Hydrology and Water Quality

APPENDIX G

North Canyon Ranch TTM5658
Preliminary Drainage Report

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Section 1 - Introduction and Background

1.1 Existing Site Conditions and General Hydrology

The proposed North Canyon Ranch development is located in the City of Simi Valley and is bounded by the Simi Valley Town Center to the south and the Big Sky Ranch residential development to the east. Currently, the site is an undeveloped mountain/hillside that generally slopes from north to south. Figure 1.1 and Figure 1.2 show the general area discussed in this report.

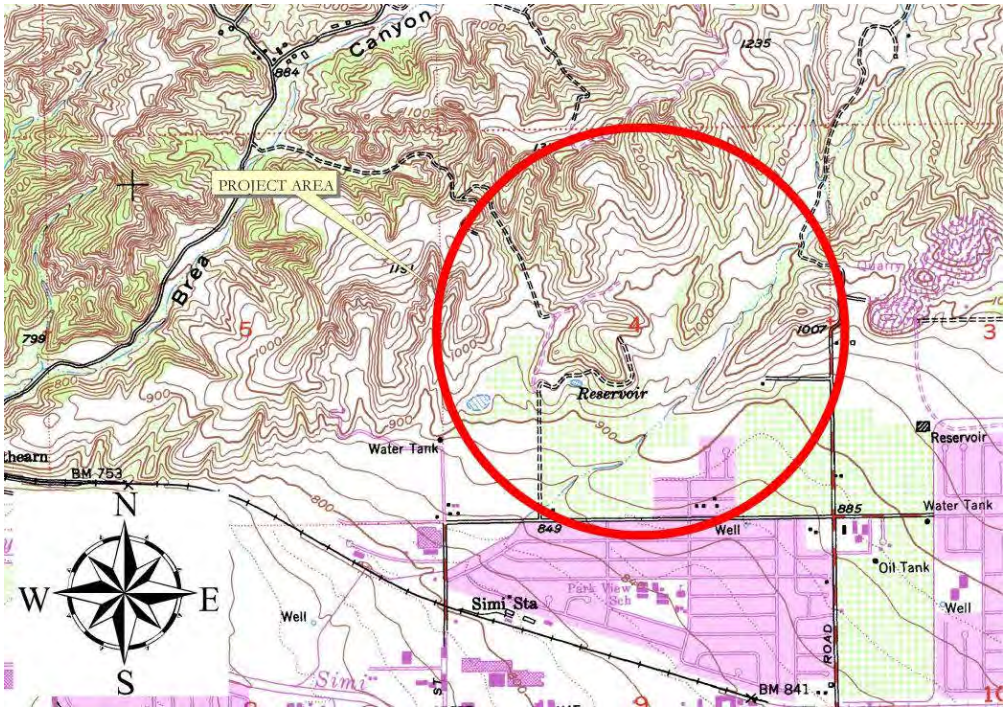


Figure 1.1. General project area of North Canyon Ranch.

Figure 1.2. Aerial photograph of general project area.

Two temporary detention ponds had previously been constructed on the southern portion of our site. These ponds are further discussed in the Paller-Roberts report. Currently these ponds are being used to capture off site flows for the mall development to the south. The existing release rates, as calculated in the Paller-Roberts report, were used as the maximum allowable release rate for the proposed conditions.

Paller-Robert's detention pond "NS23" provides detention mitigation for the "North Simi Sub-basin 2" and "North Simi Sub-basin 3" as well as portions from the Eastern and Central 1 sub-basins. Although the "Central Sub Basin 1" and "Eastern Sub-basin" do not physically contribute to pond NS23, they were used by the Paller-Robert's report to determine allowable release rates to obtain discharge credit by the Simi Valley Town Center since said portions are released without detention. To ensure that the release rates downstream of the mall site do not increase, the Paller-Roberts report deducted the difference between their peak inflow and release rates for the two areas. The proposed allowable release rates from pond NS23 account for these deductions. See Table 1-1 for NS23's existing release rates. The allowable release rates are further restricted by adding a smaller diameter opening at the headwall. This new amount is the actual release rate that we will use for comparison.

Table 1-1 NS23 Existing Allowable Release Rates

Existing Sub-Basin	Maximum Allowed Release Rate, cfs
North Simi Sub-Drain 2	96.1
North Simi Sub-Drain 3	92.8
Deductions for Eastern & Central 1 Sub-basins	-63.1
Allowable Release Rate	125.8
Actual Release rate (new control)*	113.8

*Actual Release rate in Paller-Roberts Report is 118.9 cfs

Paller-Robert's detention pond "Western" includes detention for the Western Sub-Basin 1 and the off-site flows from Western Sub-Basin 2. See Table 1-2 for the allowable release rate of this pond. The allowable release rates are further restricted by adding a smaller diameter opening at the headwall. This new amount is the actual release rate that we will use for comparison.

Table 1-2 Western Pond's Existing Allowable Release Rates

Existing Sub-Basin	Maximum Allowed Release Rate, cfs
Western Sub-Basin 1	86.3
Western Sub-Basin 2 (offsite portions)	23.5
Allowable Release Rate	109.8
Actual Release rate (new control)*	92.5

*Actual Release rate in Paller-Roberts Report is 92.6 cfs

See Appendix F for selections from the Paller-Roberts report. The flows collected in the ponds will continue through the existing storm drains through the mall site. Both the City and County have requested that previous released rated be the same or less to avoid any downstream impact. Per recently updated development requirements, the peak discharge from the site will be limited to less than the 10-yr existing development flowrates. See section 3.3.

Although drainages and ravines have existed on the site in the past, no natural water bodies, lakes, ponds, are currently known to exist. No canals, ditches, or perennial streams are located on the site as well. That is, most of the site (prior to development activities) is in its natural condition relative to drainage and hydrology. Key drainage features are shown on Exhibit 1.

1.2 Proposed Project and General Hydrology

The proposed project site consists of approximately 160 acres, with about 75.5 acres planned to be disturbed. The proposed development will consist of single family housing and multi-family apartment housing.

The proposed site plan uses the developable land within the watershed. Disturbed and developed areas (e.g., roads, lots, etc.) will drain to the south through roads, gutters, inlets, and storm drain pipes and into two detention and/or debris ponds, and subsequently discharged into existing outfall pipes that flow through the mall site and ultimately into the North Simi Drain. The two proposed detention ponds are in the same general location as the existing two temporary ponds. Culverts and other pipe connections will be used to convey flows under roads where necessary.

Drainage ditches and swales will also be employed to direct runoff from undisturbed areas into the detention ponds.

Key drainage features for proposed conditions are shown on Exhibit 2.

1.3 Previous Studies

Two previously prepared and approved studies were reviewed for this effort. In some cases, the results of these studies establish the basis of analysis or validity for various portions of this report. These studies are:

- Drainage Report for Simi Valley Town Center, prepared by Paller-Roberts Engineering, Inc., originally prepared and submitted for approval October 22, 2002 and revised and updated January 7, 2005.
- North Simi Drain Hydrology Report which supersedes the Simi Valley Drainage Master Plan.
- Preliminary North Canyon Ranch Storm Drainage Analysis Report prepared by PSOMAS.

Section 2 - Approach and Methodology

2.1 Standards and Guidelines

With the drainage area tributary to the North Simi Drain, the standards of the Ventura County Watershed Protection District (VCWPD) are relevant and were used in this analysis. This is primarily due to the fact that the North Simi Drain is impacted by any hydrologic alterations of the proposed project, and the North Simi Drain is within the regulatory jurisdiction of the VCWPD.

As a result, TGA (previous consultant) met with VCWPD in December 2008 to reconfirm the approach and methodology. Given that VCWPD has performed an extensive review and has approved the Paller-Robert's report, the previous consultant was directed to keep the release rates equal to or less than those calculated in the Paller-Robert's report. Excerpts of said calculations are included in Appendix F of this report. Furthermore, the following standards were used in this study:

- Hydrology Manual, Ventura County Watershed Protection District, prepared in 1975 and updated December 2010.
- Debris and Detention Basins, Ventura County Watershed Protection District, September 2005.

The Project complies with City's Flood damage Prevention ordinance No. 760. Figure 2.1 shows proposed site location relative to the FEMA Flood Insurance Rate Map. Note that project site is not located within a Special Flood Hazard area (SFHA). See Figure

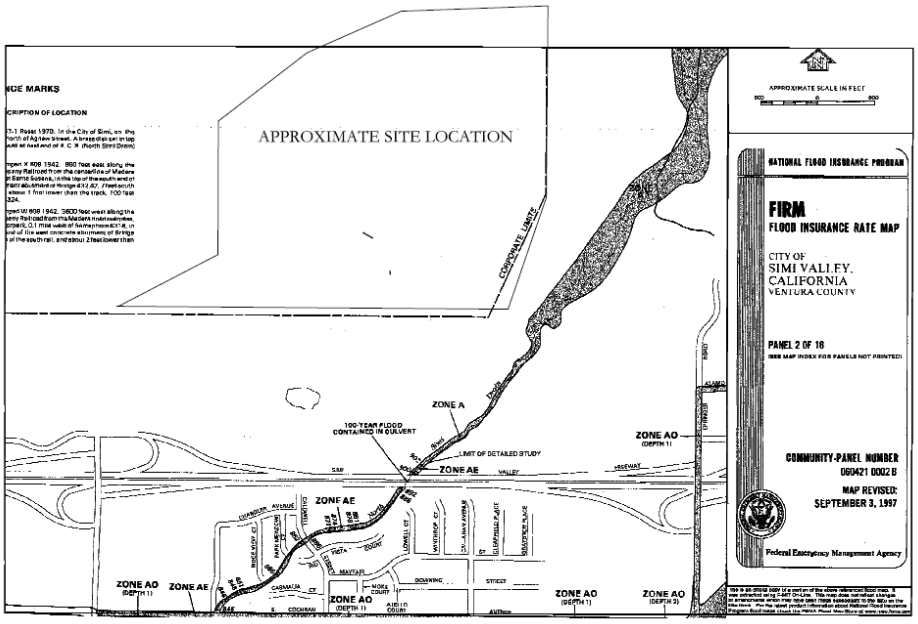


Figure 2.1 Flood Insurance Rate Map with approximate site location

2.2 Data Sources

In addition to the documents and reports already mentioned, topographic data in the form of contours were used. The contour interval was 1 foot. Both existing and proposed contours were considered for this study.

2.3 Modeling and Analysis

Results from the approved Paller-Roberts VCRAT modeling efforts were used in this study. When required, any other calculations conformed to the methods, standards, and guidelines required by the Hydrology Manual provided by Ventura County. Specific conformance to any standard is also discussed in the applicable sections of this report.

2.4 Stormdrain Systems and Facilities

Existing Facilities

As mentioned, two temporary detention ponds exist on site. Currently, a series of ditches, swales, and pipes help to convey some areas of undisturbed watershed into the two existing detention ponds. Stormwater flowing into these ponds is detained and peak discharges are attenuated. Currently, the Western Pond has a 36-inch RCP outlet pipe set at an invert elevation of 957 ft; the eastern pond has a 48-inch RCP outlet pipe set at an invert elevation of 965 ft. Each of these pipes conveys pond discharge through the mall site. Both of these existing storm drain lines were designed to intercept and convey 100-year outflows from the existing basins.

Proposed Facilities

Proposed ponds include a western pond (Pond A) and an eastern pond (Pond B) that coincide relatively near the existing western and eastern pond (NS23) area (see Exhibit 2). Sub-areas PB-6 through PB-10 drain to Pond A and sub-areas PB-1 through PB-5 drain to Pond B. Performance curves (stage-capacity) curves for these ponds are shown in Table 2-1 through Table 2-2.

Table 2-1 Stage-capacity-discharge curve for Pond A.

Elevation	Area_Ac	ΔVol	VOL (AF)	Orifice Flow $Q = CA(2gh)^{1/2}$
957.00	0.39		0.00	0.00
958.00	0.70	0.545	0.55	13.89
959.00	0.99	0.845	1.39	27.79
960.00	1.13	1.06	2.45	41.68
961.00	1.24	1.185	3.64	53.81
962.00	1.33	1.285	4.92	63.67
963.00	1.41	1.37	6.29	72.20
964.00	1.49	1.45	7.74	79.82
965.00	1.56	1.525	9.27	86.77
966.00	1.64	1.6	10.87	93.21
967.00	1.71	1.675	12.54	99.23
968.00	1.80	1.755	14.30	104.90

Table 2-2. Stage-capacity-discharge curve for Pond B.

Elevation	Area_Ac	ΔVol	VOL (AF)	Orifice Flow $Q = CA(2gh)^{1/2}$
965.00	0.56		0.00	0.00
966.00	0.92	0.74	0.74	21.39
967.00	1.31	1.115	1.86	42.78
968.00	1.55	1.43	3.29	64.18
969.00	1.70	1.625	4.91	85.57
970.00	1.80	1.75	6.66	104.80
971.00	1.87	1.835	8.50	121.01
972.00	1.93	1.9	10.40	135.30

The orifice equation was used to determine the discharged from the basin. The outlet structure for each pond consists of an RCP pipe with an invert set at the pond bottom. The flow from these discharge structures then proceeds into the existing pipes which go through the mall site to the south. Said existing pipes were designed to convey the existing 100-year flow. VCRat 2.64 was used for basin routing calculations of the inflow hydrographs through the ponds. Results and computations are found in Appendix E.

Pipes, culverts, and other closed conduit conveyance are discussed in Section 2.10. Some ditches, swales, and other open channel features will also be a part of the proposed development to assist in drainage and conveyance.

2.5 Drainage Basin Delineations and Concentration Points

Under the proposed conditions 93 acres (197 cfs) drain to Pond A. A total of 96 acres (201 cfs) drain to Pond B. These drainage areas are shown on Exhibit 2 of this report.

In order to establish peak discharge for pipe sizing and conveyance purposes, other concentration points were established for proposed conditions. These points were more “internal” and were used to establish peak flow rates at various pipe and culvert entrances within the project. These basin boundaries and corresponding areas are shown on Exhibit 2 of this report, and are also summarized in Table 2-1. The total proposed area is 188.43 acres. The total proposed acreage is less than the 203.8 acres (69+59+57+18.8) in the North Simi Hydrology Report, but it is within a 1.0% error margin and therefore considered accurate.

Table 2-1. Sub-basin areas.

Sub basin(s)	Area (ac)	Receiving Pond
1A,1B,1C,1D	41.14	B
2A	17.3	B
2B,2C	14.02	B
2D,2E,2F	14.52	B
2G	8.96	B
3A,3B,3C	43.55	A
3D	9.03	A

Sub basin(s)	Area (ac)	Receiving Pond
3E,3F	26.31	A
3K	8.05	A
3G	5.55	A

A variety of ditches, swales, and other grading features divert undisturbed area flow around backs of lots, daylight lines, etc. These features were taken into account when delineating each sub-area. In order to minimize the runoff of oils and grease that can accumulate in parking lots, a drainage swale around the church and retirement center will be used to route flows and to minimize sheet flow across this area.

2.6 Travel Times

Time of concentration for the overall watershed hydrology and detention pond analysis was calculated using the Ventura TC Calculator per the VCWPD Hydrology Manual. The time of concentration was calculated for each sub-basin and can be found in Appendix B.

2.7 Land Use, Soils, and Losses

Per the County methodology, infiltration and losses are reflected in the determined Rational "C" values. As described in the Hydrology Manual, the C value is a function of land use, soil type, rainfall intensity, and indirectly, time of concentration.

The weighted impervious percentages (tied to land use and soil type) of each sub-basin (subarea) or watershed were determined using the methods outlined in the VCWPD Hydrology Manual. Undeveloped areas are considered 0% impervious; residential areas 23%; Multi-Family / Condominiums 37% and commercial areas 50%. Area breakdowns for each sub-basin or watershed are contained in Appendix A.

A variety of soil types and conditions exists on the site and within the boundaries of the associate drainage basins. These soil types were obtained from the VCWPD's Hydrology Manual (Appendix E), and included soils 1, 2, 4, 5, and 6. Where soil numbers 6 and 7 correspond to hydrologic soil groups A, 4 and 5 to B, 3 and 4 to C, and 1 to D. The boundaries of each of these soil types are shown on both Exhibit 1 and Exhibit 2.

2.8 Precipitation

Rainfall depths in the form of precipitation rates (intensity) were considered for the 100-year storm event. The entire development is in Rainfall Zone K. The 50 year precipitation consisting of 6.25 inches was found from the Storm Rainfall Map (Isohyet). A 100-year precipitation of less than 8.0 inches is shown on the Storm Rainfall Contours map. Nevertheless, a value of 8.0 inches was used in the analysis to be conservative. Copies of the maps are included at the end of Appendix E. Actual shape files were imported and used in the drawing.

2.9 Hydrograph Yield Adjustment

The Hydrograph Yield Adjustments (fattening) were applied to the combined runoff to each of the detention ponds using the SCS Method per the VCWPD Hydrology

Manual requirements and are included in Appendix A. The calculated weighted *Curve Number* and 100 year Precipitation (*Rainfall)* were used to calculate the Direct Runoff which was used by the VCRat 2.64 program to calculate the fatten hydrograph. Using the export option in the program, the *peak inflow* and *adjusted* hydrographs were plotted for comparison and can be found in Appendix D.

2.10 Conveyance Hydraulics

The hydraulic capacity of the subterranean storm drain system of pipes was conducted by normal depth pipe flow at 75% pipe full. The pipe hydraulics will be determined using WSPG during final engineering and will follow VCWPD methodology. For this preliminary report, Manning's equation was used to size each pipe for adequate hydraulic capacity.

Pipes are to be ultimately designed as to flow under gravity (not pressurized) conditions with minimum slopes of 0.003 ft/ft. Although y/D ratios of no greater than 0.7 are generally desired, pipes can be designed as flowing full. Pipes were assumed to be reinforced concrete (Manning's n of 0.013).

Drainage and pipe conveyance for First Street will also need to be incorporated into the final design calculations. Furthermore, any open channels (lined or unlined), ditches, and swales will need to be designed in such a way that velocities are maintained within appropriate ranges for cleansing, energy considerations, erosion, and scour. In some areas of steep slopes, energy dissipation may be required.

2.11 MS4 and Water Quality

This project is now subject to the Los Angeles Regional Water Quality Control Board storm water MS4 Permit (Municipal Separate Storm Sewer System Permit) for Ventura County. As such, this project is required to capture, treat, retain and infiltrate runoff from storm events in which stormwater runoff will be limited to five percent (5%) of the site's effective impervious area. Calculations are included in Appendix H.

Table 2-2. Sub-basin areas.

Water Quality Design Summary		
Location	Water Quality Design Volume (ft3)	Infiltration Surface Area for Infiltration Basin (sf)
Pond A	10,199	7,423
Pond B	10,585	7,703

We propose to provide an area large enough to satisfy the calculated infiltration area for Ponds A and B with 4-feet of gravel and 12-inches of sand (to allow for bio-infiltration) under the basin bottom. Our project complies with the new requirements and can be considered a Low Impact Development (LID).

No further water quality or runoff mitigation or treatment is necessary for this development. However, in the spirit LID, the developer may implement water conservation and storm water reuse features in each single family lot as directed by the City. This may be done by diverting the roof runoff and lot surface flows to a designated vegetated area, unless it has the potential to create a slope or structural instability. We proposed that an area of 10-feet by 5-feet minimum be set aside for smart landscape planning located at the low side of the lot to maximum runoff collection. This area will also serve as a Bio-infiltration facility. It may have 3-inches of mulch, 18-inches of plant mix, 6-inches of sand and 24-inches of gravel. A filter fabric should be place under the bottom of the sand and gravel layers. Runoff from the roof and lot surface can be intercepted by swale then conveyed to and

stored in this area. This will promote water infiltration, storage and evapotranspiration while providing water conservation and reuse as well as minimizing storm runoff. During non-storm events, runoff from irrigation from other areas on the lot will be intercepted and captured in this area. Water will either infiltrate or will be used by the roots of the landscape immediately above or around the 10-foot by 5-foot footprint. This project does not take drainage (MS4) credit from these bio-infiltration facilities. Appendix H shows a detail of the facility described above. Although no further MS4 device is required, this project did consider bio-infiltration swales on the southerly side of the church/school sites. However, given that the downstream swales would be over fill soil, it was decided that said swales would not be appropriate.

2.12 Debris Production

Debris production rates and volumes were calculated using the method identified in the VCWPD Debris and Detention Basins Manual. More specifically Section 3.2 Debris Yeld. This method is also outlined in the *"Erosion and Sediment Yields in Mountain Watersheds of the Transverse Ranges, Ventura and Los Angeles Counties, California – Analysis of Rates of Processes"* by the USGS Water Resource Investigation 47-74 (1974).

The analysis involved the selection and use of several parameters and factors. These factors were determined by using values from the Erosion and sediment Yields in Mountain Watersheds of the Transverse Ranges. Specifically data for Brea Canyon, adjacent to our watershed, was used. These factors include:

- contributing watershed drainage area, A (sq mi)
- elongation ratio, ER
- slope failures, SF
- fire factor, FF
- Rainfall Factor, K

Debris production was determined for all debris-producing watershed areas (i.e., undeveloped). This was done in order to establish a per-acre volume for debris production. According to the aforementioned study, a 20-30 percent reduction can be included with these debris requirements. This reduction is added to account for the lower efficiencies due to the fine grained nature of the bed material in the watershed. This volume on a per-acre basis would then be used to size debris volumes depending upon where final debris ponds are located. Full calculations can be found in Appendix C.

The Home Owners Association will be the responsible party in charge of inspection and maintenance of the ponds. A maintenance schedule will be included in the Storm Water Pollution Prevention Plan to be prepared during final engineering as part of the Post Control BMP's.

Section 3 - Results

3.1 Debris Production Summary

Eight debris basins have been sized to trap debris throughout the site. See Exhibit 2 for the location of debris basins. Table 3.1 summarizes the debris basin capacities.

Debris production rates (on a per acre basis) were established for several small sediment basins. These debris basins will release water to the storm systems and eventually into Ponds A and B. Since the debris basins will collect sediment before the detention basins, the ponds have not been sized for additional debris volumes. See Appendix C for full debris analysis.

Table 3.1. Debris Basin

Basin	Area(mi^2)	Acre-ft of Debris
1	0.052	1.39
2	0.005	0.05
3	0.012	0.04
4	0.027	0.20
5	0.014	0.06
6	0.068	0.40
7	0.021	0.15
8	0.013	0.08

3.2 Time of Concentration

For the analysis of internal concentration points for pipe-sizing purposes and detention pond analysis, areas were further broken down and travel times computed. These times are listed in Table 3-1, with corresponding calculations found in Appendix B.

Table 3-1. Time of concentration.

