 | 57 | .01  | .01  | .00 | 0. | * | 1 | 1710 | 207 | .01 | .00 | .01 | 1. |
| 1 | 0445 | 58 | .01  | .01  | .00 | 0. | * | 1 | 1715 | 208 | .01 | .00 | .01 | 1. |
| 1 | 0450 | 59 | .01  | .01  | .00 | 0. | * | 1 | 1720 | 209 | .01 | .00 | .01 | 1. |
| 1 | 0455 | 60 | .01  | .01  | .00 | 0. | * | 1 | 1725 | 210 | .01 | .00 | .01 | 1. |
| 1 | 0500 | 61 | .01  | .01  | .00 | 0. | * | 1 | 1730 | 211 | .01 | .00 | .01 | 1. |
| 1 | 0505 | 62 | .01  | .01  | .00 | 0. | * | 1 | 1735 | 212 | .01 | .00 | .00 | 1. |
| 1 | 0510 | 63 | .01  | .01  | .00 | 0. | * | 1 | 1740 | 213 | .01 | .00 | .00 | 1. |
| 1 | 0515 | 64 | .01  | .01  | .00 | 0. | * | 1 | 1745 | 214 | .01 | .00 | .00 | 1. |
| 1 | 0520 | 65 | .01  | .01  | .00 | 0. | * | 1 | 1750 | 215 | .01 | .00 | .00 | 1. |
| 1 | 0525 | 66 | .01  | .01  | .00 | 0. | * | 1 | 1755 | 216 | .01 | .00 | .00 | 1. |
| 1 | 0530 | 67 | .01  | .01  | .00 | 0. | * | 1 | 1800 | 217 | .01 | .00 | .00 | 1. |
| 1 | 0535 | 68 | .01  | .01  | .00 | 0. | * | 1 | 1805 | 218 | .01 | .00 | .00 | 1. |
| 1 | 0540 | 69 | .01  | .01  | .00 | 0. | * | 1 | 1810 | 219 | .01 | .00 | .00 | 1. |
| 1 | 0545 | 70 | .01  | .01  | .00 | 0. | * | 1 | 1815 | 220 | .01 | .00 | .00 | 1. |
| 1 | 0550 | 71 | .01  | .01  | .00 | 0. | * | 1 | 1820 | 221 | .01 | .00 | .00 | 1. |
| 1 | 0555 | 72 | .01  | .01  | .00 | 0. | * | 1 | 1825 | 222 | .01 | .00 | .00 | 1. |
| 1 | 0600 | 73 | .01  | .01  | .00 | 0. | * | 1 | 1830 | 223 | .01 | .00 | .00 | 1. |
| 1 | 0605 | 74 | .01  | .01  | .00 | 0. | * | 1 | 1835 | 224 | .01 | .00 | .00 | 1. |
| 1 | 0610 | 75 | .01  | .01  | .00 | 0. | * | 1 | 1840 | 225 | .01 | .00 | .00 | 1. |
| 1 | 0615 | 76 | .01  | .01  | .00 | 0. | * | 1 | 1845 | 226 | .01 | .00 | .00 | 1. |
| 1 | 0620 | 77 | .01  | .01  | .00 | 0. | * | 1 | 1850 | 227 | .01 | .00 | .00 | 1. |
| 1 | 0625 | 78 | .01  | .01  | .00 | 0. | * | 1 | 1855 | 228 | .01 | .00 | .00 | 1. |
| 1 | 0630 | 79 | .01  | .01  | .00 | 0. | * | 1 | 1900 | 229 | .01 | .00 | .00 | 1. |
| 1 | 0635 | 80 | .01  | .01  | .00 | 0. | * | 1 | 1905 | 230 | .01 | .00 | .00 | 1. |
| 1 | 0640 | 81 | .01  | .01  | .00 | 0. | * | 1 | 1910 | 231 | .01 | .00 | .00 | 1. |
| 1 | 0645 | 82 | .01  | .01  | .00 | 0. | * | 1 | 1915 | 232 | .01 | .00 | .00 | 1. |
| 1 | 0650 | 83 | .01  | .01  | .00 | 0. | * | 1 | 1920 | 233 | .01 | .00 | .00 | 1. |
| 1 | 0655 | 84 | .01  | .01  | .00 | 0. | * | 1 | 1925 | 234 | .01 | .00 | .00 | 1. |
| 1 | 0700 | 85 | .01  | .01  | .00 | 0. | * | 1 | 1930 | 235 | .01 | .00 | .00 | 1. |
| 1 | 0705 | 86 | .01  | .01  | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 1. |
| 1 | 0710 | 87 | .01  | .01  | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 1. |
| 1 | 0715 | 88 | .01  | .01  | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 1. |
| 1 | 0720 | 89 | .01  | .01  | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 1. |
| 1 | 0725 | 90 | .01  | .01  | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 1. |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0730 | 91  | .01 | .01 | .00 | 0.  | * | 1 | 2000 | 241 | .00 | .00 | .00 | 1. |
| 1 | 0735 | 92  | .01 | .01 | .00 | 0.  | * | 1 | 2005 | 242 | .00 | .00 | .00 | 1. |
| 1 | 0740 | 93  | .01 | .01 | .00 | 0.  | * | 1 | 2010 | 243 | .00 | .00 | .00 | 1. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0.  | * | 1 | 2015 | 244 | .00 | .00 | .00 | 1. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0.  | * | 1 | 2020 | 245 | .00 | .00 | .00 | 1. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0.  | * | 1 | 2025 | 246 | .00 | .00 | .00 | 1. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0.  | * | 1 | 2030 | 247 | .00 | .00 | .00 | 1. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0.  | * | 1 | 2035 | 248 | .00 | .00 | .00 | 1. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0.  | * | 1 | 2040 | 249 | .00 | .00 | .00 | 1. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0.  | * | 1 | 2045 | 250 | .00 | .00 | .00 | 1. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0.  | * | 1 | 2050 | 251 | .00 | .00 | .00 | 1. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0.  | * | 1 | 2055 | 252 | .00 | .00 | .00 | 1. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0.  | * | 1 | 2100 | 253 | .00 | .00 | .00 | 1. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0.  | * | 1 | 2105 | 254 | .00 | .00 | .00 | 1. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0.  | * | 1 | 2110 | 255 | .00 | .00 | .00 | 1. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0.  | * | 1 | 2115 | 256 | .00 | .00 | .00 | 1. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0.  | * | 1 | 2120 | 257 | .00 | .00 | .00 | 1. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0.  | * | 1 | 2125 | 258 | .00 | .00 | .00 | 1. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0.  | * | 1 | 2130 | 259 | .00 | .00 | .00 | 1. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0.  | * | 1 | 2135 | 260 | .00 | .00 | .00 | 1. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0.  | * | 1 | 2140 | 261 | .00 | .00 | .00 | 1. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0.  | * | 1 | 2145 | 262 | .00 | .00 | .00 | 1. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0.  | * | 1 | 2150 | 263 | .00 | .00 | .00 | 1. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0.  | * | 1 | 2155 | 264 | .00 | .00 | .00 | 1. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0.  | * | 1 | 2200 | 265 | .00 | .00 | .00 | 1. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0.  | * | 1 | 2205 | 266 | .00 | .00 | .00 | 1. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0.  | * | 1 | 2210 | 267 | .00 | .00 | .00 | 1. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0.  | * | 1 | 2215 | 268 | .00 | .00 | .00 | 1. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0.  | * | 1 | 2220 | 269 | .00 | .00 | .00 | 1. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0.  | * | 1 | 2225 | 270 | .00 | .00 | .00 | 1. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0.  | * | 1 | 2230 | 271 | .00 | .00 | .00 | 1. |
| 1 | 1005 | 122 | .02 | .01 | .00 | 0.  | * | 1 | 2235 | 272 | .00 | .00 | .00 | 1. |
| 1 | 1010 | 123 | .02 | .01 | .00 | 0.  | * | 1 | 2240 | 273 | .00 | .00 | .00 | 1. |
| 1 | 1015 | 124 | .02 | .01 | .00 | 0.  | * | 1 | 2245 | 274 | .00 | .00 | .00 | 1. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 1.  | * | 1 | 2250 | 275 | .00 | .00 | .00 | 1. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 1.  | * | 1 | 2255 | 276 | .00 | .00 | .00 | 1. |
| 1 | 1030 | 127 | .02 | .02 | .00 | 1.  | * | 1 | 2300 | 277 | .00 | .00 | .00 | 1. |
| 1 | 1035 | 128 | .03 | .02 | .01 | 1.  | * | 1 | 2305 | 278 | .00 | .00 | .00 | 1. |
| 1 | 1040 | 129 | .03 | .02 | .01 | 1.  | * | 1 | 2310 | 279 | .00 | .00 | .00 | 1. |
| 1 | 1045 | 130 | .03 | .02 | .01 | 1.  | * | 1 | 2315 | 280 | .00 | .00 | .00 | 1. |
| 1 | 1050 | 131 | .03 | .02 | .01 | 1.  | * | 1 | 2320 | 281 | .00 | .00 | .00 | 1. |
| 1 | 1055 | 132 | .03 | .02 | .01 | 1.  | * | 1 | 2325 | 282 | .00 | .00 | .00 | 1. |
| 1 | 1100 | 133 | .03 | .02 | .01 | 1.  | * | 1 | 2330 | 283 | .00 | .00 | .00 | 1. |
| 1 | 1105 | 134 | .04 | .03 | .01 | 1.  | * | 1 | 2335 | 284 | .00 | .00 | .00 | 1. |
| 1 | 1110 | 135 | .04 | .03 | .01 | 2.  | * | 1 | 2340 | 285 | .00 | .00 | .00 | 1. |
| 1 | 1115 | 136 | .04 | .03 | .01 | 2.  | * | 1 | 2345 | 286 | .00 | .00 | .00 | 1. |
| 1 | 1120 | 137 | .15 | .10 | .06 | 2.  | * | 1 | 2350 | 287 | .00 | .00 | .00 | 1. |
| 1 | 1125 | 138 | .15 | .09 | .06 | 3.  | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .15 | .08 | .07 | 5.  | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .41 | .19 | .21 | 9.  | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .41 | .16 | .24 | 14. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .41 | .14 | .27 | 22. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .06 | .02 | .04 | 29. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .02 | .05 | 31. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .06 | .02 | .05 | 29. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .01 | .03 | 23. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .01 | .03 | 18. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .01 | .03 | 14. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .01 | .02 | 11. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .01 | .02 | 9.  | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 2.25, TOTAL EXCESS = 2.15

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |       |
|--------------------|--------------|----------------------|-------|-------|----------|-------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |       |
| 31.                | 11.92        | 5.                   | 2.    | 1.    | 1.       |       |
|                    |              | (INCHES)             | 1.751 | 2.154 | 2.154    | 2.154 |
|                    |              | (AC-FT)              | 2.    | 3.    | 3.       | 3.    |

CUMULATIVE AREA = .03 SQ MI

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\* \* \*  
32 KK \* RTA2 \*

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ROUTE OSA2 TO DPA  
OSA3

HYDROGRAPH ROUTING DATA

34 RK KINEMATIC WAVE STREAM ROUTING  
 L 311. CHANNEL LENGTH  
 S .0707 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*  
 COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.24  | 1.34 | .25         | 103.67     | 31.40         | 715.50                   | 2.15           | 9.47                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2987E+01 EXCESS= .0000E+00 OUTFLOW= .2987E+01 BASIN STORAGE= .1921E-04 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |  |       |        |      |  |
|------|------|------|------|--|-------|--------|------|--|
| MAIN | 4.24 | 1.34 | 5.00 |  | 31.29 | 715.00 | 2.16 |  |
|------|------|------|------|--|-------|--------|------|--|

