MASTER DEVELOPMENT DRAINAGE REPORT (M.D.D.P.)
WOODMEN HEIGHTS ADDITONS 7, 8, AND 9 ANNEXATION
COLORADO SPRINGS, COLORADO

NOVEMBER 2005
REVISED MAY 2006
REVISED AUGUST 2006
REVISED MARCH 2007

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Job No. 0537.00

MASTER DEVELOPMENT DRAINAGE REPORT (M.D.D.P.) WOODMEN HEIGHTS ADDITONS 7, 8, AND 9 ANNEXATION COLORADO SPRINGS, COLORADO

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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 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.

Quentin Ay 3/15/07
Name

COLORADO REGISTERED QUENTIN N. ARMIJO 37170 PROFESSIONAL ENGINEER
Seal

Developer's Statement:

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

SCHOOLER AND ASSOCIATES
Business Name

By: [signature]

Title: Project Manager - First Church of the Nazarene

Address: 455 E. Pikes Peak Avenue, Suite 100, Colorado Springs, CO 80903

City of Colorado Springs Approval:

Filed in accordance with Section 7.7.906 of the Code of the City of Colorado Springs, 2001, as amended.

[signature]
For City Engineer

3/19/07
Date

Conditions

MASTER DEVELOPMENT DRAINAGE REPORT (M.D.D.P.)
WOODMEN HEIGHTS ADDITONS 7, 8, AND 9 ANNEXATION
COLORADO SPRINGS, COLORADO

PURPOSE

The purpose of this Master Development Drainage Plan is to identify and analyze the proposed drainage patterns, determine proposed runoff quantities, size drainage structures for conveyance of developed runoff, and present solutions to drainage impacts on-site and off-site resulting from this development.

GENERAL DESCRIPTION

This Master Development Drainage Plan (M.D.D.P.) consists of three Additions, Woodmen Heights Addition 7, Addition 8 and Addition 9. Addition 9 consists of 3.87 acres. Addition 8 consists of 9.73 acres. Addition 7 consists of 62.2 acres. They are located in a portion of Section 8, Township 13 South, Range 65 West of the 6th Principal Meridian currently within unincorporated El Paso County, Colorado. The development of this site for Addition 8 and 9 consists of future proposed commercial sites. The site known as Addition 7 is to be developed as Quail Brush Creek and will be single family lots with open space. The MDDP also covers the improvements of Nebraska Lane from Woodmen Road south to the Addition 7 site. The entire site is bounded to the west by the Horseshoe Rancheros residential subdivision, to the north and west by unplatted county land and to the south by open space, Sand Creek and Ridgeview filing No. 26 residential subdivision.

The site is contained within the Sand Creek Basin. Flows from this site are tributary to Sand Creek.

Soils for this project are delineated by the map in the appendix as Blakeland loamy sand (8). Soils in the study area are shown as mapped by S.C.S. in the "Soils Survey of El Paso County Area" and are primarily of Hydrologic Group A. The study area consists of undeveloped land and large lot residential development with existing natural, grassy vegetation. The existing topography is sloping from the northwest to the southeast with an average slope of 7%.

EXISTING DRAINAGE CONDITIONS

This site was most recently studied in the "Master Development Drainage Plan Amendment No. II for the Easterly Portion of Ridgeview Subdivision and Preliminary Drainage Report for the Northeasterly Portion of Ridgeview Subdivision and Phase II Sand Creek Channel Improvements." (MDDP Amend II) by JR Engineering, dated February 2004. The site was originally studied in the "Sand Creek Drainage Basin Planning Study Preliminary Design Report" (DBPS) prepared by Kiowa Engineering. This study was then updated in the "Sand Creek Drainage Basin Planning Study Preliminary Design Report Technical Addendum" by Kiowa, revised October 1995. Some of the runoff from the study area site and offsite areas upstream is tributary to existing natural channel that runs through the middle of Annexation Addition 7. This channel was studied as Reach 147 in the DBPS. In the MDDP Amend II prepared by JR Engineering a channel was designed at the north Boundary of Ridgeview Filing 26 that redirects Reach 147 southeast to a junction with Sand Creek. Other areas of the study site also are directed by sheet flow and small existing swales to Sand Creek, Which is just south east of Annexation Addition 7. Annexation Additions 8 & 9 were the only Basins studied in the historic conditions so that preliminary detention could be calculated for these two future commercial areas. Annexation Addition 9 was studied as historic Basin H-D and Annexation Addition 8 was studied as Basin H-E.

Basin H-D's 4.20 acres was analyzed as historic condition of 5 acre ranch area. Runoff currently sheet flows east off site and was calculated to be Q_5=3 cfs and Q_{100}=8 cfs. This runoff will be used as the allowable release rate for Addition 9.

Basin H-E's 9.97acres was analyzed as historic condition of 5 acre ranch area. Runoff currently sheet flows east off site and was calculated to be Q_5=8 cfs and Q_{100}=19 cfs. This runoff will be used as the allowable release rate for Addition 8.

PROPOSED DRAINAGE CONDITIONS

In the MDDP Amend II, the proposed site was part of Basins 142-2, 142-3, 147-47. Annexation Parcels 7-9 were recently studied at our request in the Sand Creek hydrological Analysis upper Sand Creek Basin Sand Creek Detention Basin No. 2" prepared by Kiowa Engineering and currently being

revised. Discussion was made with Kiowa Engineering who was in the process of reanalyzing the detention pond using HEC-1 to update our proposed sites as developed conditions and see how the change in ground cover would affect the downstream pond. The calculations preformed by Kiowa showed that the channel and downstream detention basin will be able to handle this slight increase in developed runoff (See Appendix). With this analysis there is no need for on site detention for Annexation Parcel 7. It is proposed however for Annexation Parcels 7 & 8 to have on site detention when they are developed along with water quality. The downstream detention basin being designed by Kiowa Engineering will also provide additional water quality. To the flows calculated here in this report. Developed flows from the subject site will drain to the south east via proposed on site storm sewer and swales and then drain to the existing channel, the offsite swale designed in Ridgeview Filing 26, or to Sand Creek.

The following is a description of the onsite basins, offsite bypass flows and the overall proposed drainage characteristics for the development of Woodmen Heights Additions 7, 8, and 9. The following Design Points were determined using the Rational Method since each individual basin is less then 100 acres and the combined acreage at any Design Point is also less then 100 acres. This method offers a more conservative approach to calculating swale cross sections and storm drain sizes.

It is also assumed that runoff upstream of lots will be routed down side lot swales to avoid flooding of the homes.

The existing channel running through Woodmen Heights 7 was used not reanalyzed as MDDP Amend II updated the HEC-RAS model that was used in the original Sand Creek DBPS and Technical Addendum. In the MDDP Amend II Design Point 47 was moved to the south boundary of Addition 7 (north boundary of Ridgeview Filing 26). The runoff calculated in the channel was 644 cfs for the 100 year event. To be conservative this flow was assumed for the whole reach through Addition 7. A trapezoidal cross section of a 10' wide bottom with 4:1 slopes and an average slope of 1.54% was plugged into Haestad Methods Flowmaster. This cross section was proposed in the original DBPS. The results showed a 3.69' depth in the channel with a velocity of 5.01 ft/sec (See hydraulic calculation in appendix.) To account for freeboard the channel is shown to be designed

with a 6' depth. The one street crossing at Cat Tail Creek Drive will utilize 3 60" RCP Culverts to pass the storm.

Basin OS-1's 15.74 acres sits just west of the site and consist of 5 acre ranch property that sheet flows onto the proposed Woodmen Frontage Road the old Nebraska Lane. Basin OS-1A's 0.67 acres consist of the east half of Nebraska Lane, which will now be the above mentioned Woodmen Frontage Road. Since we first analyzed this area in our MDDP we have learned that the Woodmen Road improvements in this area will improve the north 700' of old Nebraska Lane (new Quail Brush Creek Drive and Woodmen Frontage Road name change and exact location not finalized), which coincides with a high point in old Nebraska Lane (new Quail Brush Creek Drive). Our limits of Quail Brush Creek to the north will end at the south end of the proposed Woodmen Frontage Road. With these improvements DMJM Harris and the El Paso County Development Services will study these areas and analyze the drainage for these Basins and Design Points. Per their design the storm drain will be installed with these road improvements and is no longer part of our study.

Offsite Basins OS-2, OS-3A, OS-4A and OS-4B, are currently 5 acre ranch lots. For the chance that the site does develop into some other type of zoning we have stubbed a 60" on the south west corner that will be able to handle the increase in flow if developed. Due to the upsizing that this offsite flows from the west become reimbursable and we have included this under our construction cost opinion for reimbursable drainage facilities.

Runoff (Q_5=17 cfs and Q_{100}=38 cfs) from Basin OS-2's 22.76 acres flows overland and onto the west half of Quail Brush Creek Drive (old Nebraska Lane). The runoff will be collected at Design Point 2A in 2-14' sump inlets located in Quail Brush Creek Drive. Basin OS-2A's 0.69 acres consists of the west half of Quail Brush Creek Drive. Runoff (Q_5=3 cfs and Q_{100}=5 cfs) is directed to a low point in the street section and captured in the above mentioned 2-14' sump inlets at Design Point 2A (Q_5=19 cfs and Q_{100}=40 cfs) along with the runoff from Basin OS-2. Basin OS-2B's 0.84 acres is the eastern street section of Quail Brush Creek Drive (old Nebraska Lane). Runoff (Q_5=3 cfs and Q_{100}=6 cfs) is captured in a 6' sump inlet at Design Point 2B and transported by Pipe Run 2A to a junction with Design Point 2A. The combined runoff (Q_5=21 cfs and Q_{100}=42 cfs) from Design Points 2A & 2B is routed south via a 36" storm drain (Pipe Run 2B).

Offsite Basin OS-3A's runoff (Q_5=7 cfs and Q_{100}=15 cfs) sheet flows east to a low point (Design point 3A) in Quail Brush Creek Drive where an 8' D-10R sump inlet will capture the flow at the north property line of Quail Brush Creek. Basin OS-3B's 0.17 acres consists of a portion of Quail Brush Creek Drive. Runoff form this basin is captured in 6' sump inlet and routed by Pipe run 3 an 18" storm drain to a junction with Design Point 3A and Pipe run 2B. A 36" storm drain (Pipe Run 3A) will carry the combined flow (Q_5=27 cfs and Q_{100}=56 cfs) south in a 30' tract at the west boundary of Quail Brush Creek Subdivision (Addition 7).

Offsite Basin OS-4A's runoff (Q_5=8 cfs and Q_{100}=17 cfs) sheet flows southeast into proposed Swale-1 (Section A-A) at the west boundary of Addition 7. The cross section for the trapezoidal swale consists of 2' bottom with 4:1 side slopes for a 100-year depth of 0.94'. The proposed design depth will be 2.5' to provide adequate freeboard. The SC250 fabric lined (North American Green Fabric see appendix for calculations) swale will then transport the runoff south to Design Point 4A. This SC250 fabric lined swale will be maintained by the HOA established for this subdivision. At DP-4A 2-10' long city standard D-9 inlets will capture the flow. From here the combined flow (Q_5=33 cfs and Q_{100}=71 cfs) of Basin OS-4A, A1 and Pipe run 3A are transported by Pipe run 4A, a36" storm drain south to DP-4B.

Runoff from Basin OS-4B and Basin A2 is also captured by the above mentioned swale and directed to DP-4B. The combined runoff (Q_5=39 cfs and Q_{100}=84 cfs) will then be captured in 3-10' long city standard D-9 inlets. The captured flow from DP-4B and the flow in the Pipe run 4A are routed under the street section of Gold Drop Drive by Pip Run 4B a 60" storm drain to a junction with Pipe runs 6A and 6B.

Basin B1's 4.34 acres consists of single family residential lots. Runoff (Q_5=8 cfs and Q_{100}=16 cfs) will be directed to a street section and transported south to Design Point 5A. At Design Point 5A an 8' sump inlet will capture the flow. Pipe Run 5A a 24" storm drain will transport the flow south down Tract Q and then east to a junction with Pipe run 5C.

Basin B2's 5.33 acres consists of single family lots in Addition 7. Runoff (Q_5=10 cfs and Q_{100}=20

cfs) will be directed to a street section and transported south to Design Point 5B. At Design Point 5B a 12' sump inlet will capture the flow. Pipe Run 5B a 24" storm drain will transport the flow south sown Tract R to Design Point 5C. At Design Point 5C a 6' sump inlet collects the runoff (Q_5=7 cfs and Q_{100}=13 cfs) from Basin B3's 3.35 acres consisting of single family development. The combined runoff (Q_5=11 cfs and Q_{100}=22 cfs) from Pipe runs 5A & 5B and DP-5C is transported in a 36" storm drain (Pipe Run 5C) south to Design point 5D a 6' sump inlet that will collect the runoff (Q_5=2 cfs and Q_{100}=4 cfs) from Basin B4's 1.19 acres. Pipe run 5D a 36" storm drain will route the flow south into the improved channel onto a proposed 20' x 15' d50 = 12" rip-rap pad.

Basin C1's 2.09 acres consists of single family residential lots and open space. Runoff (Q_5=4 cfs and Q_{100}=9 cfs) will be directed to a street section and transported south to Design Point 6A. At Design Point 6A a 20' sump inlet will capture 3 cfs in the 5 year event and 5 cfs in the 100 year event. Pipe Run 6A an 18" storm drain will transport the flow south to a junction with Pipe run 4B a 48" storm drain. Flow by (Q_5=1 cfs and Q_{100}=3 cfs) from DP-6A is routed south down Gold Drop Drive and into Ridgeview Filing 26 and then south down Flowering Almond Drive in the curb section to 2-5' curd cuts where the runoff is collected in a water quality pond. Basin C2's 0.93 acres consists of single family residential lots. Runoff (Q_5=2 cfs and Q_{100}=4 cfs) will be directed to a street section and transported south to Design Point 6B. At Design Point 6B a 12' sump inlet will capture 1 cfs in the 5 year event and 2 cfs in the 100 year event. Pipe Run 6B an 18" storm drain will transport the flow south to a junction with Pipe run 4B a 60" storm drain. The flow is then routed into the existing swale put in with Ridgeview Filing 27 at the south boundary of Addition 7 and onto a proposed 20' x 15' d50 = 12" rip-rap pad. Design Point 7 was calculated to show the combined runoff (Q_5=79 cfs and Q_{100}=150 cfs) that our system will discharge into the existing man made swale at the south boundary.

Basin D's 4.20 acres consists of area proposed to be a future commercial area. Runoff (Q_5=12 cfs and Q_{100}=21 cfs) will be directed overland to a low point (Design Point 8) in the southeast corner of the site. At the time of the Final Drainage Report for this site a detention pond with water quality will need to be designed. The allowable release will based upon the historic runoff numbers calculated for Basin H-D (Q_5=3 cfs and Q_{100}=8 cfs). A preliminary model was setup for the detention pond in Haestad's Pondpack. It was determined that a 0.49 ac-ft pond will be required. An 18" storm

drain pipe (Pipe Run 7) will transport the allowable runoff south east across Addition 8's site to the proposed detention basin area for Basin E.

Flow (Q_5=30 cfs and Q_{100}=51 cfs) from Basin E's 9.97 acres will be directed via a private storm drain system and curb and gutter to the south east corner of Addition 8 at the time of the Final Drainage Report. Addition 8 will consist of a future commercial site. A future detention basin with water quality will release the historic flow rates of Q_5=11 cfs and Q_{100}=26 cfs out of the future pond that was preliminary sized to be 1.46 ac-ft. A 30" storm drain pipe (Pipe run 8) will be routed south through Addition 7's site to Deign point 11.

Offsite Basin OS-5's 3.18 acres was analyzed as 5 acre ranch area per the land use figure from MDDP Amend II (Basin 147-47). Runoff (Q_5=3 cfs and Q_{100}=6 cfs) will sheet flow onto a part of the northern section of the proposed Addition 7. Side lot line swales will direct the runoff south onto the street section of River Bend Drive. Basin F1's 4.84 acres consists of single family residential lots. Runoff (Q_5=8 cfs and Q_{100}=16 cfs) is directed by curb and gutter south to Deign Point 11. Basin F2's 1.33 acres consists of single family residential lots. Runoff (Q_5=3 cfs and Q_{100}=6 cfs) is directed by curb and gutter south to Design Point 11. Basin F3's 3.33 acres consists of single family residential lots. Runoff (Q_5=6 cfs and Q_{100}=12 cfs) is directed by curb and gutter south to Design Point 11. Basin F4's 1.26 acres consists of single family residential lots. Runoff (Q_5=2 cfs and Q_{100}=5 cfs) is directed by curb and gutter south to Design Point 11. The combined flow (Q_5=18 cfs and Q_{100}=35 cfs) of the above mentioned basins is captured by a 20' sump inlet. Pipe run 8 is routed through the 20' sump inlet and the combined flow (Q_5=28 cfs and Q_{100}=58 cfs) is routed into the proposed channel and onto a proposed 20' x 15' d50 = 12" rip-rap pad by Pipe run 9 a 36" storm drain.

Basin G1's 3.36 acres consists of single family lots. Runoff (Q_5=7 cfs and Q_{100}=13 cfs) sheet flows to street sections and then is directed south to low point in the street (Design Point 10A). Basin G2's 1.70 acres also consists of single family lots. Runoff (Q_5=3 cfs and Q_{100}=7 cfs) sheet flows to street sections and then is directed east Design Point 10A. At DP-10A a 10' sump inlet will capture the combined flow (Q_5=10 cfs and Q_{100}=19 cfs) of Basin G1 & G2. A 24" storm drain (Pipe Run 10A) will transport the flow across the street to Design point 10B to the main channel running through Addition 7. At Design point 10B, Basin G3's 1.40 acres will be captured by 6 sump inlet. The

combined flow (Q_5=13 cfs and Q_{100}=25 cfs) in Pipe run 10B will be routed through Tract H and onto a proposed 20' x 15' d50 = 12" rip-rap pad and into the improved channel.

Basin H1's 2.72 acres consists of single family lots. Runoff (Q_5=2cfs and Q_{100}=5cfs) sheet flows to street sections and then is directed east to Design Point 12A low point in the street. A 6' sump inlet will capture the flow. Pipe run 11A will route the flow south to Design Point 12B. At Design point 12B a 6' sump inlet will capture the street runoff (Q_5=1cfs and Q_{100}=1cfs) from Basin H2's 0.22 acres. The combined flow (Q_5=2cfs and Q_{100}=6cfs) of DP-12A & 12B will be routed by Pipe run 11B into the improved channel.

Offsite Basin OS-6's 16.51 acres consists of large lot residential as based upon the land use map for MDDP Amend II. Runoff (Q_5=9 cfs and Q_{100}=20 cfs) from Basin OS-6's area is captured on the east boundary of Addition 7 (Quail Brush Creek) by a proposed 1' high berm that will direct the runoff south and in several locations open space Tracts I, L & M will route the flow west onto Narrow Rail Drive street section in Basin I2.

Basin I2's 3.21 acres will consist of a 1/8 acre residential lots. Runoff (Q_5=6 cfs and Q_{100}=11 cfs) will be directed by curb and gutter west to Design point 13, a low point where a 20' sump inlets will capture the flow.

Basin I1's 6.40 acres will consist of a 1/8 acre residential lots and park area. Runoff (Q_5=13 cfs and Q_{100}=25 cfs) will be directed by curb and gutter south to Design point 13, a low point where it will combine with Basin I2 and OS-6 runoff. The combined runoff (Q_5=20 cfs and Q_{100}=40 cfs) is captured by the 20 sump inlet at Design point 13. A 30" storm drain (Pipe Run 12) directs the flow west through Tract S onto a proposed 20' x 15' d50 = 12" rip-rap pad and into the improved channel.

Basin J's 1.19 acres consists of rear yards along the south boundary of Addition 7. Runoff (Q_5=3 cfs and Q_{100}=6 cfs) will be directed offsite down side lot line swales to the open space area just south of Quail Brush Creek that is city maintained. From here the runoff sheet flows into Sand Creek.

Basin K's 4.05 acres consists of rear lots and open space of Tract H. Runoff (Q_5=4 cfs and Q_{100}=9

cfs) sheet flows to the overland to the channel. The channel will remain natural for a majority of the length where the existing wetlands will be protected in place. A small portion of the channel will be improved by grading in a 10' trapezoidal section with 4:1 side slopes. The channel will route the flow south west along the same historic path. At the street crossing of Cat Tail drive 3-60' RCP culverts will be installed to pass the runoff under the street section.

Basin L's 8.31 acres consists of rear lots and open space Runoff (Q_5=11 cfs and Q_{100}=24 cfs) sheet flows to the overland to the improved channel. The improved channel will route the flow south west along the same historic path.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual. The Rational Method was used to estimate storm water runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

HYDRAULIC CALCULATIONS

Hydraulic calculations were estimated using the Manning's Formula and the methods described in the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual the pertinent data sheets are included in the appendix of this report.

FLOODPLAIN STATEMENT

No portion of this site is within a designated F.E.M.A. floodplain, as determined by Flood Insurance Rate Map No. 08041C0537 F dated March 17, 1997 (see appendix). Although Sand Creek sits just south of our site at the south east corner the floodplain does not impact our site. Due to the proximity of the creek to our property we looked at JR Engineering's "Sand Creek Channel Improvement Phase 1 & 2" plans, and HEC-RAS model for any concerns. We looked at sections 295, 300 and 305 (see appendix for exhibit). The 100-year and floodplain is approximately 80' from our south boundary at cross section 295 and has a calculated high water elevation of 6783.45. At cross section 300 the calculated high water elevation is 6786.70 and the 100-year floodplain is 60 feet away from the boundary. The elevation at the boundary is a 6788.00 and the finished floors of the building in this area will sit at about 6792.00 or above. After reviewing the above mentioned

plans and looking at our proposed grading it does not seem that we need to provide any kind of bank stabilization.

EROSION CONTROL

It is the policy of the City of Colorado Springs that we submit an erosion control plan with the drainage report. At this time we respectfully request that the erosion control plan be submitted in conjunction with the final grading plan. Proposed straw bale check dams, silt fence, vehicle traffic control, and reseeding are proposed as erosion control measures.

CONSTRUCTION COST OPINION FOR WOODMEN HEIGHTS 7 (QUAIL BRUSH CREEK) Public Drainage Facilities Reimbursable

(Storm Drain for future Adjacent Development to West)

1.	60" RCP	170 LF	$ 120	$ 20,400
			Total	**$ 20,400**

(Channel Improvements per DBPS)

Item	**Description**	**Quantity**	**Unit Cost**	**Cost**
1.	Channel Improvements	385 LF	$ 200/LF*1.66	$ 127,820
2.	60" RCP Culverts	360 LF	$ 120	$ 43,200
			Total	**$ 171,020**

Public Drainage Facilities Non-Reimbursable

1.	18" RCP	145 LF	$ 45	$ 6,525
2.	24" RCP	530 LF	$ 50	$ 26,500
3.	30" RCP	1175 LF	$ 60	$ 70,500
4.	36" RCP	1140 LF	$ 70	$ 79,800
5.	48" RCP	165 LF	$ 100	$ 16,500
6.	60" RCP	170 LF	$ 120	$ 20,400
7.	6' D-10R Inlet	7 EA	$ 4,000	$ 28,000
8.	8' D-10R Inlet	1 EA	$ 4,500	$ 4,500
9.	10' D-10R Inlet	1 EA	$ 5,500	$ 5,500
10.	12' D-10R Inlet	2 EA	$ 6,000	$ 12,000

11.	20' D-10R Inlet	2EA	$ 7,200	$ 14,400
12.	D-9 Inlets	4 EA	$ 5,500	$ 22,000
13.	Type 1 Manholes	8 EA	$ 4,000	$ 32,000
			Total	**$ 338,625**

CONSTRUCTION COST OPINION FOR WOODMEN HEIGHTS 8 Private Drainage Facilities Non-Reimbursable

1.	18" RCP	960 LF	$ 45	$ 43,200
2.	Type 1 Manholes	2 EA	$ 4,000	$ 8,000
3.	Detention Pond	1 EA	$ 10,000	$ 10,000
			Total	**$ 61,200**

CONSTRUCTION COST OPINION FOR WOODMEN HEIGHTS 9 Private Drainage Facilities Non-Reimbursable

1.	Detention Pond	1 EA	$ 10,000	$ 10,000
			Total	**$ 10,000**

SUMMARY

Development of this site will not adversely affect the surrounding development. Proposed flows, as detailed in this report, will follow the drainage patterns outlined in this report and will be conveyed overland to the channel or to Sand Creek where they will outfall as shown on the approved MDDP Amend II. Although there is an increase in the runoff it was anticipated in the MDDP and will be designed for in the outfall facilities downstream. Care will be taken to accommodate overland emergency flow routes on site and temporary drainage conditions.

PREPARED BY:
TERRA NOVA ENGINEERING, INC.

Quentin N. Armijo, P.E.
Project Engineer
Jobs/0537.00/word/mddp FINAL 3-15-07

BIBLIOGRAPHY

"El Paso County and City of Colorado Springs Drainage Criteria Manual"

SCS Soils Map for El Paso County

"Master Development Drainage Plan Amendmnet No. II For The Easterly Portion Of Ridgeview Subdivision And Preliminary Drainage Report For The Northeasterly Portion Of Ridgeview Subdivision And Phase II Sand Creek Channel Improvements." Prepared by JR Engineering, February 2004.

"Final Drainage Report for The Black Forest Road Portion of Greenhaven Filing No. 1, a Portion of Dublin Boulevard and Final Design/ Analysis Report for Black Forest Storm Drain", by JR Engineering, March 10, 2004.

"Final Drainage Report Greenhaven Filing No. 1 and 2 Colorado Springs, Colorado" by Terra Nova Engineering, Inc., dated March 2004.

"Sand Creek Drainage Basin Planning Study Preliminary Design Report" (DBPS) prepared by Kiowa Engineering, revised December 1998.

"Sand Creek Drainage Basin Planning Study Preliminary Design Report Technical Addendum" by Kiowa Engineering, revised October 1995.

GENERAL LOCATION MAP

Parcel Search Home
Assessor's Office Home
El Paso County Home

El Paso County Geographic Information System

Parcel Highlighted (in red) is:

5308000098

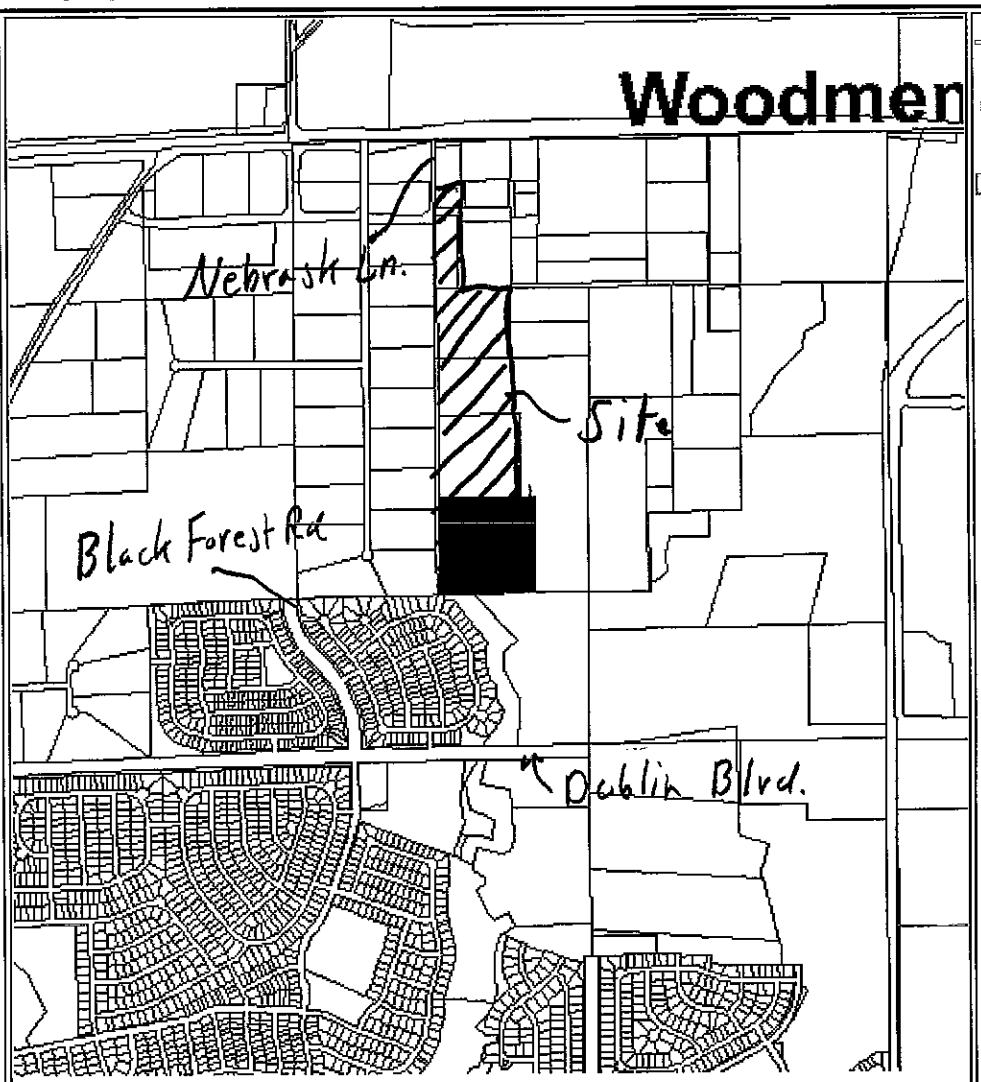
Click Parcel Number for Property Information

Located on Assessor's MapSheet:
53080

Enter Parcel to Find:

Find

Click on Map to:
- Identify Parcel
- Zoom In
- Zoom Out
- Full County



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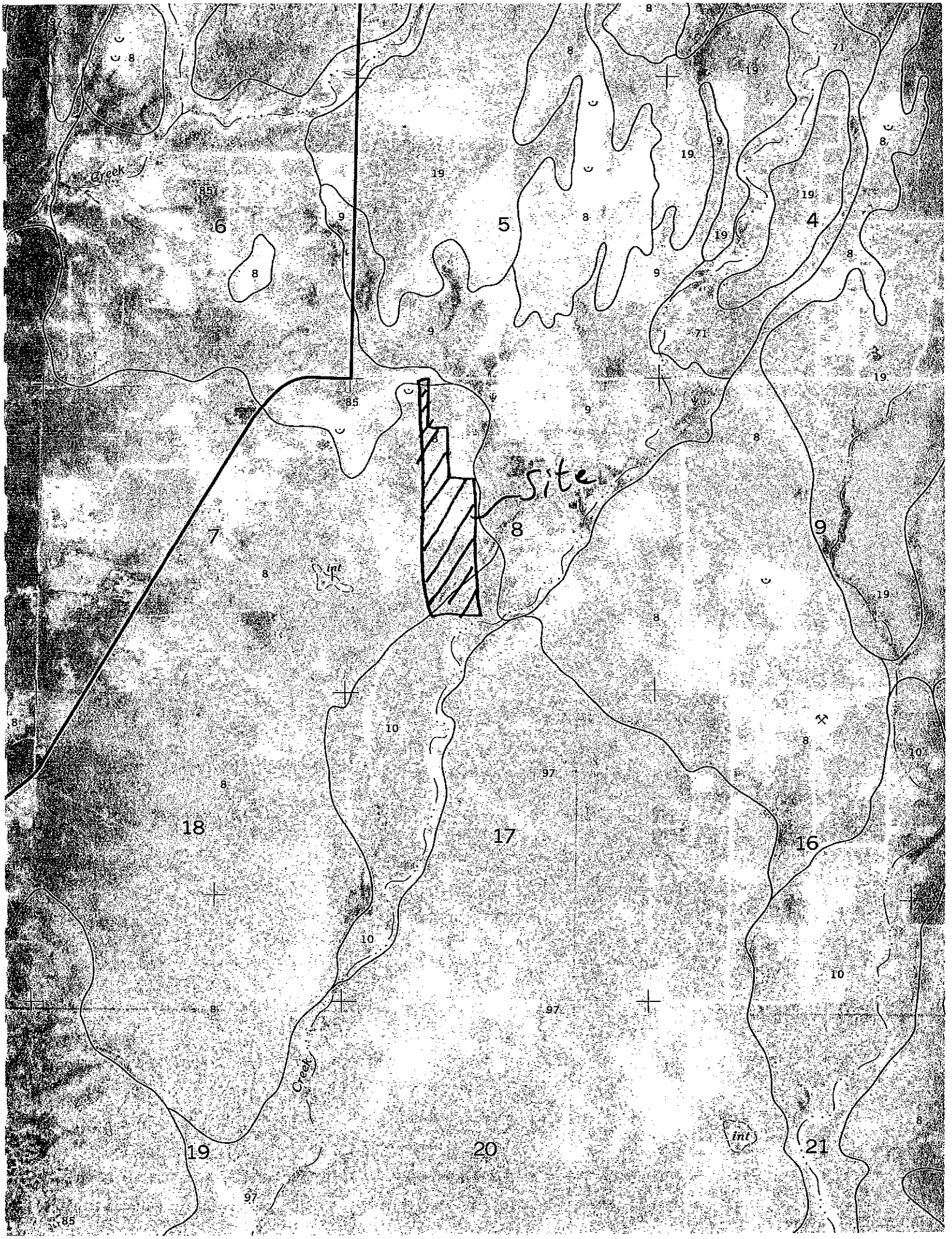
This site uses Unisys Patent No 4,558,302 and/or foreign counterparts and is provided free by Unisys as a public service.

Last updated 11/14/05

email: webmaster@elpasoco.com

S.C.S. SOILS MAP


Site
Creek
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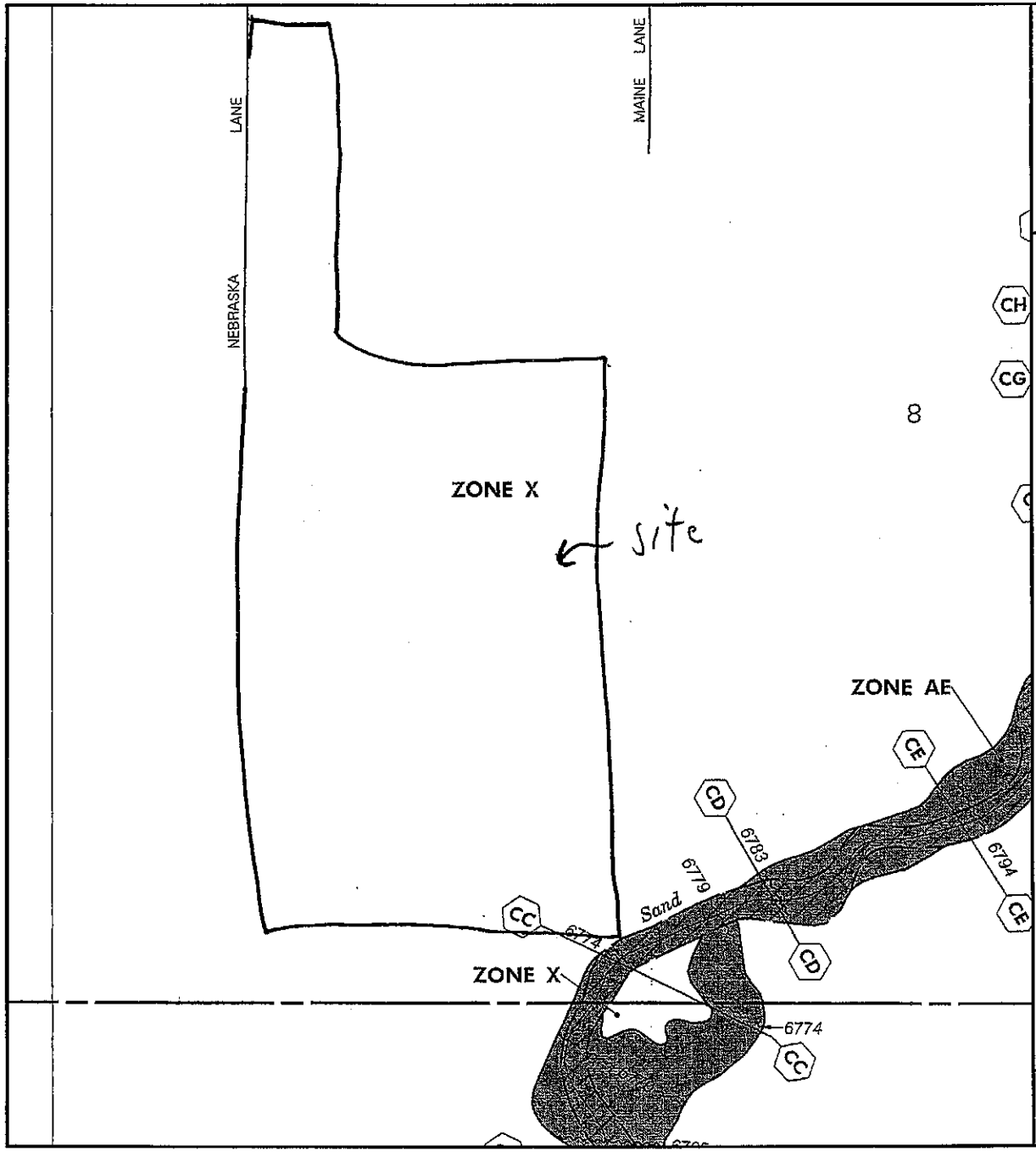
FEMA FIRM MAP



APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 537 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0537	F
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0537	F

MAP NUMBER
08041C0537 F

EFFECTIVE DATE:
MARCH 17, 1997

Federal Emergency Management Agency

HYDROLOGIC CALCULATIONS

QUAIL BRUSH CREEK MDDP
(Area Runoff Coefficient Summary)
PROPOSED CONDITIONS

		STREETS / DEVELOPED			*OVERLAND / UNDEVELOPED*			*WEIGHTED*	
BASIN	**TOTAL AREA**	**AREA**	**C_5**	**C_{100}**	**AREA**	**C_5**	**C_{100}**	**C_5**	**C_{100}**
	(Acres)	*(Acres)*			*(Acres)*				
OS-1	15.74	15.74	0.30	0.40	0.00	0.25	0.35	***0.30***	***0.40***
OS-1A	0.67	0.67	0.30	0.40	0.00	0.25	0.35	***0.30***	***0.40***
OS-2	22.76	22.76	0.30	0.40	0.00	0.30	0.40	***0.30***	***0.40***
OS-2A	0.69	0.69	0.90	0.95	0.00	0.25	0.35	***0.90***	***0.95***
OS-2B	0.84	0.84	0.90	0.95	0.00	0.25	0.35	***0.90***	***0.95***
OS-3A	7.46	7.46	0.30	0.40	0.00	0.25	0.35	***0.30***	***0.40***
OS-3B	0.17	0.13	0.90	0.95	0.04	0.25	0.35	***0.76***	***0.82***
OS-4A	8.06	8.06	0.30	0.40	0.00	0.25	0.35	***0.30***	***0.40***
OS-4B	8.21	8.21	0.30	0.40	0.00	0.25	0.35	***0.30***	***0.40***
OS-5	3.18	3.18	0.30	0.40	0.00	0.25	0.35	***0.30***	***0.40***
OS-6	16.51	16.51	0.30	0.40	0.00	0.25	0.35	***0.30***	***0.40***
A1	0.51	0.00	0.60	0.70	0.51	0.25	0.35	***0.25***	***0.35***
A2	0.83	0.00	0.60	0.70	0.83	0.25	0.35	***0.25***	***0.35***
B1	4.34	4.34	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
B2	5.33	5.33	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
B3	3.35	3.35	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
B4	1.19	1.19	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
C1	2.09	2.09	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
C2	0.93	0.93	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
*H-D**	4.20	0.00	0.90	0.90	4.20	0.25	0.35	***0.25***	***0.35***
D	4.20	4.20	0.90	0.90	0.00	0.25	0.35	***0.90***	***0.90***
*H-E**	9.97	0.00	0.90	0.90	9.97	0.25	0.35	***0.25***	***0.35***
E	9.97	9.97	0.90	0.90	0.00	0.25	0.35	***0.90***	***0.90***
F1	4.84	4.84	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
F2	1.33	1.33	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
F3	3.33	3.33	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
F4	1.26	1.26	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
G1	3.36	3.36	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***

QUAIL BRUSH CREEK MDDP
(Area Runoff Coefficient Summary)
PROPOSED CONDITIONS

		STREETS / DEVELOPED			*OVERLAND / UNDEVELOPED*			*WEIGHTED*	
BASIN	**TOTAL AREA**	**AREA**	**C_5**	**C_{100}**	**AREA**	**C_5**	**C_{100}**	**C_5**	**C_{100}**
	(Acres)	*(Acres)*			*(Acres)*				
G2	1.70	1.70	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
G3	1.40	1.40	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
H1	2.72	0.00	0.60	0.70	2.72	0.25	0.35	***0.25***	***0.35***
H2	0.22	0.00	0.60	0.70	0.22	0.25	0.35	***0.25***	***0.35***
I1	6.40	6.40	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
I2	3.21	3.21	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
J	1.19	1.19	0.60	0.70	0.00	0.25	0.35	***0.60***	***0.70***
K	4.05	0.81	0.60	0.70	3.25	0.25	0.35	***0.32***	***0.42***
L	8.31	3.06	0.60	0.70	5.25	0.25	0.35	***0.38***	***0.48***

**** BASIN H-D & H-E ARE THE HISTORIC BASINS FOR D & E FOR THE PURPOSE OF CALCULATING ALLOWABLE RELEASE RATES FOR FUTURE COMMERCIAL AREAS.***