	Proposed		Existing	
Sub basin	100-Yr TC (min)	10-Yr TC (min)	100-Yr TC (min)	10-Yr TC (min)
1A	5	6	6	7
1B	4	5	7	9
1C	10	12	8	11
1D			12	17
2A	7	8	5	6
2B			7	9
2C			10	13
2D			10	14
2G	6	8		
3A		4	7	9

Sub basin	Proposed		Existing	
	100-Yr TC (min)	10-Yr TC (min)	100-Yr TC (min)	10-Yr TC (min)
3B	10	13	10	13
3C	7	9	6	7
3D	6	7	6	7
3L	6	8		

3.3 Peak Discharges & Comparison

Peak discharges entering the detention ponds are discussed in Section 3.5. Peak discharges for other internal concentration points for initial pipe sizing purposes are shown in Table 3-2.

Table 3-2. Peak discharges for selected internal concentration points.

Subarea Flow Location	Proposed		Existing	
	100-yr flow (cfs)	10-yr flow (cfs)	100-yr flow (cfs)	10-yr flow (cfs)
3A,3B,3C	84	52		
3D	21	13		
3E,3F	37	21		
3K	16	10		
3G	25	16		
Tributary to Pond A	**197**	**121**	**159**	**91**
1A,1B,1C	68	41		
1D	70	41		
2A	36	23		
2B,2C	78	48		
2D	21	13		
2E,2F	24	15		
2G	25	16		
Tributary to Pond B	**201**	**122**	**199**	**105**

The calculations demonstrate that the routed developed 100-year storm event runoff is less than the 10-year undeveloped storm event.

Table 3-2.1 100-yr Routed Release Rates

100-yr Proposed Release Rates	
Location	Release (cfs)
Pond A	73
Pond B	95
Total Release for Site:	168

3.4 Detention Basin Hydrographs & Runoff Volume

Combined Hydrographs were prepared for each of the basins for the purposes of detention pond analysis. As mentioned previously, these hydrographs calculations and the pond routing computations can be found in Appendix D and E respectively. Total storm volumes (the area under the hydrograph curves) for these Ventura County hydrographs were computed by VCRAT 2.64, and are listed in Table 3-3.

3.5 Detention Pond Performance and Freeboard

Although tributary areas for each of the proposed ponds are slightly different from those cited in the Paller-Roberts report, the 100-year peak discharges from the watershed associated with each detention basin were used for comparison during detention pond analysis. The allowable release rate for the existing western pond was determined from the Paller Roberts report to be 109.8 cfs with an actual (new maximum allowed) release rate of 92.6 cfs. Our proposed peak storm mitigation through the use of detention Pond “A”, reduced the proposed release rate to 73 cfs. See Appendix E for Pond routing and basin storage versus discharge capacity calculations. The allowable release rate for Pond NS23 with the required deductions for the Eastern sub basin and Simi Central sub basin according to the Paller-Roberts report is 125.8 cfs with an actual release of 118.9 cfs. The proposed release rate for Pond B is 95 cfs. See Appendix E for full Pond calculations. Among other items, Table 3-3 lists the peak inflow calculated for the drainage area to each pond.

Peak discharge rates are below the maximum allowable release rates addressed earlier in this report. The total combined maximum actual allowed release rate is 168 cfs and represent 67.6 cfs reduction from the total allowed release of 235.6 cfs. The downstream storm drain facilities will see 29% reduction beyond the allowed release rate coming from the Western and NS23 sub-basins. Clearly, proper mitigation is achieved by the development of Tract 5658. As a result, the North Simi Drain and tributary storm drain facilities at Highway 118 and south of Highway 118 will benefit from the reductions.

It is important to note that this peak discharge is much less than the historic flow prior to the Simi Valley Town Center development. According to comparable numbers from the North Simi Drain Hydrology Report and Simi Valley Master Drainage, the existing runoff north of the Town Center (within TTM 5658) is approximately 545.8 cfs. Therefore, our proposed discharge represents a true peak flow reduction of approximately 31 percent. As a result, our development along with the Simi Valley Town Center development will bring a significant benefit to the downstream storm drain facilities south of the Freeway 118.

Table 3-3. 100-Yr Detention pond summary.

Detention Pond	Tributary Area (ac.)	Total Capacity (AF)	Total Depth (ft)	Hydrograph Peak Inflow (cfs)	Peak Outflow (cfs)	Total Inflow Volume (AF)	Peak Storage (AF)	Peak Elevation	Peak Depth (ft)
A	93	14.3	11	197	73	16.15	6.38	963.06	6.06
B	96	10.4	7	201	95	16.87	5.79	969.50	4.5

Pond A, has a peak water surface elevation of 963.06 ft. Since debris basins have been sized separately, no additional debris storage is required. Our basin design provides 4.9 feet from the top of the basin to the 100-year water surface elevation (WSE) and 4-ft from the spillway elevation to the WSE. For Pond B, the peak water surface elevation is at 969.50. The WSE is approximately 4.5 ft below the spillway and 5.5 feet below the top of the basin. In both cases, the crest of the embankment (or top of pond) is a minimum of three feet (freeboard) above the maximum water surface elevation from a 100-year storm.

Emergency Spillway

The maximum release rate was compared to 50% of the Q100 inflow. Since 50% of the inflow was found to be larger, the spillways were sized for the higher rate. Pond A spillway was sized for 145.1 cfs and Pond B spillway was designed for 180.1 cfs. In both cases, a 45-feet spillway with a 1-foot water depth is adequate and matches the existing condition. The existing spillway condition, size and elevation will be further investigated during final design and may be protected in place if found to be adequate. Otherwise, the spillway will be removed and reconstructed per details in Appendix G.

3.6 Conveyance Hydraulics

Pipes, culverts, swales, and ditches, and other hydraulic discharge and conveyance structures will need to be considered further during final design. Table 3-4 lists full-pipe capacities as a function of slope for the typical slopes encountered in this project.

Table 3-4. Flow capacity vs. slope and pipe diameter.

Flow Capacity (cfs)						
Sope	Diameter (inches)					
%	12	18	24	36	42	48
1	4	11	23	67	101	144
2	5	15	32	95	143	204
3	6	18	39	116	175	249
4	7	21	45	134	202	288
5	8	24	51	150	226	322
6	9	26	56	164	247	353
7	9	28	60	177	267	381
8	10	30	64	189	285	407
9	11	32	68	201	303	432
10	11	33	72	211	319	455

Note: Using Mannings of 0.013

Section 4 - Conclusions & Recommendations

Under proposed conditions, overall drainage patterns are the same as those discussed in the Paller-Roberts report. The proposed detention ponds perform adequately and in accordance to the standards set forth by Ventura County. As discussed in the Results section of this report, both debris and peak runoff rate are controlled to established limits.

Inlets, headwalls, ditches, swales, and pipes have been preliminarily sized and designed per this report, and will require further detail during final design. Water quality and first flush volumes can be adequately handled through the use of mechanical devices that intercept flows from disturbed and otherwise developed areas.

For pipes and other conveyance, slope is generally more than adequate to convey peak discharges. In fact, some energy dissipation may need to be a part of final designs.

Given that the storm drain facilities within the Simi Valley Town will not be adversely impacted since the existing drainage installed by the mall were designed to capture 100-yr control flow from Tract 5658, there is no need for hydraulic modeling under this Preliminary Report.

This project implements the elements of a Low Impact Development. It protects natural areas (steep slopes), minimizes land disturbance and minimizes impervious cover. The proposed development will capture, treat, retain and infiltrate runoff from storm events and will limit stormwater runoff to five percent (5%) of the site's effective impervious area as required by the MS4 Permit for Ventura County.

1A
5.73

1B
11.27

1C
25.53

1D
17.2

2A
5.62

2B
8.37

2C
22.35

2D
19.26

3A
6.12

3B
10.03

3C
27.66

3D
37.1

EXHIBIT 1

SIMI VALLEY
NORTH CANYON RANCH
EXISTING CONDITION
HYDROLOGY MAP

Flow Lines - Existing

Sub Watersheds - Existing

1A
6.12
Subarea Locator
Area (Ac.)

TETRA TECH
17885 Von Karman, Suite 500
Irvine, CA 92614
(949) 809-5000

N

0 250 500 Feet

1 in = 150 ft at 24" x 36"

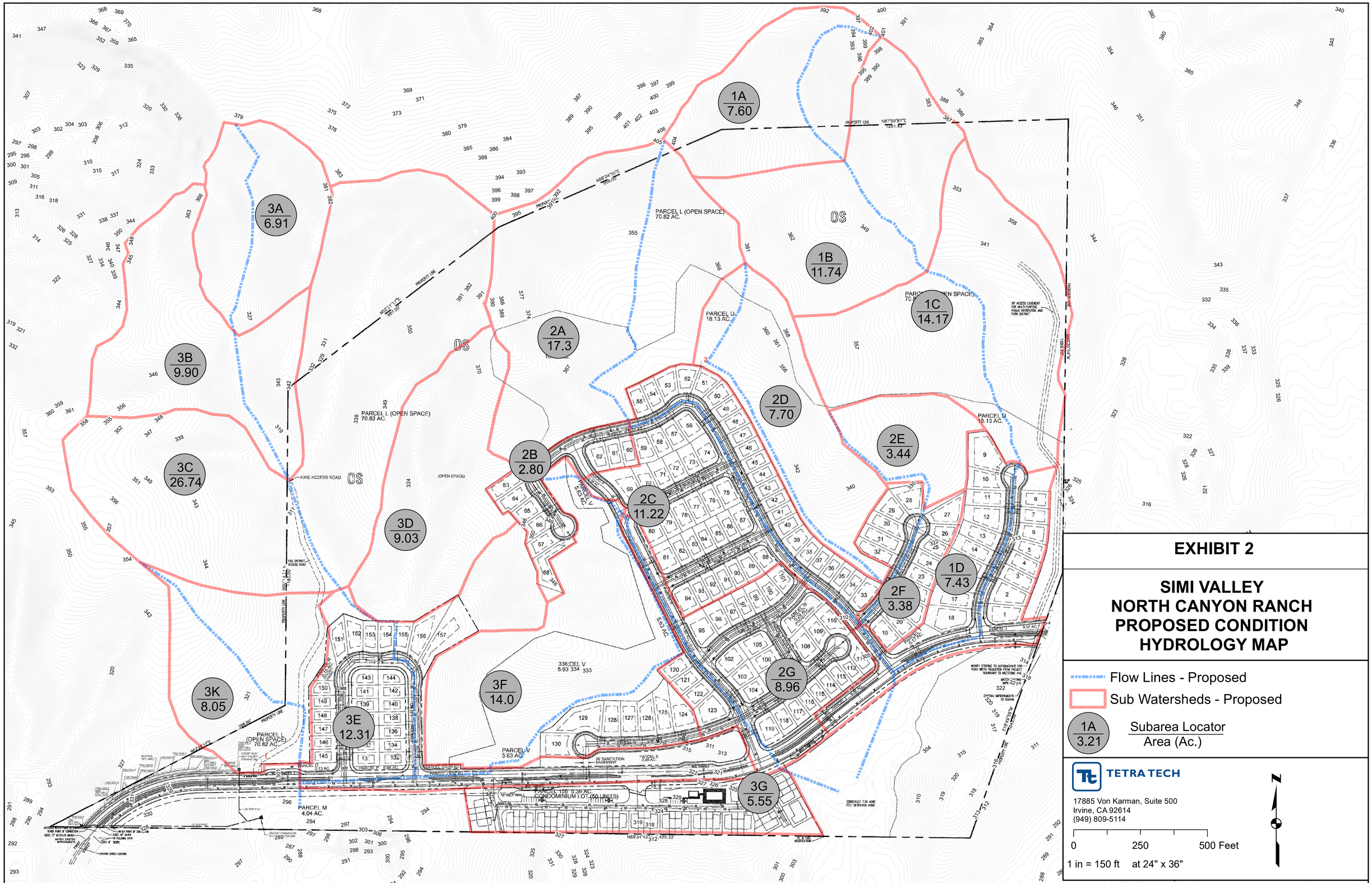


EXHIBIT 2

SIMI VALLEY
NORTH CANYON RANCH
PROPOSED CONDITION
HYDROLOGY MAP

Flow Lines - Proposed

Sub Watersheds - Proposed

1A / 3.21 — Subarea Locator / Area (Ac.)

TETRA TECH
17885 Von Karman, Suite 500
Irvine, CA 92614
(949) 809-5114

0 250 500 Feet

1 in = 150 ft at 24" x 36"

N

APPENDIX A
HYDROGRAPH YIELD ADJUSTMENTS

East Basin Subarea	Land Use Specific	Exhibit 14 Land Use	Area (ac)	CN Soil 1	CN Soil 2	CN Soil 1.968	WTD CN	% of Imp	WTD % of Imp
1A	Oepn Space	Open Brush Poor	7.60	75	70	70.16	5.57	0	0.00
1B	Oepn Space	Open Brush Poor	11.74	75	70	70.16	8.60	0	0.00
1C	Oepn Space	Open Brush Poor	14.17	75	70	70.16	10.38	0	0.00
1D	1/4 ac. Lot	Residential, 1/4 ac Lot	7.43	87	84	84.10	6.53	38	2.95
2A	Oepn Space	Open Brush Fair	17.29	75	70	70.16	12.67	0	0.00
2B	1/4 ac. Lot	Residential, 1/4 ac Lot	2.80	87	84	84.10	2.46	38	1.11
2C	1/4 ac. Lot	Residential, 1/4 ac Lot	11.22	87	84	84.10	9.86	38	4.45
2D	Oepn Space	Open Brush Poor	7.71	75	70	70.16	5.65	0	0.00
2E	Oepn Space	Open Brush Poor	3.44	75	70	70.16	2.52	0	0.00
2F	1/4 ac. Lot	Residential, 1/4 ac Lot	3.38	87	84	84.10	2.97	38	1.34
2G	1/4 ac. Lot	Residential, 1/4 ac Lot	8.96	87	84	84.10	7.87	38	3.56
			95.74				75.08		13.41

CN AMC II Yield	
100-yr 24-hr Precip. P (in)	7.5
WTD CN	75.08
Potential Abstraction S = (1000/CN) - 10	3.32
Initial Abstraction I_a = 0.2S	0.66
Yield = $(P-0.2S)^2/(P+0.8S)$ (in)	4.60

West Basin Subarea	Land Use Specific	Exhibit 14 Land Use	Area (ac)	CN Soil 1	CN Soil 2	CN Soil 1.953	WTD CN	% of Imp	WTD % of Imp
3A	Oepn Space	Open Brush Poor	6.92	75	70	70.24	5.08	0	0.00
3B	Oepn Space	Open Brush Poor	9.90	75	70	70.24	7.26	0	0.00
3C	Oepn Space	Open Brush Poor	26.74	75	70	70.24	19.62	0	0.00
3D	Oepn Space	Open Brush Poor	9.03	75	70	70.24	6.62	0	0.00
3E	Multi-Family	Residential, Condo	12.31	93	92	92.05	11.84	69	9.18
3F	Oepn Space	Open Brush Poor	13.99	75	70	70.24	10.26	0	0.00
3G	Townhome	Residential, Condo	5.55	93	92	92.05	5.34	69	4.14
3K	Oepn Space	Open Brush Poor	8.06	75	70	70.24	5.91	0	0.00
			92.50				71.93		13.32

CN AMC II Yield	
100-yr 24-hr Precip. P (in)	7.5
WTD CN	71.93
Potential Abstraction S = (1000/CN) - 10	3.90
Initial Abstraction I_a = 0.2S	0.78
Yield = $(P-0.2S)^2/(P+0.8S)$ (in)	4.25