HYDROGRAPH AT STATION RTA2

| DA | MON  | HRMN | ORD | FLOW | * | DA   | MON | HRMN | ORD | FLOW | *    | DA  | MON | HRMN | ORD | FLOW | *   | DA | MON | HRMN | ORD | FLOW | * |
|----|------|------|-----|------|---|------|-----|------|-----|------|------|-----|-----|------|-----|------|-----|----|-----|------|-----|------|---|
| 1  | 0000 | 1    | 0.  | *    | 1 | 0615 | 76  | 0.   | *   | 1    | 1230 | 151 | 8.  | *    | 1   | 1845 | 226 | 1. |     |      |     |      |   |
| 1  | 0005 | 2    | 0.  | *    | 1 | 0620 | 77  | 0.   | *   | 1    | 1235 | 152 | 7.  | *    | 1   | 1850 | 227 | 1. |     |      |     |      |   |
| 1  | 0010 | 3    | 0.  | *    | 1 | 0625 | 78  | 0.   | *   | 1    | 1240 | 153 | 6.  | *    | 1   | 1855 | 228 | 1. |     |      |     |      |   |
| 1  | 0015 | 4    | 0.  | *    | 1 | 0630 | 79  | 0.   | *   | 1    | 1245 | 154 | 5.  | *    | 1   | 1900 | 229 | 1. |     |      |     |      |   |
| 1  | 0020 | 5    | 0.  | *    | 1 | 0635 | 80  | 0.   | *   | 1    | 1250 | 155 | 5.  | *    | 1   | 1905 | 230 | 1. |     |      |     |      |   |
| 1  | 0025 | 6    | 0.  | *    | 1 | 0640 | 81  | 0.   | *   | 1    | 1255 | 156 | 4.  | *    | 1   | 1910 | 231 | 1. |     |      |     |      |   |
| 1  | 0030 | 7    | 0.  | *    | 1 | 0645 | 82  | 0.   | *   | 1    | 1300 | 157 | 4.  | *    | 1   | 1915 | 232 | 1. |     |      |     |      |   |
| 1  | 0035 | 8    | 0.  | *    | 1 | 0650 | 83  | 0.   | *   | 1    | 1305 | 158 | 4.  | *    | 1   | 1920 | 233 | 1. |     |      |     |      |   |
| 1  | 0040 | 9    | 0.  | *    | 1 | 0655 | 84  | 0.   | *   | 1    | 1310 | 159 | 4.  | *    | 1   | 1925 | 234 | 1. |     |      |     |      |   |
| 1  | 0045 | 10   | 0.  | *    | 1 | 0700 | 85  | 0.   | *   | 1    | 1315 | 160 | 3.  | *    | 1   | 1930 | 235 | 1. |     |      |     |      |   |
| 1  | 0050 | 11   | 0.  | *    | 1 | 0705 | 86  | 0.   | *   | 1    | 1320 | 161 | 3.  | *    | 1   | 1935 | 236 | 1. |     |      |     |      |   |
| 1  | 0055 | 12   | 0.  | *    | 1 | 0710 | 87  | 0.   | *   | 1    | 1325 | 162 | 3.  | *    | 1   | 1940 | 237 | 1. |     |      |     |      |   |
| 1  | 0100 | 13   | 0.  | *    | 1 | 0715 | 88  | 0.   | *   | 1    | 1330 | 163 | 3.  | *    | 1   | 1945 | 238 | 1. |     |      |     |      |   |
| 1  | 0105 | 14   | 0.  | *    | 1 | 0720 | 89  | 0.   | *   | 1    | 1335 | 164 | 3.  | *    | 1   | 1950 | 239 | 1. |     |      |     |      |   |
| 1  | 0110 | 15   | 0.  | *    | 1 | 0725 | 90  | 0.   | *   | 1    | 1340 | 165 | 3.  | *    | 1   | 1955 | 240 | 1. |     |      |     |      |   |
| 1  | 0115 | 16   | 0.  | *    | 1 | 0730 | 91  | 0.   | *   | 1    | 1345 | 166 | 2.  | *    | 1   | 2000 | 241 | 1. |     |      |     |      |   |
| 1  | 0120 | 17   | 0.  | *    | 1 | 0735 | 92  | 0.   | *   | 1    | 1350 | 167 | 2.  | *    | 1   | 2005 | 242 | 1. |     |      |     |      |   |
| 1  | 0125 | 18   | 0.  | *    | 1 | 0740 | 93  | 0.   | *   | 1    | 1355 | 168 | 2.  | *    | 1   | 2010 | 243 | 1. |     |      |     |      |   |
| 1  | 0130 | 19   | 0.  | *    | 1 | 0745 | 94  | 0.   | *   | 1    | 1400 | 169 | 2.  | *    | 1   | 2015 | 244 | 1. |     |      |     |      |   |
| 1  | 0135 | 20   | 0.  | *    | 1 | 0750 | 95  | 0.   | *   | 1    | 1405 | 170 | 2.  | *    | 1   | 2020 | 245 | 1. |     |      |     |      |   |
| 1  | 0140 | 21   | 0.  | *    | 1 | 0755 | 96  | 0.   | *   | 1    | 1410 | 171 | 2.  | *    | 1   | 2025 | 246 | 1. |     |      |     |      |   |
| 1  | 0145 | 22   | 0.  | *    | 1 | 0800 | 97  | 0.   | *   | 1    | 1415 | 172 | 2.  | *    | 1   | 2030 | 247 | 1. |     |      |     |      |   |
| 1  | 0150 | 23   | 0.  | *    | 1 | 0805 | 98  | 0.   | *   | 1    | 1420 | 173 | 2.  | *    | 1   | 2035 | 248 | 1. |     |      |     |      |   |
| 1  | 0155 | 24   | 0.  | *    | 1 | 0810 | 99  | 0.   | *   | 1    | 1425 | 174 | 2.  | *    | 1   | 2040 | 249 | 1. |     |      |     |      |   |
| 1  | 0200 | 25   | 0.  | *    | 1 | 0815 | 100 | 0.   | *   | 1    | 1430 | 175 | 2.  | *    | 1   | 2045 | 250 | 1. |     |      |     |      |   |
| 1  | 0205 | 26   | 0.  | *    | 1 | 0820 | 101 | 0.   | *   | 1    | 1435 | 176 | 2.  | *    | 1   | 2050 | 251 | 1. |     |      |     |      |   |
| 1  | 0210 | 27   | 0.  | *    | 1 | 0825 | 102 | 0.   | *   | 1    | 1440 | 177 | 2.  | *    | 1   | 2055 | 252 | 1. |     |      |     |      |   |
| 1  | 0215 | 28   | 0.  | *    | 1 | 0830 | 103 | 0.   | *   | 1    | 1445 | 178 | 2.  | *    | 1   | 2100 | 253 | 1. |     |      |     |      |   |
| 1  | 0220 | 29   | 0.  | *    | 1 | 0835 | 104 | 0.   | *   | 1    | 1450 | 179 | 2.  | *    | 1   | 2105 | 254 | 1. |     |      |     |      |   |
| 1  | 0225 | 30   | 0.  | *    | 1 | 0840 | 105 | 0.   | *   | 1    | 1455 | 180 | 2.  | *    | 1   | 2110 | 255 | 1. |     |      |     |      |   |
| 1  | 0230 | 31   | 0.  | *    | 1 | 0845 | 106 | 0.   | *   | 1    | 1500 | 181 | 2.  | *    | 1   | 2115 | 256 | 1. |     |      |     |      |   |
| 1  | 0235 | 32   | 0.  | *    | 1 | 0850 | 107 | 0.   | *   | 1    | 1505 | 182 | 2.  | *    | 1   | 2120 | 257 | 1. |     |      |     |      |   |
| 1  | 0240 | 33   | 0.  | *    | 1 | 0855 | 108 | 0.   | *   | 1    | 1510 | 183 | 2.  | *    | 1   | 2125 | 258 | 1. |     |      |     |      |   |
| 1  | 0245 | 34   | 0.  | *    | 1 | 0900 | 109 | 0.   | *   | 1    | 1515 | 184 | 2.  | *    | 1   | 2130 | 259 | 1. |     |      |     |      |   |
| 1  | 0250 | 35   | 0.  | *    | 1 | 0905 | 110 | 0.   | *   | 1    | 1520 | 185 | 1.  | *    | 1   | 2135 | 260 | 1. |     |      |     |      |   |
| 1  | 0255 | 36   | 0.  | *    | 1 | 0910 | 111 | 0.   | *   | 1    | 1525 | 186 | 1.  | *    | 1   | 2140 | 261 | 1. |     |      |     |      |   |
| 1  | 0300 | 37   | 0.  | *    | 1 | 0915 | 112 | 0.   | *   | 1    | 1530 | 187 | 1.  | *    | 1   | 2145 | 262 | 1. |     |      |     |      |   |
| 1  | 0305 | 38   | 0.  | *    | 1 | 0920 | 113 | 0.   | *   | 1    | 1535 | 188 | 1.  | *    | 1   | 2150 | 263 | 1. |     |      |     |      |   |
| 1  | 0310 | 39   | 0.  | *    | 1 | 0925 | 114 | 0.   | *   | 1    | 1540 | 189 | 1.  | *    | 1   | 2155 | 264 | 1. |     |      |     |      |   |



|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .01 | .01 | .01 | .01 | .01 | .03 | .03 | .03 | .09 | .09 |
| .09 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |
| .01 | .01 | .01 | .01 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
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| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

38 LS            SCS LOSS RATE  
                  STRTL            .60 INITIAL ABSTRACTION  
                  CRVNBR        77.00 CURVE NUMBER  
                  RTIMP            .00 PERCENT IMPERVIOUS AREA

39 UD            SCS DIMENSIONLESS UNITGRAPH  
                  TLAG            .23 LAG

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WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

UNIT HYDROGRAPH  
16 END-OF-PERIOD ORDINATES

|    |     |     |     |     |    |    |    |    |    |
|----|-----|-----|-----|-----|----|----|----|----|----|
| 3. | 11. | 16. | 15. | 10. | 6. | 4. | 2. | 1. | 1. |
| 0. | 0.  | 0.  | 0.  | 0.  | 0. |    |    |    |    |

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HYDROGRAPH AT STATION

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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|-----|------|-----|------|------|--------|--------|---|----|-----|------|-----|------|------|--------|--------|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.     | * | 1  |     | 1230 | 151 | .03  | .01  | .02    | 2.     |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.     | * | 1  |     | 1235 | 152 | .03  | .01  | .02    | 2.     |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.     | * | 1  |     | 1240 | 153 | .03  | .01  | .02    | 2.     |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.     | * | 1  |     | 1245 | 154 | .03  | .01  | .02    | 2.     |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.     | * | 1  |     | 1250 | 155 | .02  | .01  | .02    | 2.     |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.     | * | 1  |     | 1255 | 156 | .02  | .01  | .02    | 1.     |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.     | * | 1  |     | 1300 | 157 | .02  | .01  | .02    | 1.     |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1305 | 158 | .02  | .00  | .01    | 1.     |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1310 | 159 | .02  | .00  | .01    | 1.     |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.     | * | 1  |     | 1315 | 160 | .02  | .00  | .01    | 1.     |
| 1  |     | 0050 | 11  | .02  | .02  | .00    | 0.     | * | 1  |     | 1320 | 161 | .02  | .00  | .01    | 1.     |
| 1  |     | 0055 | 12  | .02  | .02  | .00    | 0.     | * | 1  |     | 1325 | 162 | .02  | .00  | .01    | 1.     |
| 1  |     | 0100 | 13  | .02  | .02  | .00    | 0.     | * | 1  |     | 1330 | 163 | .02  | .00  | .01    | 1.     |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.     | * | 1  |     | 1335 | 164 | .01  | .00  | .01    | 1.     |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.     | * | 1  |     | 1340 | 165 | .01  | .00  | .01    | 1.     |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.     | * | 1  |     | 1345 | 166 | .01  | .00  | .01    | 1.     |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.     | * | 1  |     | 1350 | 167 | .01  | .00  | .01    | 1.     |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.     | * | 1  |     | 1355 | 168 | .01  | .00  | .01    | 1.     |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.     | * | 1  |     | 1400 | 169 | .01  | .00  | .01    | 1.     |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.     | * | 1  |     | 1405 | 170 | .01  | .00  | .01    | 1.     |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.     | * | 1  |     | 1410 | 171 | .01  | .00  | .01    | 1.     |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.     | * | 1  |     | 1415 | 172 | .01  | .00  | .01    | 1.     |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.     | * | 1  |     | 1420 | 173 | .01  | .00  | .01    | 1.     |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.     | * | 1  |     | 1425 | 174 | .01  | .00  | .01    | 1.     |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.     | * | 1  |     | 1430 | 175 | .01  | .00  | .01    | 1.     |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.     | * | 1  |     | 1435 | 176 | .01  | .00  | .01    | 1.     |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.     | * | 1  |     | 1440 | 177 | .01  | .00  | .01    | 1.     |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.     | * | 1  |     | 1445 | 178 | .01  | .00  | .01    | 1.     |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.     | * | 1  |     | 1450 | 179 | .01  | .00  | .01    | 1.     |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.     | * | 1  |     | 1455 | 180 | .01  | .00  | .01    | 1.     |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.     | * | 1  |     | 1500 | 181 | .01  | .00  | .01    | 1.     |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.     | * | 1  |     | 1505 | 182 | .01  | .00  | .01    | 1.     |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.     | * | 1  |     | 1510 | 183 | .01  | .00  | .01    | 1.     |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.     | * | 1  |     | 1515 | 184 | .01  | .00  | .01    | 1.     |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.     | * | 1  |     | 1520 | 185 | .01  | .00  | .01    | 1.     |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.     | * | 1  |     | 1525 | 186 | .01  | .00  | .01    | 0.     |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.     | * | 1  |     | 1530 | 187 | .01  | .00  | .01    | 0.     |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.     | * | 1  |     | 1535 | 188 | .01  | .00  | .01    | 0.     |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.     | * | 1  |     | 1540 | 189 | .01  | .00  | .01    | 0.     |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.     | * | 1  |     | 1545 | 190 | .01  | .00  | .01    | 0.     |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.     | * | 1  |     | 1550 | 191 | .01  | .00  | .01    | 0.     |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.     | * | 1  |     | 1555 | 192 | .01  | .00  | .01    | 0.     |