Calculated by: QNA
Date: 3/15/2007
Checked by: _____

QUAIL BRUSH CREEK MDDP
AREA DRAINAGE SUMMARY

		WEIGHTED		*OVERLAND*				*STREET / CHANNEL FLOW*				T_t	*INTENSITY*		*TOTAL FLOWS*	
BASIN	AREA TOTAL	C_5	C_{100}	C_5	Length	Height	T_C	Length	Slope	Velocity	T_t	TOTAL	I_5	I_{100}	Q_5	Q_{100}
	(Acres)	* For Calcs See Runoff Summary			*(ft)*	*(ft)*	*(min)*	*(ft)*	*(%)*	*(fps)*	*(min)*	*(min)*	*(in/hr)*	*(in/hr)*	*(c.f.s.)*	*(c.f.s.)*
OS-1	15.74	0.30	0.40	0.25	300	14.0	16.6	875	6.6%	1.9	7.7	24.2	2.8	4.6	*13*	*29*
OS-1A	0.67	0.30	0.40	0.25	20	0.5	5.3	250	4.0%	4.0	1.0	6.3	4.7	8.4	*1*	*2*
OS-2	22.76	0.30	0.40	0.25	300	10.0	18.5	1200	6.3%	1.9	10.5	29.0	2.5	4.1	*17*	*38*
OS-2A	0.69	0.90	0.95	0.25	20	0.5	5.3	800	4.0%	4.0	3.3	8.6	4.3	7.5	*3*	*5*
OS-2B	0.84	0.90	0.95	0.25	20	0.5	5.3	800	4.0%	4.0	3.3	8.6	4.3	7.5	*3*	*6*
OS-3A	7.46	0.30	0.40	0.25	300	32.0	12.6	850	7.1%	2.0	7.1	19.7	3.1	5.1	*7*	*15*
OS-3B	0.17	0.76	0.82	0.25	10	0.5	3.0	200	3.0%	3.0	1.1	5.0	5.0	9.1	*1*	*1*
OS-4A	8.06	0.30	0.40	0.25	300	22.0	14.3	550	6.9%	2.0	4.6	18.8	3.1	5.3	*8*	*17*
OS-4B	8.21	0.30	0.40	0.25	300	22.0	14.3	551	6.9%	3.0	3.1	17.3	3.3	5.5	*8*	*18*
OS-5	3.18	0.30	0.40	0.25	300	10.0	18.5	325	2.5%	1.1	4.9	23.4	2.8	4.7	*3*	*6*
OS-6	16.51	0.30	0.40	0.25	300	12.0	17.4	2250	2.7%	1.2	31.3	48.7	1.9	3.0	*9*	*20*
A1	0.51	0.25	0.35	0.25	10	1.0	2.4	670	1.8%	2.5	4.5	6.8	4.6	8.2	*1*	*1*
A2	0.83	0.25	0.35	0.25	10	1.0	2.4	1200	3.3%	4.0	5.0	7.4	4.5	8.0	*1*	*2*
B1	4.34	0.60	0.70	0.25	120	2.4	13.9	1100	2.7%	3.5	5.2	19.1	3.1	5.2	*8*	*16*
B2	5.33	0.60	0.70	0.25	140	4.0	13.3	880	2.7%	3.5	4.2	17.5	3.2	5.5	*10*	*20*
B3	3.35	0.60	0.70	0.25	100	2.0	12.6	340	0.8%	1.8	3.1	15.8	3.4	5.7	*7*	*13*
B4	1.19	0.60	0.70	0.25	120	2.4	13.9	570	0.8%	1.8	5.3	19.1	3.1	5.2	*2*	*4*
C1	2.09	0.60	0.70	0.25	120	4.0	11.7	640	3.0%	3.7	2.9	14.6	3.5	6.0	*4*	*9*
C2	0.93	0.60	0.70	0.25	55	1.1	9.4	640	3.0%	3.7	2.9	12.3	3.8	6.5	*2*	*4*
*H-D**	4.20	0.25	0.35	0.25	100	2.0	12.6	800	2.5%	3.0	4.4	17.1	3.3	5.5	*3*	*8*
D	4.20	0.90	0.90	0.25	100	2.0	12.6	800	2.5%	3.0	4.4	17.1	3.3	5.5	*12*	*21*
*H-E**	9.97	0.25	0.35	0.25	100	2.0	12.6	615	2.5%	3.0	3.4	16.1	3.4	5.7	*8*	*20*
E	9.97	0.90	0.90	0.25	100	2.0	12.6	615	2.5%	3.0	3.4	16.1	3.4	5.7	*30*	*51*
F1	4.84	0.60	0.70	0.25	185	5.0	15.6	1400	2.1%	2.8	8.3	23.9	2.8	4.6	*8*	*16*
F2	1.33	0.60	0.70	0.25	55	1.1	9.4	890	2.0%	2.7	5.5	14.9	3.5	5.9	*3*	*6*
F3	3.33	0.60	0.70	0.25	130	3.0	13.8	745	1.6%	2.4	5.2	18.9	3.1	5.2	*6*	*12*
F4	1.26	0.60	0.70	0.25	170	3.4	16.5	130	1.2%	2.3	0.9	17.4	3.2	5.5	*2*	*5*
G1	3.36	0.60	0.70	0.25	120	3.0	12.9	700	1.7%	2.5	4.7	17.5	3.2	5.5	*7*	*13*
G2	1.70	0.60	0.70	0.25	120	3.0	12.9	460	1.3%	2.3	3.3	16.2	3.4	5.7	*3*	*7*

QUAIL BRUSH CREEK MDDP
AREA DRAINAGE SUMMARY

		WEIGHTED		*OVERLAND*				*STREET / CHANNEL FLOW*				T_t	*INTENSITY*		*TOTAL FLOWS*	
BASIN	AREA TOTAL *(Acres)*	C_5	C_{100}	C_5	Length *(ft)*	Height *(ft)*	T_C *(min)*	Length *(ft)*	Slope *(%)*	Velocity *(fps)*	T_t *(min)*	TOTAL *(min)*	I_5 *(in/hr)*	I_{100} *(in/hr)*	Q_5 *(c.f.s.)*	Q_{100} *(c.f.s.)*
		** For Calcs See Runoff Summary*														
G3	1.40	0.60	0.70	0.25	55	1.1	9.4	460	1.3%	2.3	3.3	12.7	3.7	6.4	*3*	*6*
H1	2.72	0.25	0.35	0.25	120	3.0	12.9	670	1.2%	2.2	5.1	17.9	3.2	5.4	*2*	*5*
H2	0.22	0.25	0.35	0.25	10	0.5	3.0	130	1.2%	2.2	1.0	5.0	5.0	9.1	*1*	*1*
I1	6.40	0.60	0.70	0.25	55	1.1	9.4	1020	1.4%	2.3	7.4	16.8	3.3	5.6	*13*	*25*
I2	3.21	0.60	0.70	0.25	80	1.6	11.3	1360	1.2%	2.2	10.3	21.6	2.9	4.9	*6*	*11*
J	1.19	0.60	0.70	0.25	80	1.6	11.3	0	0.0%	0.0	0.0	11.3	3.9	6.7	*3*	*6*
K	4.05	0.32	0.42	0.25	260	8.0	17.7	0	0.0%	0.0	0.0	17.7	3.2	5.4	*4*	*9*
L	8.31	0.38	0.48	0.25	120	2.4	13.9	0	0.0%	0.0	0.0	13.9	3.6	6.1	*11*	*24*

**** BASIN H-D & H-E ARE THE HISTORIC BASINS FOR D & E FOR THE PURPOSE OF CALCULATING ALLOWABLE RELEASE RATES FOR FUTURE COMMERCIAL AREAS.***

Calculated by: QNA

Date: 3/15/2007

Checked by: _____

QUAIL BRUSH CREEK
SURFACE ROUTING SUMMARY

Design Point(s)	*Contributing Basins*	*Equivalent* CA_5	*Equivalent* CA_{100}	*Maximum* T_C	*Intensity*		*Flow*	
					I_5	I_{100}	Q_5	Q_{100}
1	OS-1	4.72	6.30	24.2	2.8	4.6	*13*	*29*
1A	OS-1A	0.60	0.64	6.3	4.7	8.4	*3*	*5*
2A	OS-2 & OS-2A	7.45	9.76	29.0	2.5	4.1	*19*	*40*
2B	OS-2B	0.75	0.80	8.6	4.3	7.5	*3*	*6*
3A	OS-3A	2.24	2.98	19.7	3.1	5.1	*7*	*15*
3B	OS-3B	0.13	0.14	5.0	5.0	9.1	*1*	*1*
4A	OS-4A, A1, PR-3A	13.11	17.08	29.0	2.5	4.1	*33*	*71*
4B	DP-4A, OS-4B & A2	15.57	20.36	29.0	2.5	4.1	*39*	*84*
5A	B1	2.60	3.04	19.1	3.1	5.2	*8*	*16*
5B	B2	3.20	3.73	17.5	3.2	5.5	*10*	*20*
5C	B3	2.01	2.34	15.8	3.4	5.7	*7*	*13*
5D	B4	0.71	0.83	19.1	3.1	5.2	*2*	*4*
5E	DP-5A - DP-5D	8.52	9.94	19.1	3.1	5.2	*27*	*52*
6A	C1	1.25	1.46	14.6	3.5	6.0	*4*	*9*
6B	C2	0.56	0.65	12.3	3.8	6.5	*2*	*4*
7	DP-2A thru DP-4B, DP-6A & DP-6B	17.38	22.47	29.0	2.5	4.1	*44*	*93*
*H-8**	H-D	1.05	1.47	17.1	3.3	5.5	*3*	*8*
8	D	3.78	3.78	17.1	3.3	5.5	*12*	*21*
*H-9**	H-D & H-E	3.54	4.96	17.1	3.3	5.5	*12*	*27*
9	D & E	12.76	12.76	16.1	3.4	5.7	*43*	*73*
10A	G1 & G2	3.03	3.54	17.5	3.2	5.5	*10*	*19*
10B	G3	0.84	0.98	12.7	3.7	6.4	*3*	*6*
11	F1, F2, F3, & F4	6.45	7.53	23.9	2.8	4.6	*18*	*35*

QUAIL BRUSH CREEK
SURFACE ROUTING SUMMARY

Design Point(s)	*Contributing Basins*	*Equivalent* CA_5	*Equivalent* CA_{100}	*Maximum* T_C	*Intensity*		*Flow*	
					I_5	I_{100}	Q_5	Q_{100}
12A	H1	0.68	0.95	17.9	3.2	5.4	*2*	*5*
12B	H2	0.05	0.08	5.0	5.0	9.1	*1*	*1*
13	I1 & I2	10.72	13.33	48.7	1.9	3.0	*20*	*40*

* DESIGN POINTS H-8 & H-9 ARE THE HISTORIC FLOWS FOR DP-8 & DP-9 FOR THE PURPOSE OF CALCULATING DETENTION FOR FUTURE COMMERCIAL AREAS.

Date: 3/15/2007

Checked by: _____

QUAIL BRUSH CREEK MDDP
PIPE and SWALE ROUTING SUMMARY

Pipe Run(s)	*Contributing Design Points*	*Equivalent* CA_5	*Equivalent* CA_{100}	*Maximum* T_C	*Intensity*		*Flow*	
					I_5	I_{100}	Q_5	Q_{100}
1	**DP-1 & DP-1A**	5.33	6.93	24.2	2.8	4.6	*15*	*32*
1A	**DP-1A**	0.60	0.64	6.3	4.7	8.4	*3*	*5*
2A	**DP-2B**	0.75	0.80	8.6	4.3	7.5	*3*	*6*
2B	**DP-2A & DP-2B**	8.20	10.56	29.0	2.5	4.1	*21*	*44*
3	**DP-3B**	0.13	0.14	5.0	5.0	9.1	*1*	*1*
3A	**DP-3A, PR-3, & PR-2A**	10.57	13.67	29.0	2.5	4.1	*27*	*56*
4A	**DP-4A & PR-3A**	13.11	17.08	29.0	2.5	4.1	*33*	*71*
4B	**DP-4B**	15.57	20.36	29.0	2.5	4.1	*39*	*84*
5A	**DP-5A**	2.60	3.04	19.1	3.1	5.2	*8*	*16*
5B	**DP-5B**	3.20	3.73	17.5	3.2	5.5	*10*	*20*
5C	**PR-5A, PR-5B, DP-5C**	7.81	9.11	19.1	3.1	5.2	*24*	*48*
5D	**PR-5C & DP-5D**	8.52	9.94	19.1	3.1	5.2	*27*	*52*
6A	**PR-4B & DP-6A**	16.83	21.82	29.0	2.5	4.1	*42*	*90*
6B	**DP-6B & PR-6A**	17.38	22.47	29.0	2.5	4.1	*44*	*93*
*7***	**DP-8**	1.05	1.47	17.1	3.3	5.5	*3*	*8*
*8***	**DP-9**	3.54	4.96	17.1	3.3	5.5	*12*	*27*
9	**DP-11 & PR-8**	10.00	12.49	23.9	2.8	4.6	*28*	*58*
10A	**DP-10A**	3.03	3.54	17.5	3.2	5.5	*10*	*19*

QUAIL BRUSH CREEK MDDP
PIPE and SWALE ROUTING SUMMARY

10B	**DP-10A & DP-10B**	3.88	4.52	17.5	3.2	5.5	*13*	*25*
11A	**DP-12A**	0.68	0.95	17.9	3.2	5.4	*2*	*5*
11B	**DP-12A & DP-12B**	0.73	1.03	17.9	3.2	5.4	*2*	*6*
12	**DP-13**	10.72	13.33	48.7	1.9	3.0	*20*	*40*

PIPERUNS 1 & 1A ARE SHOWN FOR INFORMATION ONL. THESE RUNS ARE TO BE CONSTRUCTED W/ DMJM IMPROVEMENTS

*** PIPERUNS 7 AND 8 ARE BASED UPON THE ALLOWABLE HISTORIC RELEASE FOR BASINS D & E***

Swale Run(s)	*Contributing Design Points*	*Equivalent* CA_5	*Equivalent* CA_{100}	*Maximum* T_C	*Intensity*		*Flow*	
					I_5	I_{100}	Q_5	Q_{100}
1	**DP-3A**	10.57	13.67	29.0	2.5	4.1	*27*	*56*
2	**DP-4A**	13.11	17.08	29.0	2.5	4.1	*33*	*71*

Calculated by: QNA

Date: 3/15/2007

Checked by: _____

HYDRAULIC CALCULATIONS

DESIGN POINT 1

Total Flow:

Q_5 = **13** cfs

Q_{100} = **29** cfs

Maximum allowable ponding depth at sump:

D_5 = 0.45

D_{100} = 0.70 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25

Li (1.25) = Length of inlet opening

5-Year Event: **10** foot inlet required

100-Year Event: **14** foot inlet required

(Install a 20' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA

Date: 3/15/2007

Checked by: _____

DESIGN POINT 1A

Total Flow: Q_5 = **3** cfs

Q_{100} = **5** cfs

Maximum allowable ponding depth at sump:

D_5 = 0.45

D_{100} = 0.83 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25

Li (1.25) = Length of inlet opening

5-Year Event: **4** foot inlet required

100-Year Event: **4** foot inlet required

(Install a 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA

Date: ########

Checked by: _____

DESIGN POINT 2A

Total Flow:

Q_5 = **19** cfs

Q_{100} = **40** cfs

Maximum allowable ponding depth at sump:

D_5 = 0.45

D_{100} = 0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25

Li (1.25) = Length of inlet opening

5-Year Event: **16** foot inlet required

100-Year Event: **24** foot inlet required

(Install two 14' D-10-R inlets to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA

Date: ########

Checked by: _____

DESIGN POINT 2B

Total Flow:

Q_5 = **3** cfs

Q_{100} = **6** cfs

Maximum allowable ponding depth at sump:

D_5 = 0.45

D_{100} = 0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25

Li (1.25) = Length of inlet opening

5-Year Event: **4** foot inlet required

100-Year Event: **4** foot inlet required

(Install a 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA

Date: ########

Checked by: _____

DESIGN POINT 3A

Total Flow: Q_5 = 7 cfs

Q_{100} = 15 cfs

Maximum allowable ponding depth at sump:

D_5 = 0.45

D_{100} = 0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25

Li (1.25) = Length of inlet opening

5-Year Event: 4 foot inlet required

100-Year Event: 6 foot inlet required

(Install a 8' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA

Date: 3/15/2007

Checked by: _____

DESIGN POINT 3B

Total Flow: Q_5 = 1 cfs

Q_{100} = 1 cfs

Maximum allowable ponding depth at sump:

D_5 = 0.45

D_{100} = 0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25

Li (1.25) = Length of inlet opening

5-Year Event: 4 foot inlet required

100-Year Event: 4 foot inlet required

(Install a 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA

Date: ########

Checked by: _____

Design Point 4A

Equation 7-2 $Q = \frac{3 \times P \times d^{1.5}}{F}$

Maxium Ponding Depth (d) =	1	ft
Discharge (Q) =	71	cfs
Clogging Factor (F) =	2	
Grate perimeter (P) =	**47.01**	ft

Circular Grate Inlet

Diameter (D) **D =** **7.48** ft

Rectangle Grate Inlet

Length of Each Side (L) **L =** **11.75** ft

Install 2 10' City Std. D-9 inlets at this design point.

Design Point 4B

Equation 7-2 $Q = \frac{3 \times P \times d^{1.5}}{F}$

Maxium Ponding Depth (d) =	1	ft
Discharge (Q) =	84	cfs
Clogging Factor (F) =	2	
Grate perimeter (P) =	**56.05**	ft

Circular Grate Inlet

Diameter (D) **D =** **8.92** ft

Rectangle Grate Inlet

Length of Each Side (L) **L =** **14.01** ft

Install 3 10' City Std. D-9 inlets at this design point.

DESIGN POINT 5A

Total Flow:	Q_5	=	**8** cfs
	Q_{100}	=	**16** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.67 (dmax)
	Qi	= =	1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**4**	foot inlet required
100-Year Event:	**6**	foot inlet required

(Install a 8' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 5B

Total Flow:	Q_5	=	**10** cfs
	Q_{100}	=	**20** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**6**	foot inlet required
100-Year Event:	**10**	foot inlet required

(Install a 12' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 5C

Total Flow:	Q_5	=	7 cfs
	Q_{100}	=	**13** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	4	foot inlet required
100-Year Event:	4	foot inlet required

(Install a 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 5D

Total Flow:	Q_5	=	**2** cfs
	Q_{100}	=	**4** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**4**	foot inlet required
100-Year Event:	**4**	foot inlet required

(Install a 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 6A

5-YR FLOW

Q(5)	4	I(5)	3.5		
DEPTH	0.28	Fr	2.54	Inlet size ? L(i) =	**20**
SPREAD	12.9	L(1)	25.2	If Li < L(2) then Qi =	3.5
CROSS SLOPE	2.0%	L(2)	15.1	If Li > L(2) then Qi =	3.0
STREET SLOPE	4.0%	L(3)	54.0	FB =	1
				CA(eqv.)=	0.41

100-YR FLOW

Q(100)	9	I(100)	6.0		
DEPTH	0.35	Fr	2.65	Inlet size ? L(i) =	**20**
SPREAD	16.1	L(1)	32.9	If Li < L(2) then Qi =	5.3
CROSS SLOPE	2.0%	L(2)	19.8	If Li > L(2) then Qi =	5.3
STREET SLOPE	4.0%	L(3)	70.6	FB =	3
				CA(eqv.)=	0.58

DESIGN POINT 6A

5-YR FLOW

Q(5)	2	I(5)	3.8		
DEPTH	0.22	Fr	2.41	Inlet size ? L(i) =	**12**
SPREAD	9.9	L(1)	18.3	If Li < L(2) then Qi =	1.4
CROSS SLOPE	2.0%	L(2)	11.0	If Li > L(2) then Qi =	1.3
STREET SLOPE	4.0%	L(3)	39.2	FB =	1
				CA(eqv.)=	0.21

100-YR FLOW

Q(100)	4	I(100)	6.5		
DEPTH	0.28	Fr	2.53	Inlet size ? L(i) =	**12**
SPREAD	12.6	L(1)	24.6	If Li < L(2) then Qi =	2.1
CROSS SLOPE	2.0%	L(2)	14.8	If Li > L(2) then Qi =	2.3
STREET SLOPE	4.0%	L(3)	52.7	FB =	2
				CA(eqv.)=	0.33

DESIGN POINT 10A

Total Flow:	Q_5	=	**10** cfs
	Q_{100}	=	**19** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**6**	foot inlet required
100-Year Event:	**8**	foot inlet required

(Install a 10' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 10B

Total Flow:	Q_5	=	**3** cfs
	Q_{100}	=	**6** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**4**	foot inlet required
100-Year Event:	**4**	foot inlet required

(Install a 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 11

Total Flow:	Q_5	=	**18** cfs
	Q_{100}	=	**35** cfs

Maximum allowable ponding depth at sump:

D_5	=	0.45
D_{100}	=	0.67 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**16**	foot inlet required
100-Year Event:	**20**	foot inlet required

(Install an 20' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 12A

Total Flow:	Q_5	=	**2** cfs
	Q_{100}	=	**5** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.83 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**4**	foot inlet required
100-Year Event:	**4**	foot inlet required

(Install 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

DESIGN POINT 12B

Total Flow:

Q_5 = **1** cfs

Q_{100} = **1** cfs

Maximum allowable ponding depth at sump:

D_5 = 0.45

D_{100} = 0.83 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25

Li (1.25) = Length of inlet opening

5-Year Event: **4** foot inlet required

100-Year Event: **4** foot inlet required

(Install 6' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA

Date: 5/05/2006

Checked by: _____

DESIGN POINT 13

Total Flow:	Q_5	=	**20** cfs
	Q_{100}	=	**40** cfs

Maximum allowable ponding depth at sump:

	D_5	=	0.45
	D_{100}	=	0.83 (dmax)

Qi = = 1.7(Li+1.8(W))(dmax + w/12)^1.85

Clogging Factor = 1.25
Li (1.25) = Length of inlet opening

5-Year Event:	**18**	foot inlet required
100-Year Event:	**16**	foot inlet required

(Install 20' D-10-R inlet to accept both 5 yr. & 100 yr. developed flows at this design point.)

Calculated by: QNA
Date: 5/05/2006
Checked by: _____

Culvert Calculator Report
CHANNEL XING

Solve For: Section Size

Culvert Summary					
Allowable HW Elevation	6,800.00	ft	Headwater Depth/Height	1.54	
Computed Headwater Elevation	6,798.71	ft	Discharge	618.00	cfs
Inlet Control HW Elev.	6,798.71	ft	Tailwater Elevation	6,793.63	ft
Outlet Control HW Elev.	6,798.44	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	6,791.00	ft	Downstream Invert	6,790.00	ft
Length	100.00	ft	Constructed Slope	1.0000	%

Hydraulic Profile					
Profile	S2		Depth, Downstream	3.53	ft
Slope Type	Steep		Normal Depth	3.36	ft
Flow Regime	Supercritical		Critical Depth	4.09	ft
Velocity Downstream	13.89	ft/s	Critical Slope	0.6276	%

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	5.00	ft
Section Size	60 inch		Rise	5.00	ft
Number Sections	3				

Outlet Control Properties					
Outlet Control HW Elev.	6,798.44	ft	Upstream Velocity Head	2.23	ft
Ke	0.50		Entrance Loss	1.11	ft

Inlet Control Properties					
Inlet Control HW Elev.	6,798.71	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	58.9	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

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Pipe run 1A

Project Description	
Worksheet	PR-1A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	18	in
Discharge	5.00	cfs

Results		
Slope	0.23	%
Depth	1.50	ft
Flow Area	1.8	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	0.86	ft
Percent Full	100.0	%
Critical Slope	0.58	%
Velocity	2.83	ft/s
Velocity Head	0.12	ft
Specific Energy	1.62	ft
Froude Number	0.00	
Maximum Discharge	5.38	cfs
Discharge Full	5.00	cfs
Slope Full	0.23	%
Flow Type	N/A	

Pipe run 2A

Project Description	
Worksheet	PR-2A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	18	in
Discharge	6.00	cfs

Results		
Slope	0.33	%
Depth	1.50	ft
Flow Area	1.8	ft^2
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	0.95	ft
Percent Full	100.0	%
Critical Slope	0.62	%
Velocity	3.40	ft/s
Velocity Head	0.18	ft
Specific Energy	1.68	ft
Froude Number	0.00	
Maximum Discharge	6.45	cfs
Discharge Full	6.00	cfs
Slope Full	0.33	%
Flow Type	N/A	

Pipe run 3

Project Description	
Worksheet	PR-3
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	18	in
Discharge	1.00	cfs

Results		
Slope	0.01	%
Depth	1.50	ft
Flow Area	1.8	ft^2
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	0.37	ft
Percent Full	100.0	%
Critical Slope	0.49	%
Velocity	0.57	ft/s
Velocity Head	4.98e-3	ft
Specific Energy	1.50	ft
Froude Number	0.00	
Maximum Discharge	1.08	cfs
Discharge Full	1.00	cfs
Slope Full	0.01	%
Flow Type	N/A	

Piperun 3A

Project Description	
Worksheet	PR-3A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	36	in
Discharge	56.00	cfs

Results		
Slope	0.71	%
Depth	3.00	ft
Flow Area	7.1	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.43	ft
Percent Full	100.0	%
Critical Slope	0.72	%
Velocity	7.92	ft/s
Velocity Head	0.98	ft
Specific Energy	3.98	ft
Froude Number	0.00	
Maximum Discharge	60.24	cfs
Discharge Full	56.00	cfs
Slope Full	0.71	%
Flow Type	N/A	

Piperun 4A

Project Description	
Worksheet	PR-4A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	48	in
Discharge	71.00	cfs

Results		
Slope	0.24	%
Depth	4.00	ft
Flow Area	12.6	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.55	ft
Percent Full	100.0	%
Critical Slope	0.45	%
Velocity	5.65	ft/s
Velocity Head	0.50	ft
Specific Energy	4.50	ft
Froude Number	0.00	
Maximum Discharge	76.38	cfs
Discharge Full	71.00	cfs
Slope Full	0.24	%
Flow Type	N/A	

Piperun 4B

Project Description	
Worksheet	PR-4B
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	48	in
Discharge	84.00	cfs

Results		
Slope	0.34	%
Depth	4.00	ft
Flow Area	12.6	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.78	ft
Percent Full	100.0	%
Critical Slope	0.50	%
Velocity	6.68	ft/s
Velocity Head	0.69	ft
Specific Energy	4.69	ft
Froude Number	0.00	
Maximum Discharge	90.36	cfs
Discharge Full	84.00	cfs
Slope Full	0.34	%
Flow Type	N/A	

Pipe run 5A

Project Description	
Worksheet	PR-5A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	24	in
Discharge	16.00	cfs

Results		
Slope	0.50	%
Depth	2.00	ft
Flow Area	3.1	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	1.44	ft
Percent Full	100.0	%
Critical Slope	0.66	%
Velocity	5.09	ft/s
Velocity Head	0.40	ft
Specific Energy	2.40	ft
Froude Number	0.00	
Maximum Discharge	17.21	cfs
Discharge Full	16.00	cfs
Slope Full	0.50	%
Flow Type	N/A	

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Pipe run 5B

Project Description	
Worksheet	PR-5B
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	24	in
Discharge	20.00	cfs

Results		
Slope	0.78	%
Depth	2.00	ft
Flow Area	3.1	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	1.61	ft
Percent Full	100.0	%
Critical Slope	0.81	%
Velocity	6.37	ft/s
Velocity Head	0.63	ft
Specific Energy	2.63	ft
Froude Number	0.00	
Maximum Discharge	21.51	cfs
Discharge Full	20.00	cfs
Slope Full	0.78	%
Flow Type	N/A	

Pipe run 5C

Project Description	
Worksheet	PR-5C
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	36	in
Discharge	48.00	cfs

Results		
Slope	0.52	%
Depth	3.00	ft
Flow Area	7.1	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.26	ft
Percent Full	100.0	%
Critical Slope	0.62	%
Velocity	6.79	ft/s
Velocity Head	0.72	ft
Specific Energy	3.72	ft
Froude Number	0.00	
Maximum Discharge	51.63	cfs
Discharge Full	48.00	cfs
Slope Full	0.52	%
Flow Type	N/A	

Pipe run 5D

Project Description	
Worksheet	PR-5D
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	36	in
Discharge	52.00	cfs

Results		
Slope	0.61	%
Depth	3.00	ft
Flow Area	7.1	ft^2
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.35	ft
Percent Full	100.0	%
Critical Slope	0.67	%
Velocity	7.36	ft/s
Velocity Head	0.84	ft
Specific Energy	3.84	ft
Froude Number	0.00	
Maximum Discharge	55.94	cfs
Discharge Full	52.00	cfs
Slope Full	0.61	%
Flow Type	N/A	

Piperun 6A

Project Description	
Worksheet	PR-6A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	60	in
Discharge	90.00	cfs

Results		
Slope	0.12	%
Depth	5.00	ft
Flow Area	19.6	ft^2
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.69	ft
Percent Full	100.0	%
Critical Slope	0.37	%
Velocity	4.58	ft/s
Velocity Head	0.33	ft
Specific Energy	5.33	ft
Froude Number	0.00	
Maximum Discharge	96.81	cfs
Discharge Full	90.00	cfs
Slope Full	0.12	%
Flow Type	N/A	

Piperun 6B

Project Description	
Worksheet	PR-6B
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	60	in
Discharge	93.00	cfs

Results		
Slope	0.13	%
Depth	5.00	ft
Flow Area	19.6	ft^2
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.74	ft
Percent Full	100.0	%
Critical Slope	0.38	%
Velocity	4.74	ft/s
Velocity Head	0.35	ft
Specific Energy	5.35	ft
Froude Number	0.00	
Maximum Discharge	100.04	cfs
Discharge Full	93.00	cfs
Slope Full	0.13	%
Flow Type	N/A	

Pipe run 7

Project Description	
Worksheet	PR-7
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	18	in
Discharge	8.00	cfs

Results		
Slope	0.58	%
Depth	1.50	ft
Flow Area	1.8	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	1.10	ft
Percent Full	100.0	%
Critical Slope	0.74	%
Velocity	4.53	ft/s
Velocity Head	0.32	ft
Specific Energy	1.82	ft
Froude Number	0.00	
Maximum Discharge	8.61	cfs
Discharge Full	8.00	cfs
Slope Full	0.58	%
Flow Type	N/A	

Pipe run 8

Project Description	
Worksheet	PR-8
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	30	in
Discharge	27.00	cfs

Results		
Slope	0.43	%
Depth	2.50	ft
Flow Area	4.9	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	1.77	ft
Percent Full	100.0	%
Critical Slope	0.60	%
Velocity	5.50	ft/s
Velocity Head	0.47	ft
Specific Energy	2.97	ft
Froude Number	0.00	
Maximum Discharge	29.04	cfs
Discharge Full	27.00	cfs
Slope Full	0.43	%
Flow Type	N/A	

Pipe run 9

Project Description	
Worksheet	PR-9
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	36	in
Discharge	58.00	cfs

Results		
Slope	0.76	%
Depth	3.00	ft
Flow Area	7.1	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.47	ft
Percent Full	100.0	%
Critical Slope	0.75	%
Velocity	8.21	ft/s
Velocity Head	1.05	ft
Specific Energy	4.05	ft
Froude Number	0.00	
Maximum Discharge	62.39	cfs
Discharge Full	58.00	cfs
Slope Full	0.76	%
Flow Type	N/A	

Pipe run 10A

Project Description	
Worksheet	PR-10A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	24	in
Discharge	19.00	cfs

Results		
Slope	0.71	%
Depth	2.00	ft
Flow Area	3.1	ft^2
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	1.57	ft
Percent Full	100.0	%
Critical Slope	0.77	%
Velocity	6.05	ft/s
Velocity Head	0.57	ft
Specific Energy	2.57	ft
Froude Number	0.00	
Maximum Discharge	20.44	cfs
Discharge Full	19.00	cfs
Slope Full	0.71	%
Flow Type	N/A	

Pipe run 10B

Project Description	
Worksheet	PR-10B
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	30	in
Discharge	25.00	cfs

Results		
Slope	0.37	%
Depth	2.50	ft
Flow Area	4.9	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	1.70	ft
Percent Full	100.0	%
Critical Slope	0.57	%
Velocity	5.09	ft/s
Velocity Head	0.40	ft
Specific Energy	2.90	ft
Froude Number	0.00	
Maximum Discharge	26.89	cfs
Discharge Full	25.00	cfs
Slope Full	0.37	%
Flow Type	N/A	

Pipe run 11A

Project Description	
Worksheet	PR-11A
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	18	in
Discharge	5.00	cfs

Results		
Slope	0.23	%
Depth	1.50	ft
Flow Area	1.8	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	0.86	ft
Percent Full	100.0	%
Critical Slope	0.58	%
Velocity	2.83	ft/s
Velocity Head	0.12	ft
Specific Energy	1.62	ft
Froude Number	0.00	
Maximum Discharge	5.38	cfs
Discharge Full	5.00	cfs
Slope Full	0.23	%
Flow Type	N/A	

Pipe run 11B

Project Description	
Worksheet	PR-11B
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	18	in
Discharge	6.00	cfs

Results		
Slope	0.33	%
Depth	1.50	ft
Flow Area	1.8	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	0.95	ft
Percent Full	100.0	%
Critical Slope	0.62	%
Velocity	3.40	ft/s
Velocity Head	0.18	ft
Specific Energy	1.68	ft
Froude Number	0.00	
Maximum Discharge	6.45	cfs
Discharge Full	6.00	cfs
Slope Full	0.33	%
Flow Type	N/A	

Pipe run 12

Project Description	
Worksheet	PR-12
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Slope

Input Data		
Mannings Coefficient	0.013	
Diameter	30	in
Discharge	40.00	cfs

Results		
Slope	0.95	%
Depth	2.50	ft
Flow Area	4.9	ft²
Wetted Perimeter	0.00	ft
Top Width	0.00	ft
Critical Depth	2.13	ft
Percent Full	100.0	%
Critical Slope	0.89	%
Velocity	8.15	ft/s
Velocity Head	1.03	ft
Specific Energy	3.53	ft
Froude Number	0.00	
Maximum Discharge	43.03	cfs
Discharge Full	40.00	cfs
Slope Full	0.95	%
Flow Type	N/A	

Swale X-sect
A-A

Project Description	
Worksheet	SW-1 X-SECT A-A
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.030	
Slope	2.80	%
Left Side Slope	4.00	H : V
Right Side Slope	4.00	H : V
Bottom Width	2.00	ft
Discharge	30.00	cfs

Results		
Depth	0.94	ft
Flow Area	5.4	ft²
Wetted Perimeter	9.72	ft
Top Width	9.48	ft
Critical Depth	1.06	ft
Critical Slope	1.58	%
Velocity	5.58	ft/s
Velocity Head	0.48	ft
Specific Energy	1.42	ft
Froude Number	1.31	
Flow Type	Supercritical	

Swale X-sect
B-B

Project Description	
Worksheet	SW-1 X-SECT B-B
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.030	
Slope	1.04	%
Left Side Slope	4.00	H : V
Right Side Slope	4.00	H : V
Bottom Width	2.00	ft
Discharge	32.00	cfs

Results		
Depth	1.20	ft
Flow Area	8.1	ft²
Wetted Perimeter	11.89	ft
Top Width	11.59	ft
Critical Depth	1.10	ft
Critical Slope	1.56	%
Velocity	3.93	ft/s
Velocity Head	0.24	ft
Specific Energy	1.44	ft
Froude Number	0.83	
Flow Type	Subcritical	

Main Channel

Project Description	
Worksheet	Main Channel
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.045	
Slope	0.61	%
Left Side Slope	4.00	H : V
Right Side Slope	4.00	H : V
Bottom Width	10.00	ft
Discharge	644.00	cfs

Results		
Depth	4.56	ft
Flow Area	128.7	ft^2
Wetted Perimeter	47.58	ft
Top Width	46.46	ft
Critical Depth	3.34	ft
Critical Slope	2.36	%
Velocity	5.01	ft/s
Velocity Head	0.39	ft
Specific Energy	4.95	ft
Froude Number	0.53	
Flow Type	Subcritical	

Berm at East boundary

Project Description	
Worksheet	Triangular Channel - 1
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.035	
Slope	2.00	%
Left Side Slope	4.00	H : V
Right Side Slope	50.00	H : V
Discharge	20.00	cfs

Results		
Depth	0.54	ft
Flow Area	8.0	ft^2
Wetted Perimeter	29.39	ft
Top Width	29.32	ft
Critical Depth	0.51	ft
Critical Slope	2.83	%
Velocity	2.51	ft/s
Velocity Head	0.10	ft
Specific Energy	0.64	ft
Froude Number	0.85	
Flow Type	Subcriti cal	

Swale A-A
SC250 Fabric Lined

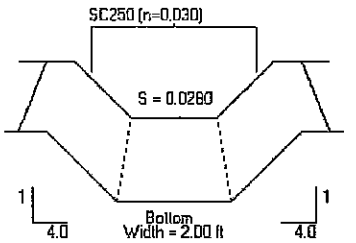
North American Green - ECMDS Version 4.3 | 8/2/2006 | 09:39 AM | COMPUTED BY: Quenitn Armijo

PROJECT NAME: Quail Brush Creek | PROJECT NO.: 0537.00

FROM STATION/REACH: Swale B-B | TO STATION/REACH: Swale B-B | DRAINAGE AREA: | DESIGN FREQUENCY: 100-year

HYDRAULIC RESULTS

Discharge (cfs)	Peak Flow Period (hrs)	Velocity (fps)	Area (sq.ft)	Hydraulic Radius(ft)	Normal Depth (ft)
80.0	2.0	7.17	11.16	0.80	1.44



Not to Scale

LINER RESULTS

Reach	Matting Type / Staple Pattern	Stability Analysis	Vegetation Characteristics: Phase	Class	Type	Density	Permissible Shear Stress (psf)	Calculated Shear Stress (psf)	Safety Factor	Remarks
Straight	SC250	Vegetation	2	C	Mix	50-75%	8.00	2.51	3.18	STABLE
	Staple E	Soil	Sandy Loam				2.500	0.533	4.69	STABLE

Back to Input Screen

KIOWA ENGINEERING HEC-1 ANALYSIS

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   11NOV05  TIME  08:16:07   *
*                                       *
*****************************************
```

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

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

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

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


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

   1          ID             Sand Creek Detention Basin No. 2 Final design
   2          ID             FUTURE DEVELOPMENT CONDITION WITH SAND CREEK PER FINAL DESIGN
   3          ID             10-YEAR AND 100-YEAR 24-HOUR STORM  FN:SC2-FD.DAT
              *DIAGRAM
   4          IT       5       0       0     300
   5          IO       5       0
   6          JR    PREC     .68     1.0

   7          KK    SB82
   8          KM       RUNOFF FROM SUB-BASIN 82
   9          BA    .190
  10          IN      30
  11          PB     4.4
  12          PC  0.0000  0.0025  0.0050  0.0075  0.0100  0.0150  0.0200  0.0250  0.0300  0.0500
```

Revised CN's
SC2
Stations 23, 25 + 26

```
 13          PC  0.0600  0.1000  0.1000  0.7000  0.7000  0.7500  0.7800  0.7980  0.8200  0.8300
 14          PC  0.9150  0.9210  0.9270  0.9330  0.9400  0.9450  0.9500  0.9525  0.9550  0.9600
 15          PC  0.9650  0.9700  0.9750  0.9800  0.9830  0.9850  0.9880  0.9900  0.9930  0.9950
 16          PC  0.9980  1.0000  1.0000
 17          LS       0      67
 18          UD    .110

 19          KK    RT-4
 20          KM   ROUTE FLOW FROM SUB-BASIN 82 TO DP 74
 21          RK    2300    .030    .035            TRAP      10      10

 22          KK    SB74
 23          KM   RUNOFF FROM SUB-BASIN 74
 24          BA    .180
 25          LS       0      67
 26          UD    0.29

 27          KK    DP74
 28          KM   DESIGN POINT 74 COMBINE RUNOFF FROM SUB-BASIN 74 AND RT-4
 29          HC       2

 30          KK    RT-3
 31          KM   ROUTE FLOW FROM DP 74 TO DP 75
 32          RK    2800    .025    .035            TRAP              10

 33          KK    SB80
 34          KM   RUNOFF FROM SUB-BASIN 80
 35          BA    .220
 36          LS       0      67
 37          UD    .240

 38          KK    RT-2
 39          KM   ROUTE FLOW FROM SB 80 TO DP 75
 40          RK    4100    .035    .035            TRAP              10

 41          KK    SB81
 42          KM   RUNOFF FROM SUB-BASIN 81
 43          BA    .390
 44          LS       0      67
 45          UD    .306
1                                        HEC-1 INPUT                                        PAGE  2

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

 46          KK    RT-1
 47          KM   ROUTE FLOW FROM SB 81 TO DP 75
 48          RK    3850     .03    .035            TRAP              10

 49          KK    SB73
 50          KM   RUNOFF FROM SUB-BASIN 73
 51          BA    .1200
```

```
 52          LS       0      67
 53          UD    .312

 54          KK    SB75
 55          KM   RUNOFF FROM SUB-BASIN 75
 56          BA   .1200
 57          LS       0      67
 58          UD    .420

 59          KK    SB76
 60          KM   RUNOFF FROM SUB-BASIN 76
 61          BA   .1700
 62          LS       0      67
 63          UD    .408

 64          KK    DP75
 65          KM   DESIGN POINT 75 COMBINE RUNOFF FROM SUB-BASINS 73, 75, 76, RT-1, RT-2 & RT-3
 66          HC       6

 67          KK    RT-5
 68          KM   ROUTE FLOW FROM DP 75 TO DP 77
 69          RK    1700    .025    .035            TRAP      10      10

 70          KK    SB79
 71          KM   RUNOFF FROM SUB-BASIN 79
 72          BA   .2900
 73          LS       0      67
 74          UD    .174

 75          KK    RT-7
 76          KM   ROUTE FLOW FROM SUB-BASIN 79 TO DP 78
 77          RK    3000    0.03   0.035            TRAP       6       6

 78          KK    SB78
 79          KM   RUNOFF FROM SUB-BASIN 78
 80          BA     .88
 81          LS       0      67
 82          UD    .264

 83          KK    DP78
 84          KM   DESIGN POINT 78 COMBINE RUNOFF FROM SUB-BASIN 78 AND RT-7
 85          HC       2
```



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

 86          KK    RT-6
 87          KM   ROUTE FLOW FROM DESIGN POINT 78 TO DP 77
 88          RK    3350    .025    .035            TRAP      10       6

 89          KK    SB77
```

```
 90          KM   RUNOFF FROM SUB-BASIN 77
 91          BA     .25
 92          LS       0      67
 93          UD    .336

 94          KK    SB88
 95          KM   RUNOFF FROM SUB-BASIN 88
 96          BA   .1000
 97          LS       0      67
 98          UD    .204

 99          KK    DP77
100          KM   DESIGN POINT 77 COMBINE RUNOFF FROM SUB-BASINS 77 AND 88 AND RT-6, AND RT-5
101          HC       4

102          KK    RT-8
103          KM   ROUTE FLOW FROM DESIGN POINT 77 TO DP 71
104          RK    3850    .025    .035            TRAP      20      10

105          KK    SB71
106          KM   RUNOFF FROM SUB-BASIN 71
107          BA     .36
108          LS       0      70
109          UD    .300

110          KK    DP71
111          KM   DESIGN POINT 71 COMBINE RUNOFF FROM SUB-BASIN 71 AND RT-8
112          HC       2

113          KK    RT-9
114          KM   ROUTE FLOW FROM DESIGN POINT 71 TO DP 70
115          RK    2500    .025    .035            TRAP      20       4