APPENDIX B
TIME OF CONCENTRATION CALCULATIONS

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1a	User Input
Watershed Area ac =	5.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.900	Calculated
C_undeveloped =	0.840	Calculated
C_composite =	0.840	Calculated
Peak cfs =	9.18	Calculated
Calculated Tc=	**7.30**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.70	1293	1128	682	0.242					100.0%	9.2	9.2
2	None	0					#VALUE!	#VALUE!				0.0%	-	9.2
3	None	0										0.0%	-	9.2
4	None	0										0.0%	-	9.2
5	None	0										0.0%	-	9.2
6	None	0										0.0%	-	9.2
7	None	0										0.0%	-	9.2
8	None	0										0.0%	-	9.2
9	None	0										0.0%	-	9.2
10	None	0										0.0%	-	9.2
Sum			**5.7**									**100%**	**9.2**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1a	User Input
Watershed Area ac =	5.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**6.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.550	Calculated
C_undeveloped =	0.914	Calculated
C_composite =	0.914	Calculated
Peak cfs =	18.64	Calculated
Calculated Tc=	**5.82**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.70	1293	1128	682	0.242					100.0%	18.6	18.6
2	None	0					#VALUE!	#VALUE!				0.0%	-	18.6
3	None	0										0.0%	-	18.6
4	None	0										0.0%	-	18.6
5	None	0										0.0%	-	18.6
6	None	0										0.0%	-	18.6
7	None	0										0.0%	-	18.6
8	None	0										0.0%	-	18.6
9	None	0										0.0%	-	18.6
10	None	0										0.0%	-	18.6
Sum			**5.7**									**100%**	**18.6**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1b	User Input
Watershed Area ac =	11.3	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**9.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.760	Calculated
C_undeveloped =	0.828	Calculated
C_composite =	0.828	Calculated
Peak cfs =	16.60	Calculated
Calculated Tc=	**8.76**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	3.05	1333	1115	781	0.279					27.0%	4.5	4.5
2	Natural Valley Channel	3	8.25	1115	1086	395	0.073					73.0%	12.1	16.6
3	None	0										0.0%	-	16.6
4	None	0										0.0%	-	16.6
5	None	0										0.0%	-	16.6
6	None	0										0.0%	-	16.6
7	None	0										0.0%	-	16.6
8	None	0										0.0%	-	16.6
9	None	0										0.0%	-	16.6
10	None	0										0.0%	-	16.6
Sum			**11.3**									**100%**	**16.6**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1b	User Input
Watershed Area ac =	11.3	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.190	Calculated
C_undeveloped =	0.905	Calculated
C_composite =	0.905	Calculated
Peak cfs =	32.88	Calculated
Calculated Tc=	**7.07**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	3.05	1333	1115	781	0.279					27.0%	8.9	8.9
2	Natural Valley Channel	3	8.25	1115	1086	395	0.073					73.0%	24.0	32.9
3	None	0										0.0%	-	32.9
4	None	0										0.0%	-	32.9
5	None	0										0.0%	-	32.9
6	None	0										0.0%	-	32.9
7	None	0										0.0%	-	32.9
8	None	0										0.0%	-	32.9
9	None	0										0.0%	-	32.9
10	None	0										0.0%	-	32.9
Sum			**11.3**									**100%**	**32.9**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1c	User Input
Watershed Area ac =	25.5	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**11.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.640	Calculated
C_undeveloped =	0.815	Calculated
C_composite =	0.815	Calculated
Peak cfs =	34.35	Calculated
Calculated Tc=	**10.58**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	2.40	1250	1086	768	0.214					9.4%	3.2	3.2
2	Natural Valley Channel	3	23.10	1086	1007	964	0.082					90.6%	31.1	34.3
3	None	0										0.0%	-	34.3
4	None	0										0.0%	-	34.3
5	None	0										0.0%	-	34.3
6	None	0										0.0%	-	34.3
7	None	0										0.0%	-	34.3
8	None	0										0.0%	-	34.3
9	None	0										0.0%	-	34.3
10	None	0										0.0%	-	34.3
Sum			**25.5**									**100%**	**34.3**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1c	User Input
Watershed Area ac =	25.5	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**8.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.990	Calculated
C_undeveloped =	0.900	Calculated
C_composite =	0.900	Calculated
Peak cfs =	69.16	Calculated
Calculated Tc=	**8.23**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	2.40	1250	1086	768	0.214					9.4%	6.5	6.5
2	Natural Valley Channel	3	23.10	1086	1007	964	0.082					90.6%	62.7	69.2
3	None	0										0.0%	-	69.2
4	None	0										0.0%	-	69.2
5	None	0										0.0%	-	69.2
6	None	0										0.0%	-	69.2
7	None	0										0.0%	-	69.2
8	None	0										0.0%	-	69.2
9	None	0										0.0%	-	69.2
10	None	0										0.0%	-	69.2
Sum			**25.5**									**100%**	**69.2**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1d	User Input
Watershed Area ac =	17.2	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**17.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.390	Calculated
C_undeveloped =	0.783	Calculated
C_composite =	0.783	Calculated
Peak cfs =	18.88	Calculated
Calculated Tc=	**17.26**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.44	1102	1003	768	0.129					8.4%	1.6	1.6
2	Natural Valley Channel	3	15.76	1003	964	972	0.040					91.6%	17.3	18.9
3	None	0										0.0%	-	18.9
4	None	0										0.0%	-	18.9
5	None	0										0.0%	-	18.9
6	None	0										0.0%	-	18.9
7	None	0										0.0%	-	18.9
8	None	0										0.0%	-	18.9
9	None	0										0.0%	-	18.9
10	None	0										0.0%	-	18.9
Sum			**17.2**									**100%**	**18.9**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1d	User Input
Watershed Area ac =	17.2	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**12.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.580	Calculated
C_undeveloped =	0.883	Calculated
C_composite =	0.883	Calculated
Peak cfs =	39.52	Calculated
Calculated Tc=	**11.82**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.44	1102	1003	768	0.129					8.4%	3.3	3.3
2	Natural Valley Channel	3	15.76	1003	964	972	0.040					91.6%	36.2	39.5
3	None	0										0.0%	-	39.5
4	None	0										0.0%	-	39.5
5	None	0										0.0%	-	39.5
6	None	0										0.0%	-	39.5
7	None	0										0.0%	-	39.5
8	None	0										0.0%	-	39.5
9	None	0										0.0%	-	39.5
10	None	0										0.0%	-	39.5
Sum			**17.2**									**100%**	**39.5**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2a	User Input
Watershed Area ac =	5.6	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**6.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.010	Calculated
C_undeveloped =	0.850	Calculated
C_composite =	0.850	Calculated
Peak cfs =	9.68	Calculated
Calculated Tc=	**5.90**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.62	1292	1128	569	0.288					100.0%	9.7	9.7
2	None	0					#VALUE!	#VALUE!				0.0%	-	9.7
3	None	0										0.0%	-	9.7
4	None	0										0.0%	-	9.7
5	None	0										0.0%	-	9.7
6	None	0										0.0%	-	9.7
7	None	0										0.0%	-	9.7
8	None	0										0.0%	-	9.7
9	None	0										0.0%	-	9.7
10	None	0										0.0%	-	9.7
Sum			**5.6**									**100%**	**9.7**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2a	User Input
Watershed Area ac =	5.6	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**5.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	4.060	Calculated
C_undeveloped =	0.926	Calculated
C_composite =	0.926	Calculated
Peak cfs =	21.30	Calculated
Calculated Tc=	**5.01**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.62	1292	1128	600	0.273					100.0%	21.3	21.3
2	None	0					#VALUE!	#VALUE!				0.0%	-	21.3
3	None	0										0.0%	-	21.3
4	None	0										0.0%	-	21.3
5	None	0										0.0%	-	21.3
6	None	0										0.0%	-	21.3
7	None	0										0.0%	-	21.3
8	None	0										0.0%	-	21.3
9	None	0										0.0%	-	21.3
10	None	0										0.0%	-	21.3
Sum			**5.6**									**100%**	**21.3**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2b	User Input
Watershed Area ac =	8.4	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**9.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.760	Calculated
C_undeveloped =	0.828	Calculated
C_composite =	0.828	Calculated
Peak cfs =	12.30	Calculated
Calculated Tc=	**9.24**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	8.37	1325	1105	885	0.249					100.0%	12.3	12.3
2	None	0					#VALUE!	#VALUE!				0.0%	-	12.3
3	None	0										0.0%	-	12.3
4	None	0										0.0%	-	12.3
5	None	0										0.0%	-	12.3
6	None	0										0.0%	-	12.3
7	None	0										0.0%	-	12.3
8	None	0										0.0%	-	12.3
9	None	0										0.0%	-	12.3
10	None	0										0.0%	-	12.3
Sum			**8.4**									**100%**	**12.3**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2b	User Input
Watershed Area ac =	8.4	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.190	Calculated
C_undeveloped =	0.905	Calculated
C_composite =	0.905	Calculated
Peak cfs =	24.36	Calculated
Calculated Tc=	**7.42**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	8.37	1325	1105	885	0.249					100.0%	24.4	24.4
2	None	0					#VALUE!	#VALUE!				0.0%	-	24.4
3	None	0										0.0%	-	24.4
4	None	0										0.0%	-	24.4
5	None	0										0.0%	-	24.4
6	None	0										0.0%	-	24.4
7	None	0										0.0%	-	24.4
8	None	0										0.0%	-	24.4
9	None	0										0.0%	-	24.4
10	None	0										0.0%	-	24.4
Sum			**8.4**									**100%**	**24.4**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2c	User Input
Watershed Area ac =	22.4	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**13.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.550	Calculated
C_undeveloped =	0.804	Calculated
C_composite =	0.804	Calculated
Peak cfs =	28.10	Calculated
Calculated Tc=	**12.99**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	8.59	1259	1053	1006	0.205					38.4%	10.8	10.8
2	Natural Valley Channel	3	13.76	1053	1033	301	0.066					61.6%	17.3	28.1
3	None	0										0.0%	-	28.1
4	None	0										0.0%	-	28.1
5	None	0										0.0%	-	28.1
6	None	0										0.0%	-	28.1
7	None	0										0.0%	-	28.1
8	None	0										0.0%	-	28.1
9	None	0										0.0%	-	28.1
10	None	0										0.0%	-	28.1
Sum			**22.4**									**100%**	**28.1**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2c	User Input
Watershed Area ac =	22.4	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**10.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.780	Calculated
C_undeveloped =	0.891	Calculated
C_composite =	0.891	Calculated
Peak cfs =	55.83	Calculated
Calculated Tc=	**9.91**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	8.59	1259	1053	1006	0.205					38.4%	21.5	21.5
2	Natural Valley Channel	3	13.76	1053	1033	301	0.066					61.6%	34.4	55.8
3	None	0										0.0%	-	55.8
4	None	0										0.0%	-	55.8
5	None	0										0.0%	-	55.8
6	None	0										0.0%	-	55.8
7	None	0										0.0%	-	55.8
8	None	0										0.0%	-	55.8
9	None	0										0.0%	-	55.8
10	None	0										0.0%	-	55.8
Sum			**22.4**									**100%**	**55.8**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2d	User Input
Watershed Area ac =	19.3	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**14.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.510	Calculated
C_undeveloped =	0.800	Calculated
C_composite =	0.800	Calculated
Peak cfs =	23.46	Calculated
Calculated Tc=	**14.36**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	4.31	1145	1020	790	0.158					22.4%	5.2	5.2
2	Natural Valley Channel	3	14.95	1020	964	986	0.057					77.6%	18.2	23.5
3	None	0										0.0%	-	23.5
4	None	0										0.0%	-	23.5
5	None	0										0.0%	-	23.5
6	None	0										0.0%	-	23.5
7	None	0										0.0%	-	23.5
8	None	0										0.0%	-	23.5
9	None	0										0.0%	-	23.5
10	None	0										0.0%	-	23.5
Sum			**19.3**									**100%**	**23.5**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2d	User Input
Watershed Area ac =	19.3	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**10.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.780	Calculated
C_undeveloped =	0.891	Calculated
C_composite =	0.891	Calculated
Peak cfs =	48.11	Calculated
Calculated Tc=	**10.34**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	4.31	1145	1020	790	0.158					22.4%	10.8	10.8
2	Natural Valley Channel	3	14.95	1020	964	986	0.057					77.6%	37.3	48.1
3	None	0										0.0%	-	48.1
4	None	0										0.0%	-	48.1
5	None	0										0.0%	-	48.1
6	None	0										0.0%	-	48.1
7	None	0										0.0%	-	48.1
8	None	0										0.0%	-	48.1
9	None	0										0.0%	-	48.1
10	None	0										0.0%	-	48.1
Sum			**19.3**									**100%**	**48.1**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3a	User Input
Watershed Area ac =	6.1	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**9.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.760	Calculated
C_undeveloped =	0.828	Calculated
C_composite =	0.828	Calculated
Peak cfs =	8.99	Calculated
Calculated Tc=	**9.09**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	6.12	1208	1056	736	0.207					100.0%	9.0	9.0
2	None	0					#VALUE!	#VALUE!				0.0%	-	9.0
3	None	0										0.0%	-	9.0
4	None	0										0.0%	-	9.0
5	None	0										0.0%	-	9.0
6	None	0										0.0%	-	9.0
7	None	0										0.0%	-	9.0
8	None	0										0.0%	-	9.0
9	None	0										0.0%	-	9.0
10	None	0										0.0%	-	9.0
Sum			**6.1**									**100%**	**9.0**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3a	User Input
Watershed Area ac =	6.1	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.190	Calculated
C_undeveloped =	0.905	Calculated
C_composite =	0.905	Calculated
Peak cfs =	17.81	Calculated
Calculated Tc=	**6.94**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	6.12	1208	1056	736	0.207					100.0%	17.8	17.8
2	None	0					#VALUE!	#VALUE!				0.0%	-	17.8
3	None	0										0.0%	-	17.8
4	None	0										0.0%	-	17.8
5	None	0										0.0%	-	17.8
6	None	0										0.0%	-	17.8
7	None	0										0.0%	-	17.8
8	None	0										0.0%	-	17.8
9	None	0										0.0%	-	17.8
10	None	0										0.0%	-	17.8
Sum			**6.1**									**100%**	**17.8**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3b	User Input
Watershed Area ac =	10.0	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**13.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.550	Calculated
C_undeveloped =	0.804	Calculated
C_composite =	0.804	Calculated
Peak cfs =	12.61	Calculated
Calculated Tc=	**13.19**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.40	1193	1056	808	0.170					53.8%	6.8	6.8
2	Natural Valley Channel	3	4.63	1056	1020	598	0.060					46.2%	5.8	12.6
3	None	0										0.0%	-	12.6
4	None	0										0.0%	-	12.6
5	None	0										0.0%	-	12.6
6	None	0										0.0%	-	12.6
7	None	0										0.0%	-	12.6
8	None	0										0.0%	-	12.6
9	None	0										0.0%	-	12.6
10	None	0										0.0%	-	12.6
Sum			**10.0**									**100%**	**12.6**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3b	User Input
Watershed Area ac =	10.0	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**10.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.780	Calculated
C_undeveloped =	0.891	Calculated
C_composite =	0.891	Calculated
Peak cfs =	25.06	Calculated
Calculated Tc=	**9.63**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.40	1193	1056	808	0.170					53.8%	13.5	13.5
2	Natural Valley Channel	3	4.63	1056	1020	598	0.060					46.2%	11.6	25.1
3	None	0										0.0%	-	25.1
4	None	0										0.0%	-	25.1
5	None	0										0.0%	-	25.1
6	None	0										0.0%	-	25.1
7	None	0										0.0%	-	25.1
8	None	0										0.0%	-	25.1
9	None	0										0.0%	-	25.1
10	None	0										0.0%	-	25.1
Sum			**10.0**									**100%**	**25.1**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3c	User Input
Watershed Area ac =	27.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.900	Calculated
C_undeveloped =	0.840	Calculated
C_composite =	0.840	Calculated
Peak cfs =	44.53	Calculated
Calculated Tc=	**7.43**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	6.07	1301	1084	517	0.420					21.9%	9.8	9.8
2	Natural Valley Channel	3	7.50	1084	1020	802	0.080					27.1%	12.1	21.8
3	Natural Valley Channel	3	14.09	1020	994	598	0.043					50.9%	22.7	44.5
4	None	0										0.0%	-	44.5
5	None	0										0.0%	-	44.5
6	None	0										0.0%	-	44.5
7	None	0										0.0%	-	44.5
8	None	0										0.0%	-	44.5
9	None	0										0.0%	-	44.5
10	None	0										0.0%	-	44.5
Sum			**27.7**									**100%**	**44.5**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3c	User Input
Watershed Area ac =	27.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**6.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.550	Calculated
C_undeveloped =	0.914	Calculated
C_composite =	0.914	Calculated
Peak cfs =	90.47	Calculated
Calculated Tc=	**6.02**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	6.07	1301	1084	517	0.420					21.9%	19.9	19.9
2	Natural Valley Channel	3	7.50	1084	1020	802	0.080					27.1%	24.5	44.4
3	Natural Valley Channel	3	14.09	1020	994	598	0.043					50.9%	46.1	90.5
4	None	0										0.0%	-	90.5
5	None	0										0.0%	-	90.5
6	None	0										0.0%	-	90.5
7	None	0										0.0%	-	90.5
8	None	0										0.0%	-	90.5
9	None	0										0.0%	-	90.5
10	None	0										0.0%	-	90.5
Sum			**27.7**									**100%**	**90.5**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3d	User Input
Watershed Area ac =	37.1	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.900	Calculated
C_undeveloped =	0.840	Calculated
C_composite =	0.840	Calculated
Peak cfs =	59.73	Calculated
Calculated Tc=	**7.22**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.55	1268	1097	420	0.407					4.2%	2.5	2.5
2	Natural Valley Channel	3	13.13	1097	984	1107	0.102					35.4%	21.1	23.6
3	Natural Valley Channel	3	22.42	984	968	659	0.024					60.4%	36.1	59.7
4	None	0										0.0%	-	59.7
5	None	0										0.0%	-	59.7
6	None	0										0.0%	-	59.7
7	None	0										0.0%	-	59.7
8	None	0										0.0%	-	59.7
9	None	0										0.0%	-	59.7
10	None	0										0.0%	-	59.7
Sum			**37.1**									**100%**	**59.7**	

Existing Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3d	User Input
Watershed Area ac =	37.1	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**6.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.550	Calculated
C_undeveloped =	0.914	Calculated
C_composite =	0.914	Calculated
Peak cfs =	121.34	Calculated
Calculated Tc=	**5.86**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.55	1268	1097	420	0.407					4.2%	5.1	5.1
2	Natural Valley Channel	3	13.13	1097	984	1107	0.102					35.4%	42.9	48.0
3	Natural Valley Channel	3	22.42	984	968	659	0.024					60.4%	73.3	121.3
4	None	0										0.0%	-	121.3
5	None	0										0.0%	-	121.3
6	None	0										0.0%	-	121.3
7	None	0										0.0%	-	121.3
8	None	0										0.0%	-	121.3
9	None	0										0.0%	-	121.3
10	None	0										0.0%	-	121.3
Sum			**37.1**									**100%**	**121.3**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1a	User Input
Watershed Area ac =	11.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**6.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.010	Calculated
C_undeveloped =	0.850	Calculated
C_composite =	0.850	Calculated
Peak cfs =	20.22	Calculated
Calculated Tc=	**5.59**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.73	1320	1151	441	0.383					14.7%	3.0	3.0
2	Natural Valley Channel	3	10.01	1151	1129	477	0.046					85.3%	17.2	20.2
3	None	0										0.0%	-	20.2
4	None	0										0.0%	-	20.2
5	None	0										0.0%	-	20.2
6	None	0										0.0%	-	20.2
7	None	0										0.0%	-	20.2
8	None	0										0.0%	-	20.2
9	None	0										0.0%	-	20.2
10	None	0										0.0%	-	20.2
Sum			**11.7**									**100%**	**20.2**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1a	User Input
Watershed Area ac =	11.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**15.00**	**Tc Outside of Range, Reset to 15**
Intensity in/hr =	2.360	Calculated
C_undeveloped =	0.872	Calculated
C_composite =	0.872	Calculated
Peak cfs =	24.35	Calculated
Calculated Tc=	**4.65**	**Tc Outside of Range, Revise Flowpaths**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.73	1320	1151	441	0.383					14.7%	3.6	3.6
2	Natural Valley Channel	3	10.01	1151	1129	477	0.046					85.3%	20.8	24.3
3	None	0										0.0%	-	24.3
4	None	0										0.0%	-	24.3
5	None	0										0.0%	-	24.3
6	None	0										0.0%	-	24.3
7	None	0										0.0%	-	24.3
8	None	0										0.0%	-	24.3
9	None	0										0.0%	-	24.3
10	None	0										0.0%	-	24.3
Sum			**11.7**									**100%**	**24.3**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1b	User Input
Watershed Area ac =	11.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**15.00**	**Tc Outside of Range, Reset to 15**
Intensity in/hr =	2.360	Calculated
C_undeveloped =	0.872	Calculated
C_composite =	0.872	Calculated
Peak cfs =	24.35	Calculated
Calculated Tc=	**4.31**	**Tc Outside of Range, Revise Flowpaths**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.73	1320	1151	441	0.383					14.7%	3.6	3.6
2	Natural Valley Channel	3	10.01	1151	1129	358	0.061					85.3%	20.8	24.3
3	None	0										0.0%	-	24.3
4	None	0										0.0%	-	24.3
5	None	0										0.0%	-	24.3
6	None	0										0.0%	-	24.3
7	None	0										0.0%	-	24.3
8	None	0										0.0%	-	24.3
9	None	0										0.0%	-	24.3
10	None	0										0.0%	-	24.3
Sum			**11.7**									**100%**	**24.3**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1b	User Input
Watershed Area ac =	11.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**5.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.160	Calculated
C_undeveloped =	0.860	Calculated
C_composite =	0.860	Calculated
Peak cfs =	21.98	Calculated
Calculated Tc=	**5.22**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.73	1320	1151	441	0.383					14.7%	3.2	3.2
2	Natural Valley Channel	3	10.01	1151	1129	358	0.061					85.3%	18.7	22.0
3	None	0										0.0%	-	22.0
4	None	0										0.0%	-	22.0
5	None	0										0.0%	-	22.0
6	None	0										0.0%	-	22.0
7	None	0										0.0%	-	22.0
8	None	0										0.0%	-	22.0
9	None	0										0.0%	-	22.0
10	None	0										0.0%	-	22.0
Sum			**11.7**									**100%**	**22.0**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1c	User Input
Watershed Area ac =	14.2	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	2	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**12.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.590	Calculated
C_undeveloped =	0.717	Calculated
C_composite =	0.717	Calculated
Peak cfs =	16.30	Calculated
Calculated Tc=	**12.33**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	6.64	1259	1050	973	0.215					46.9%	7.6	7.6
2	Natural Valley Channel	3	7.53	1050	1034	361	0.044					53.1%	8.7	16.3
3	None	0										0.0%	-	16.3
4	None	0										0.0%	-	16.3
5	None	0										0.0%	-	16.3
6	None	0										0.0%	-	16.3
7	None	0										0.0%	-	16.3
8	None	0										0.0%	-	16.3
9	None	0										0.0%	-	16.3
10	None	0										0.0%	-	16.3
Sum			**14.2**									**100%**	**16.3**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	1c	User Input
Watershed Area ac =	14.2	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	2	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**10.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.780	Calculated
C_undeveloped =	0.816	Calculated
C_composite =	0.816	Calculated
Peak cfs =	32.42	Calculated
Calculated Tc=	**9.56**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	6.64	1259	1050	973	0.215					46.9%	15.2	15.2
2	Natural Valley Channel	3	7.53	1050	1034	361	0.044					53.1%	17.2	32.4
3	None	0										0.0%	-	32.4
4	None	0										0.0%	-	32.4
5	None	0										0.0%	-	32.4
6	None	0										0.0%	-	32.4
7	None	0										0.0%	-	32.4
8	None	0										0.0%	-	32.4
9	None	0										0.0%	-	32.4
10	None	0										0.0%	-	32.4
Sum			**14.2**									**100%**	**32.4**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2a	User Input
Watershed Area ac =	17.3	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**8.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.820	Calculated
C_undeveloped =	0.833	Calculated
C_composite =	0.833	Calculated
Peak cfs =	26.47	Calculated
Calculated Tc=	**8.20**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	8.43	1333	1128	728	0.282					48.7%	12.9	12.9
2	Natural Valley Channel	3	8.88	1128	1112	361	0.044					51.3%	13.6	26.5
3	None	0										0.0%	-	26.5
4	None	0										0.0%	-	26.5
5	None	0										0.0%	-	26.5
6	None	0										0.0%	-	26.5
7	None	0										0.0%	-	26.5
8	None	0										0.0%	-	26.5
9	None	0										0.0%	-	26.5
10	None	0										0.0%	-	26.5
Sum			**17.3**									**100%**	**26.5**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2a	User Input
Watershed Area ac =	17.3	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.190	Calculated
C_undeveloped =	0.905	Calculated
C_composite =	0.905	Calculated
Peak cfs =	50.37	Calculated
Calculated Tc=	**6.62**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	8.43	1333	1128	728	0.282					48.7%	24.5	24.5
2	Natural Valley Channel	3	8.88	1128	1112	361	0.044					51.3%	25.8	50.4
3	None	0										0.0%	-	50.4
4	None	0										0.0%	-	50.4
5	None	0										0.0%	-	50.4
6	None	0										0.0%	-	50.4
7	None	0										0.0%	-	50.4
8	None	0										0.0%	-	50.4
9	None	0										0.0%	-	50.4
10	None	0										0.0%	-	50.4
Sum			**17.3**									**100%**	**50.4**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: Tc Calculator V6

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2g	User Input
Watershed Area ac =	9.7	Calculated from flowpath data
% Imperviousness =	38	User Input
Land Use Description =	LowRes1/4	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**8.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.820	Calculated
C_undeveloped =	0.833	Calculated
C_composite =	0.878	Calculated
Peak cfs =	15.61	Calculated
Calculated Tc=	**8.22**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	0.73	1139	1084	360	0.153					7.5%	1.2	1.2
2	Street-40'Wide8"Curbs	8	8.96	1084	992	1125	0.082					92.5%	14.4	15.6
3	None	0										0.0%	-	15.6
4	None	0							3.0	0.012		0.0%	-	15.6
5	None	0							3.0	0.015		0.0%	-	15.6
6	None	0										0.0%	-	15.6
7	None	0										0.0%	-	15.6
8	None	0										0.0%	-	15.6
9	None	0										0.0%	-	15.6
10	None	0										0.0%	-	15.6
Sum			**9.7**									**100%**	**15.6**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: Tc Calculator V6

USER INPUT IN BLUE FIELDS:		
Subarea Name =	2g	User Input
Watershed Area ac =	9.7	Calculated from flowpath data
% Imperviousness =	38	User Input
Land Use Description =	LowRes1/4	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**6.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.550	Calculated
C_undeveloped =	0.914	Calculated
C_composite =	0.928	Calculated
Peak cfs =	32.17	Calculated
Calculated Tc=	**6.05**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	0.73	1139	1084	360	0.153					7.5%	2.4	2.4
2	Street-40'Wide8"Curbs	8	8.96	1084	992	1125	0.082					92.5%	29.7	32.2
3	None	0										0.0%	-	32.2
4	None	0							3.0	0.012		0.0%	-	32.2
5	None	0							3.0	0.015		0.0%	-	32.2
6	None	0										0.0%	-	32.2
7	None	0										0.0%	-	32.2
8	None	0										0.0%	-	32.2
9	None	0										0.0%	-	32.2
10	None	0										0.0%	-	32.2
Sum			**9.7**									**100%**	**32.2**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3a	User Input
Watershed Area ac =	6.9	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**15.00**	**Tc Outside of Range, Reset to 15**
Intensity in/hr =	1.470	Calculated
C_undeveloped =	0.794	Calculated
C_composite =	0.794	Calculated
Peak cfs =	8.14	Calculated
Calculated Tc=	**4.18**	**Tc Outside of Range, Revise Flowpaths**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	1.53	1245	1120	328	0.381					22.1%	1.8	1.8
2	Natural Valley Channel	3	5.38	1120	1056	507	0.126					77.9%	6.3	8.1
3	None	0										0.0%	-	8.1
4	None	0										0.0%	-	8.1
5	None	0										0.0%	-	8.1
6	None	0										0.0%	-	8.1
7	None	0										0.0%	-	8.1
8	None	0										0.0%	-	8.1
9	None	0										0.0%	-	8.1
10	None	0										0.0%	-	8.1
Sum			**6.9**									**100%**	**8.1**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3b	User Input
Watershed Area ac =	9.9	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**13.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.550	Calculated
C_undeveloped =	0.804	Calculated
C_composite =	0.804	Calculated
Peak cfs =	12.45	Calculated
Calculated Tc=	**13.19**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.29	1197	1056	819	0.172					53.4%	6.7	6.7
2	Natural Valley Channel	3	4.61	1056	1021	606	0.058					46.6%	5.8	12.4
3	None	0										0.0%	-	12.4
4	None	0										0.0%	-	12.4
5	None	0										0.0%	-	12.4
6	None	0										0.0%	-	12.4
7	None	0										0.0%	-	12.4
8	None	0										0.0%	-	12.4
9	None	0										0.0%	-	12.4
10	None	0										0.0%	-	12.4
Sum			**9.9**									**100%**	**12.4**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3b	User Input
Watershed Area ac =	9.9	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**10.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	2.780	Calculated
C_undeveloped =	0.891	Calculated
C_composite =	0.891	Calculated
Peak cfs =	24.73	Calculated
Calculated Tc=	**9.68**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	5.29	1197	1056	819	0.172					53.4%	13.2	13.2
2	Natural Valley Channel	3	4.61	1056	1021	606	0.058					46.6%	11.5	24.7
3	None	0										0.0%	-	24.7
4	None	0										0.0%	-	24.7
5	None	0										0.0%	-	24.7
6	None	0										0.0%	-	24.7
7	None	0										0.0%	-	24.7
8	None	0										0.0%	-	24.7
9	None	0										0.0%	-	24.7
10	None	0										0.0%	-	24.7
Sum			**9.9**									**100%**	**24.7**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3c	User Input
Watershed Area ac =	26.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**9.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.760	Calculated
C_undeveloped =	0.828	Calculated
C_composite =	0.828	Calculated
Peak cfs =	39.29	Calculated
Calculated Tc=	**8.95**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	7.06	1313	1072	681	0.354					26.4%	10.4	10.4
2	Natural Valley Channel	3	19.68	1072	1021	1113	0.046					73.6%	28.9	39.3
3	None	0										0.0%	-	39.3
4	None	0										0.0%	-	39.3
5	None	0										0.0%	-	39.3
6	None	0										0.0%	-	39.3
7	None	0										0.0%	-	39.3
8	None	0										0.0%	-	39.3
9	None	0										0.0%	-	39.3
10	None	0										0.0%	-	39.3
Sum			**26.7**									**100%**	**39.3**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3c	User Input
Watershed Area ac =	26.7	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.190	Calculated
C_undeveloped =	0.905	Calculated
C_composite =	0.905	Calculated
Peak cfs =	77.82	Calculated
Calculated Tc=	**7.24**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	7.06	1313	1072	681	0.354					26.4%	20.5	20.5
2	Natural Valley Channel	3	19.68	1072	1021	1113	0.046					73.6%	57.3	77.8
3	None	0										0.0%	-	77.8
4	None	0										0.0%	-	77.8
5	None	0										0.0%	-	77.8
6	None	0										0.0%	-	77.8
7	None	0										0.0%	-	77.8
8	None	0										0.0%	-	77.8
9	None	0										0.0%	-	77.8
10	None	0										0.0%	-	77.8
Sum			**26.7**									**100%**	**77.8**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3d	User Input
Watershed Area ac =	9.0	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**7.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.900	Calculated
C_undeveloped =	0.840	Calculated
C_composite =	0.840	Calculated
Peak cfs =	14.54	Calculated
Calculated Tc=	**6.85**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	2.23	1273	1075	566	0.350					24.7%	3.6	3.6
2	Natural Valley Channel	3	6.80	1075	1002	679	0.108					75.3%	10.9	14.5
3	None	0										0.0%	-	14.5
4	None	0										0.0%	-	14.5
5	None	0										0.0%	-	14.5
6	None	0										0.0%	-	14.5
7	None	0										0.0%	-	14.5
8	None	0										0.0%	-	14.5
9	None	0										0.0%	-	14.5
10	None	0										0.0%	-	14.5
Sum			**9.0**									**100%**	**14.5**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3d	User Input
Watershed Area ac =	9.0	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**6.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	3.550	Calculated
C_undeveloped =	0.914	Calculated
C_composite =	0.914	Calculated
Peak cfs =	29.53	Calculated
Calculated Tc=	**5.54**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	2.23	1273	1075	566	0.350					24.7%	7.3	7.3
2	Natural Valley Channel	3	6.80	1075	1002	679	0.108					75.3%	22.2	29.5
3	None	0										0.0%	-	29.5
4	None	0										0.0%	-	29.5
5	None	0										0.0%	-	29.5
6	None	0										0.0%	-	29.5
7	None	0										0.0%	-	29.5
8	None	0										0.0%	-	29.5
9	None	0										0.0%	-	29.5
10	None	0										0.0%	-	29.5
Sum			**9.0**									**100%**	**29.5**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3l	User Input
Watershed Area ac =	8.1	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	10	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_10	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**8.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	1.820	Calculated
C_undeveloped =	0.833	Calculated
C_composite =	0.833	Calculated
Peak cfs =	12.31	Calculated
Calculated Tc=	**7.92**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	0.88	1161	1103	413	0.140					10.9%	1.3	1.3
2	Natural Valley Channel	3	4.84	1103	982	168	0.720					60.1%	7.4	8.7
3	Trapezoid-Channel	11	2.33	982	981	102	0.010		0.0	0.015	1.0	28.9%	3.6	12.3
4	None	0										0.0%	-	12.3
5	None	0										0.0%	-	12.3
6	None	0										0.0%	-	12.3
7	None	0										0.0%	-	12.3
8	None	0										0.0%	-	12.3
9	None	0										0.0%	-	12.3
10	None	0										0.0%	-	12.3
Sum			**8.1**									**100%**	**12.3**	