|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0330 | 43  | .00 | .00 | .00 | 0. | * | 1 | 1600 | 193 | .01 | .00 | .01 | 0. |
| 1 | 0335 | 44  | .01 | .01 | .00 | 0. | * | 1 | 1605 | 194 | .01 | .00 | .01 | 0. |
| 1 | 0340 | 45  | .01 | .01 | .00 | 0. | * | 1 | 1610 | 195 | .01 | .00 | .01 | 0. |
| 1 | 0345 | 46  | .01 | .01 | .00 | 0. | * | 1 | 1615 | 196 | .01 | .00 | .01 | 0. |
| 1 | 0350 | 47  | .01 | .01 | .00 | 0. | * | 1 | 1620 | 197 | .01 | .00 | .01 | 0. |
| 1 | 0355 | 48  | .01 | .01 | .00 | 0. | * | 1 | 1625 | 198 | .01 | .00 | .01 | 0. |
| 1 | 0400 | 49  | .01 | .01 | .00 | 0. | * | 1 | 1630 | 199 | .01 | .00 | .01 | 0. |
| 1 | 0405 | 50  | .01 | .01 | .00 | 0. | * | 1 | 1635 | 200 | .01 | .00 | .01 | 0. |
| 1 | 0410 | 51  | .01 | .01 | .00 | 0. | * | 1 | 1640 | 201 | .01 | .00 | .01 | 0. |
| 1 | 0415 | 52  | .01 | .01 | .00 | 0. | * | 1 | 1645 | 202 | .01 | .00 | .01 | 0. |
| 1 | 0420 | 53  | .01 | .01 | .00 | 0. | * | 1 | 1650 | 203 | .01 | .00 | .01 | 0. |
| 1 | 0425 | 54  | .01 | .01 | .00 | 0. | * | 1 | 1655 | 204 | .01 | .00 | .01 | 0. |
| 1 | 0430 | 55  | .01 | .01 | .00 | 0. | * | 1 | 1700 | 205 | .01 | .00 | .01 | 0. |
| 1 | 0435 | 56  | .01 | .01 | .00 | 0. | * | 1 | 1705 | 206 | .01 | .00 | .01 | 0. |
| 1 | 0440 | 57  | .01 | .01 | .00 | 0. | * | 1 | 1710 | 207 | .01 | .00 | .01 | 0. |
| 1 | 0445 | 58  | .01 | .01 | .00 | 0. | * | 1 | 1715 | 208 | .01 | .00 | .01 | 0. |
| 1 | 0450 | 59  | .01 | .01 | .00 | 0. | * | 1 | 1720 | 209 | .01 | .00 | .01 | 0. |
| 1 | 0455 | 60  | .01 | .01 | .00 | 0. | * | 1 | 1725 | 210 | .01 | .00 | .01 | 0. |
| 1 | 0500 | 61  | .01 | .01 | .00 | 0. | * | 1 | 1730 | 211 | .01 | .00 | .01 | 0. |
| 1 | 0505 | 62  | .01 | .01 | .00 | 0. | * | 1 | 1735 | 212 | .01 | .00 | .00 | 0. |
| 1 | 0510 | 63  | .01 | .01 | .00 | 0. | * | 1 | 1740 | 213 | .01 | .00 | .00 | 0. |
| 1 | 0515 | 64  | .01 | .01 | .00 | 0. | * | 1 | 1745 | 214 | .01 | .00 | .00 | 0. |
| 1 | 0520 | 65  | .01 | .01 | .00 | 0. | * | 1 | 1750 | 215 | .01 | .00 | .00 | 0. |
| 1 | 0525 | 66  | .01 | .01 | .00 | 0. | * | 1 | 1755 | 216 | .01 | .00 | .00 | 0. |
| 1 | 0530 | 67  | .01 | .01 | .00 | 0. | * | 1 | 1800 | 217 | .01 | .00 | .00 | 0. |
| 1 | 0535 | 68  | .01 | .01 | .00 | 0. | * | 1 | 1805 | 218 | .01 | .00 | .00 | 0. |
| 1 | 0540 | 69  | .01 | .01 | .00 | 0. | * | 1 | 1810 | 219 | .01 | .00 | .00 | 0. |
| 1 | 0545 | 70  | .01 | .01 | .00 | 0. | * | 1 | 1815 | 220 | .01 | .00 | .00 | 0. |
| 1 | 0550 | 71  | .01 | .01 | .00 | 0. | * | 1 | 1820 | 221 | .01 | .00 | .00 | 0. |
| 1 | 0555 | 72  | .01 | .01 | .00 | 0. | * | 1 | 1825 | 222 | .01 | .00 | .00 | 0. |
| 1 | 0600 | 73  | .01 | .01 | .00 | 0. | * | 1 | 1830 | 223 | .01 | .00 | .00 | 0. |
| 1 | 0605 | 74  | .01 | .01 | .00 | 0. | * | 1 | 1835 | 224 | .01 | .00 | .00 | 0. |
| 1 | 0610 | 75  | .01 | .01 | .00 | 0. | * | 1 | 1840 | 225 | .01 | .00 | .00 | 0. |
| 1 | 0615 | 76  | .01 | .01 | .00 | 0. | * | 1 | 1845 | 226 | .01 | .00 | .00 | 0. |
| 1 | 0620 | 77  | .01 | .01 | .00 | 0. | * | 1 | 1850 | 227 | .01 | .00 | .00 | 0. |
| 1 | 0625 | 78  | .01 | .01 | .00 | 0. | * | 1 | 1855 | 228 | .01 | .00 | .00 | 0. |
| 1 | 0630 | 79  | .01 | .01 | .00 | 0. | * | 1 | 1900 | 229 | .01 | .00 | .00 | 0. |
| 1 | 0635 | 80  | .01 | .01 | .00 | 0. | * | 1 | 1905 | 230 | .01 | .00 | .00 | 0. |
| 1 | 0640 | 81  | .01 | .01 | .00 | 0. | * | 1 | 1910 | 231 | .01 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .01 | .01 | .00 | 0. | * | 1 | 1915 | 232 | .01 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .01 | .01 | .00 | 0. | * | 1 | 1920 | 233 | .01 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .01 | .01 | .00 | 0. | * | 1 | 1925 | 234 | .01 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .01 | .01 | .00 | 0. | * | 1 | 1930 | 235 | .01 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .01 | .01 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .01 | .01 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .01 | .01 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .01 | .01 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .01 | .01 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .01 | .01 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .01 | .01 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .01 | .01 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .02 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .02 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .02 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 1030 | 127 | .02 | .02 | .00 | 0.  | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .03 | .02 | .01 | 0.  | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .03 | .02 | .01 | 0.  | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .03 | .02 | .01 | 0.  | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .03 | .02 | .01 | 0.  | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .03 | .02 | .01 | 0.  | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .03 | .02 | .01 | 0.  | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .04 | .03 | .01 | 1.  | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .04 | .03 | .01 | 1.  | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .04 | .03 | .01 | 1.  | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .15 | .10 | .06 | 1.  | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .15 | .09 | .06 | 1.  | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .15 | .08 | .07 | 2.  | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .41 | .19 | .21 | 4.  | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .41 | .16 | .24 | 6.  | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .41 | .14 | .27 | 9.  | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .06 | .02 | .04 | 11. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .02 | .05 | 11. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .06 | .02 | .05 | 9.  | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .01 | .03 | 7.  | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .01 | .03 | 5.  | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .01 | .03 | 4.  | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .01 | .02 | 3.  | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .01 | .02 | 3.  | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 2.25, TOTAL EXCESS = 2.15

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |       |
|--------------------|--------------|----------------------|-------|-------|----------|-------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |       |
| 11.                | 11.83        | 2.                   | 1.    | 1.    | 1.       |       |
|                    |              | (INCHES)             | 1.751 | 2.154 | 2.154    | 2.154 |
|                    |              | (AC-FT)              | 1.    | 1.    | 1.       | 1.    |
| CUMULATIVE AREA =  |              | .01 SQ MI            |       |       |          |       |

\*\*\* \*\*

40 KK \*\*\*\*\*  
\* RTA3 \*  
\*\*\*\*\*

ROUTE OSA3 TO DPA

HYDROGRAPH ROUTING DATA

42 RK KINEMATIC WAVE STREAM ROUTING  
 L 292. CHANNEL LENGTH  
 S .0822 SLOPE  
 N .035 CHANNEL ROUGHNESS COEFFICIENT  
 CA .00 CONTRIBUTING AREA  
 SHAPE TRAP CHANNEL SHAPE  
 WD 2.00 BOTTOM WIDTH OR DIAMETER  
 Z 4.00 SIDE SLOPE  
 NDXMIN 2 MINIMUM NUMBER OF DX INTERVALS

\*\*\*  
 COMPUTED KINEMATIC PARAMETERS  
 VARIABLE TIME STEP  
 (DT SHOWN IS A MINIMUM)

| ELEMENT | ALPHA | M    | DT<br>(MIN) | DX<br>(FT) | PEAK<br>(CFS) | TIME TO<br>PEAK<br>(MIN) | VOLUME<br>(IN) | MAXIMUM<br>CELERITY<br>(FPS) |
|---------|-------|------|-------------|------------|---------------|--------------------------|----------------|------------------------------|
| MAIN    | 4.57  | 1.34 | .24         | 97.33      | 11.46         | 710.50                   | 2.15           | 7.75                         |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1034E+01 EXCESS= .0000E+00 OUTFLOW= .1034E+01 BASIN STORAGE= .2826E-05 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

|      |      |      |      |  |       |        |      |  |
|------|------|------|------|--|-------|--------|------|--|
| MAIN | 4.57 | 1.34 | 5.00 |  | 11.40 | 715.00 | 2.16 |  |
|------|------|------|------|--|-------|--------|------|--|