116          KK    SB70
117          KM   RUNOFF FROM SUB-BASIN 70
118          BA   .3100
119          LS       0      70
120          UD    .350

121          KK    DP70
122          KM   DESIGN POINT 70 COMBINE RUNOFF FROM SUB-BASIN 70 AND RT-9
123          HC       2

124          KK   RT-11
125          KM   ROUTE FLOW FROM DESIGN POINT 70 TO DP 87
126          RK    1200    .025    .035            TRAP      20       4
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

127          KK    SB72
```

```
128          KM   RUNOFF FROM SUB-BASIN 72
129          BA   .2500
130          LS      0      70
131          UD    .138

132          KK   RT-10
133          KM   ROUTE FLOW FROM SUB-BASIN 72 TO DESIGN POINT 70
134          RK    3000    .035    .035            TRAP      10       4

135          KK    SB69
136          KM   RUNOFF FROM SUB-BASIN 69
137          BA   .2500
138          LS      0      75
139          UD    .483

140          KK    DP69
141          KM   DESIGN POINT 69 COMBINE RUNOFF FROM SUB-BASIN 69 AND RT-10
142          HC      2

143          KK   RT-12
144          KM   ROUTE FLOW FROM DESIGN POINT 69 TO DP 87
145          RK    1400    .025    .035            TRAP      20       4

146          KK  SC3-15
147          KM   RUNOFF FROM SUB-BASIN SC3-15
148          BA   .0730
149          LS      0    72.0
150          UD    .230

151          KK    DP87
152          KM   DESIGN POINT 87 COMBINE RUNOFF FROM SUB-BASIN SC3-15, RT-12 AND RT-11
153          HC      3

154          KK   RT-13
155          KM   ROUTE FLOW FROM DESIGN POINT 87 TO DP 63
156          RK    4400    .025    .035            TRAP      40       4

157          KK  SC3-12
158          KM   RUNOFF FROM SUB-BASIN SC3-12
159          BA   .2380
160          LS      0    70.6
161          UD    .410

162          KK    DP63
163          KM   DESIGN POINT 63 COMBINE RUNOFF FROM SUB-BASIN SC3-12 AND RT-13
164          HC      2

165          KK   RT-17
166          KM   ROUTE FLOW FROM DESIGN POINT 63 TO DP 60
167          RK    4390    .015    .035            TRAP      10       4
```

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

 168          KK    SB68
 169          KM   RUNOFF FROM SUB-BASIN 68
 170          BA   .2200
 171          LS       0      75
 172          UD    .390

 173          KK   RT-14
 174          KM   ROUTE FLOW FROM SUB-BASIN 68 TO DESIGN POINT 67
 175          RK    3300    .020    .035            TRAP      20       4

 176          KK  SC3-14
 177          KM   RUNOFF FROM SUB-BASIN SC3-14
 178          BA   .3150
 179          LS       0    70.0
 180          UD    .410

 181          KK    DP67
 182          KM   DESIGN POINT 67 COMBINE RUNOFF FROM SUB-BASIN SC3-14 AND RT-14
 183          HC       2

 184          KK   RT-15
 185          KM   ROUTE FLOW FROM DP 67 TO DESIGN POINT 64
 186          RK    2500    .035    .035            TRAP      20       6

 187          KK  SC3-13
 188          KM   RUNOFF FROM SUB-BASIN SC3-13
 189          BA   .2550
 190          LS       0    81.4
 191          UD    .390

 192          KK    DP64
 193          KM   DESIGN POINT 64 COMBINE RUNOFF FROM SUB-BASIN SC3-13 AND RT-15
 194          HC       2

 195          KK   RT-16
 196          KM   ROUTE FLOW FROM DP 64 TO DESIGN POINT 60
 197          RK    4010    .018    .035            TRAP      20      10

 198          KK   SC3-9
 199          KM   RUNOFF FROM SUB-BASIN SC3-9
 200          BA   .2360
 201          LS       0    75.5
 202          UD    .320

 203          KK    DP60
 204          KM   DESIGN POINT 60 COMBINE RUNOFF FROM SUB-BASIN SC3-9, RT-17 AND RT-16
 205          HC       3

 206          KK   RT-18
```

```
 207          KM   ROUTE FLOW FROM DP 60 TO DESIGN POINT 53
 208          RK    2690    .015    .035            TRAP      10       4
1                                    HEC-1 INPUT                                                PAGE  6

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


 209          KK   SC3-2
 210          KM   RUNOFF FROM SUB-BASIN SC3-2
 211          BA   .1920
 212          LS       0    76.1
 213          UD    .310

 214          KK  SC3-11
 215          KM   RUNOFF FROM SUB-BASIN SC3-11
 216          BA   .2750
 217          LS       0    80.8
 218          UD    .430

 219          KK   RT-19
 220          KM   ROUTE FLOW FROM SUB-BASIN SC3-11 TO DESIGN POINT 55
 221          RK    2600    .022    .035            TRAP      10       6

 222          KK  SC3-10
 223          KM   RUNOFF FROM SUB-BASIN SC3-10
 224          BA   .1130
 225          LS       0    75.0
 226          UD    .290

 227          KK    DP55
 228          KM   DESIGN POINT 55 COMBINE RUNOFF FROM SUB-BASIN SC3-10 AND RT-19
 229          HC       2

 230          KK   RT-20
 231          KM   ROUTE FLOW FROM DESIGN POINT 55 TO DESIGN POINT 56
 232          RK    3670    .012    .035            TRAP      10      10

 233          KK   SC3-1
 234          KM   RUNOFF FROM SUB-BASIN SC3-1
 235          BA   .1290
 236          LS       0    80.0
 237          UD    .320

 238          KK    DP56
 239          KM   DESIGN POINT 56 COMBINE RUNOFF FROM SUB-BASIN SC3-1 AND RT-20
 240          HC       2

 241          KK    DB95
 242          KM        ROUTE FLOW FROM DP 56 THROUGH DBPS STRUCTURE 95
 243          RS       1    ELEV     100
 244          SV       0      20      34      39      42      50
 245          SQ       0      10      20      30      40      43
```

```
246          SE     100     104     107     108     109     110

247          KK   RT-21
248          KM   ROUTE FLOW FROM DETENTION BASIN DB95 TO DESIGN POINT 53
249          RK     870    .023    .035            TRAP      10      10
1                                      HEC-1 INPUT                                                    PAGE  7

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

250          KK    DP53
251          KM   DESIGN POINT 53 COMBINE RUNOFF FROM SUB-BASIN SC3-2, RT-21 AND RT-18
252          HC       3

253          KK    DB94
254          KM        ROUTE FLOW FROM DP 53 THROUGH DBPS STRUCTURE 94
255          RS       1    ELEV     100
256          SV       0      30      40      60      80     120     130
257          SQ       0      80      90     300     800    1750    2000
258          SE     100     104     105     107     108     109     110

259          KK   RT-27
260          KM   ROUTE FLOW FROM DETETNION BASIN DB94 TO DESIGN POINT 50
261          RK    1380    .022    .035            TRAP      10      10

262          KK  SC2-24
263          KM   RUNOFF FROM SUB-BASIN SC2-24
264          BA   .0660
265          LS       0    90.7
266          UD    .190

267          KK   RT-29
268          KM   ROUTE FLOW FROM SUB-BASIN SC2-24 TO DESIGN POINT 50
269          RK     330    .020    .013            CIRC       4

270          KK  SC2-27
271          KM   RUNOFF FROM SUB-BASIN SC2-27
272          BA   .0780
273          LS       0    92.0
274          UD    .210

275          KK    DP50
276          KM   DESIGN POINT 50 COMBINE RUNOFF FROM SC2-27, RT-27 AND RT-29
277          HC       3

278          KK   RT-31
279          KM   ROUTE FLOW FROM DESIGN POINT 50 TO DESIGN POINT 49
280          RK     940    .020    .035            TRAP      40       6

281          KK   SC3-8
282          KM   RUNOFF FROM SUB-BASIN SC3-8
283          BA   .2420
```

```
 284          LS        0    67.0
 285          UD     .290

 286          KK    RT-25
 287          KM    ROUTE FLOW FROM SUB-BASIN SC3-8 TO DESIGN POINT 51
 288          RK     2690    .015    .035           TRAP      20       6
```



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


 289          KK    SC3-3
 290          KM    RUNOFF FROM SUB-BASIN SC3-3
 291          BA    .1270
 292          LS        0    88.5
 293          UD     .280

 294          KK     DP51
 295          KM    DESIGN POINT 51 COMBINE RUNOFF FROM SC3-3 AND RT-25
 296          HC        2

 297          KK     DB93
 298          KM         ROUTE FLOW FROM DP 51 THROUGH DBPS STRUCTURE 93
 299          RS        1    ELEV     100
 300          SV        0      10      20      30
 301          SQ        0      20     100     290
 302          SE      100     104     106     108

 303          KK    RT-30
 304          KM    ROUTE FLOW FROM DETENTION BASIN DB93 TO DESIGN POINT 49
 305          RK     1590    .019    .035           TRAP      20      10

 306          KK     DP49
 307          KM    DESIGN POINT 49 COMBINE RUNOFF FROM RT-31 AND RT-30
 308          HC        2

 309          KK    RT-32
 310          KM    ROUTE FLOW FROM DESIGN POINT 49 TO DESIGN POINT 48
 311          RK     4930    .017    .035           TRAP      40       6

 312          KK    SC3-6
 313          KM    RUNOFF FROM SUB-BASIN SC3-6
 314          BA    .2420
 315          LS        0    70.0
 316          UD     .310

 317          KK    RT-23
 318          KM    ROUTE FLOW FROM SUB-BASIN SC3-6 TO DESIGN POINT 54
 319          RK     1830    .023    .035           TRAP      10      10

 320          KK    SC3-5
 321          KM    RUNOFF FROM SUB-BASIN SC3-5
```

```
 322            BA   .1150
 323            LS       0    88.7
 324            UD    .280

 325            KK   RT-24
 326            KM   ROUTE FLOW FROM SUB-BASIN SC3-5 TO DESIGN POINT 54
 327            RK    1760    .041    .035            TRAP      10        4
```



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


 328            KK   SC3-7
 329            KM   RUNOFF FROM SUB-BASIN SC3-7
 330            BA   .5380
 331            LS       0    81.5
 332            UD    .530

 333            KK   RT-22
 334            KM   ROUTE FLOW FROM SUB-BASIN SC3-7 TO DESIGN POINT 54
 335            RK    2860    .021    .035            TRAP      30        6

 336            KK   SC3-4
 337            KM   RUNOFF FROM SUB-BASIN SC3-4
 338            BA   .3210
 339            LS       0    81.9
 340            UD    .330

 341            KK    DP54
 342            KM   DESIGN POINT 54 COMBINE RUNOFF FROM SUB-BASIN SC3-4, RT-22, RT-23 AND RT-24
 343            HC       4

 344            KK    DB92
 345            KM        ROUTE FLOW FROM DP 54 THROUGH DBPS STRUCTURE 92
 346            RS       1    ELEV     100
 347            SV       0      40      60      90     110     120     130
 348            SQ       0      40      60      82      90      91      95
 349            SE     100     104     105     106     108     109     110

 350            KK   RT-26
 351            KM   ROUTE FLOW FROM DETENTION BASIN 92 TO DESIGN POINT 47
 352            RK    4680    .028    .035            TRAP      40       10

 353            KK  SC2-26
 354            KM   RUNOFF FROM SUB-BASIN SC2-26
 355            BA   .1860
 356            LS       0      79
 357            UD    .320

 358            KK   RT-34
 359            KM   ROUTE FLOW FROM SUB-BASIN SC2-26 TO DESIGN POINT 47
 360            RK    1620    .014    .035            TRAP       4        4
```

```
361          KK  SC2-25
362          KM   RUNOFF FROM SUB-BASIN SC2-25
363          BA   .4440
364          LS       0      79
365          UD    .440

366          KK    DP47
367          KM   DESIGN POINT 47 COMBINE RUNOFF FROM SUB-BASIN SC3-26 AND RT-26 AND RT-34
368          HC       3
```



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

369          KK   RT-33
370          KM   ROUTE FLOW FROM DESIGN POINT 47 TO DESIGN POINT 48
371          RK     510    .020    .035            TRAP       6       4

372          KK  SC2-28
373          KM   RUNOFF FROM SUB-BASIN SC2-28
374          BA   .2740
375          LS       0    67.1
376          UD    .510

377          KK  SC2-21
378          KM   RUNOFF FROM SUB-BASIN SC2-21
379          BA   .1930
380          LS       0    79.0
381          UD    .390

382          KK    DP48
383          KM   DESIGN POINT 48 COMBINE RUNOFF FROM SB'S SC2-21 AND SC2-28, RT-33 AND RT-32
384          HC       4

385          KK   RT-37
386          KM   ROUTE FLOW FROM DESIGN POINT 48 TO DESIGN POINT 42
387          RK    1080    .022    .035            TRAP      60       6

388          KK  SC2-23
389          KM   RUNOFF FROM SUB-BASIN SC2-23
390          BA   .1960
391          LS       0      79
392          UD    .330

393          KK   RT-35
394          KM   ROUTE FLOW FROM SUB-BASIN SC2-23 TO DESIGN POINT 46
395          RK    1180    .015    .013            CIRC       5

396          KK  SC2-22
397          KM   RUNOFF FROM SUB-BASIN SC2-22
398          BA   .0810
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```
399          LS       0    79.0
400          UD    .220

401          KK    DP46
402          KM   DESIGN POINT 46 COMBINE RUNOFF FROM SUB-BASIN SC2-22 AND RT-35
403          HC       2

404          KK   RT-36
405          KM   ROUTE FLOW FROM DESIGN POINT 46 TO DESIGN POINT 42
406          RK    1790    .017    .013            TRAP      30       4

407          KK    DP42
408          KM   DESIGN POINT 42 COMBINE RUNOFF FROM RT- 37 AND RT-36
409          HC       2
```



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


410          KK   RT-38
411          KM   ROUTE FLOW FROM DESIGN POINT 42 TO DESIGN POINT 85
412          RK    1790    .013    .035            TRAP      60       6

413          KK  SC2-20
414          KM   RUNOFF FROM SUB-BASIN SC2-20
415          BA   .3240
416          LS       0    79.0
417          UD    .380

418          KK   RT-41
419          KM   ROUTE FLOW FROM SUB-BASIN SC2-20 TO DESIGN POINT 85
420          RK    1560    .020    .013            CIRC     6.5

421          KK  SC2-15
422          KM   RUNOFF FROM SUB-BASIN SC2-15
423          BA   .1810
424          LS       0    79.0
425          UD    .240

426          KK   RT-39
427          KM   ROUTE FLOW FROM SUB-BASIN SC2-15 TO DESIGN POINT 85
428          RK     990    .022    .013            CIRC     6.5

429          KK  SC2-13
430          KM   RUNOFF FROM SUB-BASIN SC2-13
431          BA   .1630
432          LS       0    79.0
433          UD    .280

434          KK   RT-40
435          KM   ROUTE FLOW FROM SUB-BASIN SC2-13 TO DESIGN POINT 85
436          RK     300    .033    .013            CIRC     5.5
```

```
437          KK    DP85
438          KM   DESIGN POINT 85 COMBINE RUNOFF FROM RT-41, RT-38, RT-39 AND RT-40
439          HC       4

440          KK   RT-42
441          KM   ROUTE FLOW FROM DESIGN POINT 85 TO DESIGN POINT 37
442          RK    2900    .016    .035            TRAP      60       6

443          KK  SC2-14
444          KM   RUNOFF FROM SUB-BASIN SC2-14
445          BA   .2650
446          LS       0    76.2
447          UD    .450

448          KK  SC2-16
449          KM   RUNOFF FROM SUB-BASIN SC2-16
450          BA   .2120
451          LS       0    76.2
452          UD    .310
```



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

453          KK    DP37
454          KM   DESIGN POINT 37 COMBINE RUNOFF FROM RT-42, SUB-BASINS SC2-14 AND SC2-16
455          HC       3

456          KK   RT-43
457          KM   ROUTE FLOW FROM DESIGN POINT 37 TO DESIGN POINT 36
458          RK    3380    .016    .035            TRAP      60       4

459          KK  SC2-12
460          KM   RUNOFF FROM SUB-BASIN SC2-12
461          BA   .1790
462          LS       0    70.6
463          UD    .280

464          KK   RT-46
465          KM   ROUTE FLOW FROM SUB-BASIN SC2-12 TO DESIGN POINT 33
466          RK    2280    .024    .035            TRAP      20       4

467          KK   SC2-8
468          KM   RUNOFF FROM SUB-BASIN SC2-8
469          BA   .3480
470          LS       0    79.0
471          UD    .440

472          KK    DP33
473          KM   DESIGN POINT 33 COMBINE RUNOFF FROM RT-46 AND SUB-BASIN SC2-8
474          HC       2
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475          KK   RT-45
476          KM   ROUTE FLOW FROM DESIGN POINT 33 TO DESIGN POINT 36
477          RK     850    .021    .035            TRAP      20       4

478          KK    DP36
479          KM   DESIGN POINT 36 COMBINE RUNOFF FROM RT-45 AND RT-43
480          HC       2

481          KK   RT-44
482          KM   ROUTE FLOW FROM DESIGN POINT 36 TO DESIGN POINT 35
483          RK    1740    .016    .035            TRAP      60       4

484          KK  SC2-11
485          KM   RUNOFF FROM SUB-BASIN SC2-11
486          BA   .2100
487          LS       0    79.0
488          UD    .240

489          KK   RT-52
490          KM   ROUTE FLOW FROM SUB-BASIN SC2-11 TO DESIGN POINT 39
491          RK    2680    .008    .035            TRAP      30       4
1                                    HEC-1 INPUT                                    PAGE 13

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

492          KK  SC2-19
493          KM   RUNOFF FROM SUB-BASIN SC2-19
494          BA   .1820
495          LS       0    86.0
496          UD    .300

497          KK   RT-51
498          KM   ROUTE FLOW FROM SUB-BASIN SC2-19 TO DESIGN POINT 39
499          RK    3100    .022    .013            CIRC       6

500          KK  SC2-18
501          KM   RUNOFF FROM SUB-BASIN SC2-18
502          BA   .1980
503          LS       0    88.0
504          UD    .290

505          KK    DP39
506          KM   DESIGN POINT 39 COMBINE RUNOFF FROM RT-52, RT-51 AND SUB-BASIN SC2-18
507          HC       3

508          KK   RT-49
509          KM   ROUTE FLOW FROM DESIGN POINT 39 TO DESIGN POINT 34
510          RK    1160    .024    .035            TRAP      20       4

511          KK  SC2-17
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```
512          KM   RUNOFF FROM SUB-BASIN SC2-17
513          BA   .1600
514          LS       0    79.0
515          UD    .320

516          KK   RT-50
517          KM   ROUTE FLOW FROM SUB-BASIN SC2-17 TO DESIGN POINT 34
518          RK    1840    .025    .035            TRAP      20       4

519          KK  SC2-29
520          KM   RUNOFF FROM SUB-BASIN SC2-29
521          BA   .1510
522          LS       0    88.0
523          UD    .210

524          KK    DP34
525          KM   DESIGN POINT 34 COMBINE RUNOFF FROM RT-49, RT-50 AND SUB-BASIN SC2-29
526          HC       3

527          KK   RT-48
528          KM   ROUTE FLOW FROM DESIGN POINT 34 TO DESIGN POINT 32
529          RK    1470    .020     .04            TRAP      20       4

530          KK  SC2-10
531          KM   RUNOFF FROM SUB-BASIN SC2-10
532          BA   .3290
533          LS       0    78.4
534          UD    .390
1                                        HEC-1 INPUT                                        PAGE 14

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

535          KK    DP32
536          KM   DESIGN POINT 32 COMBINE RUNOFF FROM RT-48 AND SUB-BASIN SC2-10
537          HC       2

538          KK   RT-47
539          KM   ROUTE FLOW FROM SUB-BASIN DESIGN POINT 32 TO DESIGN POINT 35
540          RK     991    .028    .031            TRAP      20       4

541          KK   SC2-9
542          KM   RUNOFF FROM SUB-BASIN SC2-9
543          BA   .2060
544          LS       0    73.0
545          UD    .520

546          KK    DP35
547          KM   DESIGN POINT 35 COMBINE RUNOFF FROM RT-47, RT-44 AND SUB-BASIN SC2-9
548          HC       3

549          KK   RT-53
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```
550          KM   ROUTE FLOW FROM DESIGN POINT 35 TO DESIGN POINT 29
551          RK    1120    .020    .035            TRAP      60       6

552          KK   SC2-7
553          KM   RUNOFF FROM SUB-BASIN SC2-7
554          BA   .1440
555          LS      0    79.0
556          UD    .320

557          KK    DP29
558          KM   DESIGN POINT 29 COMBINE RUNOFF FROM RT-53 AND SUB-BASIN SC2-7
559          HC      2

560          KK   RT-54
561          KM   ROUTE FLOW FROM DESIGN POINT 29 TO DESIGN POINT 28
562          RK    1560    .011    .035            TRAP      60       4

563          KK   SC2-6
564          KM   RUNOFF FROM SUB-BASIN SC2-6
565          BA   .1500
566          LS      0    81.6
567          UD    .240

568          KK   RT-55
569          KM   ROUTE FLOW FROM SUB-BASIN SC2-6 TO DESIGN POINT 28
570          RD     950    .020    .035            TRAP      10       4

571          KK   SC2-2
572          KM   RUNOFF FROM SUB-BASIN SC2-2
573          BA   .1670
574          LS      0    80.8
575          UD    .280
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

576          KK    DP28
577          KM   DESIGN POINT 28 COMBINE RUNOFF FROM RT-54, RT-55 AND SUB-BASIN SC2-2
578          HC      3

579          KK   RT-56
580          KM   ROUTE FLOW FROM DESIGN POINT 28 TO DESIGN POINT 21
581          RK    1280    .017    .035            TRAP      60       4

582          KK   SC2-5
583          KM   RUNOFF FROM SUB-BASIN SC2-5
584          BA   .1610
585          LS      0    92.0
586          UD    .280

587          KK   RT-58
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```
588          KM   ROUTE FLOW FROM SUB-BASIN SC2-5 TO DESIGN POINT 21
589          RK    1670    .027    .024            CIRC       5

590          KK   SC2-0
591          KM   RUNOFF FROM SUB-BASIN SC2-0
592          BA   .1500
593          LS       0    73.4
594          UD    .320

595          KK   RT-57
596          KM   ROUTE FLOW FROM SUB-BASIN SC2-0 TO DESIGN POINT 21
597          RK     800    .032    .035            TRAP      10       4

598          KK    DP21
599          KM   DESIGN POINT 21 COMBINE RUNOFF FROM RT-58, RT-56 AND RT- 57
600          HC       3

601          KK   RT-59
602          KM   ROUTE FLOW FROM DESIGN POINT 21 TO DESIGN POINT 20
603          RK     830    .01     .035            TRAP      80       4

604          KK   SC2-4
605          KM   RUNOFF FROM SUB-BASIN SC2-4
606          BA   .2850
607          LS       0    92.0
608          UD    .320

609          KK   RT-61
610          KM   ROUTE FLOW FROM SUB-BASIN SC2-4 TO DESIGN PÓINT 22
611          RK    1670    .019    .035            TRAP      20       3

612          KK   SC2-3
613          KM   RUNOFF FROM SUB-BASIN SC2-3
614          BA   .0710
615          LS       0    92.0
616          UD    .210
```



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

617          KK    DP22
618          KM   DESIGN POINT 22 COMBINE RUNOFF FROM RT-61 AND SC2-3
619          HC       2

620          KK   RT-60
621          KM   ROUTE FLOW FROM DESIGN POINT 22 TO DESIGN POINT 20
622          RK    1010    .018    .035            TRAP      20       3

623          KK   SC2-1
624          KM   RUNOFF FROM SUB-BASIN SC2-1
625          BA   .1850
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626          LS       0    80.0
627          UD    .290

628          KK    DP20
629          KM   DESIGN POINT 20 COMBINE RUNOFF FROM RT-60, RT-59 AND SB SC2-1
630          HC       3

631          KK   DBSC2
632          KM        ROUTE FLOW FROM DP 20 THROUGH SAND CREEK DETENTION BASIN DBSC2
633          RS       1    ELEV  6496.5
634          SV       0    6.75    29.8    58.8    92.2   129.4   168.6   209.8   255.0   302.2
635          SQ       0      10      30     100     400     800    2000    4300    5000    7000
636          SE  6496.5    6498    6500    6502    6504    6506    6508    6510    6512    6514

637          KK   RT-63
638          KM   ROUTE FLOW FROM DETENTION BASIN SC2 TO DESIGN POINT 18
639          RK    1290    .007    .035            TRAP     100       3

640          KK  SC1-10
641          KM   RUNOFF FROM SUB-BASIN SC1-10
642          BA   .2880
643          LS       0    78.2
644          UD    .390

645          KK    DP18
646          KM   DESIGN POINT 18 COMBINE RUNOFF FROM RT-63 AND SUB-BASIN SC1-10
647          HC       2

648          KK   RT-66
649          KM   ROUTE FLOW FROM DESIGN POINT 18 TO DESIGN POINT 17
650          RK     320    .007    .035            TRAP     100       3

651          KK  SC1-13
652          KM   RUNOFF FROM SUB-BASIN SC1-13
653          BA   .1300
654          LS       0    87.3
655          UD    .270
```



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

656          KK   RT-64
657          KM   ROUTE FLOW FROM SUB-BASIN SC1-13 TO DESIGN POINT 19
658          RK    1970    .026    .013            CIRC     4.5

659          KK  SC1-14
660          KM   RUNOFF FROM SUB-BASIN SC1-14
661          BA   .1100
662          LS       0    92.0
663          UD    .280
```

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664          KK    DP19
665          KM   DESIGN POINT 19 COMBINE RUNOFF FROM RT-64 AND SUB-BASIN SC1-14
666          HC       2

667          KK   RT-65
668          KM   ROUTE FLOW FROM DESIGN POINT 19 TO DESIGN POINT 17
669          RK     700    .022    .013            TRAP      10      .1

670          KK    DP17
671          KM   DESIGN POINT 17 COMBINE RUNOFF FROM RT-65 AND RT-66
672          HC       2

673          KK   RT-67
674          KM   ROUTE FLOW FROM DESIGN POINT 17 TO DESIGN POINT 13
675          RK     910    .007    .035            TRAP     100       3

676          KK   SC1-9
677          KM   RUNOFF FROM SUB-BASIN SC1-9
678          BA   .2400
679          LS       0    76.9
680          UD    .240

681          KK  DBSR29
682          KM        ROUTE FLOW FROM SB SC1-9 THROUGH SPRINGS RANCH DETENTION BASIN DBSR29
683          RS       1    ELEV     100
684          SV       0     .03    0.47    1.20    2.60    6.70     8.8    10.7
685          SQ       0      .2     7.8      22      40      73      97     113
686          SE     100   100.5   101.5   102.5   103.5   104.5   105.5   106.5

687          KK   RT-70
688          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR29 TO DESIGN POINT 14
689          RD    2750    .013    .013            CIRC     5.5

690          KK   SC1-8
691          KM   RUNOFF FROM SUB-BASIN SC1-8
692          BA   .2100
693          LS       0    79.5
694          UD    .320
1                                        HEC-1 INPUT                                        PAGE 18

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

695          KK   RT-71
696          KM   ROUTE FLOW FROM SUB-BASIN SC1-8 TO DESIGN POINT 14
697          RK     600    .010    .013            CIRC       5

698          KK    DP14
699          KM   DESIGN POINT 14 COMBINE RUNOFF FROM RT-71 AND RT-70
700          HC       2

701          KK   RT-69
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702          KM   ROUTE FLOW FROM DESIGN POINT 14 TO DESIGN POINT 12
703          RK    1550    .015    .013           TRAP       7      .1

704          KK   SC1-7
705          KM   RUNOFF FROM SUB-BASIN SC1-7
706          BA   .0960
707          LS       0    80.1
708          UD    .230

709          KK    DP12
710          KM   DESIGN POINT 12 COMBINE RUNOFF FROM SUB-BASIN SC1-7 AND RT-69
711          HC       2

712          KK   RT-68
713          KM   ROUTE FLOW FROM DESIGN POINT 12 TO DESIGN POINT 13
714          RK     390    .025    .013           TRAP       7      .1

715          KK    DP13
716          KM   DESIGN POINT 13 COMBINE RUNOFF FROM RT-67 AND RT-68
717          HC       2

718          KK   RT-72
719          KM   ROUTE FLOW FROM DESIGN POINT 13 TO DESIGN POINT 10
720          RK    1150    .007     .04           TRAP     100       3

721          KK   SC1-6
722          KM   RUNOFF FROM SUB-BASIN SC1-6
723          BA   .1590
724          LS       0    80.6
725          UD    .220

726          KK  DBSR15
727          KM        ROUTE FLOW FROM SB SC1-6 THROUGH SPRINGS RANCH DETENTION BASIN DBSR15
728          RS       1    ELEV     100
729          SV       0    1.50    3.80    6.50    9.70   13.80
730          SQ       0      80     125     150     180     210
731          SE     100     102     104     106     108     110

732          KK   RT-74
733          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR15 TO DESIGN POINT 11
734          RK    2080    .021    .013           CIRC     3.5
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

735          KK   SC1-5
736          KM   RUNOFF FROM SUB-BASIN SC1-5
737          BA   .1730
738          LS       0    79.0
739          UD    .310
```

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740          KK    DP11
741          KM   DESIGN POINT 11 COMBINE RUNOFF FROM SUB-BASIN SC1-5 AND RT-74
742          HC       2

743          KK   RT-73
744          KM   ROUTE FLOW FROM DESIGN POINT 11 TO DESIGN POINT 10
745          RK     580    .024    .013            CIRC     3.5

746          KK    DP10
747          KM   DESIGN POINT 10 COMBINE RUNOFF FROM RT-72 AND RT-73
748          HC       2

749          KK   RT-75
750          KM   ROUTE FLOW FROM DESIGN POINT 10 TO DESIGN POINT 9
751          RK    2270    .007    .035            TRAP     100       3

752          KK   SC1-2
753          KM   RUNOFF FROM SUB-BASIN SC1-2
754          BA   .1360
755          LS       0    79.0
756          UD    .320

757          KK   RT-76
758          KM   ROUTE FLOW FROM SUB-BASIN SC1-2 TO DESIGN POINT 9
759          RD     500    .039    .013            CIRC       3

760          KK     DP9
761          KM   DESIGN POINT 9 COMBINE RUNOFF FROM RT-75 AND RT-76
762          HC       2

763          KK   RT-78
764          KM   ROUTE FLOW FROM DESIGN POINT 9 TO DESIGN POINT 4
765          RK    1530    .007    .035            TRAP     100       3

766          KK  SC1-12
767          KM   RUNOFF FROM SUB-BASIN SC1-12
768          BA   .2480
769          LS       0    84.0
770          UD    .370

771          KK   RT-81
772          KM   ROUTE FLOW FROM SUB-BASIN SC1-12 TO DESIGN POINT 8
773          RK    1400    .008    .035            TRAP      30       4
1                                        HEC-1 INPUT                                                    PAGE 20

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


774          KK  SC1-11
775          KM   RUNOFF FROM SUB-BASIN SC1-11
776          BA   .1600
777          LS       0    92.0
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778          UD    .290

779          KK     DP8
780          KM   DESIGN POINT 8 COMBINE RUNOFF FROM SUB-BASIN SC1-11 AND RT-81
781          HC       2

782          KK   RT-77
783          KM   ROUTE FLOW FROM DESIGN POINT 8 TO DESIGN POINT 4
784          RK    3100    .007    .035            TRAP     100       3

785          KK   SC1-4
786          KM   RUNOFF FROM SUB-BASIN SC1-4
787          BA   .1010
788          LS       0    92.0
789          UD    .270

790          KK   RT-80
791          KM   ROUTE FLOW FROM SUB-BASIN SC1-4 TO DESIGN POINT 4
792          RK     720    .014    .013            CIRC       5

793          KK   SC1-1
794          KM   RUNOFF FROM SUB-BASIN SC1-1
795          BA   .1090
796          LS       0    79.0
797          UD    .280

798          KK   RT-79
799          KM   ROUTE FLOW FROM SUB-BASIN SC1-1 TO DESIGN POINT 4
800          RK    1115    .027    .013            CIRC       3

801          KK   SC1-3
802          KM   RUNOFF FROM SUB-BASIN SC1-3
803          BA   .3530
 804          LS       0    65.0
805          UD    .460

806          KK     DP4
807          KM   DESIGN POINT 4 COMBINE RUNOFF FROM SB SC1-3, RT-80, RT-77, RT-78 AND RT-79
808          HC       5

809          KK   DBSC1
810          KM        ROUTE FLOW FROM DP 4 THROUGH SAND CREEK DETENTION BASIN DBSC1
811          KO       0
812          RS       1    ELEV    6393
813          SV       0    3.06   14.95   31.12   53.59   69.95   86.31   106.5   126.7   150.4
814          SV   174.1   200.4   226.7   254.9   283.2   313.4   343.6   375.2   406.8   439.5
815          SQ       0       3       5     189     954    1465    2055    2431    2755    3045
816          SQ    3310    3555    3785    4037    5518    7863   10797   14211   18042   22245
817          SE    6393    6394    6396    6398    6400    6401    6402    6403    6404    6405
818          SE    6406    6407    6408    6409    6410    6411    6412    6413    6414    6415
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          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

           819          ZZ


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


            **************
            *            *
 809 KK     *     DBSC1  *
            *            *
            **************

 811 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
1

               PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                                   FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                                TIME TO PEAK IN HOURS


                                                                        RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA     PLAN                    RATIO 1  RATIO 2
                                                                  .68     1.00

 HYDROGRAPH AT
+                  SB82        .19      1   FLOW                 84.      232.
                                             TIME               6.50     6.50

 ROUTED TO
+                  RT-4        .19      1   FLOW                 83.      220.
                                             TIME               6.58     6.58

 HYDROGRAPH AT
+                  SB74        .18      1   FLOW                 49.      143.
                                             TIME               6.67     6.67

   2 COMBINED AT
+                  DP74        .37      1   FLOW                122.      345.
                                             TIME               6.58     6.58

 ROUTED TO
+                  RT-3        .37      1   FLOW                119.      331.
                                             TIME               6.67     6.67