Proposed Condition

Tc Calculator Data Sheet V6.1

Project Name and Number: TT 5658-A

USER INPUT IN BLUE FIELDS:		
Subarea Name =	3l	User Input
Watershed Area ac =	8.1	Calculated from flowpath data
% Imperviousness =	0	User Input
Land Use Description =	Open	DropMenu
Storm Frequency	100	DropMenu
Storm Zone =	Jp	DropMenu
Zone ID =	Jp_100	Calculated
District Soil Number (1-7) =	1	DropMenu- Rev for Revised C Coefficients
Tc for Intensity Calc min =	**5.00**	**Rounded, Use for Peak Flow Calc.**
Intensity in/hr =	4.060	Calculated
C_undeveloped =	0.926	Calculated
C_composite =	0.926	Calculated
Peak cfs =	30.51	Calculated
Calculated Tc=	**5.56**	**Calculated**

Instructions:

1. Set to manual calculations with File->Options->Formulas
2. Set max iterative calculations to 50
3. Enter required subarea and flowpath data in blue fields
4. Use site-specific topo or District 2005 LiDAR data for elevations
5. LiDAR and rain zone data at: http://vcwatershed.net/publicMaps/data
6. Clear any unnessary flowpath data from blue fields
7. Manually calculate with F9 or Formulas->Calculate Now
8. If error or comments appear, revise input data accordingly
9. Tc's in cells C12 and C17 should converge to the nearest minute.
10. Use result in C12 for peak flow calculation.
11. Print area is set for printing this page on one sheet.

FLOWPATH DATA- UPSTREAM TO DOWNSTREAM

Flowpath Number	Type- Selected with DropMenus	Type#	Flowpath Area ac	Upper Elev. Ft	Bott. Elev. Ft	Length ft	Map Slope ft/ft	Mtn Chan. Eff. Slope ft/ft	Diam/ Width ft	n value	Side-slope X; XH:1V	% Area	Q cfs	Cum. Q cfs
1	Overland-Undeveloped	1	0.88	1161	1103	413	0.140					10.9%	3.3	3.3
2	Natural Valley Channel	3	4.84	1103	982	168	0.720					60.1%	18.3	21.7
3	Trapezoid-Channel	11	2.33	982	981	102	0.010		0.0	0.015	1.0	28.9%	8.8	30.5
4	None	0										0.0%	-	30.5
5	None	0										0.0%	-	30.5
6	None	0										0.0%	-	30.5
7	None	0										0.0%	-	30.5
8	None	0										0.0%	-	30.5
9	None	0										0.0%	-	30.5
10	None	0										0.0%	-	30.5
Sum			**8.1**									**100%**	**30.5**	

APPENDIX C
DEBRIS, SEDIMENT, AND EROSION CALCULATIONS

Debris Basin Analysis

Debris Yield Regression Equation (VCWPD 2005):

$SY = 17.54(A)^{0.828} (ER)^{1.382} (FF)^{0.251} (SF)^{0.375} (K)^{0.840}$

SY = Sediment Yield, cubic yards
A = Area of the Watershed, square miles
ER = Elongation Ratio
FF = Fire Factor
SF = Slope Failures
K = Dimensionless Rainfall Factor

Debris Basin #	Area (ac)	Area (mi^2)	Equivalent Diameter (ft)	Maximum Watershed Length (ft)	ER	Area (ft^2)	
1	33.51	0.052	1363	1697	0.80	1459696	1459696
2	3.44	0.005	437	492	0.89	149846	149846
3	7.7	0.012	653	1320	0.50	335412	335412
4	17.3	0.027	980	1037	0.94	753588	753588
5	9.03	0.014	708	1154	0.61	393347	393347
6	43.55	0.068	1554	1721	0.90	1897038	1897038
7	13.27	0.021	858	976	0.88	578041	578041
8	8.05	0.013	668	911	0.73	350658	350658

					100-Year Event		50-year Event		25-year Event		
Debris Basin	Area (mi^2)	ER	FF	SF	K	SY (yd^3)	K	SY (yd^3)	K	SY (yd^3)	Area prone to slipping (ac)
1	0.052	0.80	88	73.91	325	2,241	251	1,803	188	1,419	3.87
2	0.005	0.89	88	1.00	325	78	251	63	188	49	0
3	0.012	0.50	88	8.31	325	150	251	120	188	95	0.1
4	0.027	0.94	88	1.00	325	323	251	260	188	204	0
5	0.014	0.61	88	1.00	325	104	251	83	188	66	0
6	0.068	0.90	88	1.00	325	652	251	524	188	413	0
7	0.021	0.88	88	1.00	325	235	251	189	188	149	0
8	0.013	0.73	88	1.00	325	121	251	97	188	77	0

ER — Elongation Ratio, A ratio produced by dividing the diameter of a circle with an area equal to that of the watershed in square feet by the maximum watershed length measured in a straight line parallel to the main channel, also in feet.

FF — Fire Factor, The percentage of non-recovery of vegetative cover in the burned watershed. Values of the Fire Factor range from a maximum value of 100 immediately after the fire; to a value of 88 six months after the fire; to a value of 20 4.5 years after the fire; to a value of 1 7.5 years after the fire. The approach assumes a watershed is completely recovered from a burn after 7.5 years.

SF — Slope Failures. The area of the watershed in acres that is prone to slipping divided by the drainage area in square miles. California State Division of Mines has developed a map of known landslides and potential slips on 1" = 6000' scale. The information has been transposed to USGS 7-1/2' Quad maps for easier interpretation.

K — Dimensionless Rainfall Factor, This varies for different storm frequencies and is the product of the square of the 1-day precipitation value and the 10-day precipitation value for a given storm frequency in inches. The 10-day precipitation value gives the measure of watershed saturation, while the 1-day value provides a measure of the rainfall intensity causing peak runoff and sediment erosion. The Ventura County Hydrology Manual contains maps of USGS 7-1/2' Quad overlaid with 50-year 24-hour rainfall isohyetals that can be converted to other frequencies using District precipitation multipliers.

Reference:

Ventura County Watershed Protection District (VCWPD) 2005, Debris and Detention Basins, September 2005.

Debris Basin Analysis

Debris Yield Regression Equation (VCWPD 2005):

$SY = 17.54(A)^{0.828} (ER)^{1.382} (FF)^{0.251} (SF)^{0.375} (K)^{0.840}$

SY = Sediment Yield, cubic yards
A = Area of the Watershed, square miles
ER = Elongation Ratio
FF = Fire Factor
SF = Slope Failures
K = Dimensionless Rainfall Factor

Debris Basin #	Area (ac)	Area (mi^2)	Equivalent Diameter (ft)	Maximum Watershed Length (ft)	ER	Area (ft^2)	
1	33.51	0.052	1363	1697	0.80	1459696	1459696
2	3.44	0.005	437	492	0.89	149846	149846
3	7.7	0.012	653	1320	0.50	335412	335412
4	17.3	0.027	980	1037	0.94	753588	753588
5	9.03	0.014	708	1154	0.61	393347	393347
6	43.55	0.068	1554	1721	0.90	1897038	1897038
7	13.27	0.021	858	976	0.88	578041	578041
8	8.05	0.013	668	911	0.73	350658	350658

					100-Year Event		50-year Event		25-year Event		
Debris Basin	Area (mi^2)	ER	FF	SF	K	SY (yd^3)	K	SY (yd^3)	K	SY (yd^3)	Area prone to slipping (ac)
1	0.052	0.80	20	73.91	325	1,545	251	1,243	188	978	3.87
2	0.005	0.89	20	1.00	325	54	251	43	188	34	0
3	0.012	0.50	20	8.31	325	103	251	83	188	65	0.1
4	0.027	0.94	20	1.00	325	223	251	179	188	141	0
5	0.014	0.61	20	1.00	325	72	251	58	188	45	0
6	0.068	0.90	20	1.00	325	449	251	362	188	285	0
7	0.021	0.88	20	1.00	325	162	251	130	188	102	0
8	0.013	0.73	20	1.00	325	83	251	67	188	53	0

ER — Elongation Ratio, A ratio produced by dividing the diameter of a circle with an area equal to that of the watershed in square feet by the maximum watershed length measured in a straight line parallel to the main channel, also in feet.

FF — Fire Factor, The percentage of non-recovery of vegetative cover in the burned watershed. Values of the Fire Factor range from a maximum value of 100 immediately after the fire; to a value of 88 six months after the fire; to a value of 20 4.5 years after the fire; to a value of 1 7.5 years after the fire. The approach assumes a watershed is completely recovered from a burn after 7.5 years.

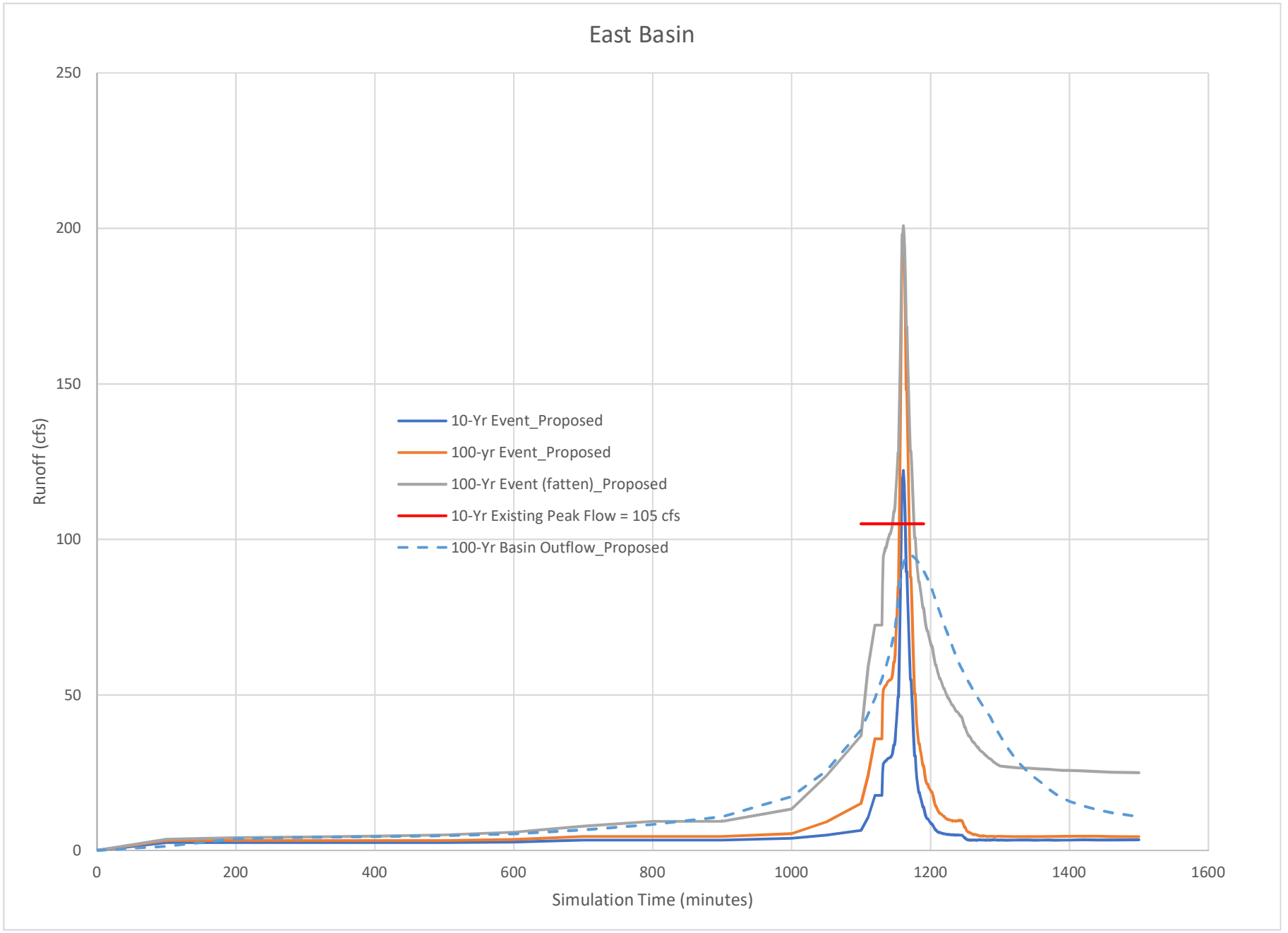
SF — Slope Failures. The area of the watershed in acres that is prone to slipping divided by the drainage area in square miles. California State Division of Mines has developed a map of known landslides and potential slips on 1" = 6000' scale. The information has been transposed to USGS 7-1/2' Quad maps for easier interpretation.

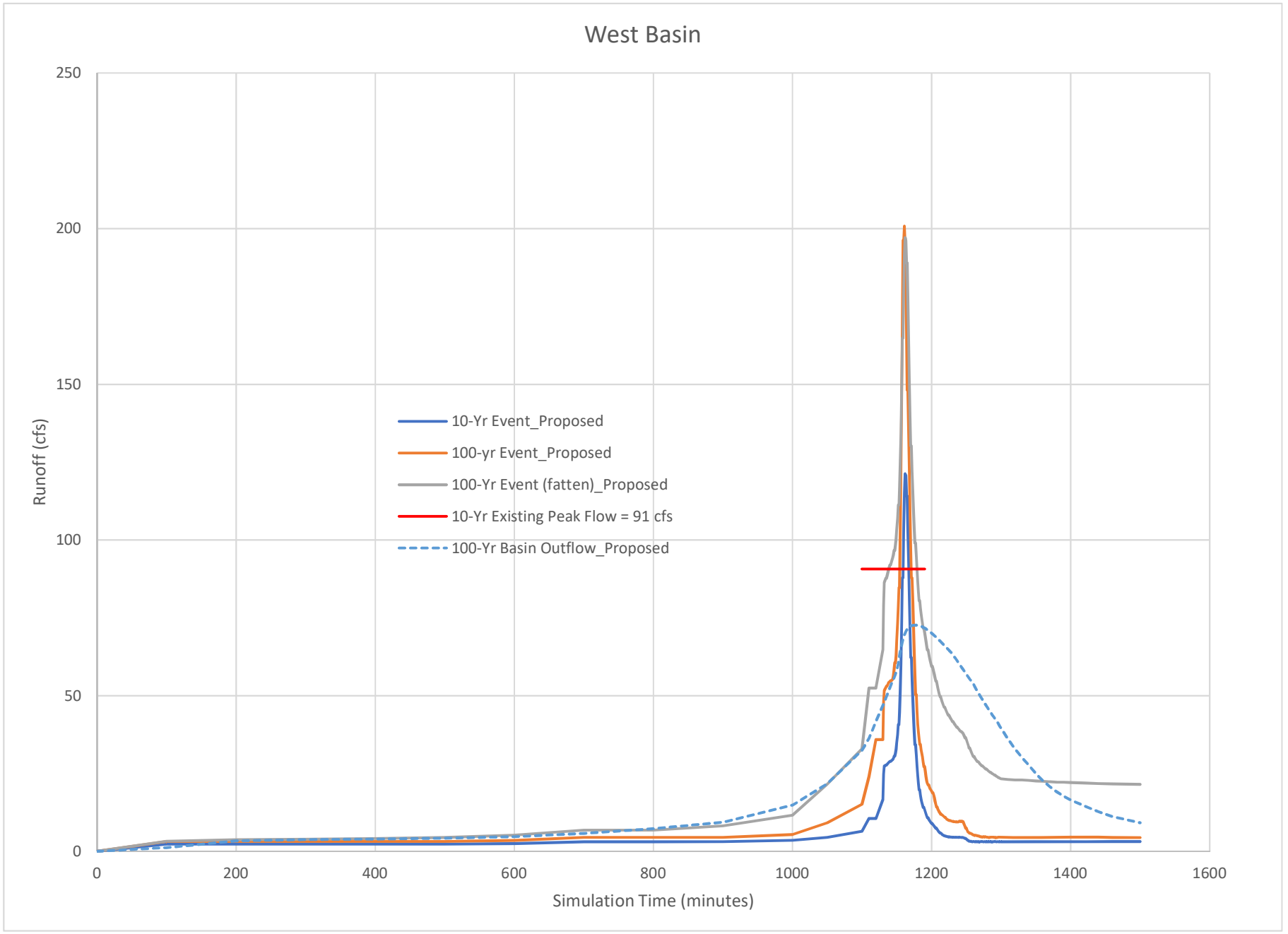
K — Dimensionless Rainfall Factor, This varies for different storm frequencies and is the product of the square of the 1-day precipitation value and the 10-day precipitation value for a given storm frequency in inches. The 10-day precipitation value gives the measure of watershed saturation, while the 1-day value provides a measure of the rainfall intensity causing peak runoff and sediment erosion. The Ventura County Hydrology Manual contains maps of USGS 7-1/2' Quad overlaid with 50-year 24-hour rainfall isohyetals that can be converted to other frequencies using District precipitation multipliers.

Reference:

Ventura County Watershed Protection District (VCWPD) 2005, Debris and Detention Basins, September 2005.