HYDROGRAPH AT STATION RTA3

| DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD | FLOW | * | DA | MON | HRMN | ORD | FLOW | * |
|----|-----|------|-----|------|---|----|-----|------|-----|------|---|----|-----|------|-----|------|---|----|-----|------|-----|------|---|
| 1  |     | 0000 | 1   | 0.   | * | 1  |     | 0615 | 76  | 0.   | * | 1  |     | 1230 | 151 | 2.   | * | 1  |     | 1845 | 226 | 0.   | * |
| 1  |     | 0005 | 2   | 0.   | * | 1  |     | 0620 | 77  | 0.   | * | 1  |     | 1235 | 152 | 2.   | * | 1  |     | 1850 | 227 | 0.   | * |
| 1  |     | 0010 | 3   | 0.   | * | 1  |     | 0625 | 78  | 0.   | * | 1  |     | 1240 | 153 | 2.   | * | 1  |     | 1855 | 228 | 0.   | * |
| 1  |     | 0015 | 4   | 0.   | * | 1  |     | 0630 | 79  | 0.   | * | 1  |     | 1245 | 154 | 2.   | * | 1  |     | 1900 | 229 | 0.   | * |
| 1  |     | 0020 | 5   | 0.   | * | 1  |     | 0635 | 80  | 0.   | * | 1  |     | 1250 | 155 | 2.   | * | 1  |     | 1905 | 230 | 0.   | * |
| 1  |     | 0025 | 6   | 0.   | * | 1  |     | 0640 | 81  | 0.   | * | 1  |     | 1255 | 156 | 1.   | * | 1  |     | 1910 | 231 | 0.   | * |
| 1  |     | 0030 | 7   | 0.   | * | 1  |     | 0645 | 82  | 0.   | * | 1  |     | 1300 | 157 | 1.   | * | 1  |     | 1915 | 232 | 0.   | * |
| 1  |     | 0035 | 8   | 0.   | * | 1  |     | 0650 | 83  | 0.   | * | 1  |     | 1305 | 158 | 1.   | * | 1  |     | 1920 | 233 | 0.   | * |
| 1  |     | 0040 | 9   | 0.   | * | 1  |     | 0655 | 84  | 0.   | * | 1  |     | 1310 | 159 | 1.   | * | 1  |     | 1925 | 234 | 0.   | * |
| 1  |     | 0045 | 10  | 0.   | * | 1  |     | 0700 | 85  | 0.   | * | 1  |     | 1315 | 160 | 1.   | * | 1  |     | 1930 | 235 | 0.   | * |
| 1  |     | 0050 | 11  | 0.   | * | 1  |     | 0705 | 86  | 0.   | * | 1  |     | 1320 | 161 | 1.   | * | 1  |     | 1935 | 236 | 0.   | * |
| 1  |     | 0055 | 12  | 0.   | * | 1  |     | 0710 | 87  | 0.   | * | 1  |     | 1325 | 162 | 1.   | * | 1  |     | 1940 | 237 | 0.   | * |
| 1  |     | 0100 | 13  | 0.   | * | 1  |     | 0715 | 88  | 0.   | * | 1  |     | 1330 | 163 | 1.   | * | 1  |     | 1945 | 238 | 0.   | * |
| 1  |     | 0105 | 14  | 0.   | * | 1  |     | 0720 | 89  | 0.   | * | 1  |     | 1335 | 164 | 1.   | * | 1  |     | 1950 | 239 | 0.   | * |
| 1  |     | 0110 | 15  | 0.   | * | 1  |     | 0725 | 90  | 0.   | * | 1  |     | 1340 | 165 | 1.   | * | 1  |     | 1955 | 240 | 0.   | * |
| 1  |     | 0115 | 16  | 0.   | * | 1  |     | 0730 | 91  | 0.   | * | 1  |     | 1345 | 166 | 1.   | * | 1  |     | 2000 | 241 | 0.   | * |
| 1  |     | 0120 | 17  | 0.   | * | 1  |     | 0735 | 92  | 0.   | * | 1  |     | 1350 | 167 | 1.   | * | 1  |     | 2005 | 242 | 0.   | * |
| 1  |     | 0125 | 18  | 0.   | * | 1  |     | 0740 | 93  | 0.   | * | 1  |     | 1355 | 168 | 1.   | * | 1  |     | 2010 | 243 | 0.   | * |
| 1  |     | 0130 | 19  | 0.   | * | 1  |     | 0745 | 94  | 0.   | * | 1  |     | 1400 | 169 | 1.   | * | 1  |     | 2015 | 244 | 0.   | * |
| 1  |     | 0135 | 20  | 0.   | * | 1  |     | 0750 | 95  | 0.   | * | 1  |     | 1405 | 170 | 1.   | * | 1  |     | 2020 | 245 | 0.   | * |
| 1  |     | 0140 | 21  | 0.   | * | 1  |     | 0755 | 96  | 0.   | * | 1  |     | 1410 | 171 | 1.   | * | 1  |     | 2025 | 246 | 0.   | * |
| 1  |     | 0145 | 22  | 0.   | * | 1  |     | 0800 | 97  | 0.   | * | 1  |     | 1415 | 172 | 1.   | * | 1  |     | 2030 | 247 | 0.   | * |
| 1  |     | 0150 | 23  | 0.   | * | 1  |     | 0805 | 98  | 0.   | * | 1  |     | 1420 | 173 | 1.   | * | 1  |     | 2035 | 248 | 0.   | * |
| 1  |     | 0155 | 24  | 0.   | * | 1  |     | 0810 | 99  | 0.   | * | 1  |     | 1425 | 174 | 1.   | * | 1  |     | 2040 | 249 | 0.   | * |
| 1  |     | 0200 | 25  | 0.   | * | 1  |     | 0815 | 100 | 0.   | * | 1  |     | 1430 | 175 | 1.   | * | 1  |     | 2045 | 250 | 0.   | * |
| 1  |     | 0205 | 26  | 0.   | * | 1  |     | 0820 | 101 | 0.   | * | 1  |     | 1435 | 176 | 1.   | * | 1  |     | 2050 | 251 | 0.   | * |
| 1  |     | 0210 | 27  | 0.   | * | 1  |     | 0825 | 102 | 0.   | * | 1  |     | 1440 | 177 | 1.   | * | 1  |     | 2055 | 252 | 0.   | * |
| 1  |     | 0215 | 28  | 0.   | * | 1  |     | 0830 | 103 | 0.   | * | 1  |     | 1445 | 178 | 1.   | * | 1  |     | 2100 | 253 | 0.   | * |
| 1  |     | 0220 | 29  | 0.   | * | 1  |     | 0835 | 104 | 0.   | * | 1  |     | 1450 | 179 | 1.   | * | 1  |     | 2105 | 254 | 0.   | * |
| 1  |     | 0225 | 30  | 0.   | * | 1  |     | 0840 | 105 | 0.   | * | 1  |     | 1455 | 180 | 1.   | * | 1  |     | 2110 | 255 | 0.   | * |
| 1  |     | 0230 | 31  | 0.   | * | 1  |     | 0845 | 106 | 0.   | * | 1  |     | 1500 | 181 | 1.   | * | 1  |     | 2115 | 256 | 0.   | * |
| 1  |     | 0235 | 32  | 0.   | * | 1  |     | 0850 | 107 | 0.   | * | 1  |     | 1505 | 182 | 1.   | * | 1  |     | 2120 | 257 | 0.   | * |
| 1  |     | 0240 | 33  | 0.   | * | 1  |     | 0855 | 108 | 0.   | * | 1  |     | 1510 | 183 | 1.   | * | 1  |     | 2125 | 258 | 0.   | * |
| 1  |     | 0245 | 34  | 0.   | * | 1  |     | 0900 | 109 | 0.   | * | 1  |     | 1515 | 184 | 1.   | * | 1  |     | 2130 | 259 | 0.   | * |
| 1  |     | 0250 | 35  | 0.   | * | 1  |     | 0905 | 110 | 0.   | * | 1  |     | 1520 | 185 | 1.   | * | 1  |     | 2135 | 260 | 0.   | * |
| 1  |     | 0255 | 36  | 0.   | * | 1  |     | 0910 | 111 | 0.   | * | 1  |     | 1525 | 186 | 0.   | * | 1  |     | 2140 | 261 | 0.   | * |
| 1  |     | 0300 | 37  | 0.   | * | 1  |     | 0915 | 112 | 0.   | * | 1  |     | 1530 | 187 | 0.   | * | 1  |     | 2145 | 262 | 0.   | * |
| 1  |     | 0305 | 38  | 0.   | * | 1  |     | 0920 | 113 | 0.   | * | 1  |     | 1535 | 188 | 0.   | * | 1  |     | 2150 | 263 | 0.   | * |
| 1  |     | 0310 | 39  | 0.   | * | 1  |     | 0925 | 114 | 0.   | * | 1  |     | 1540 | 189 | 0.   | * | 1  |     | 2155 | 264 | 0.   | * |
| 1  |     | 0315 | 40  | 0.   | * | 1  |     | 0930 | 115 | 0.   | * | 1  |     | 1545 | 190 | 0.   | * | 1  |     | 2200 | 265 | 0.   | * |
| 1  |     | 0320 | 41  | 0.   | * | 1  |     | 0935 | 116 | 0.   | * | 1  |     | 1550 | 191 | 0.   | * | 1  |     | 2205 | 266 | 0.   | * |
| 1  |     | 0325 | 42  | 0.   | * | 1  |     | 0940 | 117 | 0.   | * | 1  |     | 1555 | 192 | 0.   | * | 1  |     | 2210 | 267 | 0.   | * |
| 1  |     | 0330 | 43  | 0.   | * | 1  |     | 0945 | 118 | 0.   | * | 1  |     | 1600 | 193 | 0.   | * | 1  |     | 2215 | 268 | 0.   | * |
| 1  |     | 0335 | 44  | 0.   | * | 1  |     | 0950 | 119 | 0.   | * | 1  |     | 1605 | 194 | 0.   | * | 1  |     | 2220 | 269 | 0.   | * |
| 1  |     | 0340 | 45  | 0.   | * | 1  |     | 0955 | 120 | 0.   | * | 1  |     | 1610 | 195 | 0.   | * | 1  |     | 2225 | 270 | 0.   | * |
| 1  |     | 0345 | 46  | 0.   | * | 1  |     | 1000 | 121 | 0.   | * | 1  |     | 1615 | 196 | 0.   | * | 1  |     | 2230 | 271 | 0.   | * |
| 1  |     | 0350 | 47  | 0.   | * | 1  |     | 1005 | 122 | 0.   | * | 1  |     | 1620 | 197 | 0.   | * | 1  |     | 2235 | 272 | 0.   | * |
| 1  |     | 0355 | 48  | 0.   | * | 1  |     | 1010 | 123 | 0.   | * | 1  |     | 1625 | 198 | 0.   | * | 1  |     | 2240 | 273 | 0.   | * |
| 1  |     | 0400 | 49  | 0.   | * | 1  |     | 1015 | 124 | 0.   | * | 1  |     | 1630 | 199 | 0.   | * | 1  |     | 2245 | 274 | 0.   | * |
| 1  |     | 0405 | 50  | 0.   | * | 1  |     | 1020 | 125 | 0.   | * | 1  |     | 1635 | 200 | 0.   | * | 1  |     | 2250 | 275 | 0.   | * |
| 1  |     | 0410 | 51  | 0.   | * | 1  |     | 1025 | 126 | 0.   | * | 1  |     | 1640 | 201 | 0.   | * | 1  |     | 2255 | 276 | 0.   | * |
| 1  |     | 0415 | 52  | 0.   | * | 1  |     | 1030 | 127 | 0.   | * | 1  |     | 1645 | 202 | 0.   | * | 1  |     | 2300 | 277 | 0.   | * |
| 1  |     | 0420 | 53  | 0.   | * | 1  |     | 1035 | 128 | 0.   | * | 1  |     | 1650 | 203 | 0.   | * | 1  |     | 2305 | 278 | 0.   | * |
| 1  |     | 0425 | 54  | 0.   | * | 1  |     | 1040 | 129 | 0.   | * | 1  |     | 1655 | 204 | 0.   | * | 1  |     | 2310 | 279 | 0.   | * |
| 1  |     | 0430 | 55  | 0.   | * | 1  |     | 1045 | 130 | 0.   | * | 1  |     | 1700 | 205 | 0.   | * | 1  |     | 2315 | 280 | 0.   | * |
| 1  |     | 0435 | 56  | 0.   | * | 1  |     | 1050 | 131 | 0.   | * | 1  |     | 1705 | 206 | 0.   | * | 1  |     | 2320 | 281 | 0.   | * |
| 1  |     | 0440 | 57  | 0.   | * | 1  |     | 1055 | 132 | 0.   | * | 1  |     | 1710 | 207 | 0.   | * | 1  |     | 2325 | 282 | 0.   | * |
| 1  |     | 0445 | 58  | 0.   | * | 1  |     | 1100 | 133 | 0.   | * | 1  |     | 1715 | 208 | 0.   | * | 1  |     | 2330 | 283 | 0.   | * |
| 1  |     | 0450 | 59  | 0.   | * | 1  |     | 1105 | 134 | 1.   | * | 1  |     | 1720 | 209 | 0.   | * | 1  |     | 2335 | 284 | 0.   | * |
| 1  |     | 0455 | 60  | 0.   | * | 1  |     | 1110 | 135 | 1.   | * | 1  |     | 1725 | 210 | 0.   | * | 1  |     | 2340 | 285 | 0.   | * |
| 1  |     | 0500 | 61  | 0.   | * | 1  |     | 1115 | 136 | 1.   | * | 1  |     | 1730 | 211 | 0.   | * | 1  |     | 2345 | 286 | 0.   | * |
| 1  |     | 0505 | 62  | 0.   | * | 1  |     | 1120 | 137 | 1.   | * | 1  |     | 1735 | 212 | 0.   | * | 1  |     | 2350 | 287 | 0.   | * |
| 1  |     | 0510 | 63  | 0.   | * | 1  |     | 1125 | 138 | 1.   | * | 1  |     | 1740 | 213 | 0.   | * | 1  |     | 2355 | 288 | 0.   | * |
| 1  |     | 0515 | 64  | 0.   | * | 1  |     | 1130 | 139 | 2.   | * | 1  |     | 1745 | 214 | 0.   | * | 2  |     | 0000 | 289 | 0.   | * |
| 1  |     | 0520 | 65  | 0.   | * | 1  |     | 1135 | 140 | 3.   | * | 1  |     | 1750 | 215 | 0.   | * | 2  |     | 0005 | 290 | 0.   | * |
| 1  |     | 0525 | 66  | 0.   | * | 1  |     | 1140 | 141 | 6.   | * | 1  |     | 1755 | 216 | 0.   | * | 2  |     | 0010 | 291 | 0.   | * |
| 1  |     | 0530 | 67  | 0.   | * | 1  |     | 1145 | 142 | 9.   | * | 1  |     | 1800 | 217 | 0.   | * | 2  |     | 0015 | 292 | 0.   | * |
| 1  |     | 0535 | 68  | 0.   | * | 1  |     | 1150 | 143 | 11.  | * | 1  |     | 1805 | 218 | 0.   | * | 2  |     | 0020 | 293 | 0.   | * |
| 1  |     | 0540 | 69  | 0.   | * | 1  |     | 1155 | 144 | 11.  | * | 1  |     | 1810 | 219 | 0.   | * | 2  |     | 0025 | 294 | 0.   | * |
| 1  |     | 0545 | 70  | 0.   | * | 1  |     | 1200 | 145 | 10.  | * | 1  |     | 1815 | 220 | 0.   | * | 2  |     | 0030 | 295 | 0.   | * |
| 1  |     | 0550 | 71  | 0.   | * | 1  |     | 1205 | 146 | 7.   | * | 1  |     | 1820 | 221 | 0.   | * | 2  |     | 0035 | 296 | 0.   | * |
| 1  |     | 0555 | 72  | 0.   | * | 1  |     | 1210 | 147 | 5.   | * | 1  |     | 1825 | 222 | 0.   | * | 2  |     | 0040 | 297 | 0.   | * |
| 1  |     | 0600 | 73  | 0.   | * | 1  |     | 1215 | 148 | 4.   | * | 1  |     | 1830 | 223 | 0.   | * | 2  |     | 0045 | 298 | 0.   | * |
| 1  |     | 0605 | 74  | 0.   | * | 1  |     | 1220 | 149 | 3.   | * | 1  |     | 1835 | 224 | 0.   | * | 2  |     | 0050 | 299 | 0.   | * |
| 1  |     | 0610 | 75  | 0.   | * | 1  |     | 1225 | 150 | 3.   | * | 1  |     | 1840 | 225 | 0.   | * | 2  |     | 0055 | 300 | 0.   | * |

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| PEAK FLOW<br>(CFS) | TIME<br>(HR) | (CFS)    | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------|----------------------|-------|-------|----------|
|                    |              |          | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| +                  | 11.          | 11.92    | 2.                   | 1.    | 1.    | 1.       |
|                    |              | (INCHES) | 1.752                | 2.155 | 2.155 | 2.155    |
|                    |              | (AC-FT)  | 1.                   | 1.    | 1.    | 1.       |

CUMULATIVE AREA = .01 SQ MI

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*      *
43 KK *   OSA4 *
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CHEYENNE MTN. HS OFFSITE BASIN A4

SUBBASIN RUNOFF DATA

45 BA SUBBASIN CHARACTERISTICS  
TAREA .00 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 4.40 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN

|     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |

46 LS SCS LOSS RATE  
STRTL .60 INITIAL ABSTRACTION  
CRVNER 77.00 CURVE NUMBER  
RTIMP .00 PERCENT IMPERVIOUS AREA

47 UD SCS DIMENSIONLESS UNITGRAPH  
TLAG .13 LAG

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WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

UNIT HYDROGRAPH  
10 END-OF-PERIOD ORDINATES

|    |     |     |    |    |    |    |    |    |
|----|-----|-----|----|----|----|----|----|----|
| 7. | 14. | 10. | 4. | 2. | 1. | 0. | 0. | 0. |
|----|-----|-----|----|----|----|----|----|----|