 HYDROGRAPH AT
```

+	SB80	.22	1	FLOW	68.	190.
				TIME	6.67	6.67
ROUTED TO						
+	RT-2	.22	1	FLOW	67.	185.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB81	.39	1	FLOW	100.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-1	.39	1	FLOW	99.	296.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB73	.12	1	FLOW	31.	90.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB75	.12	1	FLOW	25.	72.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB76	.17	1	FLOW	35.	105.
				TIME	6.83	6.75
6 COMBINED AT						
+	DP75	1.39	1	FLOW	364.	1022.
				TIME	6.75	6.75
ROUTED TO						
+	RT-5	1.39	1	FLOW	345.	1021.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB79	.29	1	FLOW	111.	306.
				TIME	6.58	6.58
ROUTED TO						
+	RT-7	.29	1	FLOW	107.	281.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SB78	.88	1	FLOW	259.	738.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP78	1.17	1	FLOW	367.	1020.
				TIME	6.67	6.67
ROUTED TO						

+	RT-6	1.17	1	FLOW	351.	993.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB77	.25	1	FLOW	61.	177.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB88	.10	1	FLOW	34.	97.
				TIME	6.58	6.58
4 COMBINED AT						
+	DP77	2.91	1	FLOW	780.	2207.
				TIME	6.75	6.67
ROUTED TO						
+	RT-8	2.91	1	FLOW	761.	2201.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB71	.36	1	FLOW	127.	334.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP71	3.27	1	FLOW	861.	2508.
				TIME	6.83	6.75
ROUTED TO						
+	RT-9	3.27	1	FLOW	842.	2445.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB70	.31	1	FLOW	99.	256.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP70	3.58	1	FLOW	931.	2701.
				TIME	6.83	6.75
ROUTED TO						
+	RT-11	3.58	1	FLOW	905.	2653.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB72	.25	1	FLOW	135.	321.
				TIME	6.58	6.50
ROUTED TO						
+	RT-10	.25	1	FLOW	128.	321.
				TIME	6.58	6.58
HYDROGRAPH AT						

+	SB69	.25	1	FLOW	93.	216.
				TIME	6.83	6.83
2 COMBINED AT						
+	DP69	.50	1	FLOW	191.	453.
				TIME	6.67	6.58
ROUTED TO						
+	RT-12	.50	1	FLOW	187.	446.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-15	.07	1	FLOW	35.	87.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP87	4.15	1	FLOW	1068.	3104.
				TIME	6.83	6.75
ROUTED TO						
+	RT-13	4.15	1	FLOW	1048.	3020.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-12	.24	1	FLOW	70.	183.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP63	4.39	1	FLOW	1111.	3198.
				TIME	6.92	6.83
ROUTED TO						
+	RT-17	4.39	1	FLOW	1083.	3152.
				TIME	7.00	6.83
HYDROGRAPH AT						
+	SB68	.22	1	FLOW	97.	222.
				TIME	6.75	6.75
ROUTED TO						
+	RT-14	.22	1	FLOW	95.	220.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-14	.31	1	FLOW	88.	234.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP67	.53	1	FLOW	183.	448.
				TIME	6.83	6.83
ROUTED TO						

+	RT-15	.53	1	FLOW	178.	446.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-13	.25	1	FLOW	174.	346.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP64	.79	1	FLOW	338.	763.
				TIME	6.83	6.75
ROUTED TO						
+	RT-16	.79	1	FLOW	332.	758.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-9	.24	1	FLOW	123.	279.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP60	5.42	1	FLOW	1462.	4126.
				TIME	6.92	6.83
ROUTED TO						
+	RT-18	5.42	1	FLOW	1456.	4013.
				TIME	7.00	6.92
HYDROGRAPH AT						
+	SC3-2	.19	1	FLOW	108.	239.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-11	.28	1	FLOW	167.	341.
				TIME	6.75	6.75
ROUTED TO						
+	RT-19	.28	1	FLOW	166.	336.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-10	.11	1	FLOW	61.	138.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP55	.39	1	FLOW	211.	448.
				TIME	6.75	6.75
ROUTED TO						
+	RT-20	.39	1	FLOW	209.	445.
				TIME	6.92	6.83

HYDROGRAPH AT

+	SC3-1	.13	1	FLOW	92.	187.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP56	.52	1	FLOW	274.	586.
				TIME	6.83	6.83
ROUTED TO						
+	DB95	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
			** PEAK STAGES IN FEET **			
			1	STAGE	105.02	109.39
				TIME	11.42	11.00
ROUTED TO						
+	RT-21	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
3 COMBINED AT						
+	DP53	6.13	1	FLOW	1500.	4163.
				TIME	7.00	6.83
ROUTED TO						
+	DB94	6.13	1	FLOW	440.	1908.
				TIME	10.75	7.25
			** PEAK STAGES IN FEET **			
			1	STAGE	107.28	109.63
				TIME	10.75	7.25
ROUTED TO						
+	RT-27	6.13	1	FLOW	438.	1895.
				TIME	10.75	7.25
HYDROGRAPH AT						
+	SC2-24	.07	1	FLOW	105.	172.
				TIME	6.58	6.50
ROUTED TO						
+	RT-29	.07	1	FLOW	105.	172.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-27	.08	1	FLOW	128.	207.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP50	6.27	1	FLOW	442.	1922.
				TIME	10.75	7.25
ROUTED TO						

+	RT-31	6.27	1	FLOW	440.	1920.
				TIME	10.83	7.33
HYDROGRAPH AT						
+	SC3-8	.24	1	FLOW	66.	192.
				TIME	6.67	6.67
ROUTED TO						
+	RT-25	.24	1	FLOW	63.	190.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-3	.13	1	FLOW	155.	270.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP51	.37	1	FLOW	198.	437.
				TIME	6.67	6.67
ROUTED TO						
+	DB93	.37	1	FLOW	25.	77.
				TIME	10.50	7.17
			** PEAK STAGES IN FEET **			
			1	STAGE	104.11	105.42
				TIME	10.50	7.17
ROUTED TO						
+	RT-30	.37	1	FLOW	25.	77.
				TIME	10.58	7.25
2 COMBINED AT						
+	DP49	6.64	1	FLOW	464.	1996.
				TIME	10.83	7.33
ROUTED TO						
+	RT-32	6.64	1	FLOW	463.	1988.
				TIME	10.92	7.33
HYDROGRAPH AT						
+	SC3-6	.24	1	FLOW	83.	219.
				TIME	6.67	6.67
ROUTED TO						
+	RT-23	.24	1	FLOW	82.	213.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-5	.12	1	FLOW	142.	247.
				TIME	6.67	6.58
ROUTED TO						

+	RT-24	.12	1	FLOW	142.	243.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-7	.54	1	FLOW	290.	589.
				TIME	6.83	6.83
ROUTED TO						
+	RT-22	.54	1	FLOW	290.	585.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC3-4	.32	1	FLOW	252.	496.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP54	1.22	1	FLOW	681.	1393.
				TIME	6.75	6.75
ROUTED TO						
+	DB92	1.22	1	FLOW	54.	89.
				TIME	10.92	10.92
			** PEAK STAGES IN FEET **			
			1	STAGE	104.72	107.66
				TIME	10.92	10.92
ROUTED TO						
+	RT-26	1.22	1	FLOW	54.	89.
				TIME	11.08	11.08
HYDROGRAPH AT						
+	SC2-26	.19	1	FLOW	124.	259.
				TIME	6.67	6.67
ROUTED TO						
+	RT-34	.19	1	FLOW	121.	249.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-25	.44	1	FLOW	235.	497.
				TIME	6.83	6.75
3 COMBINED AT						
+	DP47	1.85	1	FLOW	355.	749.
				TIME	6.75	6.75
ROUTED TO						
+	RT-33	1.85	1	FLOW	352.	745.
				TIME	6.75	6.75
HYDROGRAPH AT						

+	SC2-28	.27	1	FLOW	48.	142.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC2-21	.19	1	FLOW	113.	236.
				TIME	6.75	6.75
4 COMBINED AT						
+	DP48	8.95	1	FLOW	728.	2353.
				TIME	6.75	7.33
ROUTED TO						
+	RT-37	8.95	1	FLOW	715.	2350.
				TIME	6.75	7.33
HYDROGRAPH AT						
+	SC2-23	.20	1	FLOW	128.	267.
				TIME	6.67	6.67
ROUTED TO						
+	RT-35	.20	1	FLOW	125.	264.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-22	.08	1	FLOW	67.	137.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP46	.28	1	FLOW	187.	386.
				TIME	6.67	6.67
ROUTED TO						
+	RT-36	.28	1	FLOW	183.	383.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP42	9.23	1	FLOW	889.	2407.
				TIME	6.75	7.33
ROUTED TO						
+	RT-38	9.23	1	FLOW	863.	2399.
				TIME	6.83	7.33
HYDROGRAPH AT						
+	SC2-20	.32	1	FLOW	193.	401.
				TIME	6.75	6.75
ROUTED TO						
+	RT-41	.32	1	FLOW	192.	400.
				TIME	6.75	6.75
HYDROGRAPH AT						

+	SC2-15	.18	1	FLOW	141.	291.
				TIME	6.58	6.58
ROUTED TO						
+	RT-39	.18	1	FLOW	138.	288.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-13	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
ROUTED TO						
+	RT-40	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP85	9.90	1	FLOW	1265.	2615.
				TIME	6.75	6.75
ROUTED TO						
+	RT-42	9.90	1	FLOW	1235.	2586.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-14	.26	1	FLOW	114.	254.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-16	.21	1	FLOW	120.	265.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP37	10.37	1	FLOW	1442.	3082.
				TIME	6.83	6.75
ROUTED TO						
+	RT-43	10.37	1	FLOW	1438.	3007.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-12	.18	1	FLOW	71.	179.
				TIME	6.67	6.67
ROUTED TO						
+	RT-46	.18	1	FLOW	69.	171.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-8	.35	1	FLOW	184.	390.
				TIME	6.83	6.75
2 COMBINED AT						

+	DP33	.53	1	FLOW	252.	559.
				TIME	6.75	6.75
ROUTED TO						
+	RT-45	.53	1	FLOW	247.	553.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP36	10.90	1	FLOW	1685.	3537.
				TIME	6.83	6.83
ROUTED TO						
+	RT-44	10.90	1	FLOW	1647.	3536.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-11	.21	1	FLOW	163.	338.
				TIME	6.58	6.58
ROUTED TO						
+	RT-52	.21	1	FLOW	160.	335.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-19	.18	1	FLOW	191.	345.
				TIME	6.67	6.67
ROUTED TO						
+	RT-51	.18	1	FLOW	189.	343.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-18	.20	1	FLOW	234.	405.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP39	.59	1	FLOW	582.	1083.
				TIME	6.67	6.67
ROUTED TO						
+	RT-49	.59	1	FLOW	570.	1073.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-17	.16	1	FLOW	107.	222.
				TIME	6.67	6.67
ROUTED TO						
+	RT-50	.16	1	FLOW	105.	214.
				TIME	6.75	6.67
HYDROGRAPH AT						

+	SC2-29	.15	1	FLOW	208.	358.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP34	.90	1	FLOW	846.	1587.
				TIME	6.67	6.67
ROUTED TO						
+	RT-48	.90	1	FLOW	827.	1574.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-10	.33	1	FLOW	185.	391.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP32	1.23	1	FLOW	999.	1949.
				TIME	6.67	6.67
ROUTED TO						
+	RT-47	1.23	1	FLOW	980.	1930.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-9	.21	1	FLOW	61.	150.
				TIME	6.92	6.83
3 COMBINED AT						
+	DP35	12.34	1	FLOW	2561.	5419.
				TIME	6.83	6.75
ROUTED TO						
+	RT-53	12.34	1	FLOW	2545.	5359.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-7	.14	1	FLOW	96.	200.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP29	12.48	1	FLOW	2621.	5544.
				TIME	6.83	6.75
ROUTED TO						
+	RT-54	12.48	1	FLOW	2582.	5445.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-6	.15	1	FLOW	137.	269.
				TIME	6.58	6.58
ROUTED TO						

+	RT-55	.15	1	FLOW	134.	258.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-2	.17	1	FLOW	135.	266.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP28	12.80	1	FLOW	2754.	5874.
				TIME	6.83	6.75
ROUTED TO						
+	RT-56	12.80	1	FLOW	2717.	5789.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-5	.16	1	FLOW	235.	386.
				TIME	6.58	6.58
ROUTED TO						
+	RT-58	.16	1	FLOW	231.	379.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-0	.15	1	FLOW	67.	160.
				TIME	6.67	6.67
ROUTED TO						
+	RT-57	.15	1	FLOW	66.	156.
				TIME	6.75	6.67
3 COMBINED AT						
+	DP21	13.11	1	FLOW	2928.	6263.
				TIME	6.83	6.75
ROUTED TO						
+	RT-59	13.11	1	FLOW	2896.	6190.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-4	.28	1	FLOW	393.	641.
				TIME	6.67	6.67
ROUTED TO						
+	RT-61	.28	1	FLOW	388.	637.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-3	.07	1	FLOW	117.	188.
				TIME	6.58	6.58
2 COMBINED AT						

+	DP22	.36	1	FLOW	485.	793.
				TIME	6.67	6.67
ROUTED TO						
+	RT-60	.36	1	FLOW	483.	793.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-1	.19	1	FLOW	140.	282.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP20	13.65	1	FLOW	3359.	7151.
				TIME	6.83	6.75
ROUTED TO						
+	DBSC2	13.65	1	FLOW	1153.	4357.
				TIME	7.42	7.08
			** PEAK STAGES IN FEET **			
			1	STAGE	6506.59	6510.16
				TIME	7.42	7.08
ROUTED TO						
+	RT-63	13.65	1	FLOW	1150.	4348.
				TIME	7.42	7.08
HYDROGRAPH AT						
+	SC1-10	.29	1	FLOW	160.	339.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP18	13.94	1	FLOW	1185.	4499.
				TIME	7.42	7.08
ROUTED TO						
+	RT-66	13.94	1	FLOW	1183.	4493.
				TIME	7.42	7.08
HYDROGRAPH AT						
+	SC1-13	.13	1	FLOW	152.	271.
				TIME	6.58	6.58
ROUTED TO						
+	RT-64	.13	1	FLOW	151.	267.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC1-14	.11	1	FLOW	160.	263.
				TIME	6.58	6.58
2 COMBINED AT						

IN SC#2

OUT SC#2

+	DP19	.24	1	FLOW	308.	530.
				TIME	6.58	6.58
ROUTED TO						
+	RT-65	.24	1	FLOW	308.	527.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP17	14.18	1	FLOW	1219.	4589.
				TIME	7.42	7.08
ROUTED TO						
+	RT-67	14.18	1	FLOW	1213.	4575.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-9	.24	1	FLOW	162.	352.
				TIME	6.58	6.58
ROUTED TO						
+	DBSR29	.24	1	FLOW	51.	103.
				TIME	6.92	6.92
			** PEAK STAGES IN FEET **			
			1	STAGE	103.85	105.90
				TIME	6.92	6.92
ROUTED TO						
+	RT-70	.24	1	FLOW	51.	103.
				TIME	7.00	7.00
HYDROGRAPH AT						
+	SC1-8	.21	1	FLOW	145.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-71	.21	1	FLOW	144.	297.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP14	.45	1	FLOW	183.	365.
				TIME	6.75	6.67
ROUTED TO						
+	RT-69	.45	1	FLOW	182.	363.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-7	.10	1	FLOW	83.	166.
				TIME	6.58	6.58
2 COMBINED AT						

PRELIMINARY DESIGN HYDROLOGY

SC# 2 w/ DBPS + SCH 15 + SCH 24

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1*****************************************
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                                          *
                                          *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
CORPS OF ENGINEERS      *
 *                JUN   1998               *
ENGINEERING CENTER     *
 *             VERSION 4.1                 *
SECOND STREET           *
 *                                        *
CALIFORNIA 95616        *
 *  RUN DATE   06AUG04   TIME  13:04:30    *
756-1104             *
 *                                        *
*
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                                          *
                                          *   U.S. ARMY
                                          *   HYDROLOGIC
                                          *        609
                                          *      DAVIS,
                                          *        (916)
                                          *
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PAGE SCH 2
PRELIMINARY DESIGN

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT

PAGE 1

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

  1           ID            Sand Creek Detention Basin No. 2 Preliminary design
  2           ID                 Future development condition with Sand Creek No. 1
  3           ID            DETENTION BASIN MODELED PER DBPS WITH SPRINGS RANCH DETENTION
  4           ID            BASINS 15 AND 29
  5           ID            10-year and 100 Year, 24 hr Type IIA  Storm fn: SC1-FD.dat
              *DIAGRAM
  6           IT       5       0       0     300
  7           IO       5       0
  8           JR    PREC     .68     1.0

  9           KK    SB82
 10           KM       RUNOFF FROM SUB-BASIN 82
 11           BA    .190
 12           IN      30
 13           PB     4.4
 14           PC  0.0000  0.0025  0.0050  0.0075  0.0100  0.0150  0.0200  0.0250  0.0300  0.0500
 15           PC  0.0600  0.1000  0.1000  0.7000  0.7000  0.7500  0.7800  0.7980  0.8200  0.8300
 16           PC  0.9150  0.9210  0.9270  0.9330  0.9400  0.9450  0.9500  0.9525  0.9550  0.9600
 17           PC  0.9650  0.9700  0.9750  0.9800  0.9830  0.9850  0.9880  0.9900  0.9930  0.9950
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                18          PC  0.9980  1.0000  1.0000
                19          LS       0      67
                20          UD    .110

                21          KK    RT-4
                22          KM    ROUTE FLOW FROM SUB-BASIN 82 TO DP 74
                23          RK    2300     .030     .035            TRAP       10       10

                24          KK    SB74
                25          KM    RUNOFF FROM SUB-BASIN 74
                26          BA    .180
                27          LS       0      67
                28          UD    0.29

                29          KK    DP74
                30          KM    DESIGN POINT 74 COMBINE RUNOFF FROM SUB-BASIN 74 AND RT-4
                31          HC       2

                32          KK    RT-3
                33          KM    ROUTE FLOW FROM DP 74 TO DP 75
                34          RK    2800     .025     .035            TRAP              10

                35          KK    SB80
                36          KM    RUNOFF FROM SUB-BASIN 80
                37          BA    .220
                38          LS       0      67
                39          UD    .240

                40          KK    RT-2
                41          KM    ROUTE FLOW FROM SB 80 TO DP 75
                42          RK    4100     .035     .035            TRAP              10
1
                                                 HEC-1 INPUT
PAGE  2

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

                43          KK    SB81
                44          KM    RUNOFF FROM SUB-BASIN 81
                45          BA    .390
                46          LS       0      67
                47          UD    .306

                48          KK    RT-1
                49          KM    ROUTE FLOW FROM SB 81 TO DP 75
                50          RK    3850      .03     .035            TRAP              10

                51          KK    SB73
                52          KM    RUNOFF FROM SUB-BASIN 73
                53          BA    .1200
                54          LS       0      67
                55          UD    .312

                56          KK    SB75
                57          KM    RUNOFF FROM SUB-BASIN 75
                58          BA    .1200
                59          LS       0      67
                60          UD    .420

                61          KK    SB76
                62          KM    RUNOFF FROM SUB-BASIN 76
                63          BA    .1700
                64          LS       0      67
                65          UD    .408

                66          KK    DP75
                67          KM    DESIGN POINT 75 COMBINE RUNOFF FROM SUB-BASINS 73, 75, 76, RT-1, RT-2 & RT-3
                68          HC       6

                69          KK    RT-5
                70          KM    ROUTE FLOW FROM DP 75 TO DP 77
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 71          RK    1700    .025    .035            TRAP      10       10

 72          KK    SB79
 73          KM   RUNOFF FROM SUB-BASIN 79
 74          BA   .2900
 75          LS      0      67
 76          UD    .174

 77          KK    RT-7
 78          KM   ROUTE FLOW FROM SUB-BASIN 79 TO DP 78
 79          RK    3000    0.03   0.035            TRAP       6        6

 80          KK    SB78
 81          KM   RUNOFF FROM SUB-BASIN 78
 82          BA    .88
 83          LS      0      67
 84          UD    .264
1                                        HEC-1 INPUT
PAGE  3

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

 85          KK    DP78
 86          KM   DESIGN POINT 78 COMBINE RUNOFF FROM SUB-BASIN 78 AND RT-7
 87          HC      2

 88          KK    RT-6
 89          KM   ROUTE FLOW FROM DESIGN POINT 78 TO DP 77
 90          RK    3350    .025    .035            TRAP      10       6

 91          KK    SB77
 92          KM   RUNOFF FROM SUB-BASIN 77
 93          BA    .25
 94          LS      0      67
 95          UD    .336

 96          KK    SB88
 97          KM   RUNOFF FROM SUB-BASIN 88
 98          BA   .1000
 99          LS      0      67
100          UD    .204

101          KK    DP77
102          KM   DESIGN POINT 77 COMBINE RUNOFF FROM SUB-BASINS 77 AND 88 AND RT-6, AND RT-5
103          HC      4

104          KK    RT-8
105          KM   ROUTE FLOW FROM DESIGN POINT 77 TO DP 71
106          RK    3850    .025    .035            TRAP      20       10

107          KK    SB71
108          KM   RUNOFF FROM SUB-BASIN 71
109          BA    .36
110          LS      0      70
111          UD    .300

112          KK    DP71
113          KM   DESIGN POINT 71 COMBINE RUNOFF FROM SUB-BASIN 71 AND RT-8
114          HC      2

115          KK    RT-9
116          KM   ROUTE FLOW FROM DESIGN POINT 71 TO DP 70
117          RK    2500    .025    .035            TRAP      20       4

118          KK    SB70
119          KM   RUNOFF FROM SUB-BASIN 70
120          BA   .3100
121          LS      0      70
122          UD    .350
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                123          KK    DP70
                124          KM    DESIGN POINT 70 COMBINE RUNOFF FROM SUB-BASIN 70 AND RT-9
                125          HC       2
1
PAGE  4                                                HEC-1 INPUT

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

                126          KK    RT-11
                127          KM    ROUTE FLOW FROM DESIGN POINT 70 TO DP 87
                128          RK     1200     .025     .035            TRAP       20        4

                129          KK     SB72
                130          KM    RUNOFF FROM SUB-BASIN 72
                131          BA    .2500
                132          LS       0       70
                133          UD     .138

                134          KK    RT-10
                135          KM    ROUTE FLOW FROM SUB-BASIN 72 TO DESIGN POINT 70
                136          RK     3000     .035     .035            TRAP       10        4

                137          KK     SB69
                138          KM    RUNOFF FROM SUB-BASIN 69
                139          BA    .2500
                140          LS       0       75
                141          UD     .483

                142          KK     DP69
                143          KM    DESIGN POINT 69 COMBINE RUNOFF FROM SUB-BASIN 69 AND RT-10
                144          HC       2

                145          KK    RT-12
                146          KM    ROUTE FLOW FROM DESIGN POINT 69 TO DP 87
                147          RK     1400     .025     .035            TRAP       20        4

                148          KK   SC3-15
                149          KM    RUNOFF FROM SUB-BASIN SC3-15
                150          BA    .0730
                151          LS       0     72.0
                152          UD     .230

                153          KK     DP87
                154          KM    DESIGN POINT 87 COMBINE RUNOFF FROM SUB-BASIN SC3-15, RT-12 AND RT-11
                155          HC       3

                156          KK    RT-13
                157          KM    ROUTE FLOW FROM DESIGN POINT 87 TO DP 63
                158          RK     4400     .025     .035            TRAP       40        4

                159          KK   SC3-12
                160          KM    RUNOFF FROM SUB-BASIN SC3-12
                161          BA    .2380
                162          LS       0     70.6
                163          UD     .410

                164          KK     DP63
                165          KM    DESIGN POINT 63 COMBINE RUNOFF FROM SUB-BASIN SC3-12 AND RT-13
                166          HC       2
1
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              LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

                167          KK    RT-17
                168          KM    ROUTE FLOW FROM DESIGN POINT 63 TO DP 60
                169          RK     4390     .015     .035            TRAP       10        4

                170          KK     SB68
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171          KM   RUNOFF FROM SUB-BASIN 68
172          BA   .2200
173          LS      0      75
174          UD    .390

175          KK   RT-14
176          KM   ROUTE FLOW FROM SUB-BASIN 68 TO DESIGN POINT 67
177          RK    3300    .020    .035            TRAP      20       4

178          KK  SC3-14
179          KM   RUNOFF FROM SUB-BASIN SC3-14
180          BA   .3150
181          LS      0    70.0
182          UD    .410

183          KK    DP67
184          KM   DESIGN POINT 67 COMBINE RUNOFF FROM SUB-BASIN SC3-14 AND RT-14
185          HC       2

186          KK   RT-15
187          KM   ROUTE FLOW FROM DP 67 TO DESIGN POINT 64
188          RK    2500    .035    .035            TRAP      20       6

189          KK  SC3-13
190          KM   RUNOFF FROM SUB-BASIN SC3-13
191          BA   .2550
192          LS      0    81.4
193          UD    .390

194          KK    DP64
195          KM   DESIGN POINT 64 COMBINE RUNOFF FROM SUB-BASIN SC3-13 AND RT-15
196          HC       2

197          KK   RT-16
198          KM   ROUTE FLOW FROM DP 64 TO DESIGN POINT 60
199          RK    4010    .018    .035            TRAP      20      10

200          KK   SC3-9
201          KM   RUNOFF FROM SUB-BASIN SC3-9
202          BA   .2360
203          LS      0    75.5
204          UD    .320

205          KK    DP60
206          KM   DESIGN POINT 60 COMBINE RUNOFF FROM SUB-BASIN SC3-9, RT-17 AND RT-16
207          HC       3
1
PAGE  6                                  HEC-1 INPUT

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

208          KK   RT-18
209          KM   ROUTE FLOW FROM DP 60 TO DESIGN POINT 53
210          RK    2690    .015    .035            TRAP      10       4

211          KK   SC3-2
212          KM   RUNOFF FROM SUB-BASIN SC3-2
213          BA   .1920
214          LS      0    76.1
215          UD    .310

216          KK  SC3-11
217          KM   RUNOFF FROM SUB-BASIN SC3-11
218          BA   .2750
219          LS      0    80.8
220          UD    .430

221          KK   RT-19
222          KM   ROUTE FLOW FROM SUB-BASIN SC3-11 TO DESIGN POINT 55
223          RK    2600    .022    .035            TRAP      10       6
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224          KK  SC3-10
225          KM   RUNOFF FROM SUB-BASIN SC3-10
226          BA   .1130
227          LS       0    75.0
228          UD    .290

229          KK    DP55
230          KM   DESIGN POINT 55 COMBINE RUNOFF FROM SUB-BASIN SC3-10 AND RT-19
231          HC       2

232          KK   RT-20
233          KM   ROUTE FLOW FROM DESIGN POINT 55 TO DESIGN POINT 56
234          RK    3670    .012    .035            TRAP      10      10

235          KK   SC3-1
236          KM   RUNOFF FROM SUB-BASIN SC3-1
237          BA   .1290
238          LS       0    80.0
239          UD    .320

240          KK    DP56
241          KM   DESIGN POINT 56 COMBINE RUNOFF FROM SUB-BASIN SC3-1 AND RT-20
242          HC       2

243          KK    DB95
244          KM        ROUTE FLOW FROM DP 56 THROUGH DBPS STRUCTURE 95
245          RS       1    ELEV     100
246          SV       0      20      34      39      42      50
247          SQ       0      10      20      30      40      43
248          SE     100     104     107     108     109     110
1
PAGE   7                                  HEC-1 INPUT

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

249          KK   RT-21
250          KM   ROUTE FLOW FROM DETENTION BASIN DB95 TO DESIGN POINT 53
251          RK     870    .023    .035            TRAP      10      10

252          KK    DP53
253          KM   DESIGN POINT 53 COMBINE RUNOFF FROM SUB-BASIN SC3-2, RT-21 AND RT-18
254          HC       3

255          KK    DB94
256          KM        ROUTE FLOW FROM DP 53 THROUGH DBPS STRUCTURE 94
257          RS       1    ELEV     100
258          SV       0      30      40      60      80     120     130
259          SQ       0      80      90     300     800    1750    2000
260          SE     100     104     105     107     108     109     110

261          KK   RT-27
262          KM   ROUTE FLOW FROM DETETNION BASIN DB94 TO DESIGN POINT 50
263          RK    1380    .022    .035            TRAP      10      10

264          KK  SC2-24
265          KM   RUNOFF FROM SUB-BASIN SC2-24
266          BA   .0660
267          LS       0    90.7
268          UD    .190

269          KK   RT-29
270          KM   ROUTE FLOW FROM SUB-BASIN SC2-24 TO DESIGN POINT 50
271          RK     330    .020    .013            CIRC       4

272          KK  SC2-27
273          KM   RUNOFF FROM SUB-BASIN SC2-27
274          BA   .0780
275          LS       0    92.0
276          UD    .210
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277          KK    DP50
278          KM   DESIGN POINT 50 COMBINE RUNOFF FROM SC2-27, RT-27 AND RT-29
279          HC       3

280          KK   RT-31
281          KM   ROUTE FLOW FROM DESIGN POINT 50 TO DESIGN POINT 49
282          RK     940     .020     .035            TRAP       40        6

283          KK   SC3-8
284          KM   RUNOFF FROM SUB-BASIN SC3-8
285          BA   .2420
286          LS       0     67.0
287          UD    .290
1                                        HEC-1 INPUT
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          LINE       ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

288          KK   RT-25
289          KM   ROUTE FLOW FROM SUB-BASIN SC3-8 TO DESIGN POINT 51
290          RK    2690     .015     .035            TRAP       20        6

291          KK   SC3-3
292          KM   RUNOFF FROM SUB-BASIN SC3-3
293          BA   .1270
294          LS       0     88.5
295          UD    .280

296          KK    DP51
297          KM   DESIGN POINT 51 COMBINE RUNOFF FROM SC3-3 AND RT-25
298          HC       2

299          KK    DB93
300          KM        ROUTE FLOW FROM DP 51 THROUGH DBPS STRUCTURE 93
301          RS       1     ELEV      100
302          SV       0       10       20       30
303          SQ       0       20      100      290
304          SE     100      104      106      108

305          KK   RT-30
306          KM   ROUTE FLOW FROM DETENTION BASIN DB93 TO DESIGN POINT 49
307          RK    1590     .019     .035            TRAP       20       10

308          KK    DP49
309          KM   DESIGN POINT 49 COMBINE RUNOFF FROM RT-31 AND RT-30
310          HC       2

311          KK   RT-32
312          KM   ROUTE FLOW FROM DESIGN POINT 49 TO DESIGN POINT 48
313          RK    4930     .017     .035            TRAP       40        6

314          KK   SC3-6
315          KM   RUNOFF FROM SUB-BASIN SC3-6
316          BA   .2420
317          LS       0     70.0
318          UD    .310

319          KK   RT-23
320          KM   ROUTE FLOW FROM SUB-BASIN SC3-6 TO DESIGN POINT 54
321          RK    1830     .023     .035            TRAP       10       10

322          KK   SC3-5
323          KM   RUNOFF FROM SUB-BASIN SC3-5
324          BA   .1150
325          LS       0     88.7
326          UD    .280
1                                        HEC-1 INPUT
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 327      KK   RT-24
 328      KM   ROUTE FLOW FROM SUB-BASIN SC3-5 TO DESIGN POINT 54
 329      RK    1760    .041    .035            TRAP      10       4

 330      KK   SC3-7
 331      KM   RUNOFF FROM SUB-BASIN SC3-7
 332      BA   .5380
 333      LS       0    81.5
 334      UD    .530

 335      KK   RT-22
 336      KM   ROUTE FLOW FROM SUB-BASIN SC3-7 TO DESIGN POINT 54
 337      RK    2860    .021    .035            TRAP      30       6

 338      KK   SC3-4
 339      KM   RUNOFF FROM SUB-BASIN SC3-4
 340      BA   .3210
 341      LS       0    81.9
 342      UD    .330

 343      KK    DP54
 344      KM   DESIGN POINT 54 COMBINE RUNOFF FROM SUB-BASIN SC3-4, RT-22, RT-23 AND RT-24
 345      HC       4

 346      KK    DB92
 347      KM        ROUTE FLOW FROM DP 54 THROUGH DBPS STRUCTURE 92
 348      RS      1    ELEV     100
 349      SV      0      40      60      90     110     120     130
 350      SQ      0      40      60      82      90      91      95
 351      SE    100     104     105     106     108     109     110

 352      KK   RT-26
 353      KM   ROUTE FLOW FROM DETENTION BASIN 92 TO DESIGN POINT 47
 354      RK    4680    .028    .035            TRAP      40      10

 355      KK  SC2-26
 356      KM   RUNOFF FROM SUB-BASIN SC2-26
 357      BA   .1860
 358      LS       0    74.4
 359      UD    .320

 360      KK   RT-34
 361      KM   ROUTE FLOW FROM SUB-BASIN SC2-26 TO DESIGN POINT 47
 362      RK    1620    .014    .035            TRAP       4       4

 363      KK  SC2-25
 364      KM   RUNOFF FROM SUB-BASIN SC2-25
 365      BA   .4440
 366      LS       0    73.6
 367      UD    .440
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 368      KK    DP47
 369      KM   DESIGN POINT 47 COMBINE RUNOFF FROM SUB-BASIN SC3-26 AND RT-26 AND RT-34
 370      HC       3

 371      KK   RT-33
 372      KM   ROUTE FLOW FROM DESIGN POINT 47 TO DESIGN POINT 48
 373      RK     510    .020    .035            TRAP       6       4

 374      KK  SC2-28
 375      KM   RUNOFF FROM SUB-BASIN SC2-28
 376      BA   .2740
 377      LS       0    67.1
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 378          UD    .510

 379          KK  SC2-21
 380          KM   RUNOFF FROM SUB-BASIN SC2-21
 381          BA   .1930
 382          LS       0    79.0
 383          UD    .390

 384          KK    DP48
 385          KM   DESIGN POINT 48 COMBINE RUNOFF FROM SB'S SC2-21 AND SC2-28, RT-33 AND RT-32
 386          HC       4

 387          KK   RT-37
 388          KM   ROUTE FLOW FROM DESIGN POINT 48 TO DESIGN POINT 42
 389          RK    1080    .022    .035            TRAP      60       6

 390          KK  SC2-23
 391          KM   RUNOFF FROM SUB-BASIN SC2-23
 392          BA   .1960
 393          LS       0    70.0
 394          UD    .330

 395          KK   RT-35
 396          KM   ROUTE FLOW FROM SUB-BASIN SC2-23 TO DESIGN POINT 46
 397          RK    1180    .015    .013            CIRC       5

 398          KK  SC2-22
 399          KM   RUNOFF FROM SUB-BASIN SC2-22
 400          BA   .0810
 401          LS       0    79.0
 402          UD    .220

 403          KK    DP46
 404          KM   DESIGN POINT 46 COMBINE RUNOFF FROM SUB-BASIN SC2-22 AND RT-35
 405          HC       2

 406          KK   RT-36
 407          KM   ROUTE FLOW FROM DESIGN POINT 46 TO DESIGN POINT 42
 408          RK    1790    .017    .013            TRAP      30       4
1
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          LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 409          KK    DP42
 410          KM   DESIGN POINT 42 COMBINE RUNOFF FROM RT- 37 AND RT-36
 411          HC       2

 412          KK   RT-38
 413          KM   ROUTE FLOW FROM DESIGN POINT 42 TO DESIGN POINT 85
 414          RK    1790    .013    .035            TRAP      60       6

 415          KK  SC2-20
 416          KM   RUNOFF FROM SUB-BASIN SC2-20
 417          BA   .3240
 418          LS       0    79.0
 419          UD    .380

 420          KK   RT-41
 421          KM   ROUTE FLOW FROM SUB-BASIN SC2-20 TO DESIGN POINT 85
 422          RK    1560    .020    .013            CIRC     6.5

 423          KK  SC2-15
 424          KM   RUNOFF FROM SUB-BASIN SC2-15
 425          BA   .1810
 426          LS       0    79.0
 427          UD    .240

 428          KK   RT-39
 429          KM   ROUTE FLOW FROM SUB-BASIN SC2-15 TO DESIGN POINT 85
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 430          RK     990    .022    .013            CIRC     6.5

 431          KK  SC2-13
 432          KM   RUNOFF FROM SUB-BASIN SC2-13
 433          BA   .1630
 434          LS       0    79.0
 435          UD    .280

 436          KK   RT-40
 437          KM   ROUTE FLOW FROM SUB-BASIN SC2-13 TO DESIGN POINT 85
 438          RK     300    .033    .013            CIRC     5.5

 439          KK    DP85
 440          KM   DESIGN POINT 85 COMBINE RUNOFF FROM RT-41, RT-38, RT-39 AND RT-40
 441          HC       4

 442          KK   RT-42
 443          KM   ROUTE FLOW FROM DESIGN POINT 85 TO DESIGN POINT 37
 444          RK    2900    .016    .035            TRAP      60       6

 445          KK  SC2-14
 446          KM   RUNOFF FROM SUB-BASIN SC2-14
 447          BA   .2650
 448          LS       0    76.2
 449          UD    .450
1
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          LINE       ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 450          KK  SC2-16
 451          KM   RUNOFF FROM SUB-BASIN SC2-16
 452          BA   .2120
 453          LS       0    76.2
 454          UD    .310

 455          KK    DP37
 456          KM   DESIGN POINT 37 COMBINE RUNOFF FROM RT-42, SUB-BASINS SC2-14 AND SC2-16
 457          HC       3

 458          KK   RT-43
 459          KM   ROUTE FLOW FROM DESIGN POINT 37 TO DESIGN POINT 36
 460          RK    3380    .016    .035            TRAP      60       4

 461          KK  SC2-12
 462          KM   RUNOFF FROM SUB-BASIN SC2-12
 463          BA   .1790
 464          LS       0    70.6
 465          UD    .280

 466          KK   RT-46
 467          KM   ROUTE FLOW FROM SUB-BASIN SC2-12 TO DESIGN POINT 33
 468          RK    2280    .024    .035            TRAP      20       4

 469          KK   SC2-8
 470          KM   RUNOFF FROM SUB-BASIN SC2-8
 471          BA   .3480
 472          LS       0    79.0
 473          UD    .440

 474          KK    DP33
 475          KM   DESIGN POINT 33 COMBINE RUNOFF FROM RT-46 AND SUB-BASIN SC2-8
 476          HC       2

 477          KK   RT-45
 478          KM   ROUTE FLOW FROM DESIGN POINT 33 TO DESIGN POINT 36
 479          RK     850    .021    .035            TRAP      20       4

 480          KK    DP36
 481          KM   DESIGN POINT 36 COMBINE RUNOFF FROM RT-45 AND RT-43
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482          HC       2

483          KK   RT-44
484          KM   ROUTE FLOW FROM DESIGN POINT 36 TO DESIGN POINT 35
485          RK    1740    .016    .035            TRAP      60       4

486          KK  SC2-11
487          KM   RUNOFF FROM SUB-BASIN SC2-11
488          BA   .2100
489          LS      0    79.0
490          UD    .240
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HEC-1 INPUT

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

491          KK   RT-52
492          KM   ROUTE FLOW FROM SUB-BASIN SC2-11 TO DESIGN POINT 39
493          RK    2680    .008    .035            TRAP      30       4

494          KK  SC2-19
495          KM   RUNOFF FROM SUB-BASIN SC2-19
496          BA   .1820
497          LS      0    86.0
498          UD    .300

499          KK   RT-51
500          KM   ROUTE FLOW FROM SUB-BASIN SC2-19 TO DESIGN POINT 39
501          RK    3100    .022    .013            CIRC       6

502          KK  SC2-18
503          KM   RUNOFF FROM SUB-BASIN SC2-18
504          BA   .1980
505          LS      0    88.0
506          UD    .290

507          KK    DP39
508          KM   DESIGN POINT 39 COMBINE RUNOFF FROM RT-52, RT-51 AND SUB-BASIN SC2-18
509          HC       3

510          KK   RT-49
511          KM   ROUTE FLOW FROM DESIGN POINT 39 TO DESIGN POINT 34
512          RK    1160    .024    .035            TRAP      20       4

513          KK  SC2-17
514          KM   RUNOFF FROM SUB-BASIN SC2-17
515          BA   .1600
516          LS      0    79.0
517          UD    .320

518          KK   RT-50
519          KM   ROUTE FLOW FROM SUB-BASIN SC2-17 TO DESIGN POINT 34
520          RK    1840    .025    .035            TRAP      20       4

521          KK  SC2-29
522          KM   RUNOFF FROM SUB-BASIN SC2-29
523          BA   .1510
524          LS      0    88.0
525          UD    .210

526          KK    DP34
527          KM   DESIGN POINT 34 COMBINE RUNOFF FROM RT-49, RT-50 AND SUB-BASIN SC2-29
528          HC       3

529          KK   RT-48
530          KM   ROUTE FLOW FROM DESIGN POINT 34 TO DESIGN POINT 32
531          RK    1470    .020     .04            TRAP      20       4
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HEC-1 INPUT

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

 532      KK  SC2-10
 533      KM   RUNOFF FROM SUB-BASIN SC2-10
 534      BA   .3290
 535      LS       0    78.4
 536      UD    .390

 537      KK    DP32
 538      KM   DESIGN POINT 32 COMBINE RUNOFF FROM RT-48 AND SUB-BASIN SC2-10
 539      HC       2

 540      KK   RT-47
 541      KM   ROUTE FLOW FROM SUB-BASIN DESIGN POINT 32 TO DESIGN POINT 35
 542      RK     991    .028    .031            TRAP      20       4

 543      KK   SC2-9
 544      KM   RUNOFF FROM SUB-BASIN SC2-9
 545      BA   .2060
 546      LS       0    73.0
 547      UD    .520

 548      KK    DP35
 549      KM   DESIGN POINT 35 COMBINE RUNOFF FROM RT-47, RT-44 AND SUB-BASIN SC2-9
 550      HC       3

 551      KK   RT-53
 552      KM   ROUTE FLOW FROM DESIGN POINT 35 TO DESIGN POINT 29
 553      RK    1120    .020    .035            TRAP      60       6

 554      KK   SC2-7
 555      KM   RUNOFF FROM SUB-BASIN SC2-7
 556      BA   .1440
 557      LS       0    79.0
 558      UD    .320

 559      KK    DP29
 560      KM   DESIGN POINT 29 COMBINE RUNOFF FROM RT-53 AND SUB-BASIN SC2-7
 561      HC       2

 562      KK   RT-54
 563      KM   ROUTE FLOW FROM DESIGN POINT 29 TO DESIGN POINT 28
 564      RK    1560    .011    .035            TRAP      60       4

 565      KK   SC2-6
 566      KM   RUNOFF FROM SUB-BASIN SC2-6
 567      BA   .1500
 568      LS       0    81.6
 569      UD    .240

 570      KK   RT-55
 571      KM   ROUTE FLOW FROM SUB-BASIN SC2-6 TO DESIGN POINT 28
 572      RD     950    .020    .035            TRAP      10       4
1
                                HEC-1 INPUT
PAGE 15

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

 573      KK   SC2-2
 574      KM   RUNOFF FROM SUB-BASIN SC2-2
 575      BA   .1670
 576      LS       0    80.8
 577      UD    .280

 578      KK    DP28
 579      KM   DESIGN POINT 28 COMBINE RUNOFF FROM RT-54, RT-55 AND SUB-BASIN SC2-2
 580      HC       3

 581      KK   RT-56
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582          KM   ROUTE FLOW FROM DESIGN POINT 28 TO DESIGN POINT 21
583          RK    1280     .017     .035            TRAP       60        4

584          KK   SC2-5
585          KM   RUNOFF FROM SUB-BASIN SC2-5
586          BA   .1610
587          LS       0     92.0
588          UD    .280

589          KK   RT-58
590          KM   ROUTE FLOW FROM SUB-BASIN SC2-5 TO DESIGN POINT 21
591          RK    1670     .027     .024            CIRC       5

592          KK   SC2-0
593          KM   RUNOFF FROM SUB-BASIN SC2-0
594          BA   .1500
595          LS       0     73.4
596          UD    .320

597          KK   RT-57
598          KM   ROUTE FLOW FROM SUB-BASIN SC2-0 TO DESIGN POINT 21
599          RK     800     .032     .035            TRAP       10        4

600          KK    DP21
601          KM   DESIGN POINT 21 COMBINE RUNOFF FROM RT-58, RT-56 AND RT- 57
602          HC       3

603          KK   RT-59
604          KM   ROUTE FLOW FROM DESIGN POINT 21 TO DESIGN POINT 20
605          RK     830     .01      .035            TRAP       80        4

606          KK   SC2-4
607          KM   RUNOFF FROM SUB-BASIN SC2-4
608          BA   .2850
609          LS       0     92.0
610          UD    .320

611          KK   RT-61
612          KM   ROUTE FLOW FROM SUB-BASIN SC2-4 TO DESIGN POINT 22
613          RK    1670     .019     .035            TRAP       20        3
1
PAGE 16                                  HEC-1 INPUT

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

614          KK   SC2-3
615          KM   RUNOFF FROM SUB-BASIN SC2-3
616          BA   .0710
617          LS       0     92.0
618          UD    .210

619          KK    DP22
620          KM   DESIGN POINT 22 COMBINE RUNOFF FROM RT-61 AND SC2-3
621          HC       2

622          KK   RT-60
623          KM   ROUTE FLOW FROM DESIGN POINT 22 TO DESIGN POINT 20
624          RK    1010     .018     .035            TRAP       20        3

625          KK   SC2-1
626          KM   RUNOFF FROM SUB-BASIN SC2-1
627          BA   .1850
628          LS       0     80.0
629          UD    .290

630          KK    DP20
631          KM   DESIGN POINT 20 COMBINE RUNOFF FROM RT-60, RT-59 AND SB SC2-1
632          HC       3

633          KK   DBSC2
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634          KM        ROUTE FLOW FROM DP 20 THROUGH SAND CREEK DETENTION BASIN DBSC2
635          RS       1    ELEV  6496.5
636          SV       0    6.75    29.8    58.8    92.2   129.4   168.6   209.8   255.0   302.2
637          SQ       0      10      30     100     400     800    2000    4300    5000    7000
638          SE  6496.5    6498    6500    6502    6504    6506    6508    6510    6512    6514

639          KK   RT-63
640          KM   ROUTE FLOW FROM DETENTION BASIN SC2 TO DESIGN POINT 18
641          RK    1290    .007    .035            TRAP     100       3

642          KK  SC1-10
643          KM   RUNOFF FROM SUB-BASIN SC1-10
644          BA   .2880
645          LS      0    78.2
646          UD    .390

647          KK    DP18
648          KM   DESIGN POINT 18 COMBINE RUNOFF FROM RT-63 AND SUB-BASIN SC1-10
649          HC       2

650          KK   RT-66
651          KM   ROUTE FLOW FROM DESIGN POINT 18 TO DESIGN POINT 17
652          RK     320    .007    .035            TRAP     100       3
1
PAGE 17                                    HEC-1 INPUT

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

653          KK  SC1-13
654          KM   RUNOFF FROM SUB-BASIN SC1-13
655          BA   .1300
656          LS      0    87.3
657          UD    .270

658          KK   RT-64
659          KM   ROUTE FLOW FROM SUB-BASIN SC1-13 TO DESIGN POINT 19
660          RK    1970    .026    .013            CIRC     4.5

661          KK  SC1-14
662          KM   RUNOFF FROM SUB-BASIN SC1-14
663          BA   .1100
664          LS      0    92.0
665          UD    .280

666          KK    DP19
667          KM   DESIGN POINT 19 COMBINE RUNOFF FROM RT-64 AND SUB-BASIN SC1-14
668          HC       2

669          KK   RT-65
670          KM   ROUTE FLOW FROM DESIGN POINT 19 TO DESIGN POINT 17
671          RK     700    .022    .013            TRAP      10      .1

672          KK    DP17
673          KM   DESIGN POINT 17 COMBINE RUNOFF FROM RT-65 AND RT-66
674          HC       2

675          KK   RT-67
676          KM   ROUTE FLOW FROM DESIGN POINT 17 TO DESIGN POINT 13
677          RK     910    .007    .035            TRAP     100       3

678          KK   SC1-9
679          KM   RUNOFF FROM SUB-BASIN SC1-9
680          BA   .2400
681          LS      0    76.9
682          UD    .240

683          KK  DBSR29
684          KM        ROUTE FLOW FROM SB SC1-9 THROUGH SPRINGS RANCH DETENTION BASIN DBSR29
685          RS       1    ELEV     100
686          SV       0     .03    0.47    1.20    2.60    6.70     8.8    10.7
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687          SQ       0      .2      7.8      22       40       73       97      113
688          SE     100   100.5   101.5   102.5    103.5    104.5    105.5   106.5

689          KK   RT-70
690          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR29 TO DESIGN POINT 14
691          RD    2750    .013    .013            CIRC      5.5
1                                        HEC-1 INPUT
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          LINE       ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

692          KK   SC1-8
693          KM   RUNOFF FROM SUB-BASIN SC1-8
694          BA   .2100
695          LS       0    79.5
696          UD    .320

697          KK   RT-71
698          KM   ROUTE FLOW FROM SUB-BASIN SC1-8 TO DESIGN POINT 14
699          RK     600    .010    .013            CIRC        5

700          KK    DP14
701          KM   DESIGN POINT 14 COMBINE RUNOFF FROM RT-71 AND RT-70
702          HC       2

703          KK   RT-69
704          KM   ROUTE FLOW FROM DESIGN POINT 14 TO DESIGN POINT 12
705          RK    1550    .015    .013            TRAP        7       .1

706          KK   SC1-7
707          KM   RUNOFF FROM SUB-BASIN SC1-7
708          BA   .0960
709          LS       0    80.1
710          UD    .230

711          KK    DP12
712          KM   DESIGN POINT 12 COMBINE RUNOFF FROM SUB-BASIN SC1-7 AND RT-69
713          HC       2

714          KK   RT-68
715          KM   ROUTE FLOW FROM DESIGN POINT 12 TO DESIGN POINT 13
716          RK     390    .025    .013            TRAP        7       .1

717          KK    DP13
718          KM   DESIGN POINT 13 COMBINE RUNOFF FROM RT-67 AND RT-68
719          HC       2

720          KK   RT-72
721          KM   ROUTE FLOW FROM DESIGN POINT 13 TO DESIGN POINT 10
722          RK    1150    .007     .04            TRAP      100        3

723          KK   SC1-6
724          KM   RUNOFF FROM SUB-BASIN SC1-6
725          BA   .1590
726          LS       0    80.6
727          UD    .220

728          KK  DBSR15
729          KM        ROUTE FLOW FROM SB SC1-6 THROUGH SPRINGS RANCH DETENTION BASIN DBSR15
730          RS       1    ELEV     100
731          SV       0    1.50    3.80    6.50    9.70   13.80
732          SQ       0      80     125     150     180     210
733          SE     100     102     104     106     108     110
1                                        HEC-1 INPUT
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          LINE       ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

734          KK   RT-74
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735          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR15 TO DESIGN POINT 11
736          RK    2080     .021     .013            CIRC     3.5

737          KK   SC1-5
738          KM   RUNOFF FROM SUB-BASIN SC1-5
739          BA   .1730
740          LS       0    79.0
741          UD    .310

742          KK    DP11
743          KM   DESIGN POINT 11 COMBINE RUNOFF FROM SUB-BASIN SC1-5 AND RT-74
744          HC       2

745          KK   RT-73
746          KM   ROUTE FLOW FROM DESIGN POINT 11 TO DESIGN POINT 10
747          RK     580     .024     .013            CIRC     3.5

748          KK    DP10
749          KM   DESIGN POINT 10 COMBINE RUNOFF FROM RT-72 AND RT-73
750          HC       2

751          KK   RT-75
752          KM   ROUTE FLOW FROM DESIGN POINT 10 TO DESIGN POINT 9
753          RK    2270     .007     .035            TRAP     100       3

754          KK   SC1-2
755          KM   RUNOFF FROM SUB-BASIN SC1-2
756          BA   .1360
757          LS       0    79.0
758          UD    .320

759          KK   RT-76
760          KM   ROUTE FLOW FROM SUB-BASIN SC1-2 TO DESIGN POINT 9
761          RD     500     .039     .013            CIRC       3

762          KK     DP9
763          KM   DESIGN POINT 9 COMBINE RUNOFF FROM RT-75 AND RT-76
764          HC       2

765          KK   RT-78
766          KM   ROUTE FLOW FROM DESIGN POINT 9 TO DESIGN POINT 4
767          RK    1530     .007     .035            TRAP     100       3

768          KK  SC1-12
769          KM   RUNOFF FROM SUB-BASIN SC1-12
770          BA   .2480
771          LS       0    84.0
772          UD    .370
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

773          KK   RT-81
774          KM   ROUTE FLOW FROM SUB-BASIN SC1-12 TO DESIGN POINT 8
775          RK    1400     .008     .035            TRAP      30       4

776          KK  SC1-11
777          KM   RUNOFF FROM SUB-BASIN SC1-11
778          BA   .1600
779          LS       0    92.0
780          UD    .290

781          KK     DP8
782          KM   DESIGN POINT 8 COMBINE RUNOFF FROM SUB-BASIN SC1-11 AND RT-81
783          HC       2

784          KK   RT-77
785          KM   ROUTE FLOW FROM DESIGN POINT 8 TO DESIGN POINT 4
786          RK    3100     .007     .035            TRAP     100       3
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787          KK   SC1-4
788          KM   RUNOFF FROM SUB-BASIN SC1-4
789          BA   .1010
790          LS      0    92.0
791          UD    .270

792          KK   RT-80
793          KM   ROUTE FLOW FROM SUB-BASIN SC1-4 TO DESIGN POINT 4
794          RK     720    .014    .013            CIRC       5

795          KK   SC1-1
796          KM   RUNOFF FROM SUB-BASIN SC1-1
797          BA   .1090
798          LS      0    79.0
799          UD    .280

800          KK   RT-79
801          KM   ROUTE FLOW FROM SUB-BASIN SC1-1 TO DESIGN POINT 4
802          RK    1115    .027    .013            CIRC       3

803          KK   SC1-3
804          KM   RUNOFF FROM SUB-BASIN SC1-3
805          BA   .3530
806          LS      0    65.0
807          UD    .460

808          KK     DP4
809          KM   DESIGN POINT 4 COMBINE RUNOFF FROM SB SC1-3, RT-80, RT-77, RT-78 AND RT-79
810          HC      5

811          KK   DBSC1
812          KM        ROUTE FLOW FROM DP 4 THROUGH SAND CREEK DETENTION BASIN DBSC1
813          KO      0
814          RS      1    ELEV    6393
815          SV      0    3.06   14.95   31.12   53.59   69.95   86.31   106.5   126.7   150.4
816          SV  174.1   200.4   226.7   254.9   283.2   313.4   343.6   375.2   406.8   439.5
1                                          HEC-1 INPUT
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          LINE       ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

817          SQ      0       3       5     189     954    1465    2055    2431    2755    3045
818          SQ   3310    3555    3785    4037    5518    7863   10797   14211   18042   22245
819          SE   6393    6394    6396    6398    6400    6401    6402    6403    6404    6405
820          SE   6406    6407    6408    6409    6410    6411    6412    6413    6414    6415
821          ZZ
1
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OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2
					.68	1.00
HYDROGRAPH AT						
+	SB82	.19	1	FLOW	84.	232.
				TIME	6.50	6.50
ROUTED TO						
+	RT-4	.19	1	FLOW	83.	220.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SB74	.18	1	FLOW	49.	143.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP74	.37	1	FLOW	122.	345.
				TIME	6.58	6.58

ROUTED TO						
+	RT-3	.37	1	FLOW	119.	331.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SB80	.22	1	FLOW	68.	190.
				TIME	6.67	6.67
ROUTED TO						
+	RT-2	.22	1	FLOW	67.	185.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB81	.39	1	FLOW	100.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-1	.39	1	FLOW	99.	296.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB73	.12	1	FLOW	31.	90.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB75	.12	1	FLOW	25.	72.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB76	.17	1	FLOW	35.	105.
				TIME	6.83	6.75
6 COMBINED AT						
+	DP75	1.39	1	FLOW	364.	1022.
				TIME	6.75	6.75
ROUTED TO						
+	RT-5	1.39	1	FLOW	345.	1021.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB79	.29	1	FLOW	111.	306.
				TIME	6.58	6.58
ROUTED TO						
+	RT-7	.29	1	FLOW	107.	281.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SB78	.88	1	FLOW	259.	738.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP78	1.17	1	FLOW	367.	1020.
				TIME	6.67	6.67
ROUTED TO						
+	RT-6	1.17	1	FLOW	351.	993.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB77	.25	1	FLOW	61.	177.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB88	.10	1	FLOW	34.	97.
				TIME	6.58	6.58
4 COMBINED AT						
+	DP77	2.91	1	FLOW	780.	2207.
				TIME	6.75	6.67

ROUTED TO						
+	RT-8	2.91	1	FLOW	761.	2201.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB71	.36	1	FLOW	127.	334.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP71	3.27	1	FLOW	861.	2508.
				TIME	6.83	6.75
ROUTED TO						
+	RT-9	3.27	1	FLOW	842.	2445.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB70	.31	1	FLOW	99.	256.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP70	3.58	1	FLOW	931.	2701.
				TIME	6.83	6.75
ROUTED TO						
+	RT-11	3.58	1	FLOW	905.	2653.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB72	.25	1	FLOW	135.	321.
				TIME	6.58	6.50
ROUTED TO						
+	RT-10	.25	1	FLOW	128.	321.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SB69	.25	1	FLOW	93.	216.
				TIME	6.83	6.83
2 COMBINED AT						
+	DP69	.50	1	FLOW	191.	453.
				TIME	6.67	6.58
ROUTED TO						
+	RT-12	.50	1	FLOW	187.	446.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-15	.07	1	FLOW	35.	87.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP87	4.15	1	FLOW	1068.	3104.
				TIME	6.83	6.75
ROUTED TO						
+	RT-13	4.15	1	FLOW	1048.	3020.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-12	.24	1	FLOW	70.	183.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP63	4.39	1	FLOW	1111.	3198.
				TIME	6.92	6.83
ROUTED TO						
+	RT-17	4.39	1	FLOW	1083.	3152.

				TIME	7.00	6.83
HYDROGRAPH AT						
+	SB68	.22	1	FLOW	97.	222.
				TIME	6.75	6.75
ROUTED TO						
+	RT-14	.22	1	FLOW	95.	220.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-14	.31	1	FLOW	88.	234.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP67	.53	1	FLOW	183.	448.
				TIME	6.83	6.83
ROUTED TO						
+	RT-15	.53	1	FLOW	178.	446.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-13	.25	1	FLOW	174.	346.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP64	.79	1	FLOW	338.	763.
				TIME	6.83	6.75
ROUTED TO						
+	RT-16	.79	1	FLOW	332.	758.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-9	.24	1	FLOW	123.	279.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP60	5.42	1	FLOW	1462.	4126.
				TIME	6.92	6.83
ROUTED TO						
+	RT-18	5.42	1	FLOW	1456.	4013.
				TIME	7.00	6.92
HYDROGRAPH AT						
+	SC3-2	.19	1	FLOW	108.	239.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-11	.28	1	FLOW	167.	341.
				TIME	6.75	6.75
ROUTED TO						
+	RT-19	.28	1	FLOW	166.	336.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-10	.11	1	FLOW	61.	138.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP55	.39	1	FLOW	211.	448.
				TIME	6.75	6.75
ROUTED TO						
+	RT-20	.39	1	FLOW	209.	445.
				TIME	6.92	6.83
HYDROGRAPH AT						

+	SC3-1	.13	1	FLOW	92.	187.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP56	.52	1	FLOW	274.	586.
				TIME	6.83	6.83
ROUTED TO						
+	DB95	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
			** PEAK STAGES IN FEET **			
			1	STAGE	105.02	109.39
				TIME	11.42	11.00
ROUTED TO						
+	RT-21	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
3 COMBINED AT						
+	DP53	6.13	1	FLOW	1500.	4163.
				TIME	7.00	6.83
ROUTED TO						
+	DB94	6.13	1	FLOW	440.	1908.
				TIME	10.75	7.25
			** PEAK STAGES IN FEET **			
			1	STAGE	107.28	109.63
				TIME	10.75	7.25
ROUTED TO						
+	RT-27	6.13	1	FLOW	438.	1895.
				TIME	10.75	7.25
HYDROGRAPH AT						
+	SC2-24	.07	1	FLOW	105.	172.
				TIME	6.58	6.50
ROUTED TO						
+	RT-29	.07	1	FLOW	105.	172.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-27	.08	1	FLOW	128.	207.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP50	6.27	1	FLOW	442.	1922.
				TIME	10.75	7.25
ROUTED TO						
+	RT-31	6.27	1	FLOW	440.	1920.
				TIME	10.83	7.33
HYDROGRAPH AT						
+	SC3-8	.24	1	FLOW	66.	192.
				TIME	6.67	6.67
ROUTED TO						
+	RT-25	.24	1	FLOW	63.	190.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-3	.13	1	FLOW	155.	270.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP51	.37	1	FLOW	198.	437.
				TIME	6.67	6.67

ROUTED TO						
+	DB93	.37	1	FLOW	25.	77.
				TIME	10.50	7.17
			** PEAK STAGES IN FEET **			
			1	STAGE	104.11	105.42
				TIME	10.50	7.17
ROUTED TO						
+	RT-30	.37	1	FLOW	25.	77.
				TIME	10.58	7.25
2 COMBINED AT						
+	DP49	6.64	1	FLOW	464.	1996.
				TIME	10.83	7.33
ROUTED TO						
+	RT-32	6.64	1	FLOW	463.	1988.
				TIME	10.92	7.33
HYDROGRAPH AT						
+	SC3-6	.24	1	FLOW	83.	219.
				TIME	6.67	6.67
ROUTED TO						
+	RT-23	.24	1	FLOW	82.	213.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-5	.12	1	FLOW	142.	247.
				TIME	6.67	6.58
ROUTED TO						
+	RT-24	.12	1	FLOW	142.	243.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-7	.54	1	FLOW	290.	589.
				TIME	6.83	6.83
ROUTED TO						
+	RT-22	.54	1	FLOW	290.	585.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC3-4	.32	1	FLOW	252.	496.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP54	1.22	1	FLOW	681.	1393.
				TIME	6.75	6.75
ROUTED TO						
+	DB92	1.22	1	FLOW	54.	89.
				TIME	10.92	10.92
			** PEAK STAGES IN FEET **			
			1	STAGE	104.72	107.66
				TIME	10.92	10.92
ROUTED TO						
+	RT-26	1.22	1	FLOW	54.	89.
				TIME	11.08	11.08
HYDROGRAPH AT						
+	SC2-26	.19	1	FLOW	89.	208.
				TIME	6.67	6.67
ROUTED TO						
+	RT-34	.19	1	FLOW	88.	202.
				TIME	6.75	6.75

HYDROGRAPH AT						
+	SC2-25	.44	1	FLOW	159.	378.
				TIME	6.83	6.83
3 COMBINED AT						
+	DP47	1.85	1	FLOW	244.	584.
				TIME	6.75	6.75
ROUTED TO						
+	RT-33	1.85	1	FLOW	242.	579.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-28	.27	1	FLOW	48.	142.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC2-21	.19	1	FLOW	113.	236.
				TIME	6.75	6.75
4 COMBINED AT						
+	DP48	8.95	1	FLOW	616.	2318.
				TIME	6.75	7.33
ROUTED TO						
+	RT-37	8.95	1	FLOW	604.	2314.
				TIME	6.75	7.33
HYDROGRAPH AT						
+	SC2-23	.20	1	FLOW	65.	169.
				TIME	6.75	6.67
ROUTED TO						
+	RT-35	.20	1	FLOW	64.	166.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC2-22	.08	1	FLOW	67.	137.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP46	.28	1	FLOW	122.	287.
				TIME	6.67	6.67
ROUTED TO						
+	RT-36	.28	1	FLOW	119.	284.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP42	9.23	1	FLOW	717.	2358.
				TIME	6.75	7.33
ROUTED TO						
+	RT-38	9.23	1	FLOW	700.	2346.
				TIME	6.83	7.33
HYDROGRAPH AT						
+	SC2-20	.32	1	FLOW	193.	401.
				TIME	6.75	6.75
ROUTED TO						
+	RT-41	.32	1	FLOW	192.	400.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC2-15	.18	1	FLOW	141.	291.
				TIME	6.58	6.58
ROUTED TO						
+	RT-39	.18	1	FLOW	138.	288.

				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-13	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
ROUTED TO						
+	RT-40	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP85	9.90	1	FLOW	1092.	2491.
				TIME	6.75	7.33
ROUTED TO						
+	RT-42	9.90	1	FLOW	1068.	2486.
				TIME	6.83	7.42
HYDROGRAPH AT						
+	SC2-14	.26	1	FLOW	114.	254.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-16	.21	1	FLOW	120.	265.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP37	10.37	1	FLOW	1275.	2818.
				TIME	6.83	6.75
ROUTED TO						
+	RT-43	10.37	1	FLOW	1268.	2756.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-12	.18	1	FLOW	71.	179.
				TIME	6.67	6.67
ROUTED TO						
+	RT-46	.18	1	FLOW	69.	171.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-8	.35	1	FLOW	184.	390.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP33	.53	1	FLOW	252.	559.
				TIME	6.75	6.75
ROUTED TO						
+	RT-45	.53	1	FLOW	247.	553.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP36	10.90	1	FLOW	1515.	3286.
				TIME	6.83	6.83
ROUTED TO						
+	RT-44	10.90	1	FLOW	1475.	3282.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-11	.21	1	FLOW	163.	338.
				TIME	6.58	6.58
ROUTED TO						
+	RT-52	.21	1	FLOW	160.	335.
				TIME	6.67	6.67
HYDROGRAPH AT						

+	SC2-19	.18	1	FLOW	191.	345.
				TIME	6.67	6.67
ROUTED TO						
+	RT-51	.18	1	FLOW	189.	343.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-18	.20	1	FLOW	234.	405.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP39	.59	1	FLOW	582.	1083.
				TIME	6.67	6.67
ROUTED TO						
+	RT-49	.59	1	FLOW	570.	1073.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-17	.16	1	FLOW	107.	222.
				TIME	6.67	6.67
ROUTED TO						
+	RT-50	.16	1	FLOW	105.	214.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-29	.15	1	FLOW	208.	358.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP34	.90	1	FLOW	846.	1587.
				TIME	6.67	6.67
ROUTED TO						
+	RT-48	.90	1	FLOW	827.	1574.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-10	.33	1	FLOW	185.	391.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP32	1.23	1	FLOW	999.	1949.
				TIME	6.67	6.67
ROUTED TO						
+	RT-47	1.23	1	FLOW	980.	1930.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-9	.21	1	FLOW	61.	150.
				TIME	6.92	6.83
3 COMBINED AT						
+	DP35	12.34	1	FLOW	2389.	5152.
				TIME	6.83	6.75
ROUTED TO						
+	RT-53	12.34	1	FLOW	2372.	5091.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-7	.14	1	FLOW	96.	200.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP29	12.48	1	FLOW	2447.	5277.
				TIME	6.83	6.75

ROUTED TO						
+	RT-54	12.48	1	FLOW	2408.	5188.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-6	.15	1	FLOW	137.	269.
				TIME	6.58	6.58
ROUTED TO						
+	RT-55	.15	1	FLOW	134.	258.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-2	.17	1	FLOW	135.	266.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP28	12.80	1	FLOW	2579.	5605.
				TIME	6.83	6.75
ROUTED TO						
+	RT-56	12.80	1	FLOW	2544.	5522.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-5	.16	1	FLOW	235.	386.
				TIME	6.58	6.58
ROUTED TO						
+	RT-58	.16	1	FLOW	231.	379.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-0	.15	1	FLOW	67.	160.
				TIME	6.67	6.67
ROUTED TO						
+	RT-57	.15	1	FLOW	66.	156.
				TIME	6.75	6.67
3 COMBINED AT						
+	DP21	13.11	1	FLOW	2754.	5996.
				TIME	6.83	6.75
ROUTED TO						
+	RT-59	13.11	1	FLOW	2724.	5924.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-4	.28	1	FLOW	393.	641.
				TIME	6.67	6.67
ROUTED TO						
+	RT-61	.28	1	FLOW	388.	637.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-3	.07	1	FLOW	117.	188.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP22	.36	1	FLOW	485.	793.
				TIME	6.67	6.67
ROUTED TO						
+	RT-60	.36	1	FLOW	483.	793.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-1	.19	1	FLOW	140.	282.
				TIME	6.67	6.67

3 COMBINED AT						
	DP20	13.65	1	FLOW	3187.	6885. IN SCH2
				TIME	6.83	6.75
ROUTED TO						
+	DBSC2	13.65	1	FLOW	1038.	4257. OUT SCH2
				TIME	7.42	7.08
			** PEAK STAGES IN FEET **			
			1	STAGE	6506.40	6509.96
				TIME	7.42	7.08
ROUTED TO						
+	RT-63	13.65	1	FLOW	1032.	4225.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-10	.29	1	FLOW	160.	339.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP18	13.94	1	FLOW	1066.	4376.
				TIME	7.42	7.08
ROUTED TO						
+	RT-66	13.94	1	FLOW	1065.	4366.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-13	.13	1	FLOW	152.	271.
				TIME	6.58	6.58
ROUTED TO						
+	RT-64	.13	1	FLOW	151.	267.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC1-14	.11	1	FLOW	160.	263.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP19	.24	1	FLOW	308.	530.
				TIME	6.58	6.58
ROUTED TO						
+	RT-65	.24	1	FLOW	308.	527.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP17	14.18	1	FLOW	1102.	4462.
				TIME	7.50	7.08
ROUTED TO						
+	RT-67	14.18	1	FLOW	1102.	4434.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-9	.24	1	FLOW	162.	352.
				TIME	6.58	6.58
ROUTED TO						
+	DBSR29	.24	1	FLOW	51.	103.
				TIME	6.92	6.92
			** PEAK STAGES IN FEET **			
			1	STAGE	103.85	105.90
				TIME	6.92	6.92
ROUTED TO						
+	RT-70	.24	1	FLOW	51.	103.

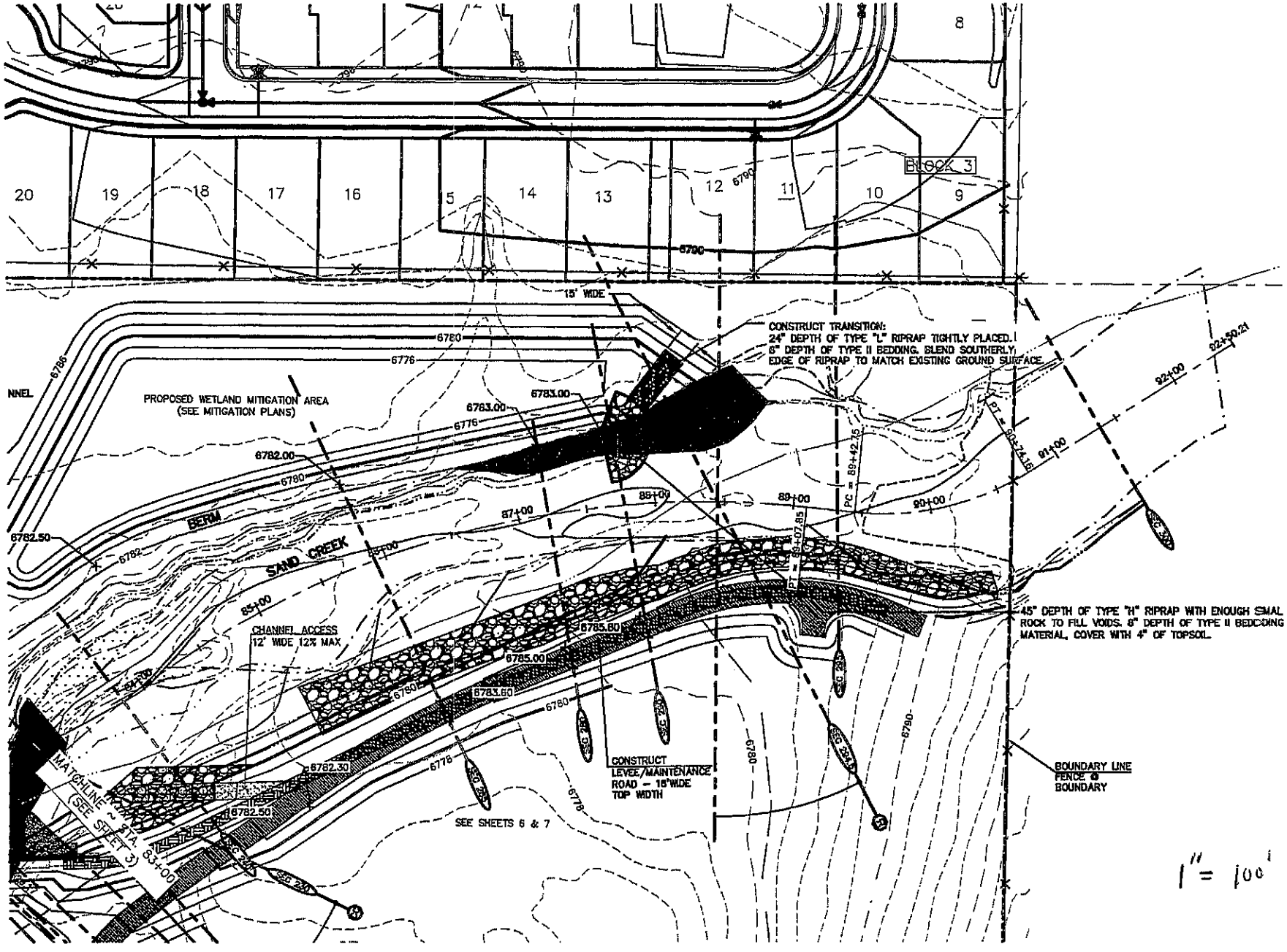
				TIME	7.00	7.00
HYDROGRAPH AT						
+	SC1-8	.21	1	FLOW	145.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-71	.21	1	FLOW	144.	297.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP14	.45	1	FLOW	183.	365.
				TIME	6.75	6.67
ROUTED TO						
+	RT-69	.45	1	FLOW	182.	363.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-7	.10	1	FLOW	83.	166.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP12	.55	1	FLOW	253.	511.
				TIME	6.67	6.67
ROUTED TO						
+	RT-68	.55	1	FLOW	252.	509.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP13	14.72	1	FLOW	1180.	4641.
				TIME	7.50	7.08
ROUTED TO						
+	RT-72	14.72	1	FLOW	1175.	4599.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-6	.16	1	FLOW	145.	286.
				TIME	6.58	6.58
ROUTED TO						
+	DBSR15	.16	1	FLOW	90.	138.
				TIME	6.75	6.83
			**	PEAK STAGES IN FEET **		
			1	STAGE	102.45	105.01
				TIME	6.75	6.83
ROUTED TO						
+	RT-74	.16	1	FLOW	89.	137.
				TIME	6.75	6.83
HYDROGRAPH AT						
+	SC1-5	.17	1	FLOW	118.	245.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP11	.33	1	FLOW	203.	374.
				TIME	6.67	6.67
ROUTED TO						
+	RT-73	.33	1	FLOW	202.	373.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP10	15.06	1	FLOW	1217.	4784.
				TIME	7.50	7.08
ROUTED TO						

+	RT-75	15.06	1	FLOW	1215.	4743.
				TIME	7.58	7.17
HYDROGRAPH AT						
+	SC1-2	.14	1	FLOW	91.	189.
				TIME	6.67	6.67
ROUTED TO						
+	RT-76	.14	1	FLOW	90.	188.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP9	15.19	1	FLOW	1231.	4781.
				TIME	7.58	7.17
ROUTED TO						
+	RT-78	15.19	1	FLOW	1226.	4770.
				TIME	7.58	7.17
HYDROGRAPH AT						
+	SC1-12	.25	1	FLOW	203.	386.
				TIME	6.75	6.67
ROUTED TO						
+	RT-81	.25	1	FLOW	202.	383.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-11	.16	1	FLOW	228.	376.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP8	.41	1	FLOW	411.	735.
				TIME	6.67	6.67
ROUTED TO						
+	RT-77	.41	1	FLOW	401.	730.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-4	.10	1	FLOW	150.	247.
				TIME	6.58	6.58
ROUTED TO						
+	RT-80	.10	1	FLOW	149.	245.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC1-1	.11	1	FLOW	79.	161.
				TIME	6.67	6.67
ROUTED TO						
+	RT-79	.11	1	FLOW	78.	161.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC1-3	.35	1	FLOW	53.	175.
				TIME	6.83	6.83
5 COMBINED AT						
+	DP4	16.16	1	FLOW	1553.	5205.
				TIME	6.75	7.17
ROUTED TO						
+	DBSC1	16.16	1	FLOW	1240.	3544.
				TIME	8.00	8.08

** PEAK STAGES IN FEET **

1	STAGE	6400.56	6406.96
	TIME	8.00	8.08

JR ENGINEERING'S SAND CREEK DATA


Block 3
20
19
18
17
16
5
14
13
12
11
10
9
8
6790
6790
15' WIDE
CONSTRUCT TRANSITION:
24" DEPTH OF TYPE "L" RIPRAP TIGHTLY PLACED.
6" DEPTH OF TYPE II BEDDING. BLEND SOUTHERLY EDGE OF RIPRAP TO MATCH EXISTING GROUND SURFACE.
PROPOSED WETLAND MITIGATION AREA
(SEE MITIGATION PLANS)
6780
6776
6783.00
6782.00
6782.50
BERM
SAND CREEK
CHANNEL ACCESS
12' WIDE 12% MAX
6785.80
6785.00
6783.60
6782.30
6782.50
MATCHLINE STA. 83+00
(SEE SHEET 3)
CONSTRUCT
LEVEE/MAINTENANCE
ROAD - 18'WIDE
TOP WIDTH
SEE SHEETS 6 & 7
PC = 89+42.75
PT = 89+07.85
PT = 90+24.68
45" DEPTH OF TYPE "H" RIPRAP WITH ENOUGH SMALL ROCK TO FILL VOIDS. 8" DEPTH OF TYPE II BEDDING MATERIAL. COVER WITH 4" OF TOPSOIL.
BOUNDARY LINE
FENCE @
BOUNDARY
85+00
87+00
88+00
89+00
90+00
91+00
92+00
92+50.21
SC 250
1" = 100'
4

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 300

INPUT
Description: UPSTREAM OF PROPERTY
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
428	6792	430	6790	436	6788	443	6786	454	6784
500	6784	548	6784	560	6786	600	6788	701	6790

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
428	.04	430	.035	560	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
430	560	230	205	170	.2 .4

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 295

INPUT
Description: NEAR UPSTREAM END OF PROPERTY
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
422	6787	445	6786	467	6784	476	6782	482	6780
500	6779.8	518	6780	573	6782	580	6784	586	6784
590	6784	616	6784	646	6786	698	6788		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
422	.04	467	.035	573	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
467	573	87	86	85	.2 .4

Left Levee Station= 455 Elevation= 6786

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 294.5

INPUT
Description: FIS CD-4082 ROTATED
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
415	6786.4	425	6784	430	6783	460	6781	475	6780
500	6779	549	6778	606	6777	633	6780	660	6786
682	6787								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
415	.04	500	.035	633	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
500	633	60	68	80	.2 .4

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 290

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
403	6785	420	6784	435	6782	446	6781	456	6780
486	6778	500	6778.39	534	6778	542	6780	546	6781.48

FLOW DATA

Flow Title: Floodplain
Flow File : x:\2910000.all\2910404\HEC-RAS\post project with no lower levee geometry\Post Project As-builts.f01

Flow Data (cfs)

River	Reach	RS	PF#1	PF 2	PF 3	PF 4	PF 5
SAND CREEK	ONE	305	1200	2100	2600	3900	600
SAND CREEK	ONE	300	1200	2100	2600	3900	600
SAND CREEK	ONE	294.5	1200	2100	2600	3900	600
SAND CREEK	ONE	214	1200	2400	3100	4600	600
SAND CREEK	ONE	179	1200	2600	3150	4800	600
SAND CREEK	ONE	108	1200	2600	3250	5100	600
SAND CREEK	ONE	84	1200	2600	3300	5100	600
SAND CREEK	ONE	75	1250	2700	3450	5350	625
SAND CREEK	ONE	38	1300	2800	3600	5700	650

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
SAND CREEK	ONE	PF#1	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 2	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 3	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 4	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 5	Normal S = 0.01	Normal S = 0.0065

GEOMETRY DATA

Geometry Title: As-builts modified for no lower levee
Geometry File : x:\2910000.all\2910404\HEC-RAS\post project with no lower levee geometry\Post Project As-builts.g01

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 305

INPUT
Description: FIS CE-4080 Upstream of Property
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	6820	1040	6816	1080	6812	1115	6808	1160	6804
1190	6800	1200	6796	1210	6792	1230	6788	1231	6786.4
1242	6786.4	1245	6788	1270	6792	1350	6792	1390	6796
1435	6800	1465	6800.2	1500	6800	1540	6802	1600	6802
1680	6802	1720	6801.6	1760	6802	1790	6802.2	1840	6802
1890	6802	1960	6803	2020	6804	2145	6806	2370	6808

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1230	.03	1245	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1230	1245	390	395	400	.1 .3

No oxBow Levee → with levee

IEC-RAS River: SAND CREEK Reach: ONE Profile: PF 3

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
ONE	305	PF 3	PPFNL	2600.00	6786.40	6793.98	6793.98	6795.31	0.004839	12.35	472.02	16[illegible].71	0.80
ONE	305	PF 3	PPFP	2600.00	6786.40	6793.98	6793.98	6795.31	0.004839	12.35	472.02	16[illegible].71	0.80
ONE	300	PF 3	PPFNL	2600.00	6784.00	6786.70	6786.70	6787.90	0.012999	8.80	299.07	13[illegible].52	0.99
ONE	300	PF 3	PPFP	2600.00	6784.00	6786.70	6786.70	6787.90	0.012999	8.80	299.07	13[illegible].52	0.99
ONE	295	PF 3	PPFNL	2600.00	6779.80	6783.45	6783.45	6784.75	0.012437	9.19	285.15	108.56	0.98
ONE	295	PF 3	PPFP	2600.00	6779.80	6783.45	6783.45	6784.75	0.012437	9.19	285.15	108.56	0.98
NE	294.5	PF 3	PPFNL	2600.00	6777.00	6783.22	6780.38	6783.37	0.000670	3.27	877.91	218.56	0.25
NE	294.5	PF 3	PPFP	2600.00	6777.00	6783.22	6780.38	6783.37	0.000670	3.27	877.91	218.56	0.25
ONE	290	PF 3	PPFNL	2600.00	6778.00	6781.70	6781.70	6783.02	0.010553	9.34	291.47	189.44	0.93
NE	290	PF 3	PPFP	2600.00	6778.00	6781.70	6781.70	6783.02	0.010553	9.34	291.47	189.44	0.93
ONE	280	PF 3	PPFNL	2600.00	6776.80	6780.86	6780.56	6781.81	0.009060	7.85	332.35	199.06	0.84
ONE	280	PF 3	PPFP	2600.00	6776.80	6780.86	6780.56	6781.81	0.009060	7.85	332.35	199.06	0.84
IE	265	PF 3	PPFNL	2600.00	6774.82	6779.09	6779.09	6780.37	0.012841	9.06	286.92	216.36	0.99
IE	265	PF 3	PPFP	2600.00	6774.82	6779.09	6779.09	6780.37	0.012841	9.06	286.92	216.36	0.99
NE	250	PF 3	PPFNL	2600.00	6768.00	6778.02	6773.08	6778.21	0.000522	3.49	779.81	189.51	0.23
E	250	PF 3	PPFP	2600.00	6768.00	6778.02	6773.08	6778.21	0.000522	3.49	779.81	189.51	0.23
ONE	240	PF 3	PPFNL	2600.00	6766.00	6778.04	6772.48	6778.16	0.000280	2.84	992.99	155.31	0.18
ONE	240	PF 3	PPFP	2600.00	6766.00	6778.04	6772.48	6778.16	0.000280	2.84	992.99	155.31	0.18
E	230	PF 3	PPFNL	2600.00	6764.00	6778.01	6771.26	6778.14	0.000249	2.95	970.71	133.21	0.17
INE	230	PF 3	PPFP	2600.00	6764.00	6778.01	6771.26	6778.14	0.000249	2.95	970.71	133.21	0.17
E	225	PF 3	PPFNL	2600.00	6770.00	6777.77	6773.92	6778.08	0.001382	4.82	616.10	104.52	0.30
E	225	PF 3	PPFP	2600.00	6770.00	6777.77	6773.92	6778.08	0.001382	4.82	616.10	104.52	0.30
NE	222	PF 3	PPFNL	2600.00	6770.10	6777.01	6774.46	6777.89	0.000455	7.52	345.74	50.12	0.50
	222	PF 3	PPFP	2600.00	6770.10	6777.01	6774.46	6777.89	0.000455	7.52	345.74	50.12	0.50
	221.6	PF 3	PPFNL	2600.00	6770.00	6777.01	6774.36	6777.86	0.000434	7.41	351.04	50.12	0.49
NE	221.6	PF 3	PPFP	2600.00	6770.00	6777.01	6774.36	6777.86	0.000434	7.41	351.04	50.12	0.49
	221.5	PF 3	PPFNL	2600.00	6770.00	6775.26	6775.26	6777.46	0.001953	11.92	218.21	49.98	1.00
	221.5	PF 3	PPFP	2600.00	6770.00	6775.26	6775.26	6777.46	0.001953	11.92	218.21	49.98	1.00
IE	221	PF 3	PPFNL	2600.00	6770.00	6774.36	6774.36	6776.57	0.001887	11.91	218.25	50.07	1.01
	221	PF 3	PPFP	2600.00	6770.00	6774.36	6774.36	6776.57	0.001887	11.91	218.25	50.07	1.01
E	215	PF 3	PPFNL	2600.00	6758.45	6765.19	6762.82	6766.11	0.000491	7.71	337.10	50.11	0.52
E	215	PF 3	PPFP	2600.00	6758.45	6765.19	6762.82	6766.11	0.000491	7.71	337.10	50.11	0.52
	214	PF 3	PPFNL	3100.00	6758.40	6763.31	6763.31	6765.78	0.001852	12.62	245.71	50.08	1.00
	214	PF 3	PPFP	3100.00	6758.40	6763.31	6763.31	6765.78	0.001852	12.62	245.71	50.08	1.00
	210	PF 3	PPFNL	3100.00	6749.75	6756.84	6754.66	6758.03	0.000596	8.73	355.04	50.12	0.58
	210	PF 3	PPFP	3100.00	6749.75	6756.84	6754.66	6758.03	0.000596	8.73	355.04	50.12	0.58
	209	PF 3	PPFNL	3100.00	6749.66	6756.83	6754.58	6757.99	0.006893	8.63	359.28	50.16	0.57
	209	PF 3	PPFP	3100.00	6749.66	6756.83	6754.58	6757.99	0.006893	8.63	359.28	50.16	0.57
	208	PF 3	PPFNL	3100.00	6750.00	6756.89	6755.38	6757.60	0.006520	6.81	455.35	110.13	0.59
	208	PF 3	PPFP	3100.00	6750.00	6756.89	6755.38	6757.60	0.006520	6.81	455.35	110.13	0.59
	207	PF 3	PPFNL	3100.00	6750.00	6754.29	6754.29	6756.06	0.016794	11.29	303.75	88.72	0.96
	207	PF 3	PPFP	3100.00	6750.00	6754.29	6754.29	6756.06	0.016794	11.29	303.75	88.72	0.96
	206	PF 3	PPFNL	3100.00	6748.00	6753.52	6752.93	6754.88	0.012785	9.37	331.00	81.89	0.82
	206	PF 3	PPFP	3100.00	6748.00	6753.52	6752.93	6754.88	0.012785	9.37	331.00	81.89	0.82
	205	PF 3	PPFNL	3100.00	6748.00	6753.61	6752.36	6754.62	0.008100	8.06	384.43	84.04	0.66
	205	PF 3	PPFP	3100.00	6748.00	6753.61	6752.36	6754.62	0.008100	8.06	384.43	84.04	0.66
	204	PF 3	PPFNL	3100.00	6747.00	6753.58	6752.12	6754.44	0.007068	7.47	414.95	92.29	0.62
	204	PF 3	PPFP	3100.00	6747.00	6753.58	6752.12	6754.44	0.007068	7.47	414.95	92.29	0.62
	203	PF 3	PPFNL	3100.00	6747.00	6753.37	6752.20	6754.29	0.008460	7.68	403.61	99.26	0.67
	203	PF 3	PPFP	3100.00	6747.00	6753.37	6752.20	6754.29	0.008460	7.68	403.61	99.26	0.67

DRAINAGE MAPS

Berm at East boundary

Project Description	
Worksheet	Triangular Channel - 1
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.035	
Slope	2.00	%
Left Side Slope	4.00	H : V
Right Side Slope	50.00	H : V
Discharge	20.00	cfs

Results		
Depth	0.54	ft
Flow Area	8.0	ft^2
Wetted Perimeter	29.39	ft
Top Width	29.32	ft
Critical Depth	0.51	ft
Critical Slope	2.83	%
Velocity	2.51	ft/s
Velocity Head	0.10	ft
Specific Energy	0.64	ft
Froude Number	0.85	
Flow Type	Subcriti cal	

Swale A-A
SC250 Fabric Lined

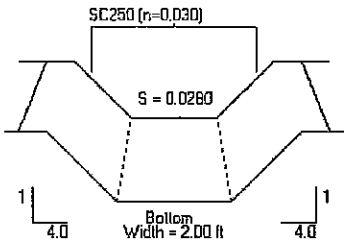
North American Green - ECMDS Version 4.3 | 8/2/2006 | 09:39 AM | COMPUTED BY: Quenitn Armijo

PROJECT NAME: Quail Brush Creek | PROJECT NO.: 0537.00

FROM STATION/REACH: Swale B-B | TO STATION/REACH: Swale B-B | DRAINAGE AREA: | DESIGN FREQUENCY: 100-year

HYDRAULIC RESULTS

Discharge (cfs)	Peak Flow Period (hrs)	Velocity (fps)	Area (sq.ft)	Hydraulic Radius(ft)	Normal Depth (ft)
80.0	2.0	7.17	11.16	0.80	1.44



Not to Scale

LINER RESULTS

Reach	Matting Type / Staple Pattern	Stability Analysis	Vegetation Characteristics: Phase	Class	Type	Density	Permissible Shear Stress (psf)	Calculated Shear Stress (psf)	Safety Factor	Remarks
Straight	SC250	Vegetation	2	C	Mix	50-75%	8.00	2.51	3.18	STABLE
	Staple E	Soil	Sandy Loam				2.500	0.533	4.69	STABLE

Back to Input Screen

KIOWA ENGINEERING HEC-1 ANALYSIS

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   11NOV05  TIME  08:16:07   *
*                                       *
*****************************************
```