APPENDIX D
HYDROGRAPH CURVES


East Basin
250
200
150
100
50
0
Runoff (cfs)
0
200
400
600
800
1000
1200
1400
1600
Simulation Time (minutes)
10-Yr Event_Proposed
100-yr Event_Proposed
100-Yr Event (fatten)_Proposed
10-Yr Existing Peak Flow = 105 cfs
100-Yr Basin Outflow_Proposed


West Basin
250
200
150
100
50
0
Runoff (cfs)
0
200
400
600
800
1000
1200
1400
1600
Simulation Time (minutes)
10-Yr Event_Proposed
100-yr Event_Proposed
100-Yr Event (fatten)_Proposed
10-Yr Existing Peak Flow = 91 cfs
100-Yr Basin Outflow_Proposed

Proposed Condition Inflow

10-yr Hydrographs

HYDROGRAPH PRINTOUT AT: 18A

DESCRIPTION: Total Hydrograph at East Basin
TOTAL AREA TO HYDROGRAPH: 96 acres
HYDROGRAPH PEAK: 122 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 10.46 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.56	200	2.56	300	2.56	400	2.56
500	2.56	600	2.71	700	3.35	800	3.35	900	3.91
1000	4.93	1050	6.43	1100	10.57	1110	17.73	1120	25.16
1130	27.86	1131	28.21	1132	28.48	1133	28.79	1134	29.08
1135	29.38	1136	29.57	1137	29.69	1138	29.82	1139	30.13
1140	30.40	1141	31.09	1142	32.52	1143	33.90	1144	35.27
1145	38.33	1146	42.17	1147	45.48	1148	49.33	1149	59.70
1150	74.05	1151	87.79	1152	103.54	1153	119.47	1154	122.19
1155	117.65	1156	110.42	1157	101.55	1158	89.62	1159	80.91
1160	74.38	1161	67.63	1162	61.10	1163	54.92	1164	49.95
1165	45.00	1166	39.54	1167	34.67	1168	30.42	1169	26.29
1170	23.38	1171	21.72	1172	20.15	1173	18.63	1174	17.54
1175	16.73	1176	15.90	1177	14.95	1178	13.97	1179	13.01
1180	12.01	1181	11.19	1182	10.59	1183	10.23	1184	9.88
1185	9.50	1186	9.18	1187	8.89	1188	8.55	1189	8.18
1190	7.82	1191	7.40	1192	6.98	1193	6.56	1194	6.22
1195	6.04	1196	5.88	1197	5.76	1198	5.72	1199	5.64
1200	5.51	1201	5.50	1202	5.44	1203	5.31	1204	5.31
1205	5.26	1206	5.16	1207	5.18	1208	5.16	1209	5.07
1210	5.10	1211	5.09	1212	5.00	1213	5.05	1214	5.04
1215	4.96	1216	5.01	1217	5.01	1218	4.94	1219	4.99
1220	4.99	1221	4.92	1222	4.91	1223	4.91	1224	4.91
1225	4.77	1226	4.50	1227	4.27	1228	4.04	1229	3.70
1230	3.52	1231	3.53	1232	3.42	1233	3.32	1234	3.36
1235	3.37	1236	3.30	1237	3.35	1238	3.36	1239	3.30
1240	3.35	1241	3.36	1242	3.30	1243	3.35	1244	3.43
1245	3.37	1246	3.36	1247	3.43	1248	3.37	1249	3.31
1250	3.36	1251	3.37	1252	3.30	1253	3.35	1254	3.36
1255	3.30	1256	3.35	1257	3.36	1258	3.30	1259	3.35
1260	3.43	1261	3.37	1262	3.36	1263	3.43	1264	3.37
1265	3.31	1266	3.36	1267	3.37	1268	3.30	1269	3.35
1270	3.36	1271	3.30	1272	3.35	1273	3.36	1274	3.30
1275	3.35	1276	3.36	1277	3.30	1278	3.35	1279	3.43
1280	3.37	1281	3.36	1282	3.43	1283	3.37	1284	3.31
1285	3.36	1286	3.37	1287	3.30	1288	3.35	1289	3.36
1290	3.30	1291	3.35	1292	3.36	1293	3.30	1294	3.35
1295	3.43	1296	3.37	1297	3.30	1298	3.17	1299	2.97
1300	2.75	1310	2.56	1320	2.58	1330	2.56	1340	2.58
1350	2.56	1360	2.56	1370	2.58	1380	2.56	1390	2.56
1400	2.58	1420	2.56	1440	2.56	1460	2.56	1500	2.56

HYDROGRAPH PRINTOUT AT: 33A

DESCRIPTION: Hydrograph at West Detention Basin
TOTAL AREA TO HYDROGRAPH: 93 acres
HYDROGRAPH PEAK: 121 cfs
TIME OF PEAK: 1155 minutes
HYDROGRAPH VOLUME: 9.88 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.32	200	2.32	300	2.32	400	2.32
500	2.32	600	2.50	700	3.08	800	3.11	900	3.57

Proposed Condition Inflow

10-yr Hydrographs

1000	4.49	1050	6.45	1100	10.57	1110	16.66	1120	24.85
1130	27.41	1131	27.53	1132	27.70	1133	27.93	1134	28.19
1135	28.45	1136	28.68	1137	28.89	1138	29.05	1139	29.25
1140	29.43	1141	29.85	1142	30.55	1143	31.53	1144	32.82
1145	34.88	1146	37.43	1147	40.69	1148	44.51	1149	51.20
1150	60.31	1151	72.85	1152	87.86	1153	103.85	1154	115.05
1155	121.28	1156	120.68	1157	114.12	1158	103.20	1159	91.90
1160	80.74	1161	70.99	1162	62.26	1163	54.90	1164	48.60
1165	43.09	1166	38.30	1167	34.31	1168	30.74	1169	27.30
1170	24.42	1171	21.84	1172	19.73	1173	18.03	1174	16.75
1175	15.73	1176	14.92	1177	14.09	1178	13.42	1179	12.72
1180	12.06	1181	11.40	1182	10.82	1183	10.33	1184	9.92
1185	9.58	1186	9.28	1187	8.99	1188	8.68	1189	8.38
1190	8.06	1191	7.71	1192	7.42	1193	7.05	1194	6.75
1195	6.42	1196	6.14	1197	5.90	1198	5.72	1199	5.47
1200	5.29	1201	5.18	1202	4.99	1203	4.90	1204	4.86
1205	4.74	1206	4.69	1207	4.70	1208	4.60	1209	4.58
1210	4.61	1211	4.53	1212	4.52	1213	4.56	1214	4.50
1215	4.50	1216	4.55	1217	4.49	1218	4.49	1219	4.54
1220	4.48	1221	4.49	1222	4.49	1223	4.48	1224	4.47
1225	4.37	1226	4.26	1227	4.16	1228	3.96	1229	3.69
1230	3.61	1231	3.45	1232	3.28	1233	3.21	1234	3.22
1235	3.12	1236	3.10	1237	3.14	1238	3.08	1239	3.08
1240	3.13	1241	3.07	1242	3.07	1243	3.13	1244	3.12
1245	3.07	1246	3.14	1247	3.14	1248	3.09	1249	3.10
1250	3.15	1251	3.08	1252	3.08	1253	3.13	1254	3.07
1255	3.07	1256	3.13	1257	3.07	1258	3.07	1259	3.12
1260	3.12	1261	3.07	1262	3.14	1263	3.14	1264	3.09
1265	3.10	1266	3.15	1267	3.08	1268	3.08	1269	3.13
1270	3.07	1271	3.07	1272	3.13	1273	3.07	1274	3.07
1275	3.12	1276	3.07	1277	3.07	1278	3.12	1279	3.12
1280	3.07	1281	3.14	1282	3.14	1283	3.09	1284	3.10
1285	3.15	1286	3.08	1287	3.08	1288	3.13	1289	3.07
1290	3.07	1291	3.13	1292	3.07	1293	3.07	1294	3.12
1295	3.12	1296	3.07	1297	3.09	1298	3.00	1299	2.93
1300	2.80	1310	2.37	1320	2.32	1330	2.34	1340	2.33
1350	2.30	1360	2.32	1370	2.33	1380	2.30	1390	2.32
1400	2.33	1420	2.33	1440	2.31	1460	1.95	1500	1.95

Proposed Condtion Inflow

100-yr Hydrographs

HYDROGRAPH PRINTOUT AT: 18A

DESCRIPTION: Total Hydrograph at East Basin
TOTAL AREA TO HYDROGRAPH: 96 acres
HYDROGRAPH PEAK: 201 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 16.87 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	3.20	200	3.20	300	3.20	400	3.20
500	3.20	600	3.51	700	4.49	800	4.51	900	5.41
1000	9.20	1050	15.11	1100	24.03	1110	35.89	1120	48.03
1130	51.59	1131	52.10	1132	52.54	1133	53.06	1134	53.56
1135	54.06	1136	54.37	1137	54.58	1138	54.82	1139	55.03
1140	55.22	1141	56.43	1142	58.40	1143	60.58	1144	62.93
1145	67.68	1146	73.36	1147	78.57	1148	84.68	1149	101.39
1150	124.17	1151	145.96	1152	171.09	1153	196.25	1154	200.82
1155	194.31	1156	183.48	1157	168.53	1158	148.13	1159	133.23
1160	121.42	1161	108.98	1162	97.80	1163	87.81	1164	79.69
1165	71.94	1166	64.06	1167	56.88	1168	50.36	1169	44.90
1170	40.86	1171	38.35	1172	36.26	1173	34.33	1174	32.60
1175	31.49	1176	30.35	1177	28.68	1178	27.23	1179	25.77
1180	24.06	1181	22.70	1182	21.96	1183	21.33	1184	20.57
1185	20.08	1186	19.76	1187	19.34	1188	18.85	1189	18.22
1190	17.24	1191	16.15	1192	15.10	1193	14.24	1194	13.57
1195	13.16	1196	12.71	1197	12.31	1198	11.94	1199	11.74
1200	11.58	1201	11.34	1202	11.14	1203	10.94	1204	10.63
1205	10.35	1206	10.21	1207	10.06	1208	9.94	1209	9.85
1210	9.76	1211	9.69	1212	9.63	1213	9.59	1214	9.55
1215	9.52	1216	9.48	1217	9.45	1218	9.43	1219	9.56
1220	9.68	1221	9.67	1222	9.68	1223	9.70	1224	9.58
1225	9.12	1226	8.56	1227	8.02	1228	7.42	1229	6.79
1230	6.33	1231	6.14	1232	5.98	1233	5.81	1234	5.70
1235	5.60	1236	5.44	1237	5.29	1238	5.19	1239	5.16
1240	5.14	1241	5.06	1242	4.99	1243	4.93	1244	4.82
1245	4.71	1246	4.66	1247	4.62	1248	4.64	1249	4.68
1250	4.67	1251	4.65	1252	4.63	1253	4.56	1254	4.49
1255	4.48	1256	4.47	1257	4.51	1258	4.57	1259	4.58
1260	4.57	1261	4.57	1262	4.51	1263	4.45	1264	4.44
1265	4.43	1266	4.48	1267	4.55	1268	4.56	1269	4.56
1270	4.56	1271	4.50	1272	4.44	1273	4.43	1274	4.43
1275	4.47	1276	4.54	1277	4.55	1278	4.55	1279	4.55
1280	4.50	1281	4.44	1282	4.43	1283	4.48	1284	4.55
1285	4.55	1286	4.55	1287	4.55	1288	4.50	1289	4.44
1290	4.43	1291	4.42	1292	4.47	1293	4.54	1294	4.55
1295	4.55	1296	4.55	1297	4.38	1298	4.11	1299	3.88
1300	3.66	1310	3.20	1320	3.22	1330	3.20	1340	3.21
1350	3.20	1360	3.21	1370	3.20	1380	3.20	1390	3.21
1400	3.20	1420	3.21	1440	3.20	1460	3.20	1500	3.20

HYDROGRAPH PRINTOUT AT: 33A

DESCRIPTION: Hydrograph at West Detention Basin
TOTAL AREA TO HYDROGRAPH: 93 acres
HYDROGRAPH PEAK: 197 cfs
TIME OF PEAK: 1155 minutes
HYDROGRAPH VOLUME: 16.15 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.96	200	2.97	300	2.96	400	2.96
500	2.97	600	3.23	700	4.08	800	4.13	900	5.04

Proposed Condtion Inflow

100-yr Hydrographs

1000	9.33	1050	14.85	1100	23.40	1110	34.00	1120	46.89
1130	50.23	1131	50.41	1132	50.70	1133	51.10	1134	51.55
1135	52.03	1136	52.45	1137	52.81	1138	53.11	1139	53.34
1140	53.54	1141	54.14	1142	55.14	1143	56.77	1144	58.84
1145	62.23	1146	66.38	1147	71.69	1148	77.61	1149	88.42
1150	103.61	1151	124.29	1152	148.13	1153	172.72	1154	188.87
1155	197.14	1156	195.47	1157	184.72	1158	166.38	1159	146.85
1160	127.90	1161	112.16	1162	98.47	1163	87.36	1164	77.83
1165	69.77	1166	62.97	1167	57.14	1168	51.79	1169	46.76
1170	42.29	1171	38.46	1172	35.40	1173	33.01	1174	31.31
1175	29.94	1176	28.70	1177	27.53	1178	26.51	1179	25.39
1180	24.23	1181	23.01	1182	21.99	1183	20.99	1184	20.20
1185	19.54	1186	19.06	1187	18.57	1188	18.20	1189	17.71
1190	17.17	1191	16.47	1192	15.69	1193	14.80	1194	14.04
1195	13.37	1196	12.81	1197	12.35	1198	11.93	1199	11.60
1200	11.26	1201	10.98	1202	10.75	1203	10.58	1204	10.39
1205	10.26	1206	10.12	1207	10.00	1208	9.91	1209	9.84
1210	9.78	1211	9.73	1212	9.69	1213	9.65	1214	9.61
1215	9.59	1216	9.57	1217	9.56	1218	9.55	1219	9.60
1220	9.61	1221	9.65	1222	9.70	1223	9.74	1224	9.72
1225	9.56	1226	9.35	1227	9.02	1228	8.62	1229	8.13
1230	7.67	1231	7.22	1232	6.74	1233	6.33	1234	5.95
1235	5.61	1236	5.27	1237	5.03	1238	4.83	1239	4.74
1240	4.63	1241	4.54	1242	4.49	1243	4.44	1244	4.35
1245	4.31	1246	4.26	1247	4.20	1248	4.20	1249	4.18
1250	4.17	1251	4.18	1252	4.18	1253	4.14	1254	4.13
1255	4.11	1256	4.09	1257	4.11	1258	4.11	1259	4.11
1260	4.14	1261	4.15	1262	4.11	1263	4.11	1264	4.10
1265	4.08	1266	4.11	1267	4.10	1268	4.11	1269	4.13
1270	4.15	1271	4.11	1272	4.11	1273	4.10	1274	4.08
1275	4.11	1276	4.10	1277	4.11	1278	4.13	1279	4.15
1280	4.11	1281	4.11	1282	4.10	1283	4.12	1284	4.11
1285	4.12	1286	4.14	1287	4.15	1288	4.11	1289	4.11
1290	4.10	1291	4.08	1292	4.11	1293	4.10	1294	4.11
1295	4.13	1296	4.15	1297	4.02	1298	3.96	1299	3.82
1300	3.67	1310	3.01	1320	2.97	1330	2.97	1340	2.97
1350	2.97	1360	2.97	1370	2.94	1380	2.97	1390	2.97
1400	2.97	1420	2.97	1440	2.97	1460	2.38	1500	2.38

APPENDIX E
VCRAT 2.64 DETENTION POND ROUTING COMPUTATIONS

Existing Condtion 10-year

SimiValleyNorthCanyonRanch_10yr

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: Simi Valley North Canyon Ranch

Project Description

VCRat version: 2.64.0.30
VCRain version: 201601
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM2: Simi Valley
Curve B: None
Curve C: None
Curve D: None

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: Simi Valley North Canyon Ranch

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	AREA (AC)	FLOW (CFS)	TIME (MIN)	CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)
N VALUES	VEL	DEPTH												
CHNL	SIDES	(FT/S)	(FT)											
1A : 1A														
1A 010	A10	7	0	6	9	6	9	1154	VALLEY	520	0.08130	---	----	
-----	-----	--	--											
2A : 1B														
2A 010	A10	9	0	11	14	17	22	1155	VALLEY	1419	0.05543	---	----	
-----	-----	--	--											
3A : 1C														
3A 020	A10	11	0	26	27	43	43	1158	VALLEY	1030	0.04140	---	----	
-----	-----	--	--											
4A : 1D														
4A 020	A10	17	0	17	13	60	54	1161	-------	----	-------	---	----	
-----	-----	--	--											
5B : 2A														
5B 010	A10	6	0	6	9	6	9	1154	VALLEY	267	0.08492	---	----	
-----	-----	--	--											
6B : 2B														
6B 010	A10	9	0	8	10	14	19	1154	VALLEY	909	0.07934	---	----	
-----	-----	--	--											

Existing Condtion 10-year

SimiValleyNorthCanyonRanch_10yr

```
     7B :  2C
     7B   020   A10    13    0     22     20       36      38   1157    VALLEY     1175  0.05858    ---     ----
  -----  -----    --     --
     8B :  2D
     8B   020   A10    14    0     19     17       55      52   1159    -------    ----  -------    ---     ----
  -----  -----    --     --
     9AB:  Confluence 1A-1D x 2A-2D
     9AB  ---   ---    --   --     55     52      115     105   1160    -------    ----  -------    ---     ----
  -----  -----    --     --
    10A :  Hydrograph at East
    10A   ---   ---    --   --    ---    ---      115     105   1160    -------    ----  -------    ---     ----
  -----  -----    --     --
    11C :  3A
    11C   010   A10     9    0      6      8        6       8   1154    VALLEY      609  0.05901    ---     ----
  -----  -----    --     --
    12C :  3B
    12C   010   A10    13    0     10     10       16      17   1156    VALLEY      674  0.03890    ---     ----
  -----  -----    --     --
    13C :  3C
    13C   010   A10     7    0     28     40       44      52   1155    VALLEY      831  0.03158    ---     ----
  -----  -----    --     --
    14C :  3D
    14C   020   A10     7    0     37     49       81      91   1155    -------    ----  -------    ---     ----
  -----  -----    --     --
    15C :  Hydrograph at West
    15C   ---   ---    --   --    ---    ---       81      91   1155    -------    ----  -------    ---     ----
  -----  -----    --     --


                                        Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE

-------------------------------------------------------------------------------------------------------------------------
-------------------------
      NO ISSUES OR WARNINGS DETECTED
♠                              Ventura County Watershed Protection District
                          Modified Rational Method Hydrology Program (VCRat v2.64)

                            Job:      1  Project: Simi Valley North Canyon Ranch
Page:     3
                                        Hydrograph Printouts

-----------------------------------------------------------------------------------------------
           HYDROGRAPH PRINTOUT AT:   10A
-----------------------------------------------------------------------------------------------
           DESCRIPTION: Hydrograph at East
           TOTAL AREA TO HYDROGRAPH:     115    acres
           HYDROGRAPH PEAK:              105    cfs
           TIME OF PEAK:                1160    minutes
           HYDROGRAPH VOLUME:              5.46 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)
     ---------------------------------------------------------------------------------
        0       0.00   100       0.80   200       0.80   300       0.80   400       0.80
      500       0.80   600       0.80   700       0.80   800       0.80   900       0.80
     1000       0.80  1050       1.15  1100       4.47  1110       9.55  1120      17.74
     1130      22.91  1131      23.18  1132      23.46  1133      23.72  1134      23.98
     1135      24.20  1136      24.41  1137      24.60  1138      24.78  1139      25.05
     1140      25.22  1141      25.66  1142      26.21  1143      26.71  1144      27.42
     1145      28.78  1146      30.21  1147      31.87  1148      33.87  1149      38.59
     1150      43.58  1151      49.58  1152      57.45  1153      66.53  1154      74.61
     1155      82.85  1156      90.35  1157      96.73  1158     101.47  1159     104.10
     1160     105.02  1161     104.07  1162     100.73  1163      94.15  1164      86.07
     1165      76.58  1166      65.46  1167      54.63  1168      46.03  1169      38.55
     1170      32.43  1171      28.30  1172      25.06  1173      22.39  1174      20.16
     1175      18.11  1176      16.34  1177      14.50  1178      12.73  1179      11.33
```

Existing Condtion 10-year

SimiValleyNorthCanyonRanch_10yr

1180	10.06	1181	8.84	1182	7.89	1183	7.21	1184	6.47
1185	5.76	1186	5.20	1187	4.67	1188	4.24	1189	3.90
1190	3.59	1191	3.32	1192	3.11	1193	2.91	1194	2.73
1195	2.57	1196	2.43	1197	2.30	1198	2.18	1199	2.06
1200	1.96	1201	1.85	1202	1.75	1203	1.66	1204	1.56
1205	1.47	1206	1.40	1207	1.33	1208	1.26	1209	1.20
1210	1.15	1211	1.10	1212	1.07	1213	1.04	1214	1.01
1215	0.98	1216	0.96	1217	0.94	1218	0.92	1219	0.91
1220	0.89	1221	0.88	1222	0.87	1223	0.86	1224	0.85
1225	0.84	1226	0.84	1227	0.83	1228	0.83	1229	0.82
1230	0.82	1231	0.82	1232	0.82	1233	0.81	1234	0.81
1235	0.81	1236	0.81	1237	0.81	1238	0.81	1239	0.81
1240	0.80	1241	0.80	1242	0.80	1243	0.80	1244	0.80
1245	0.80	1246	0.80	1247	0.80	1248	0.80	1249	0.80
1250	0.80	1251	0.80	1252	0.80	1253	0.80	1254	0.80
1255	0.80	1256	0.80	1257	0.80	1258	0.80	1259	0.80
1260	0.80	1261	0.80	1262	0.80	1263	0.80	1264	0.80
1265	0.80	1266	0.80	1267	0.80	1268	0.80	1269	0.80
1270	0.80	1271	0.80	1272	0.80	1273	0.80	1274	0.80
1275	0.80	1276	0.80	1277	0.80	1278	0.80	1279	0.80
1280	0.80	1281	0.80	1282	0.80	1283	0.80	1284	0.80
1285	0.80	1286	0.80	1287	0.80	1288	0.80	1289	0.80
1290	0.80	1291	0.80	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.80	1298	0.80	1299	0.80
1300	0.80	1310	0.80	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 15C

DESCRIPTION: Hydrograph at West
TOTAL AREA TO HYDROGRAPH: 81 acres
HYDROGRAPH PEAK: 91 cfs
TIME OF PEAK: 1155 minutes
HYDROGRAPH VOLUME: 3.81 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	0.40	1050	1.31	1100	4.60	1110	10.26	1120	15.86
1130	18.08	1131	18.26	1132	18.44	1133	18.62	1134	18.81
1135	19.00	1136	19.19	1137	19.38	1138	19.48	1139	19.76
1140	19.84	1141	20.48	1142	21.32	1143	22.02	1144	23.05
1145	25.48	1146	27.71	1147	30.41	1148	32.96	1149	40.79
1150	49.33	1151	58.93	1152	69.17	1153	80.26	1154	86.33
1155	90.68	1156	87.31	1157	81.50	1158	73.44	1159	63.20
1160	51.71	1161	45.27	1162	39.87	1163	36.04	1164	33.55
1165	30.78	1166	28.26	1167	25.89	1168	23.17	1169	20.43
1170	17.85	1171	15.15	1172	13.49	1173	12.02	1174	10.79
1175	9.85	1176	9.28	1177	8.33	1178	7.50	1179	6.75
1180	6.20	1181	5.55	1182	5.14	1183	4.74	1184	4.35
1185	3.96	1186	3.62	1187	3.37	1188	3.16	1189	2.98
1190	2.83	1191	2.70	1192	2.57	1193	2.41	1194	2.21
1195	2.00	1196	1.78	1197	1.57	1198	1.39	1199	1.27
1200	1.16	1201	1.06	1202	0.98	1203	0.90	1204	0.84
1205	0.77	1206	0.72	1207	0.67	1208	0.63	1209	0.59

Existing Condtion 10-year

SimiValleyNorthCanyonRanch_10yr

1210	0.56	1211	0.53	1212	0.51	1213	0.49	1214	0.47
1215	0.46	1216	0.45	1217	0.44	1218	0.43	1219	0.43
1220	0.42	1221	0.42	1222	0.41	1223	0.41	1224	0.41
1225	0.41	1226	0.41	1227	0.40	1228	0.40	1229	0.40
1230	0.40	1231	0.40	1232	0.40	1233	0.40	1234	0.40
1235	0.40	1236	0.40	1237	0.40	1238	0.40	1239	0.40
1240	0.40	1241	0.40	1242	0.40	1243	0.40	1244	0.40
1245	0.40	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: Simi Valley North Canyon Ranch
Page: 5