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HYDROGRAPH AT STATION OSA4

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| DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q | * | DA | MON | HRMN | ORD | RAIN | LOSS | EXCESS | COMP | Q  |
|----|-----|------|-----|------|------|--------|------|---|---|----|-----|------|-----|------|------|--------|------|----|
| 1  |     | 0000 | 1   | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1230 | 151 | .03  | .01  | .02    |      | 1. |
| 1  |     | 0005 | 2   | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1235 | 152 | .03  | .01  | .02    |      | 1. |
| 1  |     | 0010 | 3   | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1240 | 153 | .03  | .01  | .02    |      | 1. |
| 1  |     | 0015 | 4   | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1245 | 154 | .03  | .01  | .02    |      | 1. |
| 1  |     | 0020 | 5   | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1250 | 155 | .02  | .01  | .02    |      | 1. |
| 1  |     | 0025 | 6   | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1255 | 156 | .02  | .01  | .02    |      | 1. |
| 1  |     | 0030 | 7   | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1300 | 157 | .02  | .01  | .02    |      | 1. |
| 1  |     | 0035 | 8   | -.01 | -.01 | .00    | 0.   |   | * | 1  |     | 1305 | 158 | .02  | .00  | .01    |      | 1. |
| 1  |     | 0040 | 9   | -.01 | -.01 | .00    | 0.   |   | * | 1  |     | 1310 | 159 | .02  | .00  | .01    |      | 1. |
| 1  |     | 0045 | 10  | -.01 | -.01 | .00    | 0.   |   | * | 1  |     | 1315 | 160 | .02  | .00  | .01    |      | 1. |
| 1  |     | 0050 | 11  | .02  | .02  | .00    | 0.   |   | * | 1  |     | 1320 | 161 | .02  | .00  | .01    |      | 1. |
| 1  |     | 0055 | 12  | .02  | .02  | .00    | 0.   |   | * | 1  |     | 1325 | 162 | .02  | .00  | .01    |      | 1. |
| 1  |     | 0100 | 13  | .02  | .02  | .00    | 0.   |   | * | 1  |     | 1330 | 163 | .02  | .00  | .01    |      | 0. |
| 1  |     | 0105 | 14  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1335 | 164 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0110 | 15  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1340 | 165 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0115 | 16  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1345 | 166 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0120 | 17  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1350 | 167 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0125 | 18  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1355 | 168 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0130 | 19  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1400 | 169 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0135 | 20  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1405 | 170 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0140 | 21  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1410 | 171 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0145 | 22  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1415 | 172 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0150 | 23  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1420 | 173 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0155 | 24  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1425 | 174 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0200 | 25  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1430 | 175 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0205 | 26  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1435 | 176 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0210 | 27  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1440 | 177 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0215 | 28  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1445 | 178 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0220 | 29  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1450 | 179 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0225 | 30  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1455 | 180 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0230 | 31  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1500 | 181 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0235 | 32  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1505 | 182 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0240 | 33  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1510 | 183 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0245 | 34  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1515 | 184 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0250 | 35  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1520 | 185 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0255 | 36  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1525 | 186 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0300 | 37  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1530 | 187 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0305 | 38  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1535 | 188 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0310 | 39  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1540 | 189 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0315 | 40  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1545 | 190 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0320 | 41  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1550 | 191 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0325 | 42  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1555 | 192 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0330 | 43  | .00  | .00  | .00    | 0.   |   | * | 1  |     | 1600 | 193 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0335 | 44  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1605 | 194 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0340 | 45  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1610 | 195 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0345 | 46  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1615 | 196 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0350 | 47  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1620 | 197 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0355 | 48  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1625 | 198 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0400 | 49  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1630 | 199 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0405 | 50  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1635 | 200 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0410 | 51  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1640 | 201 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0415 | 52  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1645 | 202 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0420 | 53  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1650 | 203 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0425 | 54  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1655 | 204 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0430 | 55  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1700 | 205 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0435 | 56  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1705 | 206 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0440 | 57  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1710 | 207 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0445 | 58  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1715 | 208 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0450 | 59  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1720 | 209 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0455 | 60  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1725 | 210 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0500 | 61  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1730 | 211 | .01  | .00  | .01    |      | 0. |
| 1  |     | 0505 | 62  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1735 | 212 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0510 | 63  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1740 | 213 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0515 | 64  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1745 | 214 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0520 | 65  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1750 | 215 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0525 | 66  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1755 | 216 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0530 | 67  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1800 | 217 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0535 | 68  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1805 | 218 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0540 | 69  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1810 | 219 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0545 | 70  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1815 | 220 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0550 | 71  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1820 | 221 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0555 | 72  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1825 | 222 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0600 | 73  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1830 | 223 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0605 | 74  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1835 | 224 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0610 | 75  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1840 | 225 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0615 | 76  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1845 | 226 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0620 | 77  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1850 | 227 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0625 | 78  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1855 | 228 | .01  | .00  | .00    |      | 0. |
| 1  |     | 0630 | 79  | .01  | .01  | .00    | 0.   |   | * | 1  |     | 1900 | 229 | .01  | .00  | .00    |      | 0. |

|   |      |     |     |     |     |    |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0635 | 80  | .01 | .01 | .00 | 0. | * | 1 | 1905 | 230 | .01 | .00 | .00 | 0. |
| 1 | 0640 | 81  | .01 | .01 | .00 | 0. | * | 1 | 1910 | 231 | .01 | .00 | .00 | 0. |
| 1 | 0645 | 82  | .01 | .01 | .00 | 0. | * | 1 | 1915 | 232 | .01 | .00 | .00 | 0. |
| 1 | 0650 | 83  | .01 | .01 | .00 | 0. | * | 1 | 1920 | 233 | .01 | .00 | .00 | 0. |
| 1 | 0655 | 84  | .01 | .01 | .00 | 0. | * | 1 | 1925 | 234 | .01 | .00 | .00 | 0. |
| 1 | 0700 | 85  | .01 | .01 | .00 | 0. | * | 1 | 1930 | 235 | .01 | .00 | .00 | 0. |
| 1 | 0705 | 86  | .01 | .01 | .00 | 0. | * | 1 | 1935 | 236 | .00 | .00 | .00 | 0. |
| 1 | 0710 | 87  | .01 | .01 | .00 | 0. | * | 1 | 1940 | 237 | .00 | .00 | .00 | 0. |
| 1 | 0715 | 88  | .01 | .01 | .00 | 0. | * | 1 | 1945 | 238 | .00 | .00 | .00 | 0. |
| 1 | 0720 | 89  | .01 | .01 | .00 | 0. | * | 1 | 1950 | 239 | .00 | .00 | .00 | 0. |
| 1 | 0725 | 90  | .01 | .01 | .00 | 0. | * | 1 | 1955 | 240 | .00 | .00 | .00 | 0. |
| 1 | 0730 | 91  | .01 | .01 | .00 | 0. | * | 1 | 2000 | 241 | .00 | .00 | .00 | 0. |
| 1 | 0735 | 92  | .01 | .01 | .00 | 0. | * | 1 | 2005 | 242 | .00 | .00 | .00 | 0. |
| 1 | 0740 | 93  | .01 | .01 | .00 | 0. | * | 1 | 2010 | 243 | .00 | .00 | .00 | 0. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0. | * | 1 | 2015 | 244 | .00 | .00 | .00 | 0. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0. | * | 1 | 2020 | 245 | .00 | .00 | .00 | 0. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0. | * | 1 | 2025 | 246 | .00 | .00 | .00 | 0. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0. | * | 1 | 2030 | 247 | .00 | .00 | .00 | 0. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0. | * | 1 | 2035 | 248 | .00 | .00 | .00 | 0. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0. | * | 1 | 2040 | 249 | .00 | .00 | .00 | 0. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0. | * | 1 | 2045 | 250 | .00 | .00 | .00 | 0. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0. | * | 1 | 2050 | 251 | .00 | .00 | .00 | 0. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0. | * | 1 | 2055 | 252 | .00 | .00 | .00 | 0. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0. | * | 1 | 2100 | 253 | .00 | .00 | .00 | 0. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0. | * | 1 | 2105 | 254 | .00 | .00 | .00 | 0. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0. | * | 1 | 2110 | 255 | .00 | .00 | .00 | 0. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0. | * | 1 | 2115 | 256 | .00 | .00 | .00 | 0. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0. | * | 1 | 2120 | 257 | .00 | .00 | .00 | 0. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0. | * | 1 | 2125 | 258 | .00 | .00 | .00 | 0. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0. | * | 1 | 2130 | 259 | .00 | .00 | .00 | 0. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 0. | * | 1 | 2135 | 260 | .00 | .00 | .00 | 0. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 0. | * | 1 | 2140 | 261 | .00 | .00 | .00 | 0. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 0. | * | 1 | 2145 | 262 | .00 | .00 | .00 | 0. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 0. | * | 1 | 2150 | 263 | .00 | .00 | .00 | 0. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 0. | * | 1 | 2155 | 264 | .00 | .00 | .00 | 0. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 0. | * | 1 | 2200 | 265 | .00 | .00 | .00 | 0. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 0. | * | 1 | 2205 | 266 | .00 | .00 | .00 | 0. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 0. | * | 1 | 2210 | 267 | .00 | .00 | .00 | 0. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 0. | * | 1 | 2215 | 268 | .00 | .00 | .00 | 0. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 0. | * | 1 | 2220 | 269 | .00 | .00 | .00 | 0. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 0. | * | 1 | 2225 | 270 | .00 | .00 | .00 | 0. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 0. | * | 1 | 2230 | 271 | .00 | .00 | .00 | 0. |
| 1 | 1005 | 122 | .02 | .01 | .00 | 0. | * | 1 | 2235 | 272 | .00 | .00 | .00 | 0. |
| 1 | 1010 | 123 | .02 | .01 | .00 | 0. | * | 1 | 2240 | 273 | .00 | .00 | .00 | 0. |
| 1 | 1015 | 124 | .02 | .01 | .00 | 0. | * | 1 | 2245 | 274 | .00 | .00 | .00 | 0. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 0. | * | 1 | 2250 | 275 | .00 | .00 | .00 | 0. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 0. | * | 1 | 2255 | 276 | .00 | .00 | .00 | 0. |
| 1 | 1030 | 127 | .02 | .02 | .00 | 0. | * | 1 | 2300 | 277 | .00 | .00 | .00 | 0. |
| 1 | 1035 | 128 | .03 | .02 | .01 | 0. | * | 1 | 2305 | 278 | .00 | .00 | .00 | 0. |
| 1 | 1040 | 129 | .03 | .02 | .01 | 0. | * | 1 | 2310 | 279 | .00 | .00 | .00 | 0. |
| 1 | 1045 | 130 | .03 | .02 | .01 | 0. | * | 1 | 2315 | 280 | .00 | .00 | .00 | 0. |
| 1 | 1050 | 131 | .03 | .02 | .01 | 0. | * | 1 | 2320 | 281 | .00 | .00 | .00 | 0. |
| 1 | 1055 | 132 | .03 | .02 | .01 | 0. | * | 1 | 2325 | 282 | .00 | .00 | .00 | 0. |
| 1 | 1100 | 133 | .03 | .02 | .01 | 0. | * | 1 | 2330 | 283 | .00 | .00 | .00 | 0. |
| 1 | 1105 | 134 | .04 | .03 | .01 | 0. | * | 1 | 2335 | 284 | .00 | .00 | .00 | 0. |
| 1 | 1110 | 135 | .04 | .03 | .01 | 0. | * | 1 | 2340 | 285 | .00 | .00 | .00 | 0. |
| 1 | 1115 | 136 | .04 | .03 | .01 | 0. | * | 1 | 2345 | 286 | .00 | .00 | .00 | 0. |
| 1 | 1120 | 137 | .15 | .10 | .06 | 1. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 0. |
| 1 | 1125 | 138 | .15 | .09 | .06 | 1. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 0. |
| 1 | 1130 | 139 | .15 | .08 | .07 | 2. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 0. |
| 1 | 1135 | 140 | .41 | .19 | .21 | 3. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 0. |
| 1 | 1140 | 141 | .41 | .16 | .24 | 6. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 0. |
| 1 | 1145 | 142 | .41 | .14 | .27 | 8. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 0. |
| 1 | 1150 | 143 | .06 | .02 | .04 | 8. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .02 | .05 | 5. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .06 | .02 | .05 | 3. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .01 | .03 | 2. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .01 | .03 | 2. | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .01 | .03 | 1. | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .01 | .02 | 1. | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .01 | .02 | 1. | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 2.25, TOTAL EXCESS = 2.15

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |       |
|--------------------|--------------|----------------------|-------|-------|----------|-------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |       |
| + 8.               | 11.75        | 1.                   | 0.    | 0.    | 0.       |       |
|                    |              | (INCHES)             | 1.752 | 2.154 | 2.154    | 2.154 |
|                    |              | (AC-FT)              | 0.    | 1.    | 1.       | 1.    |

CUMULATIVE AREA = .00 SQ MI

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48 KK  
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 \* DPA \*  
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DESIGN POINT A

50 HC HYDROGRAPH COMBINATION  
 ICOMP 4 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION DPA  
 SUM OF 4 HYDROGRAPHS