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

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

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

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


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

   1          ID             Sand Creek Detention Basin No. 2 Final design
   2          ID             FUTURE DEVELOPMENT CONDITION WITH SAND CREEK PER FINAL DESIGN
   3          ID             10-YEAR AND 100-YEAR 24-HOUR STORM  FN:SC2-FD.DAT
              *DIAGRAM
   4          IT       5       0       0     300
   5          IO       5       0
   6          JR    PREC     .68     1.0

   7          KK    SB82
   8          KM       RUNOFF FROM SUB-BASIN 82
   9          BA    .190
  10          IN      30
  11          PB     4.4
  12          PC  0.0000  0.0025  0.0050  0.0075  0.0100  0.0150  0.0200  0.0250  0.0300  0.0500
```

Revised CN's
SC2
Stations 23, 25 + 26

```
 13          PC  0.0600  0.1000  0.1000  0.7000  0.7000  0.7500  0.7800  0.7980  0.8200  0.8300
 14          PC  0.9150  0.9210  0.9270  0.9330  0.9400  0.9450  0.9500  0.9525  0.9550  0.9600
 15          PC  0.9650  0.9700  0.9750  0.9800  0.9830  0.9850  0.9880  0.9900  0.9930  0.9950
 16          PC  0.9980  1.0000  1.0000
 17          LS       0      67
 18          UD    .110

 19          KK    RT-4
 20          KM   ROUTE FLOW FROM SUB-BASIN 82 TO DP 74
 21          RK    2300    .030    .035            TRAP      10      10

 22          KK    SB74
 23          KM   RUNOFF FROM SUB-BASIN 74
 24          BA    .180
 25          LS       0      67
 26          UD    0.29

 27          KK    DP74
 28          KM   DESIGN POINT 74 COMBINE RUNOFF FROM SUB-BASIN 74 AND RT-4
 29          HC       2

 30          KK    RT-3
 31          KM   ROUTE FLOW FROM DP 74 TO DP 75
 32          RK    2800    .025    .035            TRAP              10

 33          KK    SB80
 34          KM   RUNOFF FROM SUB-BASIN 80
 35          BA    .220
 36          LS       0      67
 37          UD    .240

 38          KK    RT-2
 39          KM   ROUTE FLOW FROM SB 80 TO DP 75
 40          RK    4100    .035    .035            TRAP              10

 41          KK    SB81
 42          KM   RUNOFF FROM SUB-BASIN 81
 43          BA    .390
 44          LS       0      67
 45          UD    .306
1                                        HEC-1 INPUT                                        PAGE  2