VCRat Model Input

Model Lines

```
005     1  001A Header place holder
005     1  010A Header place holder
005     1  015C Header place holder
999
999
006     1  001A 010000000607A97200520008130                    G1
006     1  002A 010000001109A97201419005543
006     1  003A 020000002611A97201030004140
006     1  004A 020000001717A97
006     1  005B 010000000606A97200267008492
006     1  006B 010000000809A97200909007934
006     1  007B 020000002213A97201175005858
006     1  008B 020000001914A97
006     1  009AB010         A97
006     1  010A 010      099A97                              1
006     1  011C 010000000609A97200609005901
006     1  012C 010000001013A97200674003890
006     1  013C 010000002807A97200831003158
006     1  014C 020000003707A97
006     1  015C 010      099A97                              1  2
999
```

Existing Condtion 100-year

SimiValleyNorthCanyonRanch_100Yr

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: Simi Valley North Canyon Ranch

Project Description

VCRat version: 2.64.0.30
VCRain version: 201601
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM2: Simi Valley
Curve B: None
Curve C: None
Curve D: None

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: Simi Valley North Canyon Ranch

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	AREA (AC)	FLOW (CFS)	TIME (MIN)	CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)	N VALUES CHNL	VEL SIDES (FT/S)	DEPTH (FT)
1A : 1A																	
1A	010	A100	6	0	6	15	6	15	1153	VALLEY	520	0.08130	---	----	-----	-----	--
2A : 1B																	
2A	010	A100	7	0	11	25	17	39	1155	VALLEY	1419	0.05543	---	----	-----	-----	--
3A : 1C																	
3A	020	A100	8	0	26	52	43	80	1156	VALLEY	1030	0.04140	---	----	-----	-----	--
4A : 1D																	
4A	020	A100	12	0	17	27	60	102	1158	-------	----	-------	---	----	-----	-----	--
5B : 2A																	
5B	010	A100	5	0	6	17	6	17	1153	VALLEY	267	0.08492	---	----	-----	-----	--
6B : 2B																	
6B	010	A100	7	0	8	18	14	34	1154	VALLEY	909	0.07934	---	----	-----	-----	--

Existing Condtion 100-year

SimiValleyNorthCanyonRanch_100Yr

```
     7B :  2C
     7B   020   A100   10    0     22     39       36      70   1155    VALLEY     1175  0.05858    ---      ----
-----  -----    --     --
     8B :  2D
     8B   020   A100   10    0     19     34       55      97   1158    -------    ----  -------    ---      ----
-----  -----    --     --
     9AB:  Confluence 1A-1D x 2A-2D
     9AB  ---   ---    --   --     55     97      115     199   1158    -------    ----  -------    ---      ----
-----  -----    --     --
    10A :  Hydrograph at East
    10A   ---   ---    --   --    ---    ---      115     199   1158    -------    ----  -------    ---      ----
-----  -----    --     --
    11C :  3A
    11C   010   A100    7    0      6     14        6      14   1153    VALLEY      609  0.05901    ---      ----
-----  -----    --     --
    12C :  3B
    12C   010   A100   10    0     10     19       16      32   1155    VALLEY      674  0.03890    ---      ----
-----  -----    --     --
    13C :  3C
    13C   010   A100    6    0     28     69       44      93   1154    VALLEY      831  0.03158    ---      ----
-----  -----    --     --
    14C :  3D
    14C   020   A100    6    0     37     87       81     159   1154    -------    ----  -------    ---      ----
-----  -----    --     --
    15C :  Hydrograph at West
    15C   ---   ---    --   --    ---    ---       81     159   1154    -------    ----  -------    ---      ----
-----  -----    --     --


                                    Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE

-------------------------------------------------------------------------------------------------------------------------
-------------------------
      NO ISSUES OR WARNINGS DETECTED
                              Ventura County Watershed Protection District
                        Modified Rational Method Hydrology Program (VCRat v2.64)

                           Job:      1  Project: Simi Valley North Canyon Ranch
Page:     3
                                      Hydrograph Printouts

-----------------------------------------------------------------------------------------------
           HYDROGRAPH PRINTOUT AT:   10A
-----------------------------------------------------------------------------------------------
           DESCRIPTION: Hydrograph at East
           TOTAL AREA TO HYDROGRAPH:     115    acres
           HYDROGRAPH PEAK:              199    cfs
           TIME OF PEAK:                1158    minutes
           HYDROGRAPH VOLUME:             10.54 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)
     ---------------------------------------------------------------------------
        0       0.00   100       0.80   200       0.80   300       0.80   400       0.80
      500       0.80   600       0.80   700       0.80   800       0.80   900       0.88
     1000       2.94  1050       9.31  1100      19.04  1110      30.06  1120      43.54
     1130      49.22  1131      49.51  1132      49.81  1133      50.13  1134      50.44
     1135      50.77  1136      51.12  1137      51.48  1138      51.85  1139      52.25
     1140      52.66  1141      53.54  1142      54.41  1143      55.47  1144      56.66
     1145      59.32  1146      62.12  1147      65.64  1148      69.97  1149      79.97
     1150      91.48  1151     105.67  1152     123.59  1153     144.07  1154     161.68
     1155     177.45  1156     189.52  1157     196.71  1158     198.78  1159     191.68
     1160     179.25  1161     160.45  1162     139.05  1163     117.21  1164      99.71
     1165      83.99  1166      73.06  1167      64.78  1168      58.29  1169      53.01
     1170      48.32  1171      44.32  1172      40.65  1173      37.16  1174      33.92
     1175      31.36  1176      28.93  1177      27.02  1178      25.46  1179      24.07
```

Existing Condtion 100-year

1180	22.81	1181	21.59	1182	20.57	1183	19.50	1184	18.41
1185	17.42	1186	16.57	1187	15.79	1188	15.01	1189	14.24
1190	13.50	1191	12.85	1192	12.13	1193	11.45	1194	10.71
1195	10.00	1196	9.21	1197	8.47	1198	7.69	1199	7.22
1200	6.65	1201	6.19	1202	5.78	1203	5.44	1204	5.14
1205	4.88	1206	4.66	1207	4.46	1208	4.30	1209	4.11
1210	3.99	1211	3.83	1212	3.73	1213	3.63	1214	3.55
1215	3.48	1216	3.41	1217	3.36	1218	3.32	1219	3.39
1220	3.36	1221	3.33	1222	3.32	1223	3.34	1224	3.35
1225	3.04	1226	2.87	1227	2.88	1228	2.86	1229	2.78
1230	2.66	1231	2.57	1232	2.50	1233	2.44	1234	2.36
1235	2.28	1236	2.18	1237	2.08	1238	1.97	1239	1.85
1240	1.74	1241	1.64	1242	1.54	1243	1.45	1244	1.37
1245	1.30	1246	1.23	1247	1.18	1248	1.12	1249	1.08
1250	1.04	1251	1.01	1252	0.98	1253	0.95	1254	0.93
1255	0.91	1256	0.90	1257	0.88	1258	0.87	1259	0.86
1260	0.85	1261	0.85	1262	0.84	1263	0.84	1264	0.83
1265	0.83	1266	0.82	1267	0.82	1268	0.82	1269	0.82
1270	0.81	1271	0.81	1272	0.81	1273	0.81	1274	0.81
1275	0.81	1276	0.81	1277	0.81	1278	0.80	1279	0.80
1280	0.80	1281	0.80	1282	0.80	1283	0.80	1284	0.80
1285	0.80	1286	0.80	1287	0.80	1288	0.80	1289	0.80
1290	0.80	1291	0.80	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.80	1298	0.80	1299	0.80
1300	0.80	1310	0.80	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 15C

DESCRIPTION: Hydrograph at West
TOTAL AREA TO HYDROGRAPH: 81 acres
HYDROGRAPH PEAK: 159 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 7.68 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.59
1000	3.34	1050	8.22	1100	15.00	1110	24.44	1120	33.72
1130	36.56	1131	36.82	1132	37.11	1133	37.42	1134	37.77
1135	38.13	1136	38.51	1137	38.70	1138	38.89	1139	39.04
1140	39.15	1141	40.26	1142	41.39	1143	42.92	1144	44.51
1145	48.65	1146	52.88	1147	56.93	1148	61.55	1149	75.80
1150	91.89	1151	108.43	1152	128.00	1153	148.27	1154	159.27
1155	156.98	1156	147.36	1157	132.13	1158	113.44	1159	92.97
1160	80.99	1161	71.37	1162	64.85	1163	59.71	1164	55.50
1165	50.46	1166	45.65	1167	40.63	1168	35.94	1169	31.78
1170	27.61	1171	25.50	1172	23.65	1173	22.10	1174	20.98
1175	20.13	1176	19.48	1177	18.29	1178	17.37	1179	16.42
1180	15.23	1181	14.05	1182	13.29	1183	12.73	1184	12.05
1185	11.65	1186	11.52	1187	11.23	1188	10.80	1189	10.23
1190	9.65	1191	9.02	1192	8.12	1193	7.40	1194	6.63
1195	6.24	1196	5.87	1197	5.53	1198	5.24	1199	5.21
1200	5.01	1201	4.85	1202	4.72	1203	4.62	1204	4.51
1205	4.20	1206	4.11	1207	4.02	1208	3.92	1209	3.83

Existing Condtion 100-year

SimiValleyNorthCanyonRanch_100Yr

1210	3.76	1211	3.71	1212	3.66	1213	3.63	1214	3.61
1215	3.59	1216	3.57	1217	3.55	1218	3.54	1219	3.73
1220	3.72	1221	3.72	1222	3.74	1223	3.77	1224	3.79
1225	3.19	1226	3.21	1227	3.20	1228	3.09	1229	2.89
1230	2.66	1231	2.39	1232	2.10	1233	1.86	1234	1.66
1235	1.49	1236	1.35	1237	1.22	1238	1.10	1239	0.99
1240	0.89	1241	0.81	1242	0.73	1243	0.67	1244	0.62
1245	0.59	1246	0.56	1247	0.53	1248	0.51	1249	0.49
1250	0.48	1251	0.47	1252	0.45	1253	0.45	1254	0.44
1255	0.43	1256	0.43	1257	0.42	1258	0.42	1259	0.41
1260	0.41	1261	0.41	1262	0.41	1263	0.41	1264	0.41
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: Simi Valley North Canyon Ranch
Page: 5

VCRat Model Input

Model Lines

```
005     1  001A Header place holder
005     1  010A Header place holder
005     1  015C Header place holder
999
999
006     1  001A 010000000606A97200520008130                    G1
006     1  002A 010000001107A97201419005543
006     1  003A 020000002608A97201030004140
006     1  004A 020000001712A97
006     1  005B 010000000605A97200267008492
006     1  006B 010000000807A97200909007934
006     1  007B 020000002210A97201175005858
006     1  008B 020000001910A97
006     1  009AB010         A97
006     1  010A 010      099A97                              1
006     1  011C 010000000607A97200609005901
006     1  012C 010000001010A97200674003890
006     1  013C 010000002806A97200831003158
006     1  014C 020000003706A97
006     1  015C 010      099A97                              1  2
999
```

Proposed Condtion 10-year

TT5658A-Proposed_10yr

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: Tentative Tract No. 5658-A Proposed Conditions

Project Description

VCRat version: 2.64.0.30
VCRain version: 201601
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM2: Simi Valley
Curve B: None
Curve C: None
Curve D: None

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: Tentative Tract No. 5658-A Proposed Conditions

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	AREA (AC)	FLOW (CFS)	TIME (MIN)	CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)
1A : 1A														
1A 010	A10	6	0	8	13	8	13	1154	VALLEY	533	0.08369	---	----	
2A : 1B														
2A 010	A10	5	0	12	21	20	31	1153	VALLEY	873	0.05846	---	----	
3A : 1C														
3A 020	A10	12	0	14	14	34	41	1156	VALLEY	1040	0.03641	---	----	
4A : 1D														
4A 020	A10	5	38	7	15	41	41	1159	-------	----	-------	---	----	
5A ---	---	--	--	---	---	41	41	1159	-------	----	-------	---	----	
6B : 2A														
6B 010	A10	8	0	17	23	17	23	1153	PIPE	1345	0.07168	2.00	----	
7B : 2B+2C														

Proposed Condtion 10-year


```
      7B   020   A10     5   38     14     31       31      48   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
      8C :  2D
      8C   020   A10     5    0      8     13        8      13   1153    PIPE         26  0.04348      2.00  ----
  -----  -----    --     --
      9D :  2E&2F
      9D   020   A10     5   38      7     15        7      15   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     10CD:  2D x 2E&2F
     10CD
*****************************************************************************************************
            *          Peak in C:       12.81 cfs @ 1153 min  Q in D:       15.41 cfs  Combined Q:       28.22 cfs
 *
            *          Peak in D:       15.41 cfs @ 1153 min  Q in C:       12.81 cfs  Combined Q:       28.22 cfs
 *
            *      Combined Peak:       28.22 cfs @ 1153 min  Q in C:       12.81 cfs      Q in D:       15.41 cfs
 *

*****************************************************************************************************
      10CD  ---   ---    --   --      7     15       15      28   1153    PIPE        177  0.16890      2.00  ----
  -----  -----    --     --
      11C   ---   ---    --   --    ---    ---       15      28   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     12BC:  2C x 2D,2E&2F
      12BC  ---   ---    --   --     15     28       46      76   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
      13B   ---   ---    --   --    ---    ---       46      76   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     14AB:  1A-D x 2A-F
     14AB
*****************************************************************************************************
            *          Peak in A:       40.87 cfs @ 1159 min  Q in B:       29.17 cfs  Combined Q:       70.04 cfs
 *
            *          Peak in B:       76.05 cfs @ 1153 min  Q in A:       31.20 cfs  Combined Q:      107.25 cfs
 *
            *      Combined Peak:      107.25 cfs @ 1153 min  Q in A:       31.20 cfs      Q in B:       76.05 cfs
 *

*****************************************************************************************************
      14AB  ---   ---    --   --     46     76       87     107   1153    PIPE        215  0.09066      2.50  ----
  -----  -----    --     --
     15A :  Hydorgaph at East Detention Basin
      15A   ---   ---    --   --    ---    ---       87     106   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
      16C :  2G
      16C   010   A10     8   38      9     16        9      16   1153    PIPE        238  0.04624      2.00  ----
  -----  -----    --     --
     17AC:  2A-2F x 2G
     17AC
*****************************************************************************************************
            *          Peak in A:      106.22 cfs @ 1154 min  Q in C:       15.97 cfs  Combined Q:      122.19 cfs
 *
            *          Peak in C:       15.97 cfs @ 1154 min  Q in A:      106.22 cfs  Combined Q:      122.19 cfs
 *
            *      Combined Peak:      122.19 cfs @ 1154 min  Q in A:      106.22 cfs      Q in C:       15.97 cfs
 *

*****************************************************************************************************
      17AC  ---   ---    --   --      9     16       96     122   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
     18A :  Total Hydrograph at East Basin
      18A   ---   ---    --   --    ---    ---       96     122   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
      19A :  3A
      19A :  Clearing Hydrograph Bank:  A
      19A   010   A10     5    0      7     12        7      12   1153    VALLEY      634  0.05553    ---     ----
  -----  -----    --     --
```

Proposed Condtion 10-year


```
     20A :  3B
     20A   010   A10    13    0     10     10       17      21   1155    VALLEY      426  0.03135    ---     ----
  -----  -----    --     --
     21A :  3C
     21A   010   A10     9    0     27     34       44      52   1156    VALLEY      257  0.07551    ---     ----
  -----  -----    --     --
     22B :  3D
     22B :  Clearing Hydrograph Bank:  B
     22B   010   A10     7    0      9     13        9      13   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
     23AB:  3A,B,C x 3D
     23AB
*****************************************************************************************************
           *          Peak in A:       51.52 cfs @ 1157 min  Q in B:        8.81 cfs  Combined Q:       60.32 cfs
 *
           *          Peak in B:       12.91 cfs @ 1154 min  Q in A:       47.79 cfs  Combined Q:       60.70 cfs
 *
           *      Combined Peak:       62.76 cfs @ 1155 min  Q in A:       50.16 cfs      Q in B:       12.60 cfs
 *

*****************************************************************************************************
     23AB  ---   ---    --   --      9     13       53      63   1155    PIPE        630  0.03162      2.50  ----
  -----  -----    --     --
     24A :  3E
     24A   020   A10     5   69     12     32       65      84   1155    -------    ----  -------    ---     ----
  -----  -----    --     --
     25C :  3F
     25C :  Clearing Hydrograph Bank:  C
     25C   020   A10     5    0     14     23       14      23   1153    PIPE        314  0.05654      2.00  ----
  -----  -----    --     --
     26C   ---   ---    --   --    ---    ---       14      21   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
```


Model Results

```
   |---------- SUBAREA DATA AND RESULTS --------|-- ACCUMULATED DATA --|------------ ROUTING AFTER ACCUMULATION
---------------------------------|
   | NODE   SOIL  RAIN   TC    %    AREA  FLOW  |  AREA    FLOW   TIME |  CHANNEL  LENGTH   SLOPE     SIZE    H:V
    N VALUES      VEL  DEPTH |
   |  ID    TYPE  ZONE (MIN)  IMP   (AC)  (CFS) |  (AC)    (CFS)  (MIN)|    TYPE    (FT)   (FT/FT)    (FT)    (Z)
  CHNL   SIDES  (FT/S)  (FT) |

|-----------------------------------------|---------------------|-----------------------------------------
--------------------------|
     27AC:  3A,B,C,D,E, x 3F
     27AC  ---   ---    --   --     14     21       79     105   1154    PIPE        432  0.00288      4.50  ----
  -----  -----    --     --
     28A   ---   ---    --   --    ---    ---       79     102   1156    -------    ----  -------    ---     ----
  -----  -----    --     --
     29E :  3K
     29E :  Clearing Hydrograph Bank:  E
     29E   020   A10     8    0      8     10        8      10   1153    PIPE        102  0.01220      2.00  ----
  -----  -----    --     --
     30AE:  3A-F x 3K
     30AE  ---   ---    --   --      8     10       87     111   1156    PIPE         91  0.10788      2.50  ----
  -----  -----    --     --
     31F :  3G
     31F   020   A10     5   69      6     16        6      16   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     32AF:  Add 3G to Basin West
     32AF  ---   ---    --   --      6     16       93     121   1155    -------    ----  -------    ---     ----
  -----  -----    --     --
     33A :  Hydrograph at West Detention Basin
     33A   ---   ---    --   --    ---    ---       93     121   1155    -------    ----  -------    ---     ----
```

Proposed Condtion 10-year

TT5658A-Proposed_10yr

----- ----- -- --

Issue/Warning Messages

TYPE ERR NO PROCEDURE LOCATION MESSAGE

NO ISSUES OR WARNINGS DETECTED

HYDROGRAPH PRINTOUT AT: 3A

DESCRIPTION: 1C
TOTAL AREA TO HYDROGRAPH: 34 acres
HYDROGRAPH PEAK: 41 cfs
TIME OF PEAK: 1156 minutes
HYDROGRAPH VOLUME: 2.03 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	0.40	1050	0.71	1100	2.03	1110	4.23	1120	6.84
1130	7.82	1131	7.86	1132	7.91	1133	7.95	1134	8.00
1135	8.07	1136	8.13	1137	8.21	1138	8.28	1139	8.38
1140	8.43	1141	8.61	1142	8.85	1143	9.07	1144	9.43
1145	10.14	1146	10.94	1147	11.94	1148	13.13	1149	15.63
1150	18.52	1151	22.24	1152	27.00	1153	32.41	1154	37.11
1155	40.54	1156	41.38	1157	39.83	1158	36.77	1159	32.77
1160	28.65	1161	23.96	1162	19.81	1163	16.28	1164	13.22
1165	10.29	1166	8.91	1167	8.03	1168	7.34	1169	6.62
1170	5.97	1171	5.34	1172	4.72	1173	4.12	1174	3.70
1175	3.31	1176	2.92	1177	2.70	1178	2.56	1179	2.40
1180	2.22	1181	2.07	1182	1.87	1183	1.69	1184	1.47
1185	1.34	1186	1.24	1187	1.17	1188	1.11	1189	1.06
1190	1.01	1191	0.97	1192	0.91	1193	0.85	1194	0.77
1195	0.69	1196	0.62	1197	0.57	1198	0.53	1199	0.50
1200	0.47	1201	0.46	1202	0.44	1203	0.43	1204	0.42
1205	0.42	1206	0.41	1207	0.41	1208	0.41	1209	0.41
1210	0.40	1211	0.40	1212	0.40	1213	0.40	1214	0.40
1215	0.40	1216	0.40	1217	0.40	1218	0.40	1219	0.40
1220	0.40	1221	0.40	1222	0.40	1223	0.40	1224	0.40
1225	0.40	1226	0.40	1227	0.40	1228	0.40	1229	0.40
1230	0.40	1231	0.40	1232	0.40	1233	0.40	1234	0.40
1235	0.40	1236	0.40	1237	0.40	1238	0.40	1239	0.40
1240	0.40	1241	0.40	1242	0.40	1243	0.40	1244	0.40
1245	0.40	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

Proposed Condtion 10-year

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 6B

DESCRIPTION: 2A
TOTAL AREA TO HYDROGRAPH: 17 acres
HYDROGRAPH PEAK: 23 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.74 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.00	1050	0.53	1100	1.50	1110	3.24	1120	4.29
1130	4.40	1131	4.44	1132	4.48	1133	4.51	1134	4.55
1135	4.59	1136	4.62	1137	4.66	1138	4.70	1139	4.77
1140	4.77	1141	4.99	1142	5.29	1143	5.51	1144	5.81
1145	6.62	1146	7.44	1147	8.19	1148	9.02	1149	11.85
1150	14.70	1151	17.57	1152	20.46	1153	22.74	1154	22.74
1155	22.22	1156	21.42	1157	18.31	1158	15.14	1159	12.00
1160	8.79	1161	5.66	1162	4.77	1163	4.40	1164	4.40
1165	4.04	1166	3.60	1167	3.31	1168	3.02	1169	2.58
1170	2.29	1171	2.00	1172	1.63	1173	1.55	1174	1.63
1175	1.63	1176	1.63	1177	1.55	1178	1.41	1179	1.26
1180	1.11	1181	1.04	1182	0.89	1183	0.81	1184	0.67
1185	0.67	1186	0.67	1187	0.67	1188	0.67	1189	0.59
1190	0.52	1191	0.30	1192	0.22	1193	0.07	1194	0.00
1195	0.00	1196	0.00	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 8C

Proposed Condtion 10-year

TT5658A-Proposed_10yr

DESCRIPTION: 2D
TOTAL AREA TO HYDROGRAPH: 8 acres
HYDROGRAPH PEAK: 13 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.25 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.00	1050	0.00	1100	0.23	1110	1.03	1120	1.51
1130	1.56	1131	1.59	1132	1.62	1133	1.64	1134	1.67
1135	1.70	1136	1.70	1137	1.70	1138	1.70	1139	1.76
1140	1.76	1141	1.92	1142	2.15	1143	2.32	1144	2.49
1145	3.08	1146	3.51	1147	3.87	1148	4.29	1149	6.24
1150	7.90	1151	9.54	1152	11.26	1153	12.93	1154	11.26
1155	9.17	1156	6.95	1157	4.75	1158	2.54	1159	1.87
1160	1.59	1161	1.59	1162	1.53	1163	1.48	1164	1.53
1165	1.32	1166	1.00	1167	0.78	1168	0.57	1169	0.25
1170	0.25	1171	0.30	1172	0.30	1173	0.25	1174	0.30
1175	0.30	1176	0.30	1177	0.20	1178	0.14	1179	0.04
1180	0.00	1181	0.00	1182	0.00	1183	0.00	1184	0.00
1185	0.00	1186	0.00	1187	0.00	1188	0.00	1189	0.00
1190	0.00	1191	0.00	1192	0.00	1193	0.00	1194	0.00
1195	0.00	1196	0.00	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