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| DA | MON  | HRMN | ORD | FLOW | * | DA   | MON | HRMN | ORD | FLOW | *    | DA  | MON | HRMN | ORD | FLOW | *   | DA | MON | HRMN | ORD | FLOW |
|----|------|------|-----|------|---|------|-----|------|-----|------|------|-----|-----|------|-----|------|-----|----|-----|------|-----|------|
| 1  | 0000 | 1    | 0.  | *    | 1 | 0615 | 76  | 0.   | *   | 1    | 1230 | 151 | 53. | *    | 1   | 1845 | 226 | 6. |     |      |     |      |
| 1  | 0005 | 2    | 0.  | *    | 1 | 0620 | 77  | 0.   | *   | 1    | 1235 | 152 | 46. | *    | 1   | 1850 | 227 | 6. |     |      |     |      |
| 1  | 0010 | 3    | 0.  | *    | 1 | 0625 | 78  | 0.   | *   | 1    | 1240 | 153 | 41. | *    | 1   | 1855 | 228 | 6. |     |      |     |      |
| 1  | 0015 | 4    | 0.  | *    | 1 | 0630 | 79  | 0.   | *   | 1    | 1245 | 154 | 37. | *    | 1   | 1900 | 229 | 6. |     |      |     |      |
| 1  | 0020 | 5    | 0.  | *    | 1 | 0635 | 80  | 0.   | *   | 1    | 1250 | 155 | 33. | *    | 1   | 1905 | 230 | 6. |     |      |     |      |
| 1  | 0025 | 6    | 0.  | *    | 1 | 0640 | 81  | 0.   | *   | 1    | 1255 | 156 | 30. | *    | 1   | 1910 | 231 | 6. |     |      |     |      |
| 1  | 0030 | 7    | 0.  | *    | 1 | 0645 | 82  | 0.   | *   | 1    | 1300 | 157 | 28. | *    | 1   | 1915 | 232 | 6. |     |      |     |      |
| 1  | 0035 | 8    | 0.  | *    | 1 | 0650 | 83  | 0.   | *   | 1    | 1305 | 158 | 26. | *    | 1   | 1920 | 233 | 6. |     |      |     |      |
| 1  | 0040 | 9    | 0.  | *    | 1 | 0655 | 84  | 0.   | *   | 1    | 1310 | 159 | 24. | *    | 1   | 1925 | 234 | 6. |     |      |     |      |
| 1  | 0045 | 10   | 0.  | *    | 1 | 0700 | 85  | 0.   | *   | 1    | 1315 | 160 | 23. | *    | 1   | 1930 | 235 | 6. |     |      |     |      |
| 1  | 0050 | 11   | 0.  | *    | 1 | 0705 | 86  | 0.   | *   | 1    | 1320 | 161 | 21. | *    | 1   | 1935 | 236 | 6. |     |      |     |      |
| 1  | 0055 | 12   | 0.  | *    | 1 | 0710 | 87  | 0.   | *   | 1    | 1325 | 162 | 20. | *    | 1   | 1940 | 237 | 6. |     |      |     |      |
| 1  | 0100 | 13   | 0.  | *    | 1 | 0715 | 88  | 0.   | *   | 1    | 1330 | 163 | 19. | *    | 1   | 1945 | 238 | 6. |     |      |     |      |
| 1  | 0105 | 14   | 0.  | *    | 1 | 0720 | 89  | 0.   | *   | 1    | 1335 | 164 | 18. | *    | 1   | 1950 | 239 | 6. |     |      |     |      |
| 1  | 0110 | 15   | 0.  | *    | 1 | 0725 | 90  | 0.   | *   | 1    | 1340 | 165 | 18. | *    | 1   | 1955 | 240 | 5. |     |      |     |      |
| 1  | 0115 | 16   | 0.  | *    | 1 | 0730 | 91  | 0.   | *   | 1    | 1345 | 166 | 17. | *    | 1   | 2000 | 241 | 5. |     |      |     |      |
| 1  | 0120 | 17   | 0.  | *    | 1 | 0735 | 92  | 0.   | *   | 1    | 1350 | 167 | 16. | *    | 1   | 2005 | 242 | 5. |     |      |     |      |
| 1  | 0125 | 18   | 0.  | *    | 1 | 0740 | 93  | 0.   | *   | 1    | 1355 | 168 | 16. | *    | 1   | 2010 | 243 | 5. |     |      |     |      |
| 1  | 0130 | 19   | 0.  | *    | 1 | 0745 | 94  | 0.   | *   | 1    | 1400 | 169 | 15. | *    | 1   | 2015 | 244 | 5. |     |      |     |      |
| 1  | 0135 | 20   | 0.  | *    | 1 | 0750 | 95  | 0.   | *   | 1    | 1405 | 170 | 15. | *    | 1   | 2020 | 245 | 5. |     |      |     |      |
| 1  | 0140 | 21   | 0.  | *    | 1 | 0755 | 96  | 0.   | *   | 1    | 1410 | 171 | 14. | *    | 1   | 2025 | 246 | 5. |     |      |     |      |
| 1  | 0145 | 22   | 0.  | *    | 1 | 0800 | 97  | 0.   | *   | 1    | 1415 | 172 | 14. | *    | 1   | 2030 | 247 | 5. |     |      |     |      |
| 1  | 0150 | 23   | 0.  | *    | 1 | 0805 | 98  | 0.   | *   | 1    | 1420 | 173 | 13. | *    | 1   | 2035 | 248 | 5. |     |      |     |      |
| 1  | 0155 | 24   | 0.  | *    | 1 | 0810 | 99  | 0.   | *   | 1    | 1425 | 174 | 13. | *    | 1   | 2040 | 249 | 5. |     |      |     |      |
| 1  | 0200 | 25   | 0.  | *    | 1 | 0815 | 100 | 0.   | *   | 1    | 1430 | 175 | 12. | *    | 1   | 2045 | 250 | 5. |     |      |     |      |
| 1  | 0205 | 26   | 0.  | *    | 1 | 0820 | 101 | 0.   | *   | 1    | 1435 | 176 | 12. | *    | 1   | 2050 | 251 | 5. |     |      |     |      |
| 1  | 0210 | 27   | 0.  | *    | 1 | 0825 | 102 | 0.   | *   | 1    | 1440 | 177 | 11. | *    | 1   | 2055 | 252 | 5. |     |      |     |      |
| 1  | 0215 | 28   | 0.  | *    | 1 | 0830 | 103 | 0.   | *   | 1    | 1445 | 178 | 11. | *    | 1   | 2100 | 253 | 5. |     |      |     |      |
| 1  | 0220 | 29   | 0.  | *    | 1 | 0835 | 104 | 0.   | *   | 1    | 1450 | 179 | 11. | *    | 1   | 2105 | 254 | 5. |     |      |     |      |
| 1  | 0225 | 30   | 0.  | *    | 1 | 0840 | 105 | 0.   | *   | 1    | 1455 | 180 | 11. | *    | 1   | 2110 | 255 | 5. |     |      |     |      |
| 1  | 0230 | 31   | 0.  | *    | 1 | 0845 | 106 | 0.   | *   | 1    | 1500 | 181 | 11. | *    | 1   | 2115 | 256 | 5. |     |      |     |      |
| 1  | 0235 | 32   | 0.  | *    | 1 | 0850 | 107 | 0.   | *   | 1    | 1505 | 182 | 11. | *    | 1   | 2120 | 257 | 5. |     |      |     |      |
| 1  | 0240 | 33   | 0.  | *    | 1 | 0855 | 108 | 0.   | *   | 1    | 1510 | 183 | 11. | *    | 1   | 2125 | 258 | 5. |     |      |     |      |
| 1  | 0245 | 34   | 0.  | *    | 1 | 0900 | 109 | 0.   | *   | 1    | 1515 | 184 | 10. | *    | 1   | 2130 | 259 | 5. |     |      |     |      |
| 1  | 0250 | 35   | 0.  | *    | 1 | 0905 | 110 | 0.   | *   | 1    | 1520 | 185 | 10. | *    | 1   | 2135 | 260 | 5. |     |      |     |      |
| 1  | 0255 | 36   | 0.  | *    | 1 | 0910 | 111 | 0.   | *   | 1    | 1525 | 186 | 10. | *    | 1   | 2140 | 261 | 5. |     |      |     |      |
| 1  | 0300 | 37   | 0.  | *    | 1 | 0915 | 112 | 0.   | *   | 1    | 1530 | 187 | 10. | *    | 1   | 2145 | 262 | 5. |     |      |     |      |
| 1  | 0305 | 38   | 0.  | *    | 1 | 0920 | 113 | 0.   | *   | 1    | 1535 | 188 | 9.  | *    | 1   | 2150 | 263 | 5. |     |      |     |      |
| 1  | 0310 | 39   | 0.  | *    | 1 | 0925 | 114 | 0.   | *   | 1    | 1540 | 189 | 9.  | *    | 1   | 2155 | 264 | 5. |     |      |     |      |
| 1  | 0315 | 40   | 0.  | *    | 1 | 0930 | 115 | 0.   | *   | 1    | 1545 | 190 | 9.  | *    | 1   | 2200 | 265 | 5. |     |      |     |      |
| 1  | 0320 | 41   | 0.  | *    | 1 | 0935 | 116 | 0.   | *   | 1    | 1550 | 191 | 9.  | *    | 1   | 2205 | 266 | 5. |     |      |     |      |
| 1  | 0325 | 42   | 0.  | *    | 1 | 0940 | 117 | 0.   | *   | 1    | 1555 | 192 | 9.  | *    | 1   | 2210 | 267 | 5. |     |      |     |      |
| 1  | 0330 | 43   | 0.  | *    | 1 | 0945 | 118 | 0.   | *   | 1    | 1600 | 193 | 9.  | *    | 1   | 2215 | 268 | 5. |     |      |     |      |
| 1  | 0335 | 44   | 0.  | *    | 1 | 0950 | 119 | 0.   | *   | 1    | 1605 | 194 | 9.  | *    | 1   | 2220 | 269 | 5. |     |      |     |      |
| 1  | 0340 | 45   | 0.  | *    | 1 | 0955 | 120 | 0.   | *   | 1    | 1610 | 195 | 9.  | *    | 1   | 2225 | 270 | 5. |     |      |     |      |
| 1  | 0345 | 46   | 0.  | *    | 1 | 1000 | 121 | 1.   | *   | 1    | 1615 | 196 | 9.  | *    | 1   | 2230 | 271 | 5. |     |      |     |      |
| 1  | 0350 | 47   | 0.  | *    | 1 | 1005 | 122 | 1.   | *   | 1    | 1620 | 197 | 9.  | *    | 1   | 2235 | 272 | 5. |     |      |     |      |
| 1  | 0355 | 48   | 0.  | *    | 1 | 1010 | 123 | 1.   | *   | 1    | 1625 | 198 | 9.  | *    | 1   | 2240 | 273 | 5. |     |      |     |      |
| 1  | 0400 | 49   | 0.  | *    | 1 | 1015 | 124 | 1.   | *   | 1    | 1630 | 199 | 9.  | *    | 1   | 2245 | 274 | 5. |     |      |     |      |
| 1  | 0405 | 50   | 0.  | *    | 1 | 1020 | 125 | 1.   | *   | 1    | 1635 | 200 | 9.  | *    | 1   | 2250 | 275 | 5. |     |      |     |      |
| 1  | 0410 | 51   | 0.  | *    | 1 | 1025 | 126 | 1.   | *   | 1    | 1640 | 201 | 8.  | *    | 1   | 2255 | 276 | 5. |     |      |     |      |
| 1  | 0415 | 52   | 0.  | *    | 1 | 1030 | 127 | 1.   | *   | 1    | 1645 | 202 | 8.  | *    | 1   | 2300 | 277 | 5. |     |      |     |      |
| 1  | 0420 | 53   | 0.  | *    | 1 | 1035 | 128 | 2.   | *   | 1    | 1650 | 203 | 8.  | *    | 1   | 2305 | 278 | 5. |     |      |     |      |
| 1  | 0425 | 54   | 0.  | *    | 1 | 1040 | 129 | 2.   | *   | 1    | 1655 | 204 | 8.  | *    | 1   | 2310 | 279 | 5. |     |      |     |      |
| 1  | 0430 | 55   | 0.  | *    | 1 | 1045 | 130 | 3.   | *   | 1    | 1700 | 205 | 8.  | *    | 1   | 2315 | 280 | 5. |     |      |     |      |

|   |      |    |    |   |   |      |     |      |   |   |      |     |    |   |   |      |     |    |
|---|------|----|----|---|---|------|-----|------|---|---|------|-----|----|---|---|------|-----|----|
| 1 | 0435 | 56 | 0. | * | 1 | 1050 | 131 | 3.   | * | 1 | 1705 | 206 | 8. | * | 1 | 2320 | 281 | 5. |
| 1 | 0440 | 57 | 0. | * | 1 | 1055 | 132 | 4.   | * | 1 | 1710 | 207 | 8. | * | 1 | 2325 | 282 | 5. |
| 1 | 0445 | 58 | 0. | * | 1 | 1100 | 133 | 4.   | * | 1 | 1715 | 208 | 8. | * | 1 | 2330 | 283 | 5. |
| 1 | 0450 | 59 | 0. | * | 1 | 1105 | 134 | 5.   | * | 1 | 1720 | 209 | 8. | * | 1 | 2335 | 284 | 5. |
| 1 | 0455 | 60 | 0. | * | 1 | 1110 | 135 | 6.   | * | 1 | 1725 | 210 | 8. | * | 1 | 2340 | 285 | 5. |
| 1 | 0500 | 61 | 0. | * | 1 | 1115 | 136 | 7.   | * | 1 | 1730 | 211 | 8. | * | 1 | 2345 | 286 | 4. |
| 1 | 0505 | 62 | 0. | * | 1 | 1120 | 137 | 9.   | * | 1 | 1735 | 212 | 8. | * | 1 | 2350 | 287 | 4. |
| 1 | 0510 | 63 | 0. | * | 1 | 1125 | 138 | 15.  | * | 1 | 1740 | 213 | 8. | * | 1 | 2355 | 288 | 3. |
| 1 | 0515 | 64 | 0. | * | 1 | 1130 | 139 | 24.  | * | 1 | 1745 | 214 | 7. | * | 2 | 0000 | 289 | 3. |
| 1 | 0520 | 65 | 0. | * | 1 | 1135 | 140 | 41.  | * | 1 | 1750 | 215 | 7. | * | 2 | 0005 | 290 | 2. |
| 1 | 0525 | 66 | 0. | * | 1 | 1140 | 141 | 71.  | * | 1 | 1755 | 216 | 7. | * | 2 | 0010 | 291 | 1. |
| 1 | 0530 | 67 | 0. | * | 1 | 1145 | 142 | 115. | * | 1 | 1800 | 217 | 7. | * | 2 | 0015 | 292 | 1. |
| 1 | 0535 | 68 | 0. | * | 1 | 1150 | 143 | 158. | * | 1 | 1805 | 218 | 7. | * | 2 | 0020 | 293 | 1. |
| 1 | 0540 | 69 | 0. | * | 1 | 1155 | 144 | 179. | * | 1 | 1810 | 219 | 6. | * | 2 | 0025 | 294 | 0. |
| 1 | 0545 | 70 | 0. | * | 1 | 1200 | 145 | 171. | * | 1 | 1815 | 220 | 6. | * | 2 | 0030 | 295 | 0. |
| 1 | 0550 | 71 | 0. | * | 1 | 1205 | 146 | 146. | * | 1 | 1820 | 221 | 6. | * | 2 | 0035 | 296 | 0. |
| 1 | 0555 | 72 | 0. | * | 1 | 1210 | 147 | 117. | * | 1 | 1825 | 222 | 6. | * | 2 | 0040 | 297 | 0. |
| 1 | 0600 | 73 | 0. | * | 1 | 1215 | 148 | 92.  | * | 1 | 1830 | 223 | 6. | * | 2 | 0045 | 298 | 0. |
| 1 | 0605 | 74 | 0. | * | 1 | 1220 | 149 | 75.  | * | 1 | 1835 | 224 | 6. | * | 2 | 0050 | 299 | 0. |
| 1 | 0610 | 75 | 0. | * | 1 | 1225 | 150 | 62.  | * | 1 | 1840 | 225 | 6. | * | 2 | 0055 | 300 | 0. |