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

 46          KK    RT-1
 47          KM   ROUTE FLOW FROM SB 81 TO DP 75
 48          RK    3850     .03    .035            TRAP              10

 49          KK    SB73
 50          KM   RUNOFF FROM SUB-BASIN 73
 51          BA    .1200
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 52          LS       0      67
 53          UD    .312

 54          KK    SB75
 55          KM   RUNOFF FROM SUB-BASIN 75
 56          BA   .1200
 57          LS       0      67
 58          UD    .420

 59          KK    SB76
 60          KM   RUNOFF FROM SUB-BASIN 76
 61          BA   .1700
 62          LS       0      67
 63          UD    .408

 64          KK    DP75
 65          KM   DESIGN POINT 75 COMBINE RUNOFF FROM SUB-BASINS 73, 75, 76, RT-1, RT-2 & RT-3
 66          HC       6

 67          KK    RT-5
 68          KM   ROUTE FLOW FROM DP 75 TO DP 77
 69          RK    1700    .025    .035            TRAP      10      10

 70          KK    SB79
 71          KM   RUNOFF FROM SUB-BASIN 79
 72          BA   .2900
 73          LS       0      67
 74          UD    .174

 75          KK    RT-7
 76          KM   ROUTE FLOW FROM SUB-BASIN 79 TO DP 78
 77          RK    3000    0.03   0.035            TRAP       6       6

 78          KK    SB78
 79          KM   RUNOFF FROM SUB-BASIN 78
 80          BA     .88
 81          LS       0      67
 82          UD    .264

 83          KK    DP78
 84          KM   DESIGN POINT 78 COMBINE RUNOFF FROM SUB-BASIN 78 AND RT-7
 85          HC       2
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 86          KK    RT-6
 87          KM   ROUTE FLOW FROM DESIGN POINT 78 TO DP 77
 88          RK    3350    .025    .035            TRAP      10       6

 89          KK    SB77
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 90          KM   RUNOFF FROM SUB-BASIN 77
 91          BA     .25
 92          LS       0      67
 93          UD    .336

 94          KK    SB88
 95          KM   RUNOFF FROM SUB-BASIN 88
 96          BA   .1000
 97          LS       0      67
 98          UD    .204

 99          KK    DP77
100          KM   DESIGN POINT 77 COMBINE RUNOFF FROM SUB-BASINS 77 AND 88 AND RT-6, AND RT-5
101          HC       4

102          KK    RT-8
103          KM   ROUTE FLOW FROM DESIGN POINT 77 TO DP 71
104          RK    3850    .025    .035            TRAP      20      10

105          KK    SB71
106          KM   RUNOFF FROM SUB-BASIN 71
107          BA     .36
108          LS       0      70
109          UD    .300

110          KK    DP71
111          KM   DESIGN POINT 71 COMBINE RUNOFF FROM SUB-BASIN 71 AND RT-8
112          HC       2

113          KK    RT-9
114          KM   ROUTE FLOW FROM DESIGN POINT 71 TO DP 70
115          RK    2500    .025    .035            TRAP      20       4

116          KK    SB70
117          KM   RUNOFF FROM SUB-BASIN 70
118          BA   .3100
119          LS       0      70
120          UD    .350

121          KK    DP70
122          KM   DESIGN POINT 70 COMBINE RUNOFF FROM SUB-BASIN 70 AND RT-9
123          HC       2

124          KK   RT-11
125          KM   ROUTE FLOW FROM DESIGN POINT 70 TO DP 87
126          RK    1200    .025    .035            TRAP      20       4
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

127          KK    SB72
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128          KM   RUNOFF FROM SUB-BASIN 72
129          BA   .2500
130          LS      0      70
131          UD    .138

132          KK   RT-10
133          KM   ROUTE FLOW FROM SUB-BASIN 72 TO DESIGN POINT 70
134          RK    3000    .035    .035            TRAP      10       4

135          KK    SB69
136          KM   RUNOFF FROM SUB-BASIN 69
137          BA   .2500
138          LS      0      75
139          UD    .483

140          KK    DP69
141          KM   DESIGN POINT 69 COMBINE RUNOFF FROM SUB-BASIN 69 AND RT-10
142          HC      2

143          KK   RT-12
144          KM   ROUTE FLOW FROM DESIGN POINT 69 TO DP 87
145          RK    1400    .025    .035            TRAP      20       4

146          KK  SC3-15
147          KM   RUNOFF FROM SUB-BASIN SC3-15
148          BA   .0730
149          LS      0    72.0
150          UD    .230

151          KK    DP87
152          KM   DESIGN POINT 87 COMBINE RUNOFF FROM SUB-BASIN SC3-15, RT-12 AND RT-11
153          HC      3

154          KK   RT-13
155          KM   ROUTE FLOW FROM DESIGN POINT 87 TO DP 63
156          RK    4400    .025    .035            TRAP      40       4

157          KK  SC3-12
158          KM   RUNOFF FROM SUB-BASIN SC3-12
159          BA   .2380
160          LS      0    70.6
161          UD    .410

162          KK    DP63
163          KM   DESIGN POINT 63 COMBINE RUNOFF FROM SUB-BASIN SC3-12 AND RT-13
164          HC      2

165          KK   RT-17
166          KM   ROUTE FLOW FROM DESIGN POINT 63 TO DP 60
167          RK    4390    .015    .035            TRAP      10       4
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 168          KK    SB68
 169          KM   RUNOFF FROM SUB-BASIN 68
 170          BA   .2200
 171          LS       0      75
 172          UD    .390

 173          KK   RT-14
 174          KM   ROUTE FLOW FROM SUB-BASIN 68 TO DESIGN POINT 67
 175          RK    3300    .020    .035            TRAP      20       4

 176          KK  SC3-14
 177          KM   RUNOFF FROM SUB-BASIN SC3-14
 178          BA   .3150
 179          LS       0    70.0
 180          UD    .410

 181          KK    DP67
 182          KM   DESIGN POINT 67 COMBINE RUNOFF FROM SUB-BASIN SC3-14 AND RT-14
 183          HC       2

 184          KK   RT-15
 185          KM   ROUTE FLOW FROM DP 67 TO DESIGN POINT 64
 186          RK    2500    .035    .035            TRAP      20       6

 187          KK  SC3-13
 188          KM   RUNOFF FROM SUB-BASIN SC3-13
 189          BA   .2550
 190          LS       0    81.4
 191          UD    .390

 192          KK    DP64
 193          KM   DESIGN POINT 64 COMBINE RUNOFF FROM SUB-BASIN SC3-13 AND RT-15
 194          HC       2

 195          KK   RT-16
 196          KM   ROUTE FLOW FROM DP 64 TO DESIGN POINT 60
 197          RK    4010    .018    .035            TRAP      20      10

 198          KK   SC3-9
 199          KM   RUNOFF FROM SUB-BASIN SC3-9
 200          BA   .2360
 201          LS       0    75.5
 202          UD    .320

 203          KK    DP60
 204          KM   DESIGN POINT 60 COMBINE RUNOFF FROM SUB-BASIN SC3-9, RT-17 AND RT-16
 205          HC       3

 206          KK   RT-18
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 207          KM   ROUTE FLOW FROM DP 60 TO DESIGN POINT 53
 208          RK    2690    .015    .035            TRAP      10       4
1                                    HEC-1 INPUT                                                PAGE  6

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


 209          KK   SC3-2
 210          KM   RUNOFF FROM SUB-BASIN SC3-2
 211          BA   .1920
 212          LS       0    76.1
 213          UD    .310

 214          KK  SC3-11
 215          KM   RUNOFF FROM SUB-BASIN SC3-11
 216          BA   .2750
 217          LS       0    80.8
 218          UD    .430

 219          KK   RT-19
 220          KM   ROUTE FLOW FROM SUB-BASIN SC3-11 TO DESIGN POINT 55
 221          RK    2600    .022    .035            TRAP      10       6

 222          KK  SC3-10
 223          KM   RUNOFF FROM SUB-BASIN SC3-10
 224          BA   .1130
 225          LS       0    75.0
 226          UD    .290

 227          KK    DP55
 228          KM   DESIGN POINT 55 COMBINE RUNOFF FROM SUB-BASIN SC3-10 AND RT-19
 229          HC       2

 230          KK   RT-20
 231          KM   ROUTE FLOW FROM DESIGN POINT 55 TO DESIGN POINT 56
 232          RK    3670    .012    .035            TRAP      10      10

 233          KK   SC3-1
 234          KM   RUNOFF FROM SUB-BASIN SC3-1
 235          BA   .1290
 236          LS       0    80.0
 237          UD    .320

 238          KK    DP56
 239          KM   DESIGN POINT 56 COMBINE RUNOFF FROM SUB-BASIN SC3-1 AND RT-20
 240          HC       2

 241          KK    DB95
 242          KM        ROUTE FLOW FROM DP 56 THROUGH DBPS STRUCTURE 95
 243          RS       1    ELEV     100
 244          SV       0      20      34      39      42      50
 245          SQ       0      10      20      30      40      43
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```
246          SE     100     104     107     108     109     110

247          KK   RT-21
248          KM   ROUTE FLOW FROM DETENTION BASIN DB95 TO DESIGN POINT 53
249          RK     870    .023    .035            TRAP      10      10
1                                      HEC-1 INPUT                                                    PAGE  7

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

250          KK    DP53
251          KM   DESIGN POINT 53 COMBINE RUNOFF FROM SUB-BASIN SC3-2, RT-21 AND RT-18
252          HC       3

253          KK    DB94
254          KM        ROUTE FLOW FROM DP 53 THROUGH DBPS STRUCTURE 94
255          RS       1    ELEV     100
256          SV       0      30      40      60      80     120     130
257          SQ       0      80      90     300     800    1750    2000
258          SE     100     104     105     107     108     109     110

259          KK   RT-27
260          KM   ROUTE FLOW FROM DETETNION BASIN DB94 TO DESIGN POINT 50
261          RK    1380    .022    .035            TRAP      10      10

262          KK  SC2-24
263          KM   RUNOFF FROM SUB-BASIN SC2-24
264          BA   .0660
265          LS       0    90.7
266          UD    .190

267          KK   RT-29
268          KM   ROUTE FLOW FROM SUB-BASIN SC2-24 TO DESIGN POINT 50
269          RK     330    .020    .013            CIRC       4

270          KK  SC2-27
271          KM   RUNOFF FROM SUB-BASIN SC2-27
272          BA   .0780
273          LS       0    92.0
274          UD    .210

275          KK    DP50
276          KM   DESIGN POINT 50 COMBINE RUNOFF FROM SC2-27, RT-27 AND RT-29
277          HC       3

278          KK   RT-31
279          KM   ROUTE FLOW FROM DESIGN POINT 50 TO DESIGN POINT 49
280          RK     940    .020    .035            TRAP      40       6

281          KK   SC3-8
282          KM   RUNOFF FROM SUB-BASIN SC3-8
283          BA   .2420
```

```
 284            LS        0    67.0
 285            UD      .290

 286            KK    RT-25
 287            KM    ROUTE FLOW FROM SUB-BASIN SC3-8 TO DESIGN POINT 51
 288            RK     2690    .015    .035            TRAP      20       6
1                                          HEC-1 INPUT                                                 PAGE  8

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


 289            KK    SC3-3
 290            KM    RUNOFF FROM SUB-BASIN SC3-3
 291            BA    .1270
 292            LS        0    88.5
 293            UD      .280

 294            KK     DP51
 295            KM    DESIGN POINT 51 COMBINE RUNOFF FROM SC3-3 AND RT-25
 296            HC        2

 297            KK     DB93
 298            KM         ROUTE FLOW FROM DP 51 THROUGH DBPS STRUCTURE 93
 299            RS        1    ELEV     100
 300            SV        0      10      20      30
 301            SQ        0      20     100     290
 302            SE      100     104     106     108

 303            KK    RT-30
 304            KM    ROUTE FLOW FROM DETENTION BASIN DB93 TO DESIGN POINT 49
 305            RK     1590    .019    .035            TRAP      20      10

 306            KK     DP49
 307            KM    DESIGN POINT 49 COMBINE RUNOFF FROM RT-31 AND RT-30
 308            HC        2

 309            KK    RT-32
 310            KM    ROUTE FLOW FROM DESIGN POINT 49 TO DESIGN POINT 48
 311            RK     4930    .017    .035            TRAP      40       6

 312            KK    SC3-6
 313            KM    RUNOFF FROM SUB-BASIN SC3-6
 314            BA    .2420
 315            LS        0    70.0
 316            UD      .310

 317            KK    RT-23
 318            KM    ROUTE FLOW FROM SUB-BASIN SC3-6 TO DESIGN POINT 54
 319            RK     1830    .023    .035            TRAP      10      10

 320            KK    SC3-5
 321            KM    RUNOFF FROM SUB-BASIN SC3-5
```

```
BA   .1150
LS       0    88.7
UD    .280

KK   RT-24
KM   ROUTE FLOW FROM SUB-BASIN SC3-5 TO DESIGN POINT 54
RK    1760    .041    .035            TRAP      10       4
```



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

KK   SC3-7
KM   RUNOFF FROM SUB-BASIN SC3-7
BA   .5380
LS       0    81.5
UD    .530

KK   RT-22
KM   ROUTE FLOW FROM SUB-BASIN SC3-7 TO DESIGN POINT 54
RK    2860    .021    .035            TRAP      30       6

KK   SC3-4
KM   RUNOFF FROM SUB-BASIN SC3-4
BA   .3210
LS       0    81.9
UD    .330

KK    DP54
KM   DESIGN POINT 54 COMBINE RUNOFF FROM SUB-BASIN SC3-4, RT-22, RT-23 AND RT-24
HC       4

KK    DB92
KM         ROUTE FLOW FROM DP 54 THROUGH DBPS STRUCTURE 92
RS       1    ELEV     100
SV       0      40      60      90     110     120     130
SQ       0      40      60      82      90      91      95
SE     100     104     105     106     108     109     110

KK   RT-26
KM   ROUTE FLOW FROM DETENTION BASIN 92 TO DESIGN POINT 47
RK    4680    .028    .035            TRAP      40      10

KK  SC2-26
KM   RUNOFF FROM SUB-BASIN SC2-26
BA   .1860
LS       0      79
UD    .320

KK   RT-34
KM   ROUTE FLOW FROM SUB-BASIN SC2-26 TO DESIGN POINT 47
RK    1620    .014    .035            TRAP       4       4
```

```
361          KK  SC2-25
362          KM   RUNOFF FROM SUB-BASIN SC2-25
363          BA   .4440
364          LS       0      79
365          UD    .440

366          KK    DP47
367          KM   DESIGN POINT 47 COMBINE RUNOFF FROM SUB-BASIN SC3-26 AND RT-26 AND RT-34
368          HC       3
```



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

369          KK   RT-33
370          KM   ROUTE FLOW FROM DESIGN POINT 47 TO DESIGN POINT 48
371          RK     510    .020    .035            TRAP       6       4

372          KK  SC2-28
373          KM   RUNOFF FROM SUB-BASIN SC2-28
374          BA   .2740
375          LS       0    67.1
376          UD    .510

377          KK  SC2-21
378          KM   RUNOFF FROM SUB-BASIN SC2-21
379          BA   .1930
380          LS       0    79.0
381          UD    .390

382          KK    DP48
383          KM   DESIGN POINT 48 COMBINE RUNOFF FROM SB'S SC2-21 AND SC2-28, RT-33 AND RT-32
384          HC       4

385          KK   RT-37
386          KM   ROUTE FLOW FROM DESIGN POINT 48 TO DESIGN POINT 42
387          RK    1080    .022    .035            TRAP      60       6

388          KK  SC2-23
389          KM   RUNOFF FROM SUB-BASIN SC2-23
390          BA   .1960
391          LS       0      79
392          UD    .330

393          KK   RT-35
394          KM   ROUTE FLOW FROM SUB-BASIN SC2-23 TO DESIGN POINT 46
395          RK    1180    .015    .013            CIRC       5

396          KK  SC2-22
397          KM   RUNOFF FROM SUB-BASIN SC2-22
398          BA   .0810
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399          LS       0    79.0
400          UD    .220

401          KK    DP46
402          KM   DESIGN POINT 46 COMBINE RUNOFF FROM SUB-BASIN SC2-22 AND RT-35
403          HC       2

404          KK   RT-36
405          KM   ROUTE FLOW FROM DESIGN POINT 46 TO DESIGN POINT 42
406          RK    1790    .017    .013            TRAP      30       4

407          KK    DP42
408          KM   DESIGN POINT 42 COMBINE RUNOFF FROM RT- 37 AND RT-36
409          HC       2
```



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


410          KK   RT-38
411          KM   ROUTE FLOW FROM DESIGN POINT 42 TO DESIGN POINT 85
412          RK    1790    .013    .035            TRAP      60       6

413          KK  SC2-20
414          KM   RUNOFF FROM SUB-BASIN SC2-20
415          BA   .3240
416          LS       0    79.0
417          UD    .380

418          KK   RT-41
419          KM   ROUTE FLOW FROM SUB-BASIN SC2-20 TO DESIGN POINT 85
420          RK    1560    .020    .013            CIRC     6.5

421          KK  SC2-15
422          KM   RUNOFF FROM SUB-BASIN SC2-15
423          BA   .1810
424          LS       0    79.0
425          UD    .240

426          KK   RT-39
427          KM   ROUTE FLOW FROM SUB-BASIN SC2-15 TO DESIGN POINT 85
428          RK     990    .022    .013            CIRC     6.5

429          KK  SC2-13
430          KM   RUNOFF FROM SUB-BASIN SC2-13
431          BA   .1630
432          LS       0    79.0
433          UD    .280

434          KK   RT-40
435          KM   ROUTE FLOW FROM SUB-BASIN SC2-13 TO DESIGN POINT 85
436          RK     300    .033    .013            CIRC     5.5
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```
437          KK    DP85
438          KM   DESIGN POINT 85 COMBINE RUNOFF FROM RT-41, RT-38, RT-39 AND RT-40
439          HC       4

440          KK   RT-42
441          KM   ROUTE FLOW FROM DESIGN POINT 85 TO DESIGN POINT 37
442          RK    2900    .016    .035            TRAP      60       6

443          KK  SC2-14
444          KM   RUNOFF FROM SUB-BASIN SC2-14
445          BA   .2650
446          LS       0    76.2
447          UD    .450

448          KK  SC2-16
449          KM   RUNOFF FROM SUB-BASIN SC2-16
450          BA   .2120
451          LS       0    76.2
452          UD    .310
```



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

453          KK    DP37
454          KM   DESIGN POINT 37 COMBINE RUNOFF FROM RT-42, SUB-BASINS SC2-14 AND SC2-16
455          HC       3

456          KK   RT-43
457          KM   ROUTE FLOW FROM DESIGN POINT 37 TO DESIGN POINT 36
458          RK    3380    .016    .035            TRAP      60       4

459          KK  SC2-12
460          KM   RUNOFF FROM SUB-BASIN SC2-12
461          BA   .1790
462          LS       0    70.6
463          UD    .280

464          KK   RT-46
465          KM   ROUTE FLOW FROM SUB-BASIN SC2-12 TO DESIGN POINT 33
466          RK    2280    .024    .035            TRAP      20       4

467          KK   SC2-8
468          KM   RUNOFF FROM SUB-BASIN SC2-8
469          BA   .3480
470          LS       0    79.0
471          UD    .440

472          KK    DP33
473          KM   DESIGN POINT 33 COMBINE RUNOFF FROM RT-46 AND SUB-BASIN SC2-8
474          HC       2
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475          KK   RT-45
476          KM   ROUTE FLOW FROM DESIGN POINT 33 TO DESIGN POINT 36
477          RK     850    .021    .035            TRAP      20       4

478          KK    DP36
479          KM   DESIGN POINT 36 COMBINE RUNOFF FROM RT-45 AND RT-43
480          HC       2

481          KK   RT-44
482          KM   ROUTE FLOW FROM DESIGN POINT 36 TO DESIGN POINT 35
483          RK    1740    .016    .035            TRAP      60       4

484          KK  SC2-11
485          KM   RUNOFF FROM SUB-BASIN SC2-11
486          BA   .2100
487          LS       0    79.0
488          UD    .240

489          KK   RT-52
490          KM   ROUTE FLOW FROM SUB-BASIN SC2-11 TO DESIGN POINT 39
491          RK    2680    .008    .035            TRAP      30       4
1                                    HEC-1 INPUT                                    PAGE 13

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

492          KK  SC2-19
493          KM   RUNOFF FROM SUB-BASIN SC2-19
494          BA   .1820
495          LS       0    86.0
496          UD    .300

497          KK   RT-51
498          KM   ROUTE FLOW FROM SUB-BASIN SC2-19 TO DESIGN POINT 39
499          RK    3100    .022    .013            CIRC       6

500          KK  SC2-18
501          KM   RUNOFF FROM SUB-BASIN SC2-18
502          BA   .1980
503          LS       0    88.0
504          UD    .290

505          KK    DP39
506          KM   DESIGN POINT 39 COMBINE RUNOFF FROM RT-52, RT-51 AND SUB-BASIN SC2-18
507          HC       3

508          KK   RT-49
509          KM   ROUTE FLOW FROM DESIGN POINT 39 TO DESIGN POINT 34
510          RK    1160    .024    .035            TRAP      20       4

511          KK  SC2-17
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```
512          KM   RUNOFF FROM SUB-BASIN SC2-17
513          BA   .1600
514          LS       0    79.0
515          UD    .320

516          KK   RT-50
517          KM   ROUTE FLOW FROM SUB-BASIN SC2-17 TO DESIGN POINT 34
518          RK    1840    .025    .035            TRAP      20       4

519          KK  SC2-29
520          KM   RUNOFF FROM SUB-BASIN SC2-29
521          BA   .1510
522          LS       0    88.0
523          UD    .210

524          KK    DP34
525          KM   DESIGN POINT 34 COMBINE RUNOFF FROM RT-49, RT-50 AND SUB-BASIN SC2-29
526          HC       3

527          KK   RT-48
528          KM   ROUTE FLOW FROM DESIGN POINT 34 TO DESIGN POINT 32
529          RK    1470    .020     .04            TRAP      20       4

530          KK  SC2-10
531          KM   RUNOFF FROM SUB-BASIN SC2-10
532          BA   .3290
533          LS       0    78.4
534          UD    .390
1                                        HEC-1 INPUT                                        PAGE 14

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

535          KK    DP32
536          KM   DESIGN POINT 32 COMBINE RUNOFF FROM RT-48 AND SUB-BASIN SC2-10
537          HC       2

538          KK   RT-47
539          KM   ROUTE FLOW FROM SUB-BASIN DESIGN POINT 32 TO DESIGN POINT 35
540          RK     991    .028    .031            TRAP      20       4

541          KK   SC2-9
542          KM   RUNOFF FROM SUB-BASIN SC2-9
543          BA   .2060
544          LS       0    73.0
545          UD    .520

546          KK    DP35
547          KM   DESIGN POINT 35 COMBINE RUNOFF FROM RT-47, RT-44 AND SUB-BASIN SC2-9
548          HC       3

549          KK   RT-53
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```
550          KM   ROUTE FLOW FROM DESIGN POINT 35 TO DESIGN POINT 29
551          RK    1120    .020    .035            TRAP      60       6

552          KK   SC2-7
553          KM   RUNOFF FROM SUB-BASIN SC2-7
554          BA   .1440
555          LS      0    79.0
556          UD    .320

557          KK    DP29
558          KM   DESIGN POINT 29 COMBINE RUNOFF FROM RT-53 AND SUB-BASIN SC2-7
559          HC      2

560          KK   RT-54
561          KM   ROUTE FLOW FROM DESIGN POINT 29 TO DESIGN POINT 28
562          RK    1560    .011    .035            TRAP      60       4

563          KK   SC2-6
564          KM   RUNOFF FROM SUB-BASIN SC2-6
565          BA   .1500
566          LS      0    81.6
567          UD    .240

568          KK   RT-55
569          KM   ROUTE FLOW FROM SUB-BASIN SC2-6 TO DESIGN POINT 28
570          RD     950    .020    .035            TRAP      10       4

571          KK   SC2-2
572          KM   RUNOFF FROM SUB-BASIN SC2-2
573          BA   .1670
574          LS      0    80.8
575          UD    .280
```



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

576          KK    DP28
577          KM   DESIGN POINT 28 COMBINE RUNOFF FROM RT-54, RT-55 AND SUB-BASIN SC2-2
578          HC      3

579          KK   RT-56
580          KM   ROUTE FLOW FROM DESIGN POINT 28 TO DESIGN POINT 21
581          RK    1280    .017    .035            TRAP      60       4

582          KK   SC2-5
583          KM   RUNOFF FROM SUB-BASIN SC2-5
584          BA   .1610
585          LS      0    92.0
586          UD    .280

587          KK   RT-58
```

```
588          KM   ROUTE FLOW FROM SUB-BASIN SC2-5 TO DESIGN POINT 21
589          RK    1670    .027    .024            CIRC       5

590          KK   SC2-0
591          KM   RUNOFF FROM SUB-BASIN SC2-0
592          BA   .1500
593          LS       0    73.4
594          UD    .320

595          KK   RT-57
596          KM   ROUTE FLOW FROM SUB-BASIN SC2-0 TO DESIGN POINT 21
597          RK     800    .032    .035            TRAP      10       4

598          KK    DP21
599          KM   DESIGN POINT 21 COMBINE RUNOFF FROM RT-58, RT-56 AND RT- 57
600          HC       3

601          KK   RT-59
602          KM   ROUTE FLOW FROM DESIGN POINT 21 TO DESIGN POINT 20
603          RK     830    .01     .035            TRAP      80       4

604          KK   SC2-4
605          KM   RUNOFF FROM SUB-BASIN SC2-4
606          BA   .2850
607          LS       0    92.0
608          UD    .320

609          KK   RT-61
610          KM   ROUTE FLOW FROM SUB-BASIN SC2-4 TO DESIGN PÓINT 22
611          RK    1670    .019    .035            TRAP      20       3

612          KK   SC2-3
613          KM   RUNOFF FROM SUB-BASIN SC2-3
614          BA   .0710
615          LS       0    92.0
616          UD    .210
```



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

617          KK    DP22
618          KM   DESIGN POINT 22 COMBINE RUNOFF FROM RT-61 AND SC2-3
619          HC       2

620          KK   RT-60
621          KM   ROUTE FLOW FROM DESIGN POINT 22 TO DESIGN POINT 20
622          RK    1010    .018    .035            TRAP      20       3

623          KK   SC2-1
624          KM   RUNOFF FROM SUB-BASIN SC2-1
625          BA   .1850
```

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626          LS       0    80.0
627          UD    .290

628          KK    DP20
629          KM   DESIGN POINT 20 COMBINE RUNOFF FROM RT-60, RT-59 AND SB SC2-1
630          HC       3

631          KK   DBSC2
632          KM        ROUTE FLOW FROM DP 20 THROUGH SAND CREEK DETENTION BASIN DBSC2
633          RS       1    ELEV  6496.5
634          SV       0    6.75    29.8    58.8    92.2   129.4   168.6   209.8   255.0   302.2
635          SQ       0      10      30     100     400     800    2000    4300    5000    7000
636          SE  6496.5    6498    6500    6502    6504    6506    6508    6510    6512    6514

637          KK   RT-63
638          KM   ROUTE FLOW FROM DETENTION BASIN SC2 TO DESIGN POINT 18
639          RK    1290    .007    .035            TRAP     100       3

640          KK  SC1-10
641          KM   RUNOFF FROM SUB-BASIN SC1-10
642          BA   .2880
643          LS       0    78.2
644          UD    .390

645          KK    DP18
646          KM   DESIGN POINT 18 COMBINE RUNOFF FROM RT-63 AND SUB-BASIN SC1-10
647          HC       2

648          KK   RT-66
649          KM   ROUTE FLOW FROM DESIGN POINT 18 TO DESIGN POINT 17
650          RK     320    .007    .035            TRAP     100       3

651          KK  SC1-13
652          KM   RUNOFF FROM SUB-BASIN SC1-13
653          BA   .1300
654          LS       0    87.3
655          UD    .270
```



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

656          KK   RT-64
657          KM   ROUTE FLOW FROM SUB-BASIN SC1-13 TO DESIGN POINT 19
658          RK    1970    .026    .013            CIRC     4.5

659          KK  SC1-14
660          KM   RUNOFF FROM SUB-BASIN SC1-14
661          BA   .1100
662          LS       0    92.0
663          UD    .280
```

```
664          KK    DP19
665          KM   DESIGN POINT 19 COMBINE RUNOFF FROM RT-64 AND SUB-BASIN SC1-14
666          HC       2

667          KK   RT-65
668          KM   ROUTE FLOW FROM DESIGN POINT 19 TO DESIGN POINT 17
669          RK     700    .022    .013            TRAP      10      .1

670          KK    DP17
671          KM   DESIGN POINT 17 COMBINE RUNOFF FROM RT-65 AND RT-66
672          HC       2

673          KK   RT-67
674          KM   ROUTE FLOW FROM DESIGN POINT 17 TO DESIGN POINT 13
675          RK     910    .007    .035            TRAP     100       3

676          KK   SC1-9
677          KM   RUNOFF FROM SUB-BASIN SC1-9
678          BA   .2400
679          LS       0    76.9
680          UD    .240

681          KK  DBSR29
682          KM        ROUTE FLOW FROM SB SC1-9 THROUGH SPRINGS RANCH DETENTION BASIN DBSR29
683          RS       1    ELEV     100
684          SV       0     .03    0.47    1.20    2.60    6.70     8.8    10.7
685          SQ       0      .2     7.8      22      40      73      97     113
686          SE     100   100.5   101.5   102.5   103.5   104.5   105.5   106.5

687          KK   RT-70
688          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR29 TO DESIGN POINT 14
689          RD    2750    .013    .013            CIRC     5.5

690          KK   SC1-8
691          KM   RUNOFF FROM SUB-BASIN SC1-8
692          BA   .2100
693          LS       0    79.5
694          UD    .320
1                                        HEC-1 INPUT                                        PAGE 18

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

695          KK   RT-71
696          KM   ROUTE FLOW FROM SUB-BASIN SC1-8 TO DESIGN POINT 14
697          RK     600    .010    .013            CIRC       5

698          KK    DP14
699          KM   DESIGN POINT 14 COMBINE RUNOFF FROM RT-71 AND RT-70
700          HC       2

701          KK   RT-69
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702          KM   ROUTE FLOW FROM DESIGN POINT 14 TO DESIGN POINT 12
703          RK    1550    .015    .013           TRAP       7      .1

704          KK   SC1-7
705          KM   RUNOFF FROM SUB-BASIN SC1-7
706          BA   .0960
707          LS       0    80.1
708          UD    .230

709          KK    DP12
710          KM   DESIGN POINT 12 COMBINE RUNOFF FROM SUB-BASIN SC1-7 AND RT-69
711          HC       2

712          KK   RT-68
713          KM   ROUTE FLOW FROM DESIGN POINT 12 TO DESIGN POINT 13
714          RK     390    .025    .013           TRAP       7      .1

715          KK    DP13
716          KM   DESIGN POINT 13 COMBINE RUNOFF FROM RT-67 AND RT-68
717          HC       2

718          KK   RT-72
719          KM   ROUTE FLOW FROM DESIGN POINT 13 TO DESIGN POINT 10
720          RK    1150    .007     .04           TRAP     100       3

721          KK   SC1-6
722          KM   RUNOFF FROM SUB-BASIN SC1-6
723          BA   .1590
724          LS       0    80.6
725          UD    .220

726          KK  DBSR15
727          KM        ROUTE FLOW FROM SB SC1-6 THROUGH SPRINGS RANCH DETENTION BASIN DBSR15
728          RS       1    ELEV     100
729          SV       0    1.50    3.80    6.50    9.70   13.80
730          SQ       0      80     125     150     180     210
731          SE     100     102     104     106     108     110

732          KK   RT-74
733          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR15 TO DESIGN POINT 11
734          RK    2080    .021    .013           CIRC     3.5
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

735          KK   SC1-5
736          KM   RUNOFF FROM SUB-BASIN SC1-5
737          BA   .1730
738          LS       0    79.0
739          UD    .310
```

```
740          KK    DP11
741          KM   DESIGN POINT 11 COMBINE RUNOFF FROM SUB-BASIN SC1-5 AND RT-74
742          HC       2

743          KK   RT-73
744          KM   ROUTE FLOW FROM DESIGN POINT 11 TO DESIGN POINT 10
745          RK     580    .024    .013            CIRC     3.5

746          KK    DP10
747          KM   DESIGN POINT 10 COMBINE RUNOFF FROM RT-72 AND RT-73
748          HC       2

749          KK   RT-75
750          KM   ROUTE FLOW FROM DESIGN POINT 10 TO DESIGN POINT 9
751          RK    2270    .007    .035            TRAP     100       3

752          KK   SC1-2
753          KM   RUNOFF FROM SUB-BASIN SC1-2
754          BA   .1360
755          LS       0    79.0
756          UD    .320

757          KK   RT-76
758          KM   ROUTE FLOW FROM SUB-BASIN SC1-2 TO DESIGN POINT 9
759          RD     500    .039    .013            CIRC       3

760          KK     DP9
761          KM   DESIGN POINT 9 COMBINE RUNOFF FROM RT-75 AND RT-76
762          HC       2

763          KK   RT-78
764          KM   ROUTE FLOW FROM DESIGN POINT 9 TO DESIGN POINT 4
765          RK    1530    .007    .035            TRAP     100       3

766          KK  SC1-12
767          KM   RUNOFF FROM SUB-BASIN SC1-12
768          BA   .2480
769          LS       0    84.0
770          UD    .370

771          KK   RT-81
772          KM   ROUTE FLOW FROM SUB-BASIN SC1-12 TO DESIGN POINT 8
773          RK    1400    .008    .035            TRAP      30       4
1                                        HEC-1 INPUT                                                    PAGE 20

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


774          KK  SC1-11
775          KM   RUNOFF FROM SUB-BASIN SC1-11
776          BA   .1600
777          LS       0    92.0
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778          UD    .290

779          KK     DP8
780          KM   DESIGN POINT 8 COMBINE RUNOFF FROM SUB-BASIN SC1-11 AND RT-81
781          HC       2

782          KK   RT-77
783          KM   ROUTE FLOW FROM DESIGN POINT 8 TO DESIGN POINT 4
784          RK    3100    .007    .035            TRAP     100       3

785          KK   SC1-4
786          KM   RUNOFF FROM SUB-BASIN SC1-4
787          BA   .1010
788          LS       0    92.0
789          UD    .270

790          KK   RT-80
791          KM   ROUTE FLOW FROM SUB-BASIN SC1-4 TO DESIGN POINT 4
792          RK     720    .014    .013            CIRC       5

793          KK   SC1-1
794          KM   RUNOFF FROM SUB-BASIN SC1-1
795          BA   .1090
796          LS       0    79.0
797          UD    .280

798          KK   RT-79
799          KM   ROUTE FLOW FROM SUB-BASIN SC1-1 TO DESIGN POINT 4
800          RK    1115    .027    .013            CIRC       3

801          KK   SC1-3
802          KM   RUNOFF FROM SUB-BASIN SC1-3
803          BA   .3530
 804          LS       0    65.0
805          UD    .460

806          KK     DP4
807          KM   DESIGN POINT 4 COMBINE RUNOFF FROM SB SC1-3, RT-80, RT-77, RT-78 AND RT-79
808          HC       5

809          KK   DBSC1
810          KM        ROUTE FLOW FROM DP 4 THROUGH SAND CREEK DETENTION BASIN DBSC1
811          KO       0
812          RS       1    ELEV    6393
813          SV       0    3.06   14.95   31.12   53.59   69.95   86.31   106.5   126.7   150.4
814          SV   174.1   200.4   226.7   254.9   283.2   313.4   343.6   375.2   406.8   439.5
815          SQ       0       3       5     189     954    1465    2055    2431    2755    3045
816          SQ    3310    3555    3785    4037    5518    7863   10797   14211   18042   22245
817          SE    6393    6394    6396    6398    6400    6401    6402    6403    6404    6405
818          SE    6406    6407    6408    6409    6410    6411    6412    6413    6414    6415
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          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

           819          ZZ


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


            **************
            *            *
 809 KK     *     DBSC1  *
            *            *
            **************

 811 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
1

               PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                                   FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                                TIME TO PEAK IN HOURS


                                                                        RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA     PLAN                    RATIO 1  RATIO 2
                                                                  .68     1.00

 HYDROGRAPH AT
+                  SB82        .19      1   FLOW                 84.      232.
                                             TIME               6.50     6.50

 ROUTED TO
+                  RT-4        .19      1   FLOW                 83.      220.
                                             TIME               6.58     6.58

 HYDROGRAPH AT
+                  SB74        .18      1   FLOW                 49.      143.
                                             TIME               6.67     6.67

   2 COMBINED AT
+                  DP74        .37      1   FLOW                122.      345.
                                             TIME               6.58     6.58

 ROUTED TO
+                  RT-3        .37      1   FLOW                119.      331.
                                             TIME               6.67     6.67

 HYDROGRAPH AT
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+	SB80	.22	1	FLOW	68.	190.
				TIME	6.67	6.67
ROUTED TO						
+	RT-2	.22	1	FLOW	67.	185.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB81	.39	1	FLOW	100.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-1	.39	1	FLOW	99.	296.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB73	.12	1	FLOW	31.	90.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB75	.12	1	FLOW	25.	72.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB76	.17	1	FLOW	35.	105.
				TIME	6.83	6.75
6 COMBINED AT						
+	DP75	1.39	1	FLOW	364.	1022.
				TIME	6.75	6.75
ROUTED TO						
+	RT-5	1.39	1	FLOW	345.	1021.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB79	.29	1	FLOW	111.	306.
				TIME	6.58	6.58
ROUTED TO						
+	RT-7	.29	1	FLOW	107.	281.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SB78	.88	1	FLOW	259.	738.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP78	1.17	1	FLOW	367.	1020.
				TIME	6.67	6.67
ROUTED TO						

+	RT-6	1.17	1	FLOW	351.	993.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB77	.25	1	FLOW	61.	177.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB88	.10	1	FLOW	34.	97.
				TIME	6.58	6.58
4 COMBINED AT						
+	DP77	2.91	1	FLOW	780.	2207.
				TIME	6.75	6.67
ROUTED TO						
+	RT-8	2.91	1	FLOW	761.	2201.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB71	.36	1	FLOW	127.	334.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP71	3.27	1	FLOW	861.	2508.
				TIME	6.83	6.75
ROUTED TO						
+	RT-9	3.27	1	FLOW	842.	2445.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB70	.31	1	FLOW	99.	256.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP70	3.58	1	FLOW	931.	2701.
				TIME	6.83	6.75
ROUTED TO						
+	RT-11	3.58	1	FLOW	905.	2653.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB72	.25	1	FLOW	135.	321.
				TIME	6.58	6.50
ROUTED TO						
+	RT-10	.25	1	FLOW	128.	321.
				TIME	6.58	6.58
HYDROGRAPH AT						

+	SB69	.25	1	FLOW	93.	216.
				TIME	6.83	6.83
2 COMBINED AT						
+	DP69	.50	1	FLOW	191.	453.
				TIME	6.67	6.58
ROUTED TO						
+	RT-12	.50	1	FLOW	187.	446.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-15	.07	1	FLOW	35.	87.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP87	4.15	1	FLOW	1068.	3104.
				TIME	6.83	6.75
ROUTED TO						
+	RT-13	4.15	1	FLOW	1048.	3020.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-12	.24	1	FLOW	70.	183.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP63	4.39	1	FLOW	1111.	3198.
				TIME	6.92	6.83
ROUTED TO						
+	RT-17	4.39	1	FLOW	1083.	3152.
				TIME	7.00	6.83
HYDROGRAPH AT						
+	SB68	.22	1	FLOW	97.	222.
				TIME	6.75	6.75
ROUTED TO						
+	RT-14	.22	1	FLOW	95.	220.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-14	.31	1	FLOW	88.	234.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP67	.53	1	FLOW	183.	448.
				TIME	6.83	6.83
ROUTED TO						

+	RT-15	.53	1	FLOW	178.	446.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-13	.25	1	FLOW	174.	346.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP64	.79	1	FLOW	338.	763.
				TIME	6.83	6.75
ROUTED TO						
+	RT-16	.79	1	FLOW	332.	758.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-9	.24	1	FLOW	123.	279.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP60	5.42	1	FLOW	1462.	4126.
				TIME	6.92	6.83
ROUTED TO						
+	RT-18	5.42	1	FLOW	1456.	4013.
				TIME	7.00	6.92
HYDROGRAPH AT						
+	SC3-2	.19	1	FLOW	108.	239.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-11	.28	1	FLOW	167.	341.
				TIME	6.75	6.75
ROUTED TO						
+	RT-19	.28	1	FLOW	166.	336.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-10	.11	1	FLOW	61.	138.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP55	.39	1	FLOW	211.	448.
				TIME	6.75	6.75
ROUTED TO						
+	RT-20	.39	1	FLOW	209.	445.
				TIME	6.92	6.83

HYDROGRAPH AT

+	SC3-1	.13	1	FLOW	92.	187.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP56	.52	1	FLOW	274.	586.
				TIME	6.83	6.83
ROUTED TO						
+	DB95	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
			** PEAK STAGES IN FEET **			
			1	STAGE	105.02	109.39
				TIME	11.42	11.00
ROUTED TO						
+	RT-21	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
3 COMBINED AT						
+	DP53	6.13	1	FLOW	1500.	4163.
				TIME	7.00	6.83
ROUTED TO						
+	DB94	6.13	1	FLOW	440.	1908.
				TIME	10.75	7.25
			** PEAK STAGES IN FEET **			
			1	STAGE	107.28	109.63
				TIME	10.75	7.25
ROUTED TO						
+	RT-27	6.13	1	FLOW	438.	1895.
				TIME	10.75	7.25
HYDROGRAPH AT						
+	SC2-24	.07	1	FLOW	105.	172.
				TIME	6.58	6.50
ROUTED TO						
+	RT-29	.07	1	FLOW	105.	172.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-27	.08	1	FLOW	128.	207.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP50	6.27	1	FLOW	442.	1922.
				TIME	10.75	7.25
ROUTED TO						