HYDROGRAPH PRINTOUT AT: 16C

DESCRIPTION: 2G
TOTAL AREA TO HYDROGRAPH: 9 acres
HYDROGRAPH PEAK: 16 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 1.47 acre-ft

Proposed Condtion 10-year

TT5658A-Proposed_10yr

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.31	200	0.31	300	0.31	400	0.31
500	0.31	600	0.36	700	0.52	800	0.52	900	0.66
1000	0.91	1050	1.33	1100	1.96	1110	3.11	1120	3.80
1130	3.88	1131	3.91	1132	3.93	1133	3.95	1134	3.98
1135	4.00	1136	4.03	1137	4.05	1138	4.08	1139	4.13
1140	4.13	1141	4.27	1142	4.47	1143	4.61	1144	4.81
1145	5.34	1146	5.88	1147	6.37	1148	6.91	1149	8.79
1150	10.67	1151	12.57	1152	14.46	1153	15.97	1154	15.97
1155	15.63	1156	15.10	1157	13.05	1158	10.96	1159	8.89
1160	6.76	1161	4.71	1162	4.13	1163	3.88	1164	3.88
1165	3.64	1166	3.35	1167	3.16	1168	2.96	1169	2.67
1170	2.48	1171	2.29	1172	2.04	1173	2.00	1174	2.04
1175	2.04	1176	2.04	1177	2.00	1178	1.90	1179	1.80
1180	1.70	1181	1.66	1182	1.56	1183	1.51	1184	1.41
1185	1.41	1186	1.41	1187	1.41	1188	1.41	1189	1.36
1190	1.32	1191	1.17	1192	1.12	1193	1.02	1194	0.97
1195	0.95	1196	0.90	1197	0.90	1198	0.90	1199	0.90
1200	0.90	1201	0.93	1202	0.90	1203	0.90	1204	0.93
1205	0.90	1206	0.90	1207	0.93	1208	0.90	1209	0.90
1210	0.93	1211	0.90	1212	0.90	1213	0.93	1214	0.90
1215	0.90	1216	0.93	1217	0.90	1218	0.90	1219	0.93
1220	0.90	1221	0.90	1222	0.90	1223	0.90	1224	0.90
1225	0.85	1226	0.80	1227	0.76	1228	0.73	1229	0.66
1230	0.63	1231	0.58	1232	0.51	1233	0.54	1234	0.54
1235	0.51	1236	0.51	1237	0.54	1238	0.51	1239	0.51
1240	0.54	1241	0.51	1242	0.51	1243	0.54	1244	0.54
1245	0.51	1246	0.54	1247	0.54	1248	0.51	1249	0.54
1250	0.54	1251	0.51	1252	0.51	1253	0.54	1254	0.51
1255	0.51	1256	0.54	1257	0.51	1258	0.51	1259	0.54
1260	0.54	1261	0.51	1262	0.54	1263	0.54	1264	0.51
1265	0.54	1266	0.54	1267	0.51	1268	0.51	1269	0.54
1270	0.51	1271	0.51	1272	0.54	1273	0.51	1274	0.51
1275	0.54	1276	0.51	1277	0.51	1278	0.54	1279	0.54
1280	0.51	1281	0.54	1282	0.54	1283	0.51	1284	0.54
1285	0.54	1286	0.51	1287	0.51	1288	0.54	1289	0.51
1290	0.51	1291	0.54	1292	0.51	1293	0.51	1294	0.54
1295	0.54	1296	0.51	1297	0.51	1298	0.46	1299	0.44
1300	0.41	1310	0.31	1320	0.31	1330	0.31	1340	0.31
1350	0.29	1360	0.31	1370	0.31	1380	0.29	1390	0.31
1400	0.31	1420	0.31	1440	0.30	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 18A

DESCRIPTION: Total Hydrograph at East Basin
TOTAL AREA TO HYDROGRAPH: 96 acres
HYDROGRAPH PEAK: 122 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 10.46 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.56	200	2.56	300	2.56	400	2.56
500	2.56	600	2.71	700	3.35	800	3.35	900	3.91
1000	4.93	1050	6.43	1100	10.57	1110	17.73	1120	25.16

Proposed Condtion 10-year

1130	27.86	1131	28.21	1132	28.48	1133	28.79	1134	29.08
1135	29.38	1136	29.57	1137	29.69	1138	29.82	1139	30.13
1140	30.40	1141	31.09	1142	32.52	1143	33.90	1144	35.27
1145	38.33	1146	42.17	1147	45.48	1148	49.33	1149	59.70
1150	74.05	1151	87.79	1152	103.54	1153	119.47	1154	122.19
1155	117.65	1156	110.42	1157	101.55	1158	89.62	1159	80.91
1160	74.38	1161	67.63	1162	61.10	1163	54.92	1164	49.95
1165	45.00	1166	39.54	1167	34.67	1168	30.42	1169	26.29
1170	23.38	1171	21.72	1172	20.15	1173	18.63	1174	17.54
1175	16.73	1176	15.90	1177	14.95	1178	13.97	1179	13.01
1180	12.01	1181	11.19	1182	10.59	1183	10.23	1184	9.88
1185	9.50	1186	9.18	1187	8.89	1188	8.55	1189	8.18
1190	7.82	1191	7.40	1192	6.98	1193	6.56	1194	6.22
1195	6.04	1196	5.88	1197	5.76	1198	5.72	1199	5.64
1200	5.51	1201	5.50	1202	5.44	1203	5.31	1204	5.31
1205	5.26	1206	5.16	1207	5.18	1208	5.16	1209	5.07
1210	5.10	1211	5.09	1212	5.00	1213	5.05	1214	5.04
1215	4.96	1216	5.01	1217	5.01	1218	4.94	1219	4.99
1220	4.99	1221	4.92	1222	4.91	1223	4.91	1224	4.91
1225	4.77	1226	4.50	1227	4.27	1228	4.04	1229	3.70
1230	3.52	1231	3.53	1232	3.42	1233	3.32	1234	3.36
1235	3.37	1236	3.30	1237	3.35	1238	3.36	1239	3.30
1240	3.35	1241	3.36	1242	3.30	1243	3.35	1244	3.43
1245	3.37	1246	3.36	1247	3.43	1248	3.37	1249	3.31
1250	3.36	1251	3.37	1252	3.30	1253	3.35	1254	3.36
1255	3.30	1256	3.35	1257	3.36	1258	3.30	1259	3.35
1260	3.43	1261	3.37	1262	3.36	1263	3.43	1264	3.37
1265	3.31	1266	3.36	1267	3.37	1268	3.30	1269	3.35
1270	3.36	1271	3.30	1272	3.35	1273	3.36	1274	3.30
1275	3.35	1276	3.36	1277	3.30	1278	3.35	1279	3.43
1280	3.37	1281	3.36	1282	3.43	1283	3.37	1284	3.31
1285	3.36	1286	3.37	1287	3.30	1288	3.35	1289	3.36
1290	3.30	1291	3.35	1292	3.36	1293	3.30	1294	3.35
1295	3.43	1296	3.37	1297	3.30	1298	3.17	1299	2.97
1300	2.75	1310	2.56	1320	2.58	1330	2.56	1340	2.58
1350	2.56	1360	2.56	1370	2.58	1380	2.56	1390	2.56
1400	2.58	1420	2.56	1440	2.56	1460	2.56	1500	2.56

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 21A

DESCRIPTION: 3C
TOTAL AREA TO HYDROGRAPH: 44 acres
HYDROGRAPH PEAK: 52 cfs
TIME OF PEAK: 1156 minutes
HYDROGRAPH VOLUME: 2.65 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	0.40	1050	1.52	1100	3.80	1110	7.37	1120	10.41
1130	11.29	1131	11.37	1132	11.45	1133	11.53	1134	11.60
1135	11.68	1136	11.76	1137	11.84	1138	11.93	1139	12.12
1140	12.15	1141	12.50	1142	12.97	1143	13.36	1144	13.89
1145	15.18	1146	16.55	1147	18.04	1148	19.53	1149	24.40
1150	29.34	1151	34.57	1152	40.51	1153	46.74	1154	49.37
1155	51.13	1156	51.74	1157	51.28	1158	46.53	1159	40.85

Proposed Condtion 10-year

1160	34.88	1161	28.74	1162	22.66	1163	19.85	1164	17.87
1165	15.92	1166	13.95	1167	12.13	1168	10.62	1169	9.31
1170	8.24	1171	7.40	1172	6.64	1173	5.69	1174	5.39
1175	5.23	1176	5.01	1177	4.62	1178	4.34	1179	3.97
1180	3.63	1181	3.32	1182	3.12	1183	2.93	1184	2.64
1185	2.36	1186	2.28	1187	2.21	1188	2.14	1189	1.97
1190	1.80	1191	1.53	1192	1.26	1193	1.00	1194	0.84
1195	0.69	1196	0.65	1197	0.62	1198	0.58	1199	0.53
1200	0.49	1201	0.46	1202	0.44	1203	0.43	1204	0.42
1205	0.41	1206	0.41	1207	0.41	1208	0.40	1209	0.40
1210	0.40	1211	0.40	1212	0.40	1213	0.40	1214	0.40
1215	0.40	1216	0.40	1217	0.40	1218	0.40	1219	0.40
1220	0.40	1221	0.40	1222	0.40	1223	0.40	1224	0.40
1225	0.40	1226	0.40	1227	0.40	1228	0.40	1229	0.40
1230	0.40	1231	0.40	1232	0.40	1233	0.40	1234	0.40
1235	0.40	1236	0.40	1237	0.40	1238	0.40	1239	0.40
1240	0.40	1241	0.40	1242	0.40	1243	0.40	1244	0.40
1245	0.40	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 22B

DESCRIPTION: 3D
22B : Clearing Hydrograph Bank: B
TOTAL AREA TO HYDROGRAPH: 9 acres
HYDROGRAPH PEAK: 13 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.39 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.00	1050	0.28	1100	0.80	1110	1.71	1120	2.27
1130	2.33	1131	2.35	1132	2.38	1133	2.40	1134	2.42
1135	2.44	1136	2.47	1137	2.49	1138	2.49	1139	2.53
1140	2.53	1141	2.67	1142	2.85	1143	2.98	1144	3.16
1145	3.65	1146	4.10	1147	4.60	1148	4.97	1149	6.63
1150	8.41	1151	10.10	1152	11.53	1153	12.91	1154	12.91
1155	12.60	1156	10.73	1157	8.81	1158	6.94	1159	5.01
1160	3.07	1161	2.58	1162	2.35	1163	2.31	1164	2.31
1165	2.09	1166	1.87	1167	1.69	1168	1.47	1169	1.25
1170	1.07	1171	0.85	1172	0.85	1173	0.85	1174	0.85
1175	0.85	1176	0.89	1177	0.81	1178	0.72	1179	0.63
1180	0.58	1181	0.49	1182	0.40	1183	0.36	1184	0.36

Proposed Condtion 10-year

1185	0.36	1186	0.36	1187	0.36	1188	0.36	1189	0.31
1190	0.22	1191	0.13	1192	0.09	1193	0.00	1194	0.00
1195	0.00	1196	0.00	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 25C

DESCRIPTION: 3F
25C : Clearing Hydrograph Bank: C
TOTAL AREA TO HYDROGRAPH: 14 acres
HYDROGRAPH PEAK: 23 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.43 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.00	1050	0.00	1100	0.41	1110	1.79	1120	2.64
1130	2.73	1131	2.78	1132	2.83	1133	2.88	1134	2.93
1135	2.98	1136	2.98	1137	2.98	1138	2.98	1139	3.07
1140	3.07	1141	3.37	1142	3.76	1143	4.05	1144	4.35
1145	5.39	1146	6.13	1147	6.78	1148	7.50	1149	10.91
1150	13.83	1151	16.70	1152	19.70	1153	22.63	1154	19.70
1155	16.05	1156	12.17	1157	8.31	1158	4.45	1159	3.27
1160	2.78	1161	2.78	1162	2.68	1163	2.59	1164	2.68
1165	2.31	1166	1.75	1167	1.37	1168	1.00	1169	0.44
1170	0.44	1171	0.53	1172	0.53	1173	0.44	1174	0.53
1175	0.53	1176	0.53	1177	0.34	1178	0.25	1179	0.06
1180	0.00	1181	0.00	1182	0.00	1183	0.00	1184	0.00
1185	0.00	1186	0.00	1187	0.00	1188	0.00	1189	0.00
1190	0.00	1191	0.00	1192	0.00	1193	0.00	1194	0.00
1195	0.00	1196	0.00	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00

Proposed Condtion 10-year

1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 29E

DESCRIPTION: 3K
29E : Clearing Hydrograph Bank: E
TOTAL AREA TO HYDROGRAPH: 8 acres
HYDROGRAPH PEAK: 10 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.25 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.00	1050	0.00	1100	0.23	1110	1.03	1120	1.51
1130	1.56	1131	1.58	1132	1.60	1133	1.61	1134	1.63
1135	1.65	1136	1.67	1137	1.68	1138	1.70	1139	1.74
1140	1.74	1141	1.84	1142	1.98	1143	2.09	1144	2.23
1145	2.61	1146	2.98	1147	3.31	1148	3.68	1149	4.94
1150	6.19	1151	7.45	1152	8.73	1153	9.76	1154	9.76
1155	9.53	1156	9.16	1157	7.78	1158	6.38	1159	5.00
1160	3.58	1161	2.16	1162	1.74	1163	1.56	1164	1.56
1165	1.39	1166	1.19	1167	1.06	1168	0.92	1169	0.72
1170	0.59	1171	0.46	1172	0.29	1173	0.26	1174	0.29
1175	0.29	1176	0.29	1177	0.26	1178	0.19	1179	0.12
1180	0.06	1181	0.02	1182	0.00	1183	0.00	1184	0.00
1185	0.00	1186	0.00	1187	0.00	1188	0.00	1189	0.00
1190	0.00	1191	0.00	1192	0.00	1193	0.00	1194	0.00
1195	0.00	1196	0.00	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00

Proposed Condtion 10-year

1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 33A

DESCRIPTION: Hydrograph at West Detention Basin
TOTAL AREA TO HYDROGRAPH: 93 acres
HYDROGRAPH PEAK: 121 cfs
TIME OF PEAK: 1155 minutes
HYDROGRAPH VOLUME: 9.88 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.32	200	2.32	300	2.32	400	2.32
500	2.32	600	2.50	700	3.08	800	3.11	900	3.57
1000	4.49	1050	6.45	1100	10.57	1110	16.66	1120	24.85
1130	27.41	1131	27.53	1132	27.70	1133	27.93	1134	28.19
1135	28.45	1136	28.68	1137	28.89	1138	29.05	1139	29.25
1140	29.43	1141	29.85	1142	30.55	1143	31.53	1144	32.82
1145	34.88	1146	37.43	1147	40.69	1148	44.51	1149	51.20
1150	60.31	1151	72.85	1152	87.86	1153	103.85	1154	115.05
1155	121.28	1156	120.68	1157	114.12	1158	103.20	1159	91.90
1160	80.74	1161	70.99	1162	62.26	1163	54.90	1164	48.60
1165	43.09	1166	38.30	1167	34.31	1168	30.74	1169	27.30
1170	24.42	1171	21.84	1172	19.73	1173	18.03	1174	16.75
1175	15.73	1176	14.92	1177	14.09	1178	13.42	1179	12.72
1180	12.06	1181	11.40	1182	10.82	1183	10.33	1184	9.92
1185	9.58	1186	9.28	1187	8.99	1188	8.68	1189	8.38
1190	8.06	1191	7.71	1192	7.42	1193	7.05	1194	6.75
1195	6.42	1196	6.14	1197	5.90	1198	5.72	1199	5.47
1200	5.29	1201	5.18	1202	4.99	1203	4.90	1204	4.86
1205	4.74	1206	4.69	1207	4.70	1208	4.60	1209	4.58
1210	4.61	1211	4.53	1212	4.52	1213	4.56	1214	4.50
1215	4.50	1216	4.55	1217	4.49	1218	4.49	1219	4.54
1220	4.48	1221	4.49	1222	4.49	1223	4.48	1224	4.47
1225	4.37	1226	4.26	1227	4.16	1228	3.96	1229	3.69
1230	3.61	1231	3.45	1232	3.28	1233	3.21	1234	3.22
1235	3.12	1236	3.10	1237	3.14	1238	3.08	1239	3.08
1240	3.13	1241	3.07	1242	3.07	1243	3.13	1244	3.12
1245	3.07	1246	3.14	1247	3.14	1248	3.09	1249	3.10
1250	3.15	1251	3.08	1252	3.08	1253	3.13	1254	3.07
1255	3.07	1256	3.13	1257	3.07	1258	3.07	1259	3.12
1260	3.12	1261	3.07	1262	3.14	1263	3.14	1264	3.09

Proposed Condtion 10-year

TT5658A-Proposed_10yr

1265	3.10	1266	3.15	1267	3.08	1268	3.08	1269	3.13
1270	3.07	1271	3.07	1272	3.13	1273	3.07	1274	3.07
1275	3.12	1276	3.07	1277	3.07	1278	3.12	1279	3.12
1280	3.07	1281	3.14	1282	3.14	1283	3.09	1284	3.10
1285	3.15	1286	3.08	1287	3.08	1288	3.13	1289	3.07
1290	3.07	1291	3.13	1292	3.07	1293	3.07	1294	3.12
1295	3.12	1296	3.07	1297	3.09	1298	3.00	1299	2.93
1300	2.80	1310	2.37	1320	2.32	1330	2.34	1340	2.33
1350	2.30	1360	2.32	1370	2.33	1380	2.30	1390	2.32
1400	2.33	1420	2.33	1440	2.31	1460	1.95	1500	1.95

VCRat Model Input

Model Lines

```
005     1  001A Header place holder
005     1  003A Header place holder
005     1  006B Header place holder
005     1  008C Header place holder
005     1  016C Header place holder
005     1  018A Header place holder
005     1  021A Header place holder
005     1  022B Header place holder
005     1  025C Header place holder
005     1  029E Header place holder
005     1  033A Header place holder
999
999
006     1  001A 010000000806A97200533008369                    G1
006     1  002A 010000001205A97200873005846
006     1  003A 020000001412A97201040003641                  1
006     1  004A 020038000705A97
006     1  005A 010      099A97
006     1  006B 010000001708A97401345007168                  1
006     1  007B 020038001405A97
006     1  008C 020000000805A97400026004348                  1
006     1  009D 020038000705A97
006     1  010CD010         A97400177016890                   1
006     1  011C 010      099A97
006     1  012BC010         A97
006     1  013B 010      099A97
006     1  014AB010         A97400215009066                   1
006     1  015A 010      099A97
006     1  016C 010038000908A97400238004624                  1
006     1  017AC010         A97                               1
006     1  018A 010      099A97                               1
006     1  019A 010000000705A97200634005553                    A
006     1  020A 010000001013A97200426003135
006     1  021A 010000002709A97200257007551                  1
006     1  022B 010000000907A97                               1 B
006     1  023AB010         A97400630003162                   1
006     1  024A 020069001205A97
006     1  025C 020000001405A97400314005654                  1 C
006     1  026C 010      099A97
006     1  027AC010         A97400432000288
006     1  028A 010      099A97
006     1  029E 020000000808A97400102001220                  1 E
006     1  030AE010         A97400091010788
006     1  031F 020069000605A97
006     1  032AF010         A97
006     1  033A 010      099A97                               1  2
999
```

Proposed Condtion 100-year

TT5658A-Proposed_100yr

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: Tentative Tract No. 5658-A Proposed Conditions

Project Description

VCRat version: 2.64.0.30
VCRain version: 201601
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM2: Simi Valley
Curve B: None
Curve C: None
Curve D: None

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: Tentative Tract No. 5658-A Proposed Conditions

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	AREA (AC)	FLOW (CFS)	TIME (MIN)	CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)
N VALUES	VEL	DEPTH												
CHNL	SIDES	(FT/S)	(FT)											
1A : 1A														
1A	010	A100	6	0	8	20	8	20	1153	VALLEY	533	0.08369	---	----
-----	-----	--	--											
2A : 1B														
2A	010	A100	5	0	12	33	20	49	1153	VALLEY	873	0.05846	---	----
-----	-----	--	--											
3A : 1C														
3A	020	A100	12	0	14	22	34	68	1155	VALLEY	1040	0.03641	---	----
-----	-----	--	--											
4A : 1D														
4A	020	A100	5	38	7	24	41	70	1157	-------	----	-------	---	----
-----	-----	--	--											
5A	---	---	--	--	---	---	41	70	1157	-------	----	-------	---	----
-----	-----	--	--											
6B : 2A														
6B	010	A100	8	0	17	36	17	36	1153	PIPE	1345	0.07168	2.00	----
-----	-----	--	--											
7B : 2B+2C														

Proposed Condtion 100-year


```
      7B   020   A100    5   38     14     48       31      78   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
      8C :  2D
      8C   020   A100    5    0      8     21        8      21   1153    PIPE         26  0.04348      2.00  ----
  -----  -----    --     --
      9D :  2E&2F
      9D   020   A100    5   38      7     24        7      24   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     10CD:  2D x 2E&2F
     10CD
*****************************************************************************************************
           *          Peak in C:       20.68 cfs @ 1153 min  Q in D:       24.14 cfs  Combined Q:       44.82 cfs
 *
           *          Peak in D:       24.14 cfs @ 1153 min  Q in C:       20.68 cfs  Combined Q:       44.82 cfs
 *
           *      Combined Peak:       44.82 cfs @ 1153 min  Q in C:       20.68 cfs      Q in D:       24.14 cfs
 *

*****************************************************************************************************
     10CD  ---   ---    --   --      7     24       15      45   1153    PIPE        177  0.16890      2.00  ----
  -----  -----    --     --
     11C   ---   ---    --   --    ---    ---       15      44   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     12BC:  2C x 2D,2E&2F
     12BC  ---   ---    --   --     15     44       46     122   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     13B   ---   ---    --   --    ---    ---       46     122   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     14AB:  1A-D x 2A-F
     14AB
*****************************************************************************************************
           *          Peak in A:       69.69 cfs @ 1157 min  Q in B:       74.20 cfs  Combined Q:      143.89 cfs
 *
           *          Peak in B:      121.51 cfs @ 1153 min  Q in A:       55.24 cfs  Combined Q:      176.75 cfs
 *
           *      Combined Peak:      176.75 cfs @ 1153 min  Q in A:       55.24 cfs      Q in B:      121.51 cfs
 *

*****************************************************************************************************
     14AB  ---   ---    --   --     46    122       87     177   1153    PIPE        215  0.09066      3.00  ----
  -----  -----    --     --
     15A :  Hydorgaph at East Detention Basin
     15A   ---   ---    --   --    ---    ---       87     176   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
     16C :  2G
     16C   010   A100    8   38      9     25        9      25   1153    PIPE        238  0.04624      2.00  ----
  -----  -----    --     --
     17AC:  2A-2F x 2G
     17AC
*****************************************************************************************************
           *          Peak in A:      175.92 cfs @ 1154 min  Q in C:       24.90 cfs  Combined Q:      200.82 cfs
 *
           *          Peak in C:       24.90 cfs @ 1154 min  Q in A:      175.92 cfs  Combined Q:      200.82 cfs
 *
           *      Combined Peak:      200.82 cfs @ 1154 min  Q in A:      175.92 cfs      Q in C:       24.90 cfs
 *

*****************************************************************************************************
     17AC  ---   ---    --   --      9     25       96     201   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
     18A :  Total Hydrograph at East Basin
     18A   ---   ---    --   --    ---    ---       96     201   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
      18A :  48" Outlet Pipe
           *****************************************************************************************
           *      INCOMING HYDROGRAPH  PEAK (cfs):    200.82         VOLUME (acre-ft):     16.87      *
           *      NO HYDROGRAPH ADJUSTMENT                                                            *
```