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| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |          |         |          |
|--------------------|--------------|----------------------|----------|---------|----------|
|                    |              | 6-HR                 | 24-HR    | 72-HR   | 24.92-HR |
|                    |              | (CFS)                | (INCHES) | (AC-FT) |          |
| + 179.             | 11.92        | 30.                  | 9.       | 9.      | 9.       |
|                    |              | 1.408                | 1.732    | 1.732   | 1.732    |
|                    |              | 15.                  | 18.      | 18.     | 18.      |
| CUMULATIVE AREA =  |              | .20 SQ MI            |          |         |          |

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51 KK \* OSB1 \*  
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CHEYENNE MTN. HS OFFSITE BASIN B1

SUBBASIN RUNOFF DATA

53 BA SUBBASIN CHARACTERISTICS  
TAREA .14 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 4.40 BASIN TOTAL PRECIPITATION

12 PI INCREMENTAL PRECIPITATION PATTERN

|     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |



.00 .00 .00 .00 .00

54 LS SCS LOSS RATE  
 STRTLL .60 INITIAL ABSTRACTION  
 CRVNER 77.00 CURVE NUMBER  
 RTIMP .00 PERCENT IMPERVIOUS AREA

55 UD SCS DIMENSIONLESS UNITGRAPH  
 TLAG .28 LAG

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WARNING \*\*\* TIME INTERVAL IS GREATER THAN .29\*LAG

UNIT HYDROGRAPH  
 19 END-OF-PERIOD ORDINATES

|     |      |      |      |      |      |     |     |     |     |
|-----|------|------|------|------|------|-----|-----|-----|-----|
| 32. | 106. | 188. | 205. | 176. | 123. | 77. | 51. | 33. | 22. |
| 14. | 9.   | 6.   | 4.   | 3.   | 2.   | 1.  | 1.  | 0.  |     |

HYDROGRAPH AT STATION OSB1

| DA | MON  | HRMN | ORD  | RAIN | LOSS | EXCESS | COMP Q | * | DA | MON  | HRMN | ORD | RAIN | LOSS | EXCESS | COMP Q |
|----|------|------|------|------|------|--------|--------|---|----|------|------|-----|------|------|--------|--------|
| 1  | 0000 | 1    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1230 | 151  | .03 | .01  | .02  | 42.    |        |
| 1  | 0005 | 2    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1235 | 152  | .03 | .01  | .02  | 37.    |        |
| 1  | 0010 | 3    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1240 | 153  | .03 | .01  | .02  | 32.    |        |
| 1  | 0015 | 4    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1245 | 154  | .03 | .01  | .02  | 29.    |        |
| 1  | 0020 | 5    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1250 | 155  | .02 | .01  | .02  | 26.    |        |
| 1  | 0025 | 6    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1255 | 156  | .02 | .01  | .02  | 24.    |        |
| 1  | 0030 | 7    | .00  | .00  | .00  | .00    | 0.     | * | 1  | 1300 | 157  | .02 | .01  | .02  | 22.    |        |
| 1  | 0035 | 8    | -.01 | -.01 | .00  | 0.     | 0.     | * | 1  | 1305 | 158  | .02 | .00  | .01  | 20.    |        |
| 1  | 0040 | 9    | -.01 | -.01 | .00  | 0.     | 0.     | * | 1  | 1310 | 159  | .02 | .00  | .01  | 19.    |        |
| 1  | 0045 | 10   | -.01 | -.01 | .00  | 0.     | 0.     | * | 1  | 1315 | 160  | .02 | .00  | .01  | 18.    |        |
| 1  | 0050 | 11   | .02  | .02  | .00  | 0.     | 0.     | * | 1  | 1320 | 161  | .02 | .00  | .01  | 17.    |        |
| 1  | 0055 | 12   | .02  | .02  | .00  | 0.     | 0.     | * | 1  | 1325 | 162  | .02 | .00  | .01  | 16.    |        |
| 1  | 0100 | 13   | .02  | .02  | .00  | 0.     | 0.     | * | 1  | 1330 | 163  | .02 | .00  | .01  | 15.    |        |
| 1  | 0105 | 14   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1335 | 164  | .01 | .00  | .01  | 14.    |        |
| 1  | 0110 | 15   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1340 | 165  | .01 | .00  | .01  | 14.    |        |
| 1  | 0115 | 16   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1345 | 166  | .01 | .00  | .01  | 13.    |        |
| 1  | 0120 | 17   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1350 | 167  | .01 | .00  | .01  | 13.    |        |
| 1  | 0125 | 18   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1355 | 168  | .01 | .00  | .01  | 12.    |        |
| 1  | 0130 | 19   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1400 | 169  | .01 | .00  | .01  | 12.    |        |
| 1  | 0135 | 20   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1405 | 170  | .01 | .00  | .01  | 11.    |        |
| 1  | 0140 | 21   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1410 | 171  | .01 | .00  | .01  | 11.    |        |
| 1  | 0145 | 22   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1415 | 172  | .01 | .00  | .01  | 11.    |        |
| 1  | 0150 | 23   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1420 | 173  | .01 | .00  | .01  | 10.    |        |
| 1  | 0155 | 24   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1425 | 174  | .01 | .00  | .01  | 10.    |        |
| 1  | 0200 | 25   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1430 | 175  | .01 | .00  | .01  | 9.     |        |
| 1  | 0205 | 26   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1435 | 176  | .01 | .00  | .01  | 9.     |        |
| 1  | 0210 | 27   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1440 | 177  | .01 | .00  | .01  | 9.     |        |
| 1  | 0215 | 28   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1445 | 178  | .01 | .00  | .01  | 9.     |        |
| 1  | 0220 | 29   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1450 | 179  | .01 | .00  | .01  | 8.     |        |
| 1  | 0225 | 30   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1455 | 180  | .01 | .00  | .01  | 8.     |        |
| 1  | 0230 | 31   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1500 | 181  | .01 | .00  | .01  | 8.     |        |
| 1  | 0235 | 32   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1505 | 182  | .01 | .00  | .01  | 8.     |        |
| 1  | 0240 | 33   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1510 | 183  | .01 | .00  | .01  | 8.     |        |
| 1  | 0245 | 34   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1515 | 184  | .01 | .00  | .01  | 8.     |        |
| 1  | 0250 | 35   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1520 | 185  | .01 | .00  | .01  | 8.     |        |
| 1  | 0255 | 36   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1525 | 186  | .01 | .00  | .01  | 8.     |        |
| 1  | 0300 | 37   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1530 | 187  | .01 | .00  | .01  | 7.     |        |
| 1  | 0305 | 38   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1535 | 188  | .01 | .00  | .01  | 7.     |        |
| 1  | 0310 | 39   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1540 | 189  | .01 | .00  | .01  | 7.     |        |
| 1  | 0315 | 40   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1545 | 190  | .01 | .00  | .01  | 7.     |        |
| 1  | 0320 | 41   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1550 | 191  | .01 | .00  | .01  | 7.     |        |
| 1  | 0325 | 42   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1555 | 192  | .01 | .00  | .01  | 7.     |        |
| 1  | 0330 | 43   | .00  | .00  | .00  | 0.     | 0.     | * | 1  | 1600 | 193  | .01 | .00  | .01  | 7.     |        |
| 1  | 0335 | 44   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1605 | 194  | .01 | .00  | .01  | 7.     |        |
| 1  | 0340 | 45   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1610 | 195  | .01 | .00  | .01  | 7.     |        |
| 1  | 0345 | 46   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1615 | 196  | .01 | .00  | .01  | 7.     |        |
| 1  | 0350 | 47   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1620 | 197  | .01 | .00  | .01  | 7.     |        |
| 1  | 0355 | 48   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1625 | 198  | .01 | .00  | .01  | 7.     |        |
| 1  | 0400 | 49   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1630 | 199  | .01 | .00  | .01  | 7.     |        |
| 1  | 0405 | 50   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1635 | 200  | .01 | .00  | .01  | 7.     |        |
| 1  | 0410 | 51   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1640 | 201  | .01 | .00  | .01  | 6.     |        |
| 1  | 0415 | 52   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1645 | 202  | .01 | .00  | .01  | 6.     |        |
| 1  | 0420 | 53   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1650 | 203  | .01 | .00  | .01  | 6.     |        |
| 1  | 0425 | 54   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1655 | 204  | .01 | .00  | .01  | 6.     |        |
| 1  | 0430 | 55   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1700 | 205  | .01 | .00  | .01  | 6.     |        |
| 1  | 0435 | 56   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1705 | 206  | .01 | .00  | .01  | 6.     |        |
| 1  | 0440 | 57   | .01  | .01  | .00  | 0.     | 0.     | * | 1  | 1710 | 207  | .01 | .00  | .01  | 6.     |        |