+	RT-31	6.27	1	FLOW	440.	1920.
				TIME	10.83	7.33
HYDROGRAPH AT						
+	SC3-8	.24	1	FLOW	66.	192.
				TIME	6.67	6.67
ROUTED TO						
+	RT-25	.24	1	FLOW	63.	190.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-3	.13	1	FLOW	155.	270.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP51	.37	1	FLOW	198.	437.
				TIME	6.67	6.67
ROUTED TO						
+	DB93	.37	1	FLOW	25.	77.
				TIME	10.50	7.17
			** PEAK STAGES IN FEET **			
			1	STAGE	104.11	105.42
				TIME	10.50	7.17
ROUTED TO						
+	RT-30	.37	1	FLOW	25.	77.
				TIME	10.58	7.25
2 COMBINED AT						
+	DP49	6.64	1	FLOW	464.	1996.
				TIME	10.83	7.33
ROUTED TO						
+	RT-32	6.64	1	FLOW	463.	1988.
				TIME	10.92	7.33
HYDROGRAPH AT						
+	SC3-6	.24	1	FLOW	83.	219.
				TIME	6.67	6.67
ROUTED TO						
+	RT-23	.24	1	FLOW	82.	213.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-5	.12	1	FLOW	142.	247.
				TIME	6.67	6.58
ROUTED TO						

+	RT-24	.12	1	FLOW	142.	243.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-7	.54	1	FLOW	290.	589.
				TIME	6.83	6.83
ROUTED TO						
+	RT-22	.54	1	FLOW	290.	585.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC3-4	.32	1	FLOW	252.	496.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP54	1.22	1	FLOW	681.	1393.
				TIME	6.75	6.75
ROUTED TO						
+	DB92	1.22	1	FLOW	54.	89.
				TIME	10.92	10.92
			** PEAK STAGES IN FEET **			
			1	STAGE	104.72	107.66
				TIME	10.92	10.92
ROUTED TO						
+	RT-26	1.22	1	FLOW	54.	89.
				TIME	11.08	11.08
HYDROGRAPH AT						
+	SC2-26	.19	1	FLOW	124.	259.
				TIME	6.67	6.67
ROUTED TO						
+	RT-34	.19	1	FLOW	121.	249.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-25	.44	1	FLOW	235.	497.
				TIME	6.83	6.75
3 COMBINED AT						
+	DP47	1.85	1	FLOW	355.	749.
				TIME	6.75	6.75
ROUTED TO						
+	RT-33	1.85	1	FLOW	352.	745.
				TIME	6.75	6.75
HYDROGRAPH AT						

+	SC2-28	.27	1	FLOW	48.	142.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC2-21	.19	1	FLOW	113.	236.
				TIME	6.75	6.75
4 COMBINED AT						
+	DP48	8.95	1	FLOW	728.	2353.
				TIME	6.75	7.33
ROUTED TO						
+	RT-37	8.95	1	FLOW	715.	2350.
				TIME	6.75	7.33
HYDROGRAPH AT						
+	SC2-23	.20	1	FLOW	128.	267.
				TIME	6.67	6.67
ROUTED TO						
+	RT-35	.20	1	FLOW	125.	264.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-22	.08	1	FLOW	67.	137.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP46	.28	1	FLOW	187.	386.
				TIME	6.67	6.67
ROUTED TO						
+	RT-36	.28	1	FLOW	183.	383.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP42	9.23	1	FLOW	889.	2407.
				TIME	6.75	7.33
ROUTED TO						
+	RT-38	9.23	1	FLOW	863.	2399.
				TIME	6.83	7.33
HYDROGRAPH AT						
+	SC2-20	.32	1	FLOW	193.	401.
				TIME	6.75	6.75
ROUTED TO						
+	RT-41	.32	1	FLOW	192.	400.
				TIME	6.75	6.75
HYDROGRAPH AT						

+	SC2-15	.18	1	FLOW	141.	291.
				TIME	6.58	6.58
ROUTED TO						
+	RT-39	.18	1	FLOW	138.	288.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-13	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
ROUTED TO						
+	RT-40	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP85	9.90	1	FLOW	1265.	2615.
				TIME	6.75	6.75
ROUTED TO						
+	RT-42	9.90	1	FLOW	1235.	2586.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-14	.26	1	FLOW	114.	254.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-16	.21	1	FLOW	120.	265.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP37	10.37	1	FLOW	1442.	3082.
				TIME	6.83	6.75
ROUTED TO						
+	RT-43	10.37	1	FLOW	1438.	3007.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-12	.18	1	FLOW	71.	179.
				TIME	6.67	6.67
ROUTED TO						
+	RT-46	.18	1	FLOW	69.	171.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-8	.35	1	FLOW	184.	390.
				TIME	6.83	6.75
2 COMBINED AT						

+	DP33	.53	1	FLOW	252.	559.
				TIME	6.75	6.75
ROUTED TO						
+	RT-45	.53	1	FLOW	247.	553.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP36	10.90	1	FLOW	1685.	3537.
				TIME	6.83	6.83
ROUTED TO						
+	RT-44	10.90	1	FLOW	1647.	3536.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-11	.21	1	FLOW	163.	338.
				TIME	6.58	6.58
ROUTED TO						
+	RT-52	.21	1	FLOW	160.	335.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-19	.18	1	FLOW	191.	345.
				TIME	6.67	6.67
ROUTED TO						
+	RT-51	.18	1	FLOW	189.	343.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-18	.20	1	FLOW	234.	405.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP39	.59	1	FLOW	582.	1083.
				TIME	6.67	6.67
ROUTED TO						
+	RT-49	.59	1	FLOW	570.	1073.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-17	.16	1	FLOW	107.	222.
				TIME	6.67	6.67
ROUTED TO						
+	RT-50	.16	1	FLOW	105.	214.
				TIME	6.75	6.67
HYDROGRAPH AT						

+	SC2-29	.15	1	FLOW	208.	358.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP34	.90	1	FLOW	846.	1587.
				TIME	6.67	6.67
ROUTED TO						
+	RT-48	.90	1	FLOW	827.	1574.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-10	.33	1	FLOW	185.	391.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP32	1.23	1	FLOW	999.	1949.
				TIME	6.67	6.67
ROUTED TO						
+	RT-47	1.23	1	FLOW	980.	1930.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-9	.21	1	FLOW	61.	150.
				TIME	6.92	6.83
3 COMBINED AT						
+	DP35	12.34	1	FLOW	2561.	5419.
				TIME	6.83	6.75
ROUTED TO						
+	RT-53	12.34	1	FLOW	2545.	5359.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-7	.14	1	FLOW	96.	200.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP29	12.48	1	FLOW	2621.	5544.
				TIME	6.83	6.75
ROUTED TO						
+	RT-54	12.48	1	FLOW	2582.	5445.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-6	.15	1	FLOW	137.	269.
				TIME	6.58	6.58
ROUTED TO						

+	RT-55	.15	1	FLOW	134.	258.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-2	.17	1	FLOW	135.	266.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP28	12.80	1	FLOW	2754.	5874.
				TIME	6.83	6.75
ROUTED TO						
+	RT-56	12.80	1	FLOW	2717.	5789.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-5	.16	1	FLOW	235.	386.
				TIME	6.58	6.58
ROUTED TO						
+	RT-58	.16	1	FLOW	231.	379.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-0	.15	1	FLOW	67.	160.
				TIME	6.67	6.67
ROUTED TO						
+	RT-57	.15	1	FLOW	66.	156.
				TIME	6.75	6.67
3 COMBINED AT						
+	DP21	13.11	1	FLOW	2928.	6263.
				TIME	6.83	6.75
ROUTED TO						
+	RT-59	13.11	1	FLOW	2896.	6190.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-4	.28	1	FLOW	393.	641.
				TIME	6.67	6.67
ROUTED TO						
+	RT-61	.28	1	FLOW	388.	637.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-3	.07	1	FLOW	117.	188.
				TIME	6.58	6.58
2 COMBINED AT						

+	DP22	.36	1	FLOW	485.	793.
				TIME	6.67	6.67
ROUTED TO						
+	RT-60	.36	1	FLOW	483.	793.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-1	.19	1	FLOW	140.	282.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP20	13.65	1	FLOW	3359.	7151.
				TIME	6.83	6.75
ROUTED TO						
+	DBSC2	13.65	1	FLOW	1153.	4357.
				TIME	7.42	7.08
			** PEAK STAGES IN FEET **			
			1	STAGE	6506.59	6510.16
				TIME	7.42	7.08
ROUTED TO						
+	RT-63	13.65	1	FLOW	1150.	4348.
				TIME	7.42	7.08
HYDROGRAPH AT						
+	SC1-10	.29	1	FLOW	160.	339.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP18	13.94	1	FLOW	1185.	4499.
				TIME	7.42	7.08
ROUTED TO						
+	RT-66	13.94	1	FLOW	1183.	4493.
				TIME	7.42	7.08
HYDROGRAPH AT						
+	SC1-13	.13	1	FLOW	152.	271.
				TIME	6.58	6.58
ROUTED TO						
+	RT-64	.13	1	FLOW	151.	267.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC1-14	.11	1	FLOW	160.	263.
				TIME	6.58	6.58
2 COMBINED AT						

IN SC#2

OUT SC#2

+	DP19	.24	1	FLOW	308.	530.
				TIME	6.58	6.58
ROUTED TO						
+	RT-65	.24	1	FLOW	308.	527.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP17	14.18	1	FLOW	1219.	4589.
				TIME	7.42	7.08
ROUTED TO						
+	RT-67	14.18	1	FLOW	1213.	4575.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-9	.24	1	FLOW	162.	352.
				TIME	6.58	6.58
ROUTED TO						
+	DBSR29	.24	1	FLOW	51.	103.
				TIME	6.92	6.92
			** PEAK STAGES IN FEET **			
			1	STAGE	103.85	105.90
				TIME	6.92	6.92
ROUTED TO						
+	RT-70	.24	1	FLOW	51.	103.
				TIME	7.00	7.00
HYDROGRAPH AT						
+	SC1-8	.21	1	FLOW	145.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-71	.21	1	FLOW	144.	297.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP14	.45	1	FLOW	183.	365.
				TIME	6.75	6.67
ROUTED TO						
+	RT-69	.45	1	FLOW	182.	363.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-7	.10	1	FLOW	83.	166.
				TIME	6.58	6.58
2 COMBINED AT						

PRELIMINARY DESIGN HYDROLOGY

SC# 2 w/ DBPS + SCH 15 + SCH 24

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1*****************************************
******************************************
                                          *
                                          *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
CORPS OF ENGINEERS      *
 *                JUN   1998               *
ENGINEERING CENTER     *
 *             VERSION 4.1                 *
SECOND STREET           *
 *                                        *
CALIFORNIA 95616        *
 *  RUN DATE   06AUG04   TIME  13:04:30    *
756-1104             *
 *                                        *
*
 ******************************************
******************************************
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                                          *
                                          *   U.S. ARMY
                                          *   HYDROLOGIC
                                          *        609
                                          *      DAVIS,
                                          *        (916)
                                          *
```

PAGE SCH 2
PRELIMINARY DESIGN

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT

PAGE 1

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

  1           ID            Sand Creek Detention Basin No. 2 Preliminary design
  2           ID                 Future development condition with Sand Creek No. 1
  3           ID            DETENTION BASIN MODELED PER DBPS WITH SPRINGS RANCH DETENTION
  4           ID            BASINS 15 AND 29
  5           ID            10-year and 100 Year, 24 hr Type IIA  Storm fn: SC1-FD.dat
              *DIAGRAM
  6           IT       5       0       0     300
  7           IO       5       0
  8           JR    PREC     .68     1.0

  9           KK    SB82
 10           KM       RUNOFF FROM SUB-BASIN 82
 11           BA    .190
 12           IN      30
 13           PB     4.4
 14           PC  0.0000  0.0025  0.0050  0.0075  0.0100  0.0150  0.0200  0.0250  0.0300  0.0500
 15           PC  0.0600  0.1000  0.1000  0.7000  0.7000  0.7500  0.7800  0.7980  0.8200  0.8300
 16           PC  0.9150  0.9210  0.9270  0.9330  0.9400  0.9450  0.9500  0.9525  0.9550  0.9600
 17           PC  0.9650  0.9700  0.9750  0.9800  0.9830  0.9850  0.9880  0.9900  0.9930  0.9950
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                18          PC  0.9980  1.0000  1.0000
                19          LS       0      67
                20          UD    .110

                21          KK    RT-4
                22          KM    ROUTE FLOW FROM SUB-BASIN 82 TO DP 74
                23          RK    2300     .030     .035            TRAP       10       10

                24          KK    SB74
                25          KM    RUNOFF FROM SUB-BASIN 74
                26          BA    .180
                27          LS       0      67
                28          UD    0.29

                29          KK    DP74
                30          KM    DESIGN POINT 74 COMBINE RUNOFF FROM SUB-BASIN 74 AND RT-4
                31          HC       2

                32          KK    RT-3
                33          KM    ROUTE FLOW FROM DP 74 TO DP 75
                34          RK    2800     .025     .035            TRAP              10

                35          KK    SB80
                36          KM    RUNOFF FROM SUB-BASIN 80
                37          BA    .220
                38          LS       0      67
                39          UD    .240

                40          KK    RT-2
                41          KM    ROUTE FLOW FROM SB 80 TO DP 75
                42          RK    4100     .035     .035            TRAP              10
1
                                                 HEC-1 INPUT
PAGE  2

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

                43          KK    SB81
                44          KM    RUNOFF FROM SUB-BASIN 81
                45          BA    .390
                46          LS       0      67
                47          UD    .306

                48          KK    RT-1
                49          KM    ROUTE FLOW FROM SB 81 TO DP 75
                50          RK    3850      .03     .035            TRAP              10

                51          KK    SB73
                52          KM    RUNOFF FROM SUB-BASIN 73
                53          BA    .1200
                54          LS       0      67
                55          UD    .312

                56          KK    SB75
                57          KM    RUNOFF FROM SUB-BASIN 75
                58          BA    .1200
                59          LS       0      67
                60          UD    .420

                61          KK    SB76
                62          KM    RUNOFF FROM SUB-BASIN 76
                63          BA    .1700
                64          LS       0      67
                65          UD    .408

                66          KK    DP75
                67          KM    DESIGN POINT 75 COMBINE RUNOFF FROM SUB-BASINS 73, 75, 76, RT-1, RT-2 & RT-3
                68          HC       6

                69          KK    RT-5
                70          KM    ROUTE FLOW FROM DP 75 TO DP 77
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 71          RK    1700    .025    .035            TRAP      10       10

 72          KK    SB79
 73          KM   RUNOFF FROM SUB-BASIN 79
 74          BA   .2900
 75          LS      0      67
 76          UD    .174

 77          KK    RT-7
 78          KM   ROUTE FLOW FROM SUB-BASIN 79 TO DP 78
 79          RK    3000    0.03   0.035            TRAP       6        6

 80          KK    SB78
 81          KM   RUNOFF FROM SUB-BASIN 78
 82          BA    .88
 83          LS      0      67
 84          UD    .264
1                                        HEC-1 INPUT
PAGE  3

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

 85          KK    DP78
 86          KM   DESIGN POINT 78 COMBINE RUNOFF FROM SUB-BASIN 78 AND RT-7
 87          HC      2

 88          KK    RT-6
 89          KM   ROUTE FLOW FROM DESIGN POINT 78 TO DP 77
 90          RK    3350    .025    .035            TRAP      10       6

 91          KK    SB77
 92          KM   RUNOFF FROM SUB-BASIN 77
 93          BA    .25
 94          LS      0      67
 95          UD    .336

 96          KK    SB88
 97          KM   RUNOFF FROM SUB-BASIN 88
 98          BA   .1000
 99          LS      0      67
100          UD    .204

101          KK    DP77
102          KM   DESIGN POINT 77 COMBINE RUNOFF FROM SUB-BASINS 77 AND 88 AND RT-6, AND RT-5
103          HC      4

104          KK    RT-8
105          KM   ROUTE FLOW FROM DESIGN POINT 77 TO DP 71
106          RK    3850    .025    .035            TRAP      20       10

107          KK    SB71
108          KM   RUNOFF FROM SUB-BASIN 71
109          BA    .36
110          LS      0      70
111          UD    .300

112          KK    DP71
113          KM   DESIGN POINT 71 COMBINE RUNOFF FROM SUB-BASIN 71 AND RT-8
114          HC      2

115          KK    RT-9
116          KM   ROUTE FLOW FROM DESIGN POINT 71 TO DP 70
117          RK    2500    .025    .035            TRAP      20       4

118          KK    SB70
119          KM   RUNOFF FROM SUB-BASIN 70
120          BA   .3100
121          LS      0      70
122          UD    .350
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                123          KK    DP70
                124          KM    DESIGN POINT 70 COMBINE RUNOFF FROM SUB-BASIN 70 AND RT-9
                125          HC       2
1
PAGE  4                                                HEC-1 INPUT

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

                126          KK    RT-11
                127          KM    ROUTE FLOW FROM DESIGN POINT 70 TO DP 87
                128          RK     1200     .025     .035            TRAP       20        4

                129          KK     SB72
                130          KM    RUNOFF FROM SUB-BASIN 72
                131          BA    .2500
                132          LS       0       70
                133          UD     .138

                134          KK    RT-10
                135          KM    ROUTE FLOW FROM SUB-BASIN 72 TO DESIGN POINT 70
                136          RK     3000     .035     .035            TRAP       10        4

                137          KK     SB69
                138          KM    RUNOFF FROM SUB-BASIN 69
                139          BA    .2500
                140          LS       0       75
                141          UD     .483

                142          KK     DP69
                143          KM    DESIGN POINT 69 COMBINE RUNOFF FROM SUB-BASIN 69 AND RT-10
                144          HC       2

                145          KK    RT-12
                146          KM    ROUTE FLOW FROM DESIGN POINT 69 TO DP 87
                147          RK     1400     .025     .035            TRAP       20        4

                148          KK   SC3-15
                149          KM    RUNOFF FROM SUB-BASIN SC3-15
                150          BA    .0730
                151          LS       0     72.0
                152          UD     .230

                153          KK     DP87
                154          KM    DESIGN POINT 87 COMBINE RUNOFF FROM SUB-BASIN SC3-15, RT-12 AND RT-11
                155          HC       3

                156          KK    RT-13
                157          KM    ROUTE FLOW FROM DESIGN POINT 87 TO DP 63
                158          RK     4400     .025     .035            TRAP       40        4

                159          KK   SC3-12
                160          KM    RUNOFF FROM SUB-BASIN SC3-12
                161          BA    .2380
                162          LS       0     70.6
                163          UD     .410

                164          KK     DP63
                165          KM    DESIGN POINT 63 COMBINE RUNOFF FROM SUB-BASIN SC3-12 AND RT-13
                166          HC       2
1
PAGE  5                                                HEC-1 INPUT

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

                167          KK    RT-17
                168          KM    ROUTE FLOW FROM DESIGN POINT 63 TO DP 60
                169          RK     4390     .015     .035            TRAP       10        4

                170          KK     SB68
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171          KM   RUNOFF FROM SUB-BASIN 68
172          BA   .2200
173          LS      0      75
174          UD    .390

175          KK   RT-14
176          KM   ROUTE FLOW FROM SUB-BASIN 68 TO DESIGN POINT 67
177          RK    3300    .020    .035            TRAP      20       4

178          KK  SC3-14
179          KM   RUNOFF FROM SUB-BASIN SC3-14
180          BA   .3150
181          LS      0    70.0
182          UD    .410

183          KK    DP67
184          KM   DESIGN POINT 67 COMBINE RUNOFF FROM SUB-BASIN SC3-14 AND RT-14
185          HC       2

186          KK   RT-15
187          KM   ROUTE FLOW FROM DP 67 TO DESIGN POINT 64
188          RK    2500    .035    .035            TRAP      20       6

189          KK  SC3-13
190          KM   RUNOFF FROM SUB-BASIN SC3-13
191          BA   .2550
192          LS      0    81.4
193          UD    .390

194          KK    DP64
195          KM   DESIGN POINT 64 COMBINE RUNOFF FROM SUB-BASIN SC3-13 AND RT-15
196          HC       2

197          KK   RT-16
198          KM   ROUTE FLOW FROM DP 64 TO DESIGN POINT 60
199          RK    4010    .018    .035            TRAP      20      10

200          KK   SC3-9
201          KM   RUNOFF FROM SUB-BASIN SC3-9
202          BA   .2360
203          LS      0    75.5
204          UD    .320

205          KK    DP60
206          KM   DESIGN POINT 60 COMBINE RUNOFF FROM SUB-BASIN SC3-9, RT-17 AND RT-16
207          HC       3
1
PAGE  6                                  HEC-1 INPUT

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

208          KK   RT-18
209          KM   ROUTE FLOW FROM DP 60 TO DESIGN POINT 53
210          RK    2690    .015    .035            TRAP      10       4

211          KK   SC3-2
212          KM   RUNOFF FROM SUB-BASIN SC3-2
213          BA   .1920
214          LS      0    76.1
215          UD    .310

216          KK  SC3-11
217          KM   RUNOFF FROM SUB-BASIN SC3-11
218          BA   .2750
219          LS      0    80.8
220          UD    .430

221          KK   RT-19
222          KM   ROUTE FLOW FROM SUB-BASIN SC3-11 TO DESIGN POINT 55
223          RK    2600    .022    .035            TRAP      10       6
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224          KK  SC3-10
225          KM   RUNOFF FROM SUB-BASIN SC3-10
226          BA   .1130
227          LS       0    75.0
228          UD    .290

229          KK    DP55
230          KM   DESIGN POINT 55 COMBINE RUNOFF FROM SUB-BASIN SC3-10 AND RT-19
231          HC       2

232          KK   RT-20
233          KM   ROUTE FLOW FROM DESIGN POINT 55 TO DESIGN POINT 56
234          RK    3670    .012    .035            TRAP      10      10

235          KK   SC3-1
236          KM   RUNOFF FROM SUB-BASIN SC3-1
237          BA   .1290
238          LS       0    80.0
239          UD    .320

240          KK    DP56
241          KM   DESIGN POINT 56 COMBINE RUNOFF FROM SUB-BASIN SC3-1 AND RT-20
242          HC       2

243          KK    DB95
244          KM        ROUTE FLOW FROM DP 56 THROUGH DBPS STRUCTURE 95
245          RS       1    ELEV     100
246          SV       0      20      34      39      42      50
247          SQ       0      10      20      30      40      43
248          SE     100     104     107     108     109     110
1
PAGE   7                                  HEC-1 INPUT

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

249          KK   RT-21
250          KM   ROUTE FLOW FROM DETENTION BASIN DB95 TO DESIGN POINT 53
251          RK     870    .023    .035            TRAP      10      10

252          KK    DP53
253          KM   DESIGN POINT 53 COMBINE RUNOFF FROM SUB-BASIN SC3-2, RT-21 AND RT-18
254          HC       3

255          KK    DB94
256          KM        ROUTE FLOW FROM DP 53 THROUGH DBPS STRUCTURE 94
257          RS       1    ELEV     100
258          SV       0      30      40      60      80     120     130
259          SQ       0      80      90     300     800    1750    2000
260          SE     100     104     105     107     108     109     110

261          KK   RT-27
262          KM   ROUTE FLOW FROM DETETNION BASIN DB94 TO DESIGN POINT 50
263          RK    1380    .022    .035            TRAP      10      10

264          KK  SC2-24
265          KM   RUNOFF FROM SUB-BASIN SC2-24
266          BA   .0660
267          LS       0    90.7
268          UD    .190

269          KK   RT-29
270          KM   ROUTE FLOW FROM SUB-BASIN SC2-24 TO DESIGN POINT 50
271          RK     330    .020    .013            CIRC       4

272          KK  SC2-27
273          KM   RUNOFF FROM SUB-BASIN SC2-27
274          BA   .0780
275          LS       0    92.0
276          UD    .210
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277          KK    DP50
278          KM   DESIGN POINT 50 COMBINE RUNOFF FROM SC2-27, RT-27 AND RT-29
279          HC       3

280          KK   RT-31
281          KM   ROUTE FLOW FROM DESIGN POINT 50 TO DESIGN POINT 49
282          RK     940     .020     .035            TRAP       40        6

283          KK   SC3-8
284          KM   RUNOFF FROM SUB-BASIN SC3-8
285          BA   .2420
286          LS       0     67.0
287          UD    .290
1                                        HEC-1 INPUT
PAGE  8

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

288          KK   RT-25
289          KM   ROUTE FLOW FROM SUB-BASIN SC3-8 TO DESIGN POINT 51
290          RK    2690     .015     .035            TRAP       20        6

291          KK   SC3-3
292          KM   RUNOFF FROM SUB-BASIN SC3-3
293          BA   .1270
294          LS       0     88.5
295          UD    .280

296          KK    DP51
297          KM   DESIGN POINT 51 COMBINE RUNOFF FROM SC3-3 AND RT-25
298          HC       2

299          KK    DB93
300          KM        ROUTE FLOW FROM DP 51 THROUGH DBPS STRUCTURE 93
301          RS       1     ELEV      100
302          SV       0       10       20       30
303          SQ       0       20      100      290
304          SE     100      104      106      108

305          KK   RT-30
306          KM   ROUTE FLOW FROM DETENTION BASIN DB93 TO DESIGN POINT 49
307          RK    1590     .019     .035            TRAP       20       10

308          KK    DP49
309          KM   DESIGN POINT 49 COMBINE RUNOFF FROM RT-31 AND RT-30
310          HC       2

311          KK   RT-32
312          KM   ROUTE FLOW FROM DESIGN POINT 49 TO DESIGN POINT 48
313          RK    4930     .017     .035            TRAP       40        6

314          KK   SC3-6
315          KM   RUNOFF FROM SUB-BASIN SC3-6
316          BA   .2420
317          LS       0     70.0
318          UD    .310

319          KK   RT-23
320          KM   ROUTE FLOW FROM SUB-BASIN SC3-6 TO DESIGN POINT 54
321          RK    1830     .023     .035            TRAP       10       10

322          KK   SC3-5
323          KM   RUNOFF FROM SUB-BASIN SC3-5
324          BA   .1150
325          LS       0     88.7
326          UD    .280
1                                        HEC-1 INPUT
PAGE  9
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 327      KK   RT-24
 328      KM   ROUTE FLOW FROM SUB-BASIN SC3-5 TO DESIGN POINT 54
 329      RK    1760    .041    .035            TRAP      10       4

 330      KK   SC3-7
 331      KM   RUNOFF FROM SUB-BASIN SC3-7
 332      BA   .5380
 333      LS       0    81.5
 334      UD    .530

 335      KK   RT-22
 336      KM   ROUTE FLOW FROM SUB-BASIN SC3-7 TO DESIGN POINT 54
 337      RK    2860    .021    .035            TRAP      30       6

 338      KK   SC3-4
 339      KM   RUNOFF FROM SUB-BASIN SC3-4
 340      BA   .3210
 341      LS       0    81.9
 342      UD    .330

 343      KK    DP54
 344      KM   DESIGN POINT 54 COMBINE RUNOFF FROM SUB-BASIN SC3-4, RT-22, RT-23 AND RT-24
 345      HC       4

 346      KK    DB92
 347      KM        ROUTE FLOW FROM DP 54 THROUGH DBPS STRUCTURE 92
 348      RS      1    ELEV     100
 349      SV      0      40      60      90     110     120     130
 350      SQ      0      40      60      82      90      91      95
 351      SE    100     104     105     106     108     109     110

 352      KK   RT-26
 353      KM   ROUTE FLOW FROM DETENTION BASIN 92 TO DESIGN POINT 47
 354      RK    4680    .028    .035            TRAP      40      10

 355      KK  SC2-26
 356      KM   RUNOFF FROM SUB-BASIN SC2-26
 357      BA   .1860
 358      LS       0    74.4
 359      UD    .320

 360      KK   RT-34
 361      KM   ROUTE FLOW FROM SUB-BASIN SC2-26 TO DESIGN POINT 47
 362      RK    1620    .014    .035            TRAP       4       4

 363      KK  SC2-25
 364      KM   RUNOFF FROM SUB-BASIN SC2-25
 365      BA   .4440
 366      LS       0    73.6
 367      UD    .440
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 368      KK    DP47
 369      KM   DESIGN POINT 47 COMBINE RUNOFF FROM SUB-BASIN SC3-26 AND RT-26 AND RT-34
 370      HC       3

 371      KK   RT-33
 372      KM   ROUTE FLOW FROM DESIGN POINT 47 TO DESIGN POINT 48
 373      RK     510    .020    .035            TRAP       6       4

 374      KK  SC2-28
 375      KM   RUNOFF FROM SUB-BASIN SC2-28
 376      BA   .2740
 377      LS       0    67.1
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 378          UD    .510

 379          KK  SC2-21
 380          KM   RUNOFF FROM SUB-BASIN SC2-21
 381          BA   .1930
 382          LS       0    79.0
 383          UD    .390

 384          KK    DP48
 385          KM   DESIGN POINT 48 COMBINE RUNOFF FROM SB'S SC2-21 AND SC2-28, RT-33 AND RT-32
 386          HC       4

 387          KK   RT-37
 388          KM   ROUTE FLOW FROM DESIGN POINT 48 TO DESIGN POINT 42
 389          RK    1080    .022    .035            TRAP      60       6

 390          KK  SC2-23
 391          KM   RUNOFF FROM SUB-BASIN SC2-23
 392          BA   .1960
 393          LS       0    70.0
 394          UD    .330

 395          KK   RT-35
 396          KM   ROUTE FLOW FROM SUB-BASIN SC2-23 TO DESIGN POINT 46
 397          RK    1180    .015    .013            CIRC       5

 398          KK  SC2-22
 399          KM   RUNOFF FROM SUB-BASIN SC2-22
 400          BA   .0810
 401          LS       0    79.0
 402          UD    .220

 403          KK    DP46
 404          KM   DESIGN POINT 46 COMBINE RUNOFF FROM SUB-BASIN SC2-22 AND RT-35
 405          HC       2

 406          KK   RT-36
 407          KM   ROUTE FLOW FROM DESIGN POINT 46 TO DESIGN POINT 42
 408          RK    1790    .017    .013            TRAP      30       4
1
PAGE 11                                  HEC-1 INPUT

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

 409          KK    DP42
 410          KM   DESIGN POINT 42 COMBINE RUNOFF FROM RT- 37 AND RT-36
 411          HC       2

 412          KK   RT-38
 413          KM   ROUTE FLOW FROM DESIGN POINT 42 TO DESIGN POINT 85
 414          RK    1790    .013    .035            TRAP      60       6

 415          KK  SC2-20
 416          KM   RUNOFF FROM SUB-BASIN SC2-20
 417          BA   .3240
 418          LS       0    79.0
 419          UD    .380

 420          KK   RT-41
 421          KM   ROUTE FLOW FROM SUB-BASIN SC2-20 TO DESIGN POINT 85
 422          RK    1560    .020    .013            CIRC     6.5

 423          KK  SC2-15
 424          KM   RUNOFF FROM SUB-BASIN SC2-15
 425          BA   .1810
 426          LS       0    79.0
 427          UD    .240

 428          KK   RT-39
 429          KM   ROUTE FLOW FROM SUB-BASIN SC2-15 TO DESIGN POINT 85
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 430          RK     990    .022    .013            CIRC     6.5

 431          KK  SC2-13
 432          KM   RUNOFF FROM SUB-BASIN SC2-13
 433          BA   .1630
 434          LS       0    79.0
 435          UD    .280

 436          KK   RT-40
 437          KM   ROUTE FLOW FROM SUB-BASIN SC2-13 TO DESIGN POINT 85
 438          RK     300    .033    .013            CIRC     5.5

 439          KK    DP85
 440          KM   DESIGN POINT 85 COMBINE RUNOFF FROM RT-41, RT-38, RT-39 AND RT-40
 441          HC       4

 442          KK   RT-42
 443          KM   ROUTE FLOW FROM DESIGN POINT 85 TO DESIGN POINT 37
 444          RK    2900    .016    .035            TRAP      60       6

 445          KK  SC2-14
 446          KM   RUNOFF FROM SUB-BASIN SC2-14
 447          BA   .2650
 448          LS       0    76.2
 449          UD    .450
1
PAGE 12                                    HEC-1 INPUT

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

 450          KK  SC2-16
 451          KM   RUNOFF FROM SUB-BASIN SC2-16
 452          BA   .2120
 453          LS       0    76.2
 454          UD    .310

 455          KK    DP37
 456          KM   DESIGN POINT 37 COMBINE RUNOFF FROM RT-42, SUB-BASINS SC2-14 AND SC2-16
 457          HC       3

 458          KK   RT-43
 459          KM   ROUTE FLOW FROM DESIGN POINT 37 TO DESIGN POINT 36
 460          RK    3380    .016    .035            TRAP      60       4

 461          KK  SC2-12
 462          KM   RUNOFF FROM SUB-BASIN SC2-12
 463          BA   .1790
 464          LS       0    70.6
 465          UD    .280

 466          KK   RT-46
 467          KM   ROUTE FLOW FROM SUB-BASIN SC2-12 TO DESIGN POINT 33
 468          RK    2280    .024    .035            TRAP      20       4

 469          KK   SC2-8
 470          KM   RUNOFF FROM SUB-BASIN SC2-8
 471          BA   .3480
 472          LS       0    79.0
 473          UD    .440

 474          KK    DP33
 475          KM   DESIGN POINT 33 COMBINE RUNOFF FROM RT-46 AND SUB-BASIN SC2-8
 476          HC       2

 477          KK   RT-45
 478          KM   ROUTE FLOW FROM DESIGN POINT 33 TO DESIGN POINT 36
 479          RK     850    .021    .035            TRAP      20       4

 480          KK    DP36
 481          KM   DESIGN POINT 36 COMBINE RUNOFF FROM RT-45 AND RT-43
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482          HC       2

483          KK   RT-44
484          KM   ROUTE FLOW FROM DESIGN POINT 36 TO DESIGN POINT 35
485          RK    1740    .016    .035            TRAP      60       4

486          KK  SC2-11
487          KM   RUNOFF FROM SUB-BASIN SC2-11
488          BA   .2100
489          LS      0    79.0
490          UD    .240
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HEC-1 INPUT

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

491          KK   RT-52
492          KM   ROUTE FLOW FROM SUB-BASIN SC2-11 TO DESIGN POINT 39
493          RK    2680    .008    .035            TRAP      30       4

494          KK  SC2-19
495          KM   RUNOFF FROM SUB-BASIN SC2-19
496          BA   .1820
497          LS      0    86.0
498          UD    .300

499          KK   RT-51
500          KM   ROUTE FLOW FROM SUB-BASIN SC2-19 TO DESIGN POINT 39
501          RK    3100    .022    .013            CIRC       6

502          KK  SC2-18
503          KM   RUNOFF FROM SUB-BASIN SC2-18
504          BA   .1980
505          LS      0    88.0
506          UD    .290

507          KK    DP39
508          KM   DESIGN POINT 39 COMBINE RUNOFF FROM RT-52, RT-51 AND SUB-BASIN SC2-18
509          HC       3

510          KK   RT-49
511          KM   ROUTE FLOW FROM DESIGN POINT 39 TO DESIGN POINT 34
512          RK    1160    .024    .035            TRAP      20       4

513          KK  SC2-17
514          KM   RUNOFF FROM SUB-BASIN SC2-17
515          BA   .1600
516          LS      0    79.0
517          UD    .320

518          KK   RT-50
519          KM   ROUTE FLOW FROM SUB-BASIN SC2-17 TO DESIGN POINT 34
520          RK    1840    .025    .035            TRAP      20       4

521          KK  SC2-29
522          KM   RUNOFF FROM SUB-BASIN SC2-29
523          BA   .1510
524          LS      0    88.0
525          UD    .210

526          KK    DP34
527          KM   DESIGN POINT 34 COMBINE RUNOFF FROM RT-49, RT-50 AND SUB-BASIN SC2-29
528          HC       3

529          KK   RT-48
530          KM   ROUTE FLOW FROM DESIGN POINT 34 TO DESIGN POINT 32
531          RK    1470    .020     .04            TRAP      20       4
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HEC-1 INPUT

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

 532      KK  SC2-10
 533      KM   RUNOFF FROM SUB-BASIN SC2-10
 534      BA   .3290
 535      LS       0    78.4
 536      UD    .390

 537      KK    DP32
 538      KM   DESIGN POINT 32 COMBINE RUNOFF FROM RT-48 AND SUB-BASIN SC2-10
 539      HC       2

 540      KK   RT-47
 541      KM   ROUTE FLOW FROM SUB-BASIN DESIGN POINT 32 TO DESIGN POINT 35
 542      RK     991    .028    .031            TRAP      20       4

 543      KK   SC2-9
 544      KM   RUNOFF FROM SUB-BASIN SC2-9
 545      BA   .2060
 546      LS       0    73.0
 547      UD    .520

 548      KK    DP35
 549      KM   DESIGN POINT 35 COMBINE RUNOFF FROM RT-47, RT-44 AND SUB-BASIN SC2-9
 550      HC       3

 551      KK   RT-53
 552      KM   ROUTE FLOW FROM DESIGN POINT 35 TO DESIGN POINT 29
 553      RK    1120    .020    .035            TRAP      60       6

 554      KK   SC2-7
 555      KM   RUNOFF FROM SUB-BASIN SC2-7
 556      BA   .1440
 557      LS       0    79.0
 558      UD    .320

 559      KK    DP29
 560      KM   DESIGN POINT 29 COMBINE RUNOFF FROM RT-53 AND SUB-BASIN SC2-7
 561      HC       2

 562      KK   RT-54
 563      KM   ROUTE FLOW FROM DESIGN POINT 29 TO DESIGN POINT 28
 564      RK    1560    .011    .035            TRAP      60       4

 565      KK   SC2-6
 566      KM   RUNOFF FROM SUB-BASIN SC2-6
 567      BA   .1500
 568      LS       0    81.6
 569      UD    .240

 570      KK   RT-55
 571      KM   ROUTE FLOW FROM SUB-BASIN SC2-6 TO DESIGN POINT 28
 572      RD     950    .020    .035            TRAP      10       4
1
                                HEC-1 INPUT
PAGE 15

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

 573      KK   SC2-2
 574      KM   RUNOFF FROM SUB-BASIN SC2-2
 575      BA   .1670
 576      LS       0    80.8
 577      UD    .280

 578      KK    DP28
 579      KM   DESIGN POINT 28 COMBINE RUNOFF FROM RT-54, RT-55 AND SUB-BASIN SC2-2
 580      HC       3

 581      KK   RT-56
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582          KM   ROUTE FLOW FROM DESIGN POINT 28 TO DESIGN POINT 21
583          RK    1280     .017     .035            TRAP       60        4

584          KK   SC2-5
585          KM   RUNOFF FROM SUB-BASIN SC2-5
586          BA   .1610
587          LS       0     92.0
588          UD    .280

589          KK   RT-58
590          KM   ROUTE FLOW FROM SUB-BASIN SC2-5 TO DESIGN POINT 21
591          RK    1670     .027     .024            CIRC       5

592          KK   SC2-0
593          KM   RUNOFF FROM SUB-BASIN SC2-0
594          BA   .1500
595          LS       0     73.4
596          UD    .320

597          KK   RT-57
598          KM   ROUTE FLOW FROM SUB-BASIN SC2-0 TO DESIGN POINT 21
599          RK     800     .032     .035            TRAP       10        4

600          KK    DP21
601          KM   DESIGN POINT 21 COMBINE RUNOFF FROM RT-58, RT-56 AND RT- 57
602          HC       3

603          KK   RT-59
604          KM   ROUTE FLOW FROM DESIGN POINT 21 TO DESIGN POINT 20
605          RK     830     .01      .035            TRAP       80        4

606          KK   SC2-4
607          KM   RUNOFF FROM SUB-BASIN SC2-4
608          BA   .2850
609          LS       0     92.0
610          UD    .320

611          KK   RT-61
612          KM   ROUTE FLOW FROM SUB-BASIN SC2-4 TO DESIGN POINT 22
613          RK    1670     .019     .035            TRAP       20        3
1
PAGE 16                                  HEC-1 INPUT

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

614          KK   SC2-3
615          KM   RUNOFF FROM SUB-BASIN SC2-3
616          BA   .0710
617          LS       0     92.0
618          UD    .210

619          KK    DP22
620          KM   DESIGN POINT 22 COMBINE RUNOFF FROM RT-61 AND SC2-3
621          HC       2

622          KK   RT-60
623          KM   ROUTE FLOW FROM DESIGN POINT 22 TO DESIGN POINT 20
624          RK    1010     .018     .035            TRAP       20        3

625          KK   SC2-1
626          KM   RUNOFF FROM SUB-BASIN SC2-1
627          BA   .1850
628          LS       0     80.0
629          UD    .290

630          KK    DP20
631          KM   DESIGN POINT 20 COMBINE RUNOFF FROM RT-60, RT-59 AND SB SC2-1
632          HC       3

633          KK   DBSC2
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634          KM        ROUTE FLOW FROM DP 20 THROUGH SAND CREEK DETENTION BASIN DBSC2
635          RS       1    ELEV  6496.5
636          SV       0    6.75    29.8    58.8    92.2   129.4   168.6   209.8   255.0   302.2
637          SQ       0      10      30     100     400     800    2000    4300    5000    7000
638          SE  6496.5    6498    6500    6502    6504    6506    6508    6510    6512    6514

639          KK   RT-63
640          KM   ROUTE FLOW FROM DETENTION BASIN SC2 TO DESIGN POINT 18
641          RK    1290    .007    .035            TRAP     100       3

642          KK  SC1-10
643          KM   RUNOFF FROM SUB-BASIN SC1-10
644          BA   .2880
645          LS      0    78.2
646          UD    .390

647          KK    DP18
648          KM   DESIGN POINT 18 COMBINE RUNOFF FROM RT-63 AND SUB-BASIN SC1-10
649          HC       2

650          KK   RT-66
651          KM   ROUTE FLOW FROM DESIGN POINT 18 TO DESIGN POINT 17
652          RK     320    .007    .035            TRAP     100       3
1
PAGE 17                                    HEC-1 INPUT

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

653          KK  SC1-13
654          KM   RUNOFF FROM SUB-BASIN SC1-13
655          BA   .1300
656          LS      0    87.3
657          UD    .270

658          KK   RT-64
659          KM   ROUTE FLOW FROM SUB-BASIN SC1-13 TO DESIGN POINT 19
660          RK    1970    .026    .013            CIRC     4.5

661          KK  SC1-14
662          KM   RUNOFF FROM SUB-BASIN SC1-14
663          BA   .1100
664          LS      0    92.0
665          UD    .280

666          KK    DP19
667          KM   DESIGN POINT 19 COMBINE RUNOFF FROM RT-64 AND SUB-BASIN SC1-14
668          HC       2

669          KK   RT-65
670          KM   ROUTE FLOW FROM DESIGN POINT 19 TO DESIGN POINT 17
671          RK     700    .022    .013            TRAP      10      .1

672          KK    DP17
673          KM   DESIGN POINT 17 COMBINE RUNOFF FROM RT-65 AND RT-66
674          HC       2

675          KK   RT-67
676          KM   ROUTE FLOW FROM DESIGN POINT 17 TO DESIGN POINT 13
677          RK     910    .007    .035            TRAP     100       3

678          KK   SC1-9
679          KM   RUNOFF FROM SUB-BASIN SC1-9
680          BA   .2400
681          LS      0    76.9
682          UD    .240

683          KK  DBSR29
684          KM        ROUTE FLOW FROM SB SC1-9 THROUGH SPRINGS RANCH DETENTION BASIN DBSR29
685          RS       1    ELEV     100
686          SV       0     .03    0.47    1.20    2.60    6.70     8.8    10.7
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687          SQ       0      .2      7.8      22       40       73       97      113
688          SE     100   100.5   101.5   102.5    103.5    104.5    105.5   106.5

689          KK   RT-70
690          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR29 TO DESIGN POINT 14
691          RD    2750    .013    .013            CIRC      5.5
1                                        HEC-1 INPUT
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          LINE       ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

692          KK   SC1-8
693          KM   RUNOFF FROM SUB-BASIN SC1-8
694          BA   .2100
695          LS       0    79.5
696          UD    .320

697          KK   RT-71
698          KM   ROUTE FLOW FROM SUB-BASIN SC1-8 TO DESIGN POINT 14
699          RK     600    .010    .013            CIRC        5

700          KK    DP14
701          KM   DESIGN POINT 14 COMBINE RUNOFF FROM RT-71 AND RT-70
702          HC       2

703          KK   RT-69
704          KM   ROUTE FLOW FROM DESIGN POINT 14 TO DESIGN POINT 12
705          RK    1550    .015    .013            TRAP        7       .1

706          KK   SC1-7
707          KM   RUNOFF FROM SUB-BASIN SC1-7
708          BA   .0960
709          LS       0    80.1
710          UD    .230

711          KK    DP12
712          KM   DESIGN POINT 12 COMBINE RUNOFF FROM SUB-BASIN SC1-7 AND RT-69
713          HC       2

714          KK   RT-68
715          KM   ROUTE FLOW FROM DESIGN POINT 12 TO DESIGN POINT 13
716          RK     390    .025    .013            TRAP        7       .1

717          KK    DP13
718          KM   DESIGN POINT 13 COMBINE RUNOFF FROM RT-67 AND RT-68
719          HC       2

720          KK   RT-72
721          KM   ROUTE FLOW FROM DESIGN POINT 13 TO DESIGN POINT 10
722          RK    1150    .007     .04            TRAP      100        3

723          KK   SC1-6
724          KM   RUNOFF FROM SUB-BASIN SC1-6
725          BA   .1590
726          LS       0    80.6
727          UD    .220

728          KK  DBSR15
729          KM        ROUTE FLOW FROM SB SC1-6 THROUGH SPRINGS RANCH DETENTION BASIN DBSR15
730          RS       1    ELEV     100
731          SV       0    1.50    3.80    6.50    9.70   13.80
732          SQ       0      80     125     150     180     210
733          SE     100     102     104     106     108     110
1                                        HEC-1 INPUT
PAGE 19

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

734          KK   RT-74
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735          KM   ROUTE FLOW FROM SPRINGS RANCH DETENTION BASIN DBSR15 TO DESIGN POINT 11
736          RK    2080     .021     .013            CIRC     3.5

737          KK   SC1-5
738          KM   RUNOFF FROM SUB-BASIN SC1-5
739          BA   .1730
740          LS       0    79.0
741          UD    .310

742          KK    DP11
743          KM   DESIGN POINT 11 COMBINE RUNOFF FROM SUB-BASIN SC1-5 AND RT-74
744          HC       2

745          KK   RT-73
746          KM   ROUTE FLOW FROM DESIGN POINT 11 TO DESIGN POINT 10
747          RK     580     .024     .013            CIRC     3.5

748          KK    DP10
749          KM   DESIGN POINT 10 COMBINE RUNOFF FROM RT-72 AND RT-73
750          HC       2

751          KK   RT-75
752          KM   ROUTE FLOW FROM DESIGN POINT 10 TO DESIGN POINT 9
753          RK    2270     .007     .035            TRAP     100       3

754          KK   SC1-2
755          KM   RUNOFF FROM SUB-BASIN SC1-2
756          BA   .1360
757          LS       0    79.0
758          UD    .320

759          KK   RT-76
760          KM   ROUTE FLOW FROM SUB-BASIN SC1-2 TO DESIGN POINT 9
761          RD     500     .039     .013            CIRC       3

762          KK     DP9
763          KM   DESIGN POINT 9 COMBINE RUNOFF FROM RT-75 AND RT-76
764          HC       2

765          KK   RT-78
766          KM   ROUTE FLOW FROM DESIGN POINT 9 TO DESIGN POINT 4
767          RK    1530     .007     .035            TRAP     100       3

768          KK  SC1-12
769          KM   RUNOFF FROM SUB-BASIN SC1-12
770          BA   .2480
771          LS       0    84.0
772          UD    .370
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

773          KK   RT-81
774          KM   ROUTE FLOW FROM SUB-BASIN SC1-12 TO DESIGN POINT 8
775          RK    1400     .008     .035            TRAP      30       4

776          KK  SC1-11
777          KM   RUNOFF FROM SUB-BASIN SC1-11
778          BA   .1600
779          LS       0    92.0
780          UD    .290

781          KK     DP8
782          KM   DESIGN POINT 8 COMBINE RUNOFF FROM SUB-BASIN SC1-11 AND RT-81
783          HC       2

784          KK   RT-77
785          KM   ROUTE FLOW FROM DESIGN POINT 8 TO DESIGN POINT 4
786          RK    3100     .007     .035            TRAP     100       3
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787          KK   SC1-4
788          KM   RUNOFF FROM SUB-BASIN SC1-4
789          BA   .1010
790          LS      0    92.0
791          UD    .270

792          KK   RT-80
793          KM   ROUTE FLOW FROM SUB-BASIN SC1-4 TO DESIGN POINT 4
794          RK     720    .014    .013            CIRC       5

795          KK   SC1-1
796          KM   RUNOFF FROM SUB-BASIN SC1-1
797          BA   .1090
798          LS      0    79.0
799          UD    .280

800          KK   RT-79
801          KM   ROUTE FLOW FROM SUB-BASIN SC1-1 TO DESIGN POINT 4
802          RK    1115    .027    .013            CIRC       3

803          KK   SC1-3
804          KM   RUNOFF FROM SUB-BASIN SC1-3
805          BA   .3530
806          LS      0    65.0
807          UD    .460

808          KK     DP4
809          KM   DESIGN POINT 4 COMBINE RUNOFF FROM SB SC1-3, RT-80, RT-77, RT-78 AND RT-79
810          HC      5

811          KK   DBSC1
812          KM        ROUTE FLOW FROM DP 4 THROUGH SAND CREEK DETENTION BASIN DBSC1
813          KO      0
814          RS      1    ELEV    6393
815          SV      0    3.06   14.95   31.12   53.59   69.95   86.31   106.5   126.7   150.4
816          SV  174.1   200.4   226.7   254.9   283.2   313.4   343.6   375.2   406.8   439.5
1                                          HEC-1 INPUT
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          LINE       ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

817          SQ      0       3       5     189     954    1465    2055    2431    2755    3045
818          SQ   3310    3555    3785    4037    5518    7863   10797   14211   18042   22245
819          SE   6393    6394    6396    6398    6400    6401    6402    6403    6404    6405
820          SE   6406    6407    6408    6409    6410    6411    6412    6413    6414    6415
821          ZZ
1
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OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2
					.68	1.00
HYDROGRAPH AT						
+	SB82	.19	1	FLOW	84.	232.
				TIME	6.50	6.50
ROUTED TO						
+	RT-4	.19	1	FLOW	83.	220.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SB74	.18	1	FLOW	49.	143.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP74	.37	1	FLOW	122.	345.
				TIME	6.58	6.58

ROUTED TO						
+	RT-3	.37	1	FLOW	119.	331.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SB80	.22	1	FLOW	68.	190.
				TIME	6.67	6.67
ROUTED TO						
+	RT-2	.22	1	FLOW	67.	185.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB81	.39	1	FLOW	100.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-1	.39	1	FLOW	99.	296.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB73	.12	1	FLOW	31.	90.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB75	.12	1	FLOW	25.	72.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB76	.17	1	FLOW	35.	105.
				TIME	6.83	6.75
6 COMBINED AT						
+	DP75	1.39	1	FLOW	364.	1022.
				TIME	6.75	6.75
ROUTED TO						
+	RT-5	1.39	1	FLOW	345.	1021.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB79	.29	1	FLOW	111.	306.
				TIME	6.58	6.58
ROUTED TO						
+	RT-7	.29	1	FLOW	107.	281.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SB78	.88	1	FLOW	259.	738.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP78	1.17	1	FLOW	367.	1020.
				TIME	6.67	6.67
ROUTED TO						
+	RT-6	1.17	1	FLOW	351.	993.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SB77	.25	1	FLOW	61.	177.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SB88	.10	1	FLOW	34.	97.
				TIME	6.58	6.58
4 COMBINED AT						
+	DP77	2.91	1	FLOW	780.	2207.
				TIME	6.75	6.67

ROUTED TO						
+	RT-8	2.91	1	FLOW	761.	2201.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB71	.36	1	FLOW	127.	334.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP71	3.27	1	FLOW	861.	2508.
				TIME	6.83	6.75
ROUTED TO						
+	RT-9	3.27	1	FLOW	842.	2445.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB70	.31	1	FLOW	99.	256.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP70	3.58	1	FLOW	931.	2701.
				TIME	6.83	6.75
ROUTED TO						
+	RT-11	3.58	1	FLOW	905.	2653.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SB72	.25	1	FLOW	135.	321.
				TIME	6.58	6.50
ROUTED TO						
+	RT-10	.25	1	FLOW	128.	321.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SB69	.25	1	FLOW	93.	216.
				TIME	6.83	6.83
2 COMBINED AT						
+	DP69	.50	1	FLOW	191.	453.
				TIME	6.67	6.58
ROUTED TO						
+	RT-12	.50	1	FLOW	187.	446.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-15	.07	1	FLOW	35.	87.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP87	4.15	1	FLOW	1068.	3104.
				TIME	6.83	6.75
ROUTED TO						
+	RT-13	4.15	1	FLOW	1048.	3020.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-12	.24	1	FLOW	70.	183.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP63	4.39	1	FLOW	1111.	3198.
				TIME	6.92	6.83
ROUTED TO						
+	RT-17	4.39	1	FLOW	1083.	3152.

				TIME	7.00	6.83
HYDROGRAPH AT						
+	SB68	.22	1	FLOW	97.	222.
				TIME	6.75	6.75
ROUTED TO						
+	RT-14	.22	1	FLOW	95.	220.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-14	.31	1	FLOW	88.	234.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP67	.53	1	FLOW	183.	448.
				TIME	6.83	6.83
ROUTED TO						
+	RT-15	.53	1	FLOW	178.	446.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-13	.25	1	FLOW	174.	346.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP64	.79	1	FLOW	338.	763.
				TIME	6.83	6.75
ROUTED TO						
+	RT-16	.79	1	FLOW	332.	758.
				TIME	6.92	6.83
HYDROGRAPH AT						
+	SC3-9	.24	1	FLOW	123.	279.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP60	5.42	1	FLOW	1462.	4126.
				TIME	6.92	6.83
ROUTED TO						
+	RT-18	5.42	1	FLOW	1456.	4013.
				TIME	7.00	6.92
HYDROGRAPH AT						
+	SC3-2	.19	1	FLOW	108.	239.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-11	.28	1	FLOW	167.	341.
				TIME	6.75	6.75
ROUTED TO						
+	RT-19	.28	1	FLOW	166.	336.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC3-10	.11	1	FLOW	61.	138.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP55	.39	1	FLOW	211.	448.
				TIME	6.75	6.75
ROUTED TO						
+	RT-20	.39	1	FLOW	209.	445.
				TIME	6.92	6.83
HYDROGRAPH AT						

+	SC3-1	.13	1	FLOW	92.	187.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP56	.52	1	FLOW	274.	586.
				TIME	6.83	6.83
ROUTED TO						
+	DB95	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
			** PEAK STAGES IN FEET **			
			1	STAGE	105.02	109.39
				TIME	11.42	11.00
ROUTED TO						
+	RT-21	.52	1	FLOW	13.	41.
				TIME	11.42	11.00
3 COMBINED AT						
+	DP53	6.13	1	FLOW	1500.	4163.
				TIME	7.00	6.83
ROUTED TO						
+	DB94	6.13	1	FLOW	440.	1908.
				TIME	10.75	7.25
			** PEAK STAGES IN FEET **			
			1	STAGE	107.28	109.63
				TIME	10.75	7.25
ROUTED TO						
+	RT-27	6.13	1	FLOW	438.	1895.
				TIME	10.75	7.25
HYDROGRAPH AT						
+	SC2-24	.07	1	FLOW	105.	172.
				TIME	6.58	6.50
ROUTED TO						
+	RT-29	.07	1	FLOW	105.	172.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-27	.08	1	FLOW	128.	207.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP50	6.27	1	FLOW	442.	1922.
				TIME	10.75	7.25
ROUTED TO						
+	RT-31	6.27	1	FLOW	440.	1920.
				TIME	10.83	7.33
HYDROGRAPH AT						
+	SC3-8	.24	1	FLOW	66.	192.
				TIME	6.67	6.67
ROUTED TO						
+	RT-25	.24	1	FLOW	63.	190.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-3	.13	1	FLOW	155.	270.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP51	.37	1	FLOW	198.	437.
				TIME	6.67	6.67

ROUTED TO						
+	DB93	.37	1	FLOW	25.	77.
				TIME	10.50	7.17
			** PEAK STAGES IN FEET **			
			1	STAGE	104.11	105.42
				TIME	10.50	7.17
ROUTED TO						
+	RT-30	.37	1	FLOW	25.	77.
				TIME	10.58	7.25
2 COMBINED AT						
+	DP49	6.64	1	FLOW	464.	1996.
				TIME	10.83	7.33
ROUTED TO						
+	RT-32	6.64	1	FLOW	463.	1988.
				TIME	10.92	7.33
HYDROGRAPH AT						
+	SC3-6	.24	1	FLOW	83.	219.
				TIME	6.67	6.67
ROUTED TO						
+	RT-23	.24	1	FLOW	82.	213.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC3-5	.12	1	FLOW	142.	247.
				TIME	6.67	6.58
ROUTED TO						
+	RT-24	.12	1	FLOW	142.	243.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC3-7	.54	1	FLOW	290.	589.
				TIME	6.83	6.83
ROUTED TO						
+	RT-22	.54	1	FLOW	290.	585.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC3-4	.32	1	FLOW	252.	496.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP54	1.22	1	FLOW	681.	1393.
				TIME	6.75	6.75
ROUTED TO						
+	DB92	1.22	1	FLOW	54.	89.
				TIME	10.92	10.92
			** PEAK STAGES IN FEET **			
			1	STAGE	104.72	107.66
				TIME	10.92	10.92
ROUTED TO						
+	RT-26	1.22	1	FLOW	54.	89.
				TIME	11.08	11.08
HYDROGRAPH AT						
+	SC2-26	.19	1	FLOW	89.	208.
				TIME	6.67	6.67
ROUTED TO						
+	RT-34	.19	1	FLOW	88.	202.
				TIME	6.75	6.75

HYDROGRAPH AT						
+	SC2-25	.44	1	FLOW	159.	378.
				TIME	6.83	6.83
3 COMBINED AT						
+	DP47	1.85	1	FLOW	244.	584.
				TIME	6.75	6.75
ROUTED TO						
+	RT-33	1.85	1	FLOW	242.	579.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-28	.27	1	FLOW	48.	142.
				TIME	6.92	6.92
HYDROGRAPH AT						
+	SC2-21	.19	1	FLOW	113.	236.
				TIME	6.75	6.75
4 COMBINED AT						
+	DP48	8.95	1	FLOW	616.	2318.
				TIME	6.75	7.33
ROUTED TO						
+	RT-37	8.95	1	FLOW	604.	2314.
				TIME	6.75	7.33
HYDROGRAPH AT						
+	SC2-23	.20	1	FLOW	65.	169.
				TIME	6.75	6.67
ROUTED TO						
+	RT-35	.20	1	FLOW	64.	166.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC2-22	.08	1	FLOW	67.	137.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP46	.28	1	FLOW	122.	287.
				TIME	6.67	6.67
ROUTED TO						
+	RT-36	.28	1	FLOW	119.	284.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP42	9.23	1	FLOW	717.	2358.
				TIME	6.75	7.33
ROUTED TO						
+	RT-38	9.23	1	FLOW	700.	2346.
				TIME	6.83	7.33
HYDROGRAPH AT						
+	SC2-20	.32	1	FLOW	193.	401.
				TIME	6.75	6.75
ROUTED TO						
+	RT-41	.32	1	FLOW	192.	400.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC2-15	.18	1	FLOW	141.	291.
				TIME	6.58	6.58
ROUTED TO						
+	RT-39	.18	1	FLOW	138.	288.

				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC2-13	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
ROUTED TO						
+	RT-40	.16	1	FLOW	118.	241.
				TIME	6.67	6.67
4 COMBINED AT						
+	DP85	9.90	1	FLOW	1092.	2491.
				TIME	6.75	7.33
ROUTED TO						
+	RT-42	9.90	1	FLOW	1068.	2486.
				TIME	6.83	7.42
HYDROGRAPH AT						
+	SC2-14	.26	1	FLOW	114.	254.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-16	.21	1	FLOW	120.	265.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP37	10.37	1	FLOW	1275.	2818.
				TIME	6.83	6.75
ROUTED TO						
+	RT-43	10.37	1	FLOW	1268.	2756.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-12	.18	1	FLOW	71.	179.
				TIME	6.67	6.67
ROUTED TO						
+	RT-46	.18	1	FLOW	69.	171.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-8	.35	1	FLOW	184.	390.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP33	.53	1	FLOW	252.	559.
				TIME	6.75	6.75
ROUTED TO						
+	RT-45	.53	1	FLOW	247.	553.
				TIME	6.83	6.75
2 COMBINED AT						
+	DP36	10.90	1	FLOW	1515.	3286.
				TIME	6.83	6.83
ROUTED TO						
+	RT-44	10.90	1	FLOW	1475.	3282.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-11	.21	1	FLOW	163.	338.
				TIME	6.58	6.58
ROUTED TO						
+	RT-52	.21	1	FLOW	160.	335.
				TIME	6.67	6.67
HYDROGRAPH AT						

+	SC2-19	.18	1	FLOW	191.	345.
				TIME	6.67	6.67
ROUTED TO						
+	RT-51	.18	1	FLOW	189.	343.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-18	.20	1	FLOW	234.	405.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP39	.59	1	FLOW	582.	1083.
				TIME	6.67	6.67
ROUTED TO						
+	RT-49	.59	1	FLOW	570.	1073.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-17	.16	1	FLOW	107.	222.
				TIME	6.67	6.67
ROUTED TO						
+	RT-50	.16	1	FLOW	105.	214.
				TIME	6.75	6.67
HYDROGRAPH AT						
+	SC2-29	.15	1	FLOW	208.	358.
				TIME	6.58	6.58
3 COMBINED AT						
+	DP34	.90	1	FLOW	846.	1587.
				TIME	6.67	6.67
ROUTED TO						
+	RT-48	.90	1	FLOW	827.	1574.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-10	.33	1	FLOW	185.	391.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP32	1.23	1	FLOW	999.	1949.
				TIME	6.67	6.67
ROUTED TO						
+	RT-47	1.23	1	FLOW	980.	1930.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-9	.21	1	FLOW	61.	150.
				TIME	6.92	6.83
3 COMBINED AT						
+	DP35	12.34	1	FLOW	2389.	5152.
				TIME	6.83	6.75
ROUTED TO						
+	RT-53	12.34	1	FLOW	2372.	5091.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-7	.14	1	FLOW	96.	200.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP29	12.48	1	FLOW	2447.	5277.
				TIME	6.83	6.75

ROUTED TO						
+	RT-54	12.48	1	FLOW	2408.	5188.
				TIME	6.83	6.83
HYDROGRAPH AT						
+	SC2-6	.15	1	FLOW	137.	269.
				TIME	6.58	6.58
ROUTED TO						
+	RT-55	.15	1	FLOW	134.	258.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-2	.17	1	FLOW	135.	266.
				TIME	6.67	6.67
3 COMBINED AT						
+	DP28	12.80	1	FLOW	2579.	5605.
				TIME	6.83	6.75
ROUTED TO						
+	RT-56	12.80	1	FLOW	2544.	5522.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-5	.16	1	FLOW	235.	386.
				TIME	6.58	6.58
ROUTED TO						
+	RT-58	.16	1	FLOW	231.	379.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC2-0	.15	1	FLOW	67.	160.
				TIME	6.67	6.67
ROUTED TO						
+	RT-57	.15	1	FLOW	66.	156.
				TIME	6.75	6.67
3 COMBINED AT						
+	DP21	13.11	1	FLOW	2754.	5996.
				TIME	6.83	6.75
ROUTED TO						
+	RT-59	13.11	1	FLOW	2724.	5924.
				TIME	6.83	6.75
HYDROGRAPH AT						
+	SC2-4	.28	1	FLOW	393.	641.
				TIME	6.67	6.67
ROUTED TO						
+	RT-61	.28	1	FLOW	388.	637.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-3	.07	1	FLOW	117.	188.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP22	.36	1	FLOW	485.	793.
				TIME	6.67	6.67
ROUTED TO						
+	RT-60	.36	1	FLOW	483.	793.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC2-1	.19	1	FLOW	140.	282.
				TIME	6.67	6.67

3 COMBINED AT						
	DP20	13.65	1	FLOW	3187.	6885. IN SCH2
				TIME	6.83	6.75
ROUTED TO						
+	DBSC2	13.65	1	FLOW	1038.	4257. OUT SCH2
				TIME	7.42	7.08
			** PEAK STAGES IN FEET **			
			1	STAGE	6506.40	6509.96
				TIME	7.42	7.08
ROUTED TO						
+	RT-63	13.65	1	FLOW	1032.	4225.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-10	.29	1	FLOW	160.	339.
				TIME	6.75	6.75
2 COMBINED AT						
+	DP18	13.94	1	FLOW	1066.	4376.
				TIME	7.42	7.08
ROUTED TO						
+	RT-66	13.94	1	FLOW	1065.	4366.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-13	.13	1	FLOW	152.	271.
				TIME	6.58	6.58
ROUTED TO						
+	RT-64	.13	1	FLOW	151.	267.
				TIME	6.67	6.58
HYDROGRAPH AT						
+	SC1-14	.11	1	FLOW	160.	263.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP19	.24	1	FLOW	308.	530.
				TIME	6.58	6.58
ROUTED TO						
+	RT-65	.24	1	FLOW	308.	527.
				TIME	6.67	6.58
2 COMBINED AT						
+	DP17	14.18	1	FLOW	1102.	4462.
				TIME	7.50	7.08
ROUTED TO						
+	RT-67	14.18	1	FLOW	1102.	4434.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-9	.24	1	FLOW	162.	352.
				TIME	6.58	6.58
ROUTED TO						
+	DBSR29	.24	1	FLOW	51.	103.
				TIME	6.92	6.92
			** PEAK STAGES IN FEET **			
			1	STAGE	103.85	105.90
				TIME	6.92	6.92
ROUTED TO						
+	RT-70	.24	1	FLOW	51.	103.

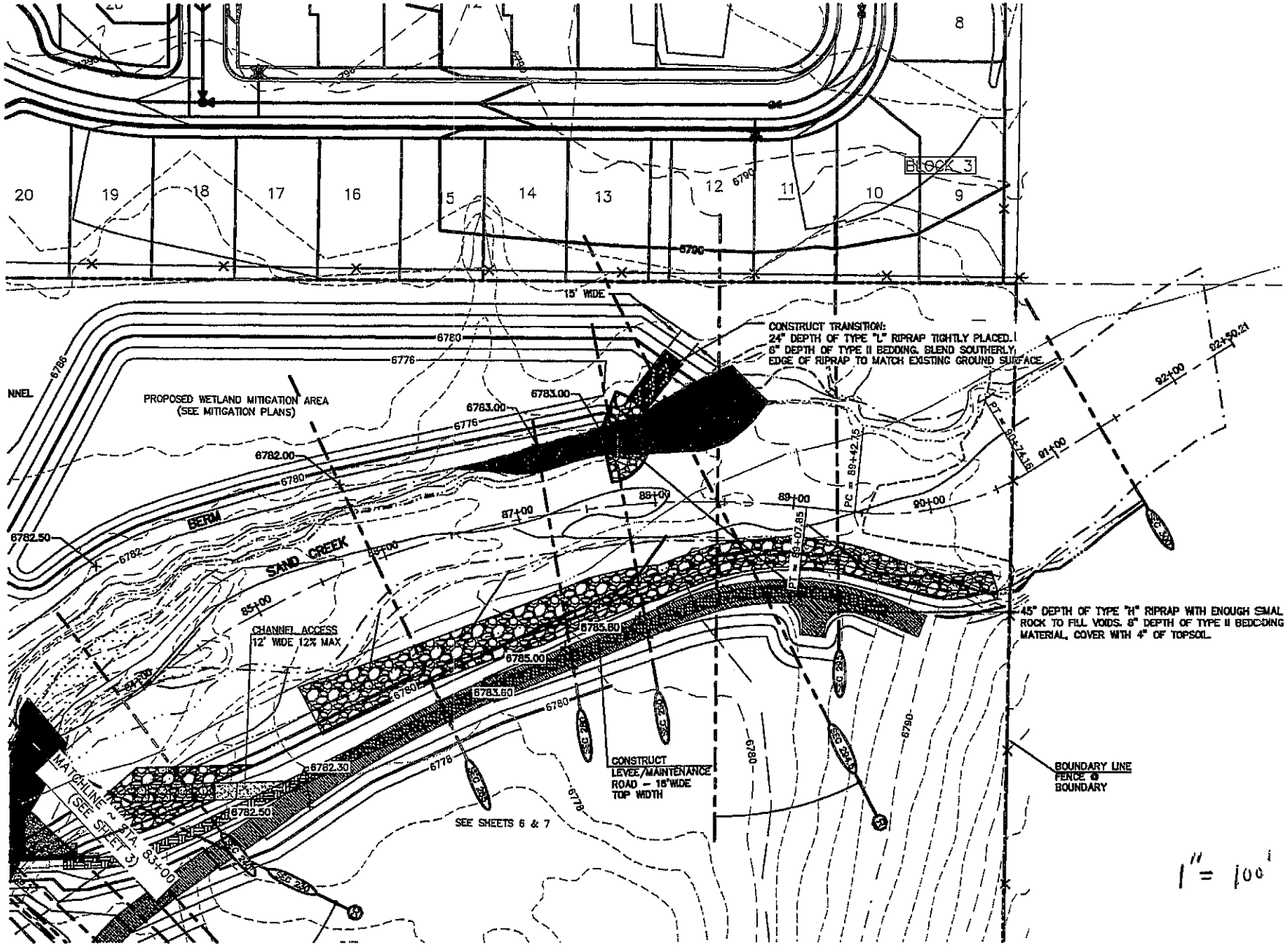
				TIME	7.00	7.00
HYDROGRAPH AT						
+	SC1-8	.21	1	FLOW	145.	298.
				TIME	6.67	6.67
ROUTED TO						
+	RT-71	.21	1	FLOW	144.	297.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP14	.45	1	FLOW	183.	365.
				TIME	6.75	6.67
ROUTED TO						
+	RT-69	.45	1	FLOW	182.	363.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-7	.10	1	FLOW	83.	166.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP12	.55	1	FLOW	253.	511.
				TIME	6.67	6.67
ROUTED TO						
+	RT-68	.55	1	FLOW	252.	509.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP13	14.72	1	FLOW	1180.	4641.
				TIME	7.50	7.08
ROUTED TO						
+	RT-72	14.72	1	FLOW	1175.	4599.
				TIME	7.50	7.08
HYDROGRAPH AT						
+	SC1-6	.16	1	FLOW	145.	286.
				TIME	6.58	6.58
ROUTED TO						
+	DBSR15	.16	1	FLOW	90.	138.
				TIME	6.75	6.83
			**	PEAK STAGES IN FEET **		
			1	STAGE	102.45	105.01
				TIME	6.75	6.83
ROUTED TO						
+	RT-74	.16	1	FLOW	89.	137.
				TIME	6.75	6.83
HYDROGRAPH AT						
+	SC1-5	.17	1	FLOW	118.	245.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP11	.33	1	FLOW	203.	374.
				TIME	6.67	6.67
ROUTED TO						
+	RT-73	.33	1	FLOW	202.	373.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP10	15.06	1	FLOW	1217.	4784.
				TIME	7.50	7.08
ROUTED TO						

+	RT-75	15.06	1	FLOW	1215.	4743.
				TIME	7.58	7.17
HYDROGRAPH AT						
+	SC1-2	.14	1	FLOW	91.	189.
				TIME	6.67	6.67
ROUTED TO						
+	RT-76	.14	1	FLOW	90.	188.
				TIME	6.67	6.67
2 COMBINED AT						
+	DP9	15.19	1	FLOW	1231.	4781.
				TIME	7.58	7.17
ROUTED TO						
+	RT-78	15.19	1	FLOW	1226.	4770.
				TIME	7.58	7.17
HYDROGRAPH AT						
+	SC1-12	.25	1	FLOW	203.	386.
				TIME	6.75	6.67
ROUTED TO						
+	RT-81	.25	1	FLOW	202.	383.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-11	.16	1	FLOW	228.	376.
				TIME	6.58	6.58
2 COMBINED AT						
+	DP8	.41	1	FLOW	411.	735.
				TIME	6.67	6.67
ROUTED TO						
+	RT-77	.41	1	FLOW	401.	730.
				TIME	6.75	6.75
HYDROGRAPH AT						
+	SC1-4	.10	1	FLOW	150.	247.
				TIME	6.58	6.58
ROUTED TO						
+	RT-80	.10	1	FLOW	149.	245.
				TIME	6.58	6.58
HYDROGRAPH AT						
+	SC1-1	.11	1	FLOW	79.	161.
				TIME	6.67	6.67
ROUTED TO						
+	RT-79	.11	1	FLOW	78.	161.
				TIME	6.67	6.67
HYDROGRAPH AT						
+	SC1-3	.35	1	FLOW	53.	175.
				TIME	6.83	6.83
5 COMBINED AT						
+	DP4	16.16	1	FLOW	1553.	5205.
				TIME	6.75	7.17
ROUTED TO						
+	DBSC1	16.16	1	FLOW	1240.	3544.
				TIME	8.00	8.08

** PEAK STAGES IN FEET **

1	STAGE	6400.56	6406.96
	TIME	8.00	8.08

JR ENGINEERING'S SAND CREEK DATA


Block 3
20
19
18
17
16
5
14
13
12
11
10
9
8
6790
6790
15' WIDE
CONSTRUCT TRANSITION:
24" DEPTH OF TYPE "L" RIPRAP TIGHTLY PLACED.
6" DEPTH OF TYPE II BEDDING. BLEND SOUTHERLY EDGE OF RIPRAP TO MATCH EXISTING GROUND SURFACE.
PROPOSED WETLAND MITIGATION AREA
(SEE MITIGATION PLANS)
6780
6776
6783.00
6782.00
6782.50
BERM
SAND CREEK
CHANNEL ACCESS
12' WIDE 12% MAX
6785.80
6785.00
6783.60
6782.30
6782.50
MATCHLINE STA. 83+00
(SEE SHEET 3)
CONSTRUCT
LEVEE/MAINTENANCE
ROAD - 18'WIDE
TOP WIDTH
SEE SHEETS 6 & 7
PC = 89+42.75
PT = 89+07.85
PT = 90+24.68
45" DEPTH OF TYPE "H" RIPRAP WITH ENOUGH SMALL ROCK TO FILL VOIDS. 8" DEPTH OF TYPE II BEDDING MATERIAL. COVER WITH 4" OF TOPSOIL.
BOUNDARY LINE
FENCE @
BOUNDARY
85+00
87+00
88+00
89+00
90+00
91+00
92+00
92+50.21
SC 250
1" = 100'
4

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 300

INPUT
Description: UPSTREAM OF PROPERTY
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
428	6792	430	6790	436	6788	443	6786	454	6784
500	6784	548	6784	560	6786	600	6788	701	6790

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
428	.04	430	.035	560	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
430	560	230	205	170	.2 .4

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 295

INPUT
Description: NEAR UPSTREAM END OF PROPERTY
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
422	6787	445	6786	467	6784	476	6782	482	6780
500	6779.8	518	6780	573	6782	580	6784	586	6784
590	6784	616	6784	646	6786	698	6788		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
422	.04	467	.035	573	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
467	573	87	86	85	.2 .4

Left Levee Station= 455 Elevation= 6786

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 294.5

INPUT
Description: FIS CD-4082 ROTATED
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
415	6786.4	425	6784	430	6783	460	6781	475	6780
500	6779	549	6778	606	6777	633	6780	660	6786
682	6787								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
415	.04	500	.035	633	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
500	633	60	68	80	.2 .4

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 290

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
403	6785	420	6784	435	6782	446	6781	456	6780
486	6778	500	6778.39	534	6778	542	6780	546	6781.48

FLOW DATA

Flow Title: Floodplain
Flow File : x:\2910000.all\2910404\HEC-RAS\post project with no lower levee geometry\Post Project As-builts.f01

Flow Data (cfs)

River	Reach	RS	PF#1	PF 2	PF 3	PF 4	PF 5
SAND CREEK	ONE	305	1200	2100	2600	3900	600
SAND CREEK	ONE	300	1200	2100	2600	3900	600
SAND CREEK	ONE	294.5	1200	2100	2600	3900	600
SAND CREEK	ONE	214	1200	2400	3100	4600	600
SAND CREEK	ONE	179	1200	2600	3150	4800	600
SAND CREEK	ONE	108	1200	2600	3250	5100	600
SAND CREEK	ONE	84	1200	2600	3300	5100	600
SAND CREEK	ONE	75	1250	2700	3450	5350	625
SAND CREEK	ONE	38	1300	2800	3600	5700	650

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
SAND CREEK	ONE	PF#1	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 2	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 3	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 4	Normal S = 0.01	Normal S = 0.0065
SAND CREEK	ONE	PF 5	Normal S = 0.01	Normal S = 0.0065

GEOMETRY DATA

Geometry Title: As-builts modified for no lower levee
Geometry File : x:\2910000.all\2910404\HEC-RAS\post project with no lower levee geometry\Post Project As-builts.g01

CROSS SECTION

RIVER: SAND CREEK
REACH: ONE RS: 305

INPUT
Description: FIS CE-4080 Upstream of Property
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	6820	1040	6816	1080	6812	1115	6808	1160	6804
1190	6800	1200	6796	1210	6792	1230	6788	1231	6786.4
1242	6786.4	1245	6788	1270	6792	1350	6792	1390	6796
1435	6800	1465	6800.2	1500	6800	1540	6802	1600	6802
1680	6802	1720	6801.6	1760	6802	1790	6802.2	1840	6802
1890	6802	1960	6803	2020	6804	2145	6806	2370	6808

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1230	.03	1245	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1230	1245	390	395	400	.1 .3

No oxBow Levee → with levee

IEC-RAS River: SAND CREEK Reach: ONE Profile: PF 3

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
ONE	305	PF 3	PPFNL	2600.00	6786.40	6793.98	6793.98	6795.31	0.004839	12.35	472.02	16[illegible].71	0.80
ONE	305	PF 3	PPFP	2600.00	6786.40	6793.98	6793.98	6795.31	0.004839	12.35	472.02	16[illegible].71	0.80
ONE	300	PF 3	PPFNL	2600.00	6784.00	6786.70	6786.70	6787.90	0.012999	8.80	299.07	13[illegible].52	0.99
ONE	300	PF 3	PPFP	2600.00	6784.00	6786.70	6786.70	6787.90	0.012999	8.80	299.07	13[illegible].52	0.99
ONE	295	PF 3	PPFNL	2600.00	6779.80	6783.45	6783.45	6784.75	0.012437	9.19	285.15	108.56	0.98
ONE	295	PF 3	PPFP	2600.00	6779.80	6783.45	6783.45	6784.75	0.012437	9.19	285.15	108.56	0.98
NE	294.5	PF 3	PPFNL	2600.00	6777.00	6783.22	6780.38	6783.37	0.000670	3.27	877.91	218.56	0.25
NE	294.5	PF 3	PPFP	2600.00	6777.00	6783.22	6780.38	6783.37	0.000670	3.27	877.91	218.56	0.25
ONE	290	PF 3	PPFNL	2600.00	6778.00	6781.70	6781.70	6783.02	0.010553	9.34	291.47	189.44	0.93
NE	290	PF 3	PPFP	2600.00	6778.00	6781.70	6781.70	6783.02	0.010553	9.34	291.47	189.44	0.93
ONE	280	PF 3	PPFNL	2600.00	6776.80	6780.86	6780.56	6781.81	0.009060	7.85	332.35	199.06	0.84
ONE	280	PF 3	PPFP	2600.00	6776.80	6780.86	6780.56	6781.81	0.009060	7.85	332.35	199.06	0.84
IE	265	PF 3	PPFNL	2600.00	6774.82	6779.09	6779.09	6780.37	0.012841	9.06	286.92	216.36	0.99
IE	265	PF 3	PPFP	2600.00	6774.82	6779.09	6779.09	6780.37	0.012841	9.06	286.92	216.36	0.99
NE	250	PF 3	PPFNL	2600.00	6768.00	6778.02	6773.08	6778.21	0.000522	3.49	779.81	189.51	0.23
E	250	PF 3	PPFP	2600.00	6768.00	6778.02	6773.08	6778.21	0.000522	3.49	779.81	189.51	0.23
ONE	240	PF 3	PPFNL	2600.00	6766.00	6778.04	6772.48	6778.16	0.000280	2.84	992.99	155.31	0.18
ONE	240	PF 3	PPFP	2600.00	6766.00	6778.04	6772.48	6778.16	0.000280	2.84	992.99	155.31	0.18
E	230	PF 3	PPFNL	2600.00	6764.00	6778.01	6771.26	6778.14	0.000249	2.95	970.71	133.21	0.17
INE	230	PF 3	PPFP	2600.00	6764.00	6778.01	6771.26	6778.14	0.000249	2.95	970.71	133.21	0.17
E	225	PF 3	PPFNL	2600.00	6770.00	6777.77	6773.92	6778.08	0.001382	4.82	616.10	104.52	0.30
E	225	PF 3	PPFP	2600.00	6770.00	6777.77	6773.92	6778.08	0.001382	4.82	616.10	104.52	0.30
NE	222	PF 3	PPFNL	2600.00	6770.10	6777.01	6774.46	6777.89	0.000455	7.52	345.74	50.12	0.50
	222	PF 3	PPFP	2600.00	6770.10	6777.01	6774.46	6777.89	0.000455	7.52	345.74	50.12	0.50
	221.6	PF 3	PPFNL	2600.00	6770.00	6777.01	6774.36	6777.86	0.000434	7.41	351.04	50.12	0.49
NE	221.6	PF 3	PPFP	2600.00	6770.00	6777.01	6774.36	6777.86	0.000434	7.41	351.04	50.12	0.49
	221.5	PF 3	PPFNL	2600.00	6770.00	6775.26	6775.26	6777.46	0.001953	11.92	218.21	49.98	1.00
	221.5	PF 3	PPFP	2600.00	6770.00	6775.26	6775.26	6777.46	0.001953	11.92	218.21	49.98	1.00
IE	221	PF 3	PPFNL	2600.00	6770.00	6774.36	6774.36	6776.57	0.001887	11.91	218.25	50.07	1.01
	221	PF 3	PPFP	2600.00	6770.00	6774.36	6774.36	6776.57	0.001887	11.91	218.25	50.07	1.01
E	215	PF 3	PPFNL	2600.00	6758.45	6765.19	6762.82	6766.11	0.000491	7.71	337.10	50.11	0.52
E	215	PF 3	PPFP	2600.00	6758.45	6765.19	6762.82	6766.11	0.000491	7.71	337.10	50.11	0.52
	214	PF 3	PPFNL	3100.00	6758.40	6763.31	6763.31	6765.78	0.001852	12.62	245.71	50.08	1.00
	214	PF 3	PPFP	3100.00	6758.40	6763.31	6763.31	6765.78	0.001852	12.62	245.71	50.08	1.00
	210	PF 3	PPFNL	3100.00	6749.75	6756.84	6754.66	6758.03	0.000596	8.73	355.04	50.12	0.58
	210	PF 3	PPFP	3100.00	6749.75	6756.84	6754.66	6758.03	0.000596	8.73	355.04	50.12	0.58
	209	PF 3	PPFNL	3100.00	6749.66	6756.83	6754.58	6757.99	0.006893	8.63	359.28	50.16	0.57
	209	PF 3	PPFP	3100.00	6749.66	6756.83	6754.58	6757.99	0.006893	8.63	359.28	50.16	0.57
	208	PF 3	PPFNL	3100.00	6750.00	6756.89	6755.38	6757.60	0.006520	6.81	455.35	110.13	0.59
	208	PF 3	PPFP	3100.00	6750.00	6756.89	6755.38	6757.60	0.006520	6.81	455.35	110.13	0.59
	207	PF 3	PPFNL	3100.00	6750.00	6754.29	6754.29	6756.06	0.016794	11.29	303.75	88.72	0.96
	207	PF 3	PPFP	3100.00	6750.00	6754.29	6754.29	6756.06	0.016794	11.29	303.75	88.72	0.96
	206	PF 3	PPFNL	3100.00	6748.00	6753.52	6752.93	6754.88	0.012785	9.37	331.00	81.89	0.82
	206	PF 3	PPFP	3100.00	6748.00	6753.52	6752.93	6754.88	0.012785	9.37	331.00	81.89	0.82
	205	PF 3	PPFNL	3100.00	6748.00	6753.61	6752.36	6754.62	0.008100	8.06	384.43	84.04	0.66
	205	PF 3	PPFP	3100.00	6748.00	6753.61	6752.36	6754.62	0.008100	8.06	384.43	84.04	0.66
	204	PF 3	PPFNL	3100.00	6747.00	6753.58	6752.12	6754.44	0.007068	7.47	414.95	92.29	0.62
	204	PF 3	PPFP	3100.00	6747.00	6753.58	6752.12	6754.44	0.007068	7.47	414.95	92.29	0.62
	203	PF 3	PPFNL	3100.00	6747.00	6753.37	6752.20	6754.29	0.008460	7.68	403.61	99.26	0.67
	203	PF 3	PPFP	3100.00	6747.00	6753.37	6752.20	6754.29	0.008460	7.68	403.61	99.26	0.67

DRAINAGE MAPS