|   |      |     |     |     |     |     |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|-----|---|---|------|-----|-----|-----|-----|----|
| 1 | 0445 | 58  | .01 | .01 | .00 | 0.  | * | 1 | 1715 | 208 | .01 | .00 | .01 | 6. |
| 1 | 0450 | 59  | .01 | .01 | .00 | 0.  | * | 1 | 1720 | 209 | .01 | .00 | .01 | 6. |
| 1 | 0455 | 60  | .01 | .01 | .00 | 0.  | * | 1 | 1725 | 210 | .01 | .00 | .01 | 6. |
| 1 | 0500 | 61  | .01 | .01 | .00 | 0.  | * | 1 | 1730 | 211 | .01 | .00 | .01 | 6. |
| 1 | 0505 | 62  | .01 | .01 | .00 | 0.  | * | 1 | 1735 | 212 | .01 | .00 | .00 | 6. |
| 1 | 0510 | 63  | .01 | .01 | .00 | 0.  | * | 1 | 1740 | 213 | .01 | .00 | .00 | 6. |
| 1 | 0515 | 64  | .01 | .01 | .00 | 0.  | * | 1 | 1745 | 214 | .01 | .00 | .00 | 6. |
| 1 | 0520 | 65  | .01 | .01 | .00 | 0.  | * | 1 | 1750 | 215 | .01 | .00 | .00 | 5. |
| 1 | 0525 | 66  | .01 | .01 | .00 | 0.  | * | 1 | 1755 | 216 | .01 | .00 | .00 | 5. |
| 1 | 0530 | 67  | .01 | .01 | .00 | 0.  | * | 1 | 1800 | 217 | .01 | .00 | .00 | 5. |
| 1 | 0535 | 68  | .01 | .01 | .00 | 0.  | * | 1 | 1805 | 218 | .01 | .00 | .00 | 5. |
| 1 | 0540 | 69  | .01 | .01 | .00 | 0.  | * | 1 | 1810 | 219 | .01 | .00 | .00 | 5. |
| 1 | 0545 | 70  | .01 | .01 | .00 | 0.  | * | 1 | 1815 | 220 | .01 | .00 | .00 | 5. |
| 1 | 0550 | 71  | .01 | .01 | .00 | 0.  | * | 1 | 1820 | 221 | .01 | .00 | .00 | 5. |
| 1 | 0555 | 72  | .01 | .01 | .00 | 0.  | * | 1 | 1825 | 222 | .01 | .00 | .00 | 5. |
| 1 | 0600 | 73  | .01 | .01 | .00 | 0.  | * | 1 | 1830 | 223 | .01 | .00 | .00 | 5. |
| 1 | 0605 | 74  | .01 | .01 | .00 | 0.  | * | 1 | 1835 | 224 | .01 | .00 | .00 | 5. |
| 1 | 0610 | 75  | .01 | .01 | .00 | 0.  | * | 1 | 1840 | 225 | .01 | .00 | .00 | 5. |
| 1 | 0615 | 76  | .01 | .01 | .00 | 0.  | * | 1 | 1845 | 226 | .01 | .00 | .00 | 5. |
| 1 | 0620 | 77  | .01 | .01 | .00 | 0.  | * | 1 | 1850 | 227 | .01 | .00 | .00 | 5. |
| 1 | 0625 | 78  | .01 | .01 | .00 | 0.  | * | 1 | 1855 | 228 | .01 | .00 | .00 | 5. |
| 1 | 0630 | 79  | .01 | .01 | .00 | 0.  | * | 1 | 1900 | 229 | .01 | .00 | .00 | 5. |
| 1 | 0635 | 80  | .01 | .01 | .00 | 0.  | * | 1 | 1905 | 230 | .01 | .00 | .00 | 5. |
| 1 | 0640 | 81  | .01 | .01 | .00 | 0.  | * | 1 | 1910 | 231 | .01 | .00 | .00 | 5. |
| 1 | 0645 | 82  | .01 | .01 | .00 | 0.  | * | 1 | 1915 | 232 | .01 | .00 | .00 | 5. |
| 1 | 0650 | 83  | .01 | .01 | .00 | 0.  | * | 1 | 1920 | 233 | .01 | .00 | .00 | 5. |
| 1 | 0655 | 84  | .01 | .01 | .00 | 0.  | * | 1 | 1925 | 234 | .01 | .00 | .00 | 5. |
| 1 | 0700 | 85  | .01 | .01 | .00 | 0.  | * | 1 | 1930 | 235 | .01 | .00 | .00 | 5. |
| 1 | 0705 | 86  | .01 | .01 | .00 | 0.  | * | 1 | 1935 | 236 | .00 | .00 | .00 | 5. |
| 1 | 0710 | 87  | .01 | .01 | .00 | 0.  | * | 1 | 1940 | 237 | .00 | .00 | .00 | 5. |
| 1 | 0715 | 88  | .01 | .01 | .00 | 0.  | * | 1 | 1945 | 238 | .00 | .00 | .00 | 5. |
| 1 | 0720 | 89  | .01 | .01 | .00 | 0.  | * | 1 | 1950 | 239 | .00 | .00 | .00 | 4. |
| 1 | 0725 | 90  | .01 | .01 | .00 | 0.  | * | 1 | 1955 | 240 | .00 | .00 | .00 | 4. |
| 1 | 0730 | 91  | .01 | .01 | .00 | 0.  | * | 1 | 2000 | 241 | .00 | .00 | .00 | 4. |
| 1 | 0735 | 92  | .01 | .01 | .00 | 0.  | * | 1 | 2005 | 242 | .00 | .00 | .00 | 4. |
| 1 | 0740 | 93  | .01 | .01 | .00 | 0.  | * | 1 | 2010 | 243 | .00 | .00 | .00 | 4. |
| 1 | 0745 | 94  | .01 | .01 | .00 | 0.  | * | 1 | 2015 | 244 | .00 | .00 | .00 | 4. |
| 1 | 0750 | 95  | .01 | .01 | .00 | 0.  | * | 1 | 2020 | 245 | .00 | .00 | .00 | 4. |
| 1 | 0755 | 96  | .01 | .01 | .00 | 0.  | * | 1 | 2025 | 246 | .00 | .00 | .00 | 4. |
| 1 | 0800 | 97  | .01 | .01 | .00 | 0.  | * | 1 | 2030 | 247 | .00 | .00 | .00 | 4. |
| 1 | 0805 | 98  | .01 | .01 | .00 | 0.  | * | 1 | 2035 | 248 | .00 | .00 | .00 | 4. |
| 1 | 0810 | 99  | .01 | .01 | .00 | 0.  | * | 1 | 2040 | 249 | .00 | .00 | .00 | 4. |
| 1 | 0815 | 100 | .01 | .01 | .00 | 0.  | * | 1 | 2045 | 250 | .00 | .00 | .00 | 4. |
| 1 | 0820 | 101 | .01 | .01 | .00 | 0.  | * | 1 | 2050 | 251 | .00 | .00 | .00 | 4. |
| 1 | 0825 | 102 | .01 | .01 | .00 | 0.  | * | 1 | 2055 | 252 | .00 | .00 | .00 | 4. |
| 1 | 0830 | 103 | .01 | .01 | .00 | 0.  | * | 1 | 2100 | 253 | .00 | .00 | .00 | 4. |
| 1 | 0835 | 104 | .01 | .01 | .00 | 0.  | * | 1 | 2105 | 254 | .00 | .00 | .00 | 4. |
| 1 | 0840 | 105 | .01 | .01 | .00 | 0.  | * | 1 | 2110 | 255 | .00 | .00 | .00 | 4. |
| 1 | 0845 | 106 | .01 | .01 | .00 | 0.  | * | 1 | 2115 | 256 | .00 | .00 | .00 | 4. |
| 1 | 0850 | 107 | .01 | .01 | .00 | 0.  | * | 1 | 2120 | 257 | .00 | .00 | .00 | 4. |
| 1 | 0855 | 108 | .01 | .01 | .00 | 0.  | * | 1 | 2125 | 258 | .00 | .00 | .00 | 4. |
| 1 | 0900 | 109 | .01 | .01 | .00 | 0.  | * | 1 | 2130 | 259 | .00 | .00 | .00 | 4. |
| 1 | 0905 | 110 | .01 | .01 | .00 | 1.  | * | 1 | 2135 | 260 | .00 | .00 | .00 | 4. |
| 1 | 0910 | 111 | .01 | .01 | .00 | 1.  | * | 1 | 2140 | 261 | .00 | .00 | .00 | 4. |
| 1 | 0915 | 112 | .01 | .01 | .00 | 1.  | * | 1 | 2145 | 262 | .00 | .00 | .00 | 4. |
| 1 | 0920 | 113 | .01 | .01 | .00 | 1.  | * | 1 | 2150 | 263 | .00 | .00 | .00 | 4. |
| 1 | 0925 | 114 | .01 | .01 | .00 | 1.  | * | 1 | 2155 | 264 | .00 | .00 | .00 | 4. |
| 1 | 0930 | 115 | .01 | .01 | .00 | 1.  | * | 1 | 2200 | 265 | .00 | .00 | .00 | 4. |
| 1 | 0935 | 116 | .01 | .01 | .00 | 1.  | * | 1 | 2205 | 266 | .00 | .00 | .00 | 4. |
| 1 | 0940 | 117 | .01 | .01 | .00 | 1.  | * | 1 | 2210 | 267 | .00 | .00 | .00 | 4. |
| 1 | 0945 | 118 | .01 | .01 | .00 | 1.  | * | 1 | 2215 | 268 | .00 | .00 | .00 | 4. |
| 1 | 0950 | 119 | .01 | .01 | .00 | 2.  | * | 1 | 2220 | 269 | .00 | .00 | .00 | 4. |
| 1 | 0955 | 120 | .01 | .01 | .00 | 2.  | * | 1 | 2225 | 270 | .00 | .00 | .00 | 4. |
| 1 | 1000 | 121 | .01 | .01 | .00 | 2.  | * | 1 | 2230 | 271 | .00 | .00 | .00 | 4. |
| 1 | 1005 | 122 | .02 | .01 | .00 | 2.  | * | 1 | 2235 | 272 | .00 | .00 | .00 | 4. |
| 1 | 1010 | 123 | .02 | .01 | .00 | 2.  | * | 1 | 2240 | 273 | .00 | .00 | .00 | 4. |
| 1 | 1015 | 124 | .02 | .01 | .00 | 2.  | * | 1 | 2245 | 274 | .00 | .00 | .00 | 4. |
| 1 | 1020 | 125 | .02 | .02 | .00 | 3.  | * | 1 | 2250 | 275 | .00 | .00 | .00 | 4. |
| 1 | 1025 | 126 | .02 | .02 | .00 | 3.  | * | 1 | 2255 | 276 | .00 | .00 | .00 | 4. |
| 1 | 1030 | 127 | .02 | .02 | .00 | 3.  | * | 1 | 2300 | 277 | .00 | .00 | .00 | 4. |
| 1 | 1035 | 128 | .03 | .02 | .01 | 4.  | * | 1 | 2305 | 278 | .00 | .00 | .00 | 4. |
| 1 | 1040 | 129 | .03 | .02 | .01 | 4.  | * | 1 | 2310 | 279 | .00 | .00 | .00 | 4. |
| 1 | 1045 | 130 | .03 | .02 | .01 | 5.  | * | 1 | 2315 | 280 | .00 | .00 | .00 | 4. |
| 1 | 1050 | 131 | .03 | .02 | .01 | 5.  | * | 1 | 2320 | 281 | .00 | .00 | .00 | 4. |
| 1 | 1055 | 132 | .03 | .02 | .01 | 6.  | * | 1 | 2325 | 282 | .00 | .00 | .00 | 4. |
| 1 | 1100 | 133 | .03 | .02 | .01 | 7.  | * | 1 | 2330 | 283 | .00 | .00 | .00 | 4. |
| 1 | 1105 | 134 | .04 | .03 | .01 | 7.  | * | 1 | 2335 | 284 | .00 | .00 | .00 | 4. |
| 1 | 1110 | 135 | .04 | .03 | .01 | 8.  | * | 1 | 2340 | 285 | .00 | .00 | .00 | 4. |
| 1 | 1115 | 136 | .04 | .03 | .01 | 9.  | * | 1 | 2345 | 286 | .00 | .00 | .00 | 3. |
| 1 | 1120 | 137 | .15 | .10 | .06 | 12. | * | 1 | 2350 | 287 | .00 | .00 | .00 | 3. |
| 1 | 1125 | 138 | .15 | .09 | .06 | 17. | * | 1 | 2355 | 288 | .00 | .00 | .00 | 3. |
| 1 | 1130 | 139 | .15 | .08 | .07 | 27. | * | 2 | 0000 | 289 | .00 | .00 | .00 | 2. |
| 1 | 1135 | 140 | .41 | .19 | .21 | 43. | * | 2 | 0005 | 290 | .00 | .00 | .00 | 1. |
| 1 | 1140 | 141 | .41 | .16 | .24 | 70. | * | 2 | 0010 | 291 | .00 | .00 | .00 | 1. |

|   |      |     |     |     |     |      |   |   |      |     |     |     |     |    |
|---|------|-----|-----|-----|-----|------|---|---|------|-----|-----|-----|-----|----|
| 1 | 1145 | 142 | .41 | .14 | .27 | 109. | * | 2 | 0015 | 292 | .00 | .00 | .00 | 1. |
| 1 | 1150 | 143 | .06 | .02 | .04 | 145. | * | 2 | 0020 | 293 | .00 | .00 | .00 | 0. |
| 1 | 1155 | 144 | .06 | .02 | .05 | 161. | * | 2 | 0025 | 294 | .00 | .00 | .00 | 0. |
| 1 | 1200 | 145 | .06 | .02 | .05 | 150. | * | 2 | 0030 | 295 | .00 | .00 | .00 | 0. |
| 1 | 1205 | 146 | .04 | .01 | .03 | 124. | * | 2 | 0035 | 296 | .00 | .00 | .00 | 0. |
| 1 | 1210 | 147 | .04 | .01 | .03 | 97.  | * | 2 | 0040 | 297 | .00 | .00 | .00 | 0. |
| 1 | 1215 | 148 | .04 | .01 | .03 | 75.  | * | 2 | 0045 | 298 | .00 | .00 | .00 | 0. |
| 1 | 1220 | 149 | .03 | .01 | .02 | 61.  | * | 2 | 0050 | 299 | .00 | .00 | .00 | 0. |
| 1 | 1225 | 150 | .03 | .01 | .02 | 50.  | * | 2 | 0055 | 300 | .00 | .00 | .00 | 0. |

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TOTAL RAINFALL = 4.40, TOTAL LOSS = 2.25, TOTAL EXCESS = 2.15

| PEAK FLOW<br>(CFS) | TIME<br>(HR) | MAXIMUM AVERAGE FLOW |       |       |          |
|--------------------|--------------|----------------------|-------|-------|----------|
|                    |              | 6-HR                 | 24-HR | 72-HR | 24.92-HR |
| 161.               | 11.92        | 26.                  | 8.    | 8.    | 8.       |
|                    |              | (INCHES)<br>1.751    | 2.154 | 2.154 | 2.154    |
|                    |              | (AC-FT)<br>13.       | 16.   | 16.   | 16.      |

CUMULATIVE AREA = .14 SQ MI

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

| OPERATION     | STATION | PEAK FLOW | TIME OF PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD |         |         | BASIN AREA | MAXIMUM STAGE | TIME OF MAX STAGE |
|---------------|---------|-----------|--------------|---------------------------------|---------|---------|------------|---------------|-------------------|
|               |         |           |              | 6-HOUR                          | 24-HOUR | 72-HOUR |            |               |                   |
| HYDROGRAPH AT | OSA1    | 132.      | 11.92        | 23.                             | 7.      | 7.      | .16        |               |                   |
| ROUTED TO     | RTA1    | 131.      | 11.92        | 23.                             | 7.      | 7.      | .16        |               |                   |
| HYDROGRAPH AT | OSA2    | 31.       | 11.92        | 5.                              | 2.      | 1.      | .03        |               |                   |
| ROUTED TO     | RTA2    | 31.       | 11.92        | 5.                              | 2.      | 1.      | .03        |               |                   |
| HYDROGRAPH AT |         | 11.       | 11.83        | 2.                              | 1.      | 1.      | .01        |               |                   |
| ROUTED TO     | RTA3    | 11.       | 11.92        | 2.                              | 1.      | 1.      | .01        |               |                   |
| HYDROGRAPH AT | OSA4    | 8.        | 11.75        | 1.                              | 0.      | 0.      | .00        |               |                   |
| 4 COMBINED AT | DPA     | 179.      | 11.92        | 30.                             | 9.      | 9.      | .20        |               |                   |
| HYDROGRAPH AT | OSB1    | 161.      | 11.92        | 26.                             | 8.      | 8.      | .14        |               |                   |

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING  
 (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

| ISTAQ | ELEMENT | DT<br>(MIN) | PEAK<br>(CFS) | TIME TO PEAK<br>(MIN) | VOLUME<br>(IN) | DT<br>(MIN) | INTERPOLATED TO COMPUTATION INTERVAL |                       | VOLUME<br>(IN) |
|-------|---------|-------------|---------------|-----------------------|----------------|-------------|--------------------------------------|-----------------------|----------------|
|       |         |             |               |                       |                |             | PEAK<br>(CFS)                        | TIME TO PEAK<br>(MIN) |                |
| RTA1  | MANE    | .27         | 132.27        | 715.57                | 1.62           | 5.00        | 131.14                               | 715.00                | 1.63           |

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1378E+02 EXCESS= .0000E+00 OUTFLOW= .1378E+02 BASIN STORAGE= .1241E-03 PERCENT ERROR= .0

|      |      |     |       |        |      |      |       |        |      |
|------|------|-----|-------|--------|------|------|-------|--------|------|
| RTA2 | MANE | .25 | 31.40 | 715.50 | 2.15 | 5.00 | 31.29 | 715.00 | 2.16 |
|------|------|-----|-------|--------|------|------|-------|--------|------|

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2987E+01 EXCESS= .0000E+00 OUTFLOW= .2987E+01 BASIN STORAGE= .1921E-04 PERCENT ERROR= .0

|      |      |     |       |        |      |      |       |        |      |
|------|------|-----|-------|--------|------|------|-------|--------|------|
| RTA3 | MANE | .24 | 11.46 | 710.50 | 2.15 | 5.00 | 11.40 | 715.00 | 2.16 |
|------|------|-----|-------|--------|------|------|-------|--------|------|

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1034E+01 EXCESS= .0000E+00 OUTFLOW= .1034E+01 BASIN STORAGE= .2826E-05 PERCENT ERROR= .0

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

**Appendix B**  
**Exhibits**