Proposed Condtion 100-year


```
           *      RUNOFF FACTOR(in):   4.60                                                                *
           *      FATTENED HYDROGRAPH  PEAK (cfs):    200.82         VOLUME (acre-ft):     36.79      *
           *      RESERVOIR INFLOW:    PEAK (cfs):    200.82 @ 1154  VOLUME (acre-ft):     36.79      *
           *      MAXIMUM ELEVATION:   STAGE (ft):    969.50 @ 1169  VOLUME (acre-ft):      5.79      *
           *      EMERGENCY SPILLWAY:   ELEV (ft):    970.00         VOLUME (acre-ft):      6.66      *
           *          DIFFERENCE:   IN STAGE (ft):     -0.50      IN VOLUME (acre-ft):      0.88      *
           *          NO SPILL EXPECTED.       PERCNT OF VOLUME REMAINING TO SPILLWAY:     13.1%      *
           *      TOP OF DAM:           ELEV (ft):    972.00         VOLUME (acre-ft):     10.40      *
           *          DIFFERENCE    IN STAGE (ft):     -2.50      IN VOLUME (acre-ft):      4.62      *
           *          NO OVERTOP EXPECTED.   PERCNT OF VOLUME REMAINING TO TOP OF DAM:     44.4%      *
           *      RESERVOIR OUTFLOW:   PEAK (cfs):     95.09 @ 1169  VOLUME (acre-ft):     34.72      *
           ********************************************************************************************
     18A   ---   ---    --   --    ---    ---       96      95   1169    -------    ----  -------    ---     ----
  -----  -----    --     --
     19A   ---   ---    --   --    ---    ---       96      95   1169    -------    ----  -------    ---     ----
  -----  -----    --     --
     20A :  3A
     20A :  Clearing Hydrograph Bank:  A
     20A   010   A100    5    0      7     19        7      19   1153    VALLEY      634  0.05553    ---     ----
  -----  -----    --     --
     21A :  3B
     21A   010   A100   13    0     10     16       17      34   1155    VALLEY      426  0.03135    ---     ----
  -----  -----    --     --
```


Model Results

```
   |---------- SUBAREA DATA AND RESULTS --------|-- ACCUMULATED DATA --|------------ ROUTING AFTER ACCUMULATION
---------------------------------|
   | NODE   SOIL  RAIN   TC    %    AREA  FLOW  |  AREA    FLOW   TIME |  CHANNEL  LENGTH   SLOPE     SIZE    H:V
    N VALUES      VEL  DEPTH |
   |  ID    TYPE  ZONE (MIN)  IMP   (AC)  (CFS) |  (AC)    (CFS)  (MIN)|    TYPE    (FT)   (FT/FT)    (FT)    (Z)
  CHNL   SIDES  (FT/S)  (FT) |

|-----------------------------------------|---------------------|-----------------------------------------
---------------------------|
     22A :  3C
     22A   010   A100    9    0     27     55       44      84   1156    VALLEY      257  0.07551    ---     ----
  -----  -----    --     --
     23B :  3D
     23B :  Clearing Hydrograph Bank:  B
     23B   010   A100    7    0      9     21        9      21   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
     24AB:  3A,B,C x 3D
     24AB
*********************************************************************************************************
           *          Peak in A:       84.00 cfs @ 1156 min  Q in B:       17.18 cfs  Combined Q:      101.18 cfs
 *
           *          Peak in B:       20.57 cfs @ 1153 min  Q in A:       72.06 cfs  Combined Q:       92.63 cfs
 *
           *      Combined Peak:      102.57 cfs @ 1155 min  Q in A:       82.53 cfs      Q in B:       20.04 cfs
 *

*********************************************************************************************************
     24AB  ---   ---    --   --      9     21       53     103   1155    PIPE        630  0.03162      3.00  ----
  -----  -----    --     --
     25A :  3E
     25A   020   A100    5   69     12     50       65     136   1154    -------    ----  -------    ---     ----
  -----  -----    --     --
     26C :  3F
     26C :  Clearing Hydrograph Bank:  C
     26C   020   A100    5    0     14     37       14      37   1153    PIPE        314  0.05654      2.00  ----
  -----  -----    --     --
     27C   ---   ---    --   --    ---    ---       14      34   1153    -------    ----  -------    ---     ----
  -----  -----    --     --
```

Proposed Condtion 100-year


```
    28AC:  3A,B,C,D,E, x 3F
    28AC  ---   ---    --   --     14     34       79     170   1154    PIPE        432  0.00288      5.25  ----
 -----  -----    --     --
    29A   ---   ---    --   --    ---    ---       79     166   1156    -------    ----  -------    ---     ----
 -----  -----    --     --
    30E :  3K
    30E :  Clearing Hydrograph Bank:  E
    30E   020   A100    8    0      8     16        8      16   1153    PIPE        102  0.01220      2.00  ----
 -----  -----    --     --
    31AE:  3A-F x 3K
    31AE  ---   ---    --   --      8     16       87     181   1156    PIPE         91  0.10788      2.75  ----
 -----  -----    --     --
    32F :  3G
    32F   020   A100    5   69      6     25        6      25   1153    -------    ----  -------    ---     ----
 -----  -----    --     --
    33AF:  Add 3G to Basin West
    33AF  ---   ---    --   --      6     25       93     197   1155    -------    ----  -------    ---     ----
 -----  -----    --     --
    34A :  Hydrograph at West Detention Basin
    34A   ---   ---    --   --    ---    ---       93     197   1155    -------    ----  -------    ---     ----
 -----  -----    --     --
     34A :  36" Outlet Pipe
          ************************************************************************************************
          *      INCOMING HYDROGRAPH  PEAK (cfs):    197.14         VOLUME (acre-ft):     16.15      *
          *      NO HYDROGRAPH ADJUSTMENT                                                            *
          *      RUNOFF FACTOR(in):   4.25                                                           *
          *      FATTENED HYDROGRAPH  PEAK (cfs):    197.14         VOLUME (acre-ft):     32.93      *
          *      RESERVOIR INFLOW:    PEAK (cfs):    197.14 @ 1155  VOLUME (acre-ft):     32.93      *
          *      MAXIMUM ELEVATION:   STAGE (ft):    963.06 @ 1176  VOLUME (acre-ft):      6.38      *
          *      EMERGENCY SPILLWAY:   ELEV (ft):    966.00         VOLUME (acre-ft):     10.87      *
          *          DIFFERENCE:   IN STAGE (ft):     -2.94      IN VOLUME (acre-ft):      4.49      *
          *          NO SPILL EXPECTED.       PERCNT OF VOLUME REMAINING TO SPILLWAY:     41.3%      *
          *      TOP OF DAM:           ELEV (ft):    968.00         VOLUME (acre-ft):     14.30      *
          *          DIFFERENCE    IN STAGE (ft):     -4.94      IN VOLUME (acre-ft):      7.92      *
          *          NO OVERTOP EXPECTED.   PERCNT OF VOLUME REMAINING TO TOP OF DAM:     55.4%      *
          *      RESERVOIR OUTFLOW:   PEAK (cfs):     72.66 @ 1176  VOLUME (acre-ft):     31.08      *
          ************************************************************************************************
    34A   ---   ---    --   --    ---    ---       93      73   1176    -------    ----  -------    ---     ----
 -----  -----    --     --
    35A   ---   ---    --   --    ---    ---       93      73   1176    -------    ----  -------    ---     ----
 -----  -----    --     --


                                      Issue/Warning Messages
    TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE

-------------------------------------------------------------------------------------------------------------------------
--------------------------
      NO ISSUES OR WARNINGS DETECTED
```



```
                                      Hydrograph Printouts

-------------------------------------------------------------------------------------------------
           HYDROGRAPH PRINTOUT AT:    3A
-------------------------------------------------------------------------------------------------
           DESCRIPTION: 1C
           TOTAL AREA TO HYDROGRAPH:      34    acres
           HYDROGRAPH PEAK:               68    cfs
           TIME OF PEAK:                1155    minutes
           HYDROGRAPH VOLUME:              3.63 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)
```

TT5658A-Proposed_100yr

0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.46
1000	1.52	1050	3.56	1100	6.43	1110	10.03	1120	14.23
1130	15.53	1131	15.58	1132	15.64	1133	15.72	1134	15.82
1135	15.95	1136	16.09	1137	16.24	1138	16.37	1139	16.48
1140	16.57	1141	16.85	1142	17.14	1143	17.54	1144	18.06
1145	19.15	1146	20.43	1147	22.07	1148	23.98	1149	27.83
1150	32.64	1151	39.07	1152	47.00	1153	55.81	1154	63.20
1155	67.75	1156	67.70	1157	63.98	1158	58.31	1159	51.45
1160	44.89	1161	37.66	1162	31.52	1163	26.41	1164	22.13
1165	18.16	1166	16.39	1167	15.12	1168	14.12	1169	13.11
1170	12.00	1171	10.96	1172	10.01	1173	9.18	1174	8.50
1175	7.95	1176	7.39	1177	7.13	1178	6.94	1179	6.73
1180	6.47	1181	6.18	1182	5.93	1183	5.59	1184	5.27
1185	5.02	1186	4.79	1187	4.55	1188	4.38	1189	4.24
1190	4.07	1191	3.93	1192	3.75	1193	3.53	1194	3.24
1195	2.99	1196	2.73	1197	2.49	1198	2.23	1199	2.07
1200	1.89	1201	1.82	1202	1.77	1203	1.75	1204	1.73
1205	1.72	1206	1.71	1207	1.69	1208	1.67	1209	1.66
1210	1.65	1211	1.59	1212	1.58	1213	1.57	1214	1.57
1215	1.56	1216	1.56	1217	1.56	1218	1.55	1219	1.59
1220	1.59	1221	1.60	1222	1.61	1223	1.63	1224	1.65
1225	1.55	1226	1.48	1227	1.45	1228	1.38	1229	1.27
1230	1.13	1231	0.98	1232	0.84	1233	0.74	1234	0.66
1235	0.59	1236	0.55	1237	0.51	1238	0.48	1239	0.46
1240	0.45	1241	0.44	1242	0.43	1243	0.42	1244	0.42
1245	0.41	1246	0.41	1247	0.41	1248	0.41	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 6B

DESCRIPTION: 2A
TOTAL AREA TO HYDROGRAPH: 17 acres
HYDROGRAPH PEAK: 36 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 1.68 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.10
1000	1.21	1050	2.29	1100	3.75	1110	6.41	1120	8.15
1130	8.27	1131	8.34	1132	8.42	1133	8.49	1134	8.57
1135	8.64	1136	8.72	1137	8.79	1138	8.87	1139	8.87

Proposed Condtion 100-year

1140	8.87	1141	9.24	1142	9.61	1143	10.04	1144	10.41
1145	11.64	1146	12.80	1147	14.04	1148	15.29	1149	19.64
1150	24.05	1151	28.31	1152	32.74	1153	36.29	1154	36.29
1155	35.48	1156	34.22	1157	29.42	1158	24.64	1159	19.86
1160	15.00	1161	10.19	1162	8.94	1163	8.34	1164	8.27
1165	7.74	1166	7.14	1167	6.55	1168	6.03	1169	5.51
1170	4.92	1171	4.48	1172	3.97	1173	3.89	1174	3.89
1175	3.97	1176	3.89	1177	3.67	1178	3.60	1179	3.38
1180	3.16	1181	3.02	1182	2.87	1183	2.65	1184	2.51
1185	2.51	1186	2.51	1187	2.51	1188	2.51	1189	2.36
1190	2.14	1191	2.00	1192	1.85	1193	1.70	1194	1.48
1195	1.33	1196	1.18	1197	1.18	1198	1.18	1199	1.26
1200	1.26	1201	1.26	1202	1.26	1203	1.26	1204	1.26
1205	1.26	1206	1.26	1207	1.18	1208	1.18	1209	1.18
1210	1.18	1211	1.18	1212	1.18	1213	1.18	1214	1.18
1215	1.18	1216	1.18	1217	1.18	1218	1.18	1219	1.26
1220	1.26	1221	1.26	1222	1.26	1223	1.26	1224	1.26
1225	1.04	1226	0.81	1227	0.52	1228	0.30	1229	0.07
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 8C

DESCRIPTION: 2D
TOTAL AREA TO HYDROGRAPH: 8 acres
HYDROGRAPH PEAK: 21 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.58 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.10	1050	0.59	1100	1.26	1110	2.51	1120	3.29
1130	3.35	1131	3.40	1132	3.45	1133	3.51	1134	3.56
1135	3.61	1136	3.61	1137	3.61	1138	3.61	1139	3.61
1140	3.61	1141	3.87	1142	4.13	1143	4.44	1144	4.70
1145	5.57	1146	6.13	1147	6.75	1148	7.32	1149	10.45
1150	13.04	1151	15.68	1152	18.28	1153	20.86	1154	18.28
1155	15.07	1156	11.58	1157	8.06	1158	4.70	1159	3.82
1160	3.45	1161	3.40	1162	3.40	1163	3.29	1164	3.29
1165	2.92	1166	2.54	1167	2.09	1168	1.76	1169	1.37

1170	1.32	1171	1.32	1172	1.37	1173	1.32	1174	1.32
1175	1.37	1176	1.32	1177	1.16	1178	1.11	1179	0.94
1180	0.78	1181	0.68	1182	0.73	1183	0.68	1184	0.68
1185	0.68	1186	0.73	1187	0.68	1188	0.68	1189	0.57
1190	0.46	1191	0.30	1192	0.20	1193	0.09	1194	0.09
1195	0.09	1196	0.09	1197	0.09	1198	0.09	1199	0.14
1200	0.14	1201	0.14	1202	0.14	1203	0.14	1204	0.09
1205	0.09	1206	0.09	1207	0.09	1208	0.09	1209	0.09
1210	0.09	1211	0.09	1212	0.09	1213	0.09	1214	0.09
1215	0.09	1216	0.09	1217	0.09	1218	0.09	1219	0.14
1220	0.14	1221	0.14	1222	0.14	1223	0.14	1224	0.09
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 16C

DESCRIPTION: 2G
TOTAL AREA TO HYDROGRAPH: 9 acres
HYDROGRAPH PEAK: 25 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 2.43 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.49	200	0.49	300	0.49	400	0.49
500	0.49	600	0.56	700	0.80	800	0.80	900	1.04
1000	1.77	1050	2.48	1100	3.45	1110	5.20	1120	6.34
1130	6.42	1131	6.47	1132	6.52	1133	6.56	1134	6.61
1135	6.66	1136	6.71	1137	6.76	1138	6.81	1139	6.81
1140	6.81	1141	7.05	1142	7.30	1143	7.59	1144	7.83
1145	8.64	1146	9.42	1147	10.24	1148	11.06	1149	13.93
1150	16.84	1151	19.65	1152	22.57	1153	24.90	1154	24.90
1155	24.36	1156	23.54	1157	20.38	1158	17.23	1159	14.07
1160	10.87	1161	7.68	1162	6.86	1163	6.47	1164	6.42
1165	6.07	1166	5.68	1167	5.29	1168	4.95	1169	4.61
1170	4.22	1171	3.93	1172	3.59	1173	3.54	1174	3.54
1175	3.59	1176	3.54	1177	3.40	1178	3.35	1179	3.21
1180	3.06	1181	2.96	1182	2.87	1183	2.72	1184	2.63
1185	2.63	1186	2.63	1187	2.63	1188	2.63	1189	2.53
1190	2.38	1191	2.29	1192	2.19	1193	2.09	1194	1.95
1195	1.85	1196	1.75	1197	1.75	1198	1.75	1199	1.80

Proposed Condtion 100-year

1200	1.80	1201	1.80	1202	1.80	1203	1.80	1204	1.80
1205	1.80	1206	1.80	1207	1.75	1208	1.75	1209	1.75
1210	1.75	1211	1.75	1212	1.75	1213	1.75	1214	1.75
1215	1.75	1216	1.75	1217	1.75	1218	1.75	1219	1.80
1220	1.80	1221	1.80	1222	1.80	1223	1.80	1224	1.80
1225	1.66	1226	1.51	1227	1.32	1228	1.17	1229	1.02
1230	0.93	1231	0.88	1232	0.80	1233	0.80	1234	0.80
1235	0.80	1236	0.80	1237	0.80	1238	0.80	1239	0.80
1240	0.80	1241	0.80	1242	0.80	1243	0.80	1244	0.80
1245	0.80	1246	0.80	1247	0.78	1248	0.80	1249	0.80
1250	0.80	1251	0.80	1252	0.80	1253	0.80	1254	0.80
1255	0.80	1256	0.78	1257	0.80	1258	0.80	1259	0.80
1260	0.80	1261	0.80	1262	0.80	1263	0.80	1264	0.80
1265	0.78	1266	0.80	1267	0.80	1268	0.80	1269	0.80
1270	0.80	1271	0.80	1272	0.80	1273	0.80	1274	0.78
1275	0.80	1276	0.80	1277	0.80	1278	0.80	1279	0.80
1280	0.80	1281	0.80	1282	0.80	1283	0.80	1284	0.80
1285	0.80	1286	0.80	1287	0.80	1288	0.80	1289	0.80
1290	0.80	1291	0.78	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.76	1298	0.73	1299	0.68
1300	0.63	1310	0.49	1320	0.49	1330	0.49	1340	0.49
1350	0.49	1360	0.49	1370	0.47	1380	0.49	1390	0.49
1400	0.49	1420	0.49	1440	0.49	1460	0.00	1500	0.00

RESERVOIR ROUTING AT 18A

DESCRIPTION: 48" Outlet Pipe

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*****************************************************************************************
*      INCOMING HYDROGRAPH  PEAK (cfs):    200.82         VOLUME (acre-ft):     16.87      *
*      NO HYDROGRAPH ADJUSTMENT                                                           *
*      RUNOFF FACTOR(in):   4.60                                                          *
*      FATTENED HYDROGRAPH  PEAK (cfs):    200.82         VOLUME (acre-ft):     36.79      *
*      RESERVOIR INFLOW:    PEAK (cfs):    200.82 @ 1154  VOLUME (acre-ft):     36.79      *
*      MAXIMUM ELEVATION:   STAGE (ft):    969.50 @ 1169  VOLUME (acre-ft):      5.79      *
*      EMERGENCY SPILLWAY:   ELEV (ft):    970.00         VOLUME (acre-ft):      6.66      *
*          DIFFERENCE:   IN STAGE (ft):     -0.50      IN VOLUME (acre-ft):      0.88      *
*          NO SPILL EXPECTED.       PERCNT OF VOLUME REMAINING TO SPILLWAY:     13.1%      *
*      TOP OF DAM:           ELEV (ft):    972.00         VOLUME (acre-ft):     10.40      *
*          DIFFERENCE    IN STAGE (ft):     -2.50      IN VOLUME (acre-ft):      4.62      *
*          NO OVERTOP EXPECTED.   PERCNT OF VOLUME REMAINING TO TOP OF DAM:     44.4%      *
*      RESERVOIR OUTFLOW:   PEAK (cfs):     95.09 @ 1169  VOLUME (acre-ft):     34.72      *
*****************************************************************************************
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Hydrograph Printouts

TIME (min)	PRE-ADJ (cfs)	PRE-FAT (cfs)	INFLOW (cfs)	OUTFLOW (cfs)	ELEVATION (feet)
0	0.00	0.00	0.00	0.00	965.00
100	3.20	3.20	3.58	1.36	965.06
200	3.20	3.20	4.12	3.74	965.17
300	3.20	3.20	4.32	4.19	965.20
400	3.20	3.20	4.59	4.42	965.21
500	3.20	3.20	4.99	4.74	965.22
600	3.51	3.51	5.88	5.32	965.25
700	4.49	4.49	7.77	6.58	965.31
800	4.51	4.51	9.37	8.35	965.39
900	5.41	5.41	13.32	10.85	965.51

Proposed Condtion 100-year

TT5658A-Proposed_100yr

1000	9.20	9.20	23.98	17.31	965.81
1050	15.11	15.11	36.86	25.56	966.20
1100	24.03	24.03	58.81	38.78	966.81
1110	35.89	35.89	72.47	43.79	967.06
1120	48.03	48.03	86.47	48.91	967.35
1130	51.59	51.59	94.48	55.16	967.70
1131	52.10	52.10	95.43	55.84	967.74
1132	52.54	52.54	96.34	56.51	967.77
1133	53.06	53.06	97.32	57.20	967.81
1134	53.56	53.56	98.28	57.88	967.85
1135	54.06	54.06	99.26	58.58	967.89
1136	54.37	54.37	100.12	59.27	967.93
1137	54.58	54.58	100.91	59.97	967.97
1138	54.82	54.82	101.73	60.71	968.01
1139	55.03	55.03	102.55	61.59	968.04
1140	55.22	55.22	103.37	62.46	968.08
1141	56.43	56.43	104.87	63.34	968.11
1142	58.40	58.40	106.88	64.23	968.15
1143	60.58	60.58	109.02	65.15	968.19
1144	62.93	62.93	111.25	66.10	968.22
1145	67.68	67.68	115.03	67.09	968.26
1146	73.36	73.36	119.37	68.15	968.30
1147	78.57	78.57	123.36	69.27	968.35
1148	84.68	84.68	127.87	70.46	968.40
1149	101.39	101.39	138.93	71.79	968.45
1150	124.17	124.17	153.55	73.36	968.51
1151	145.96	145.96	167.31	75.19	968.59
1152	171.09	171.09	182.84	77.30	968.67
1153	196.25	196.25	198.08	79.68	968.77
1154	200.82	200.82	200.82	82.21	968.87
1155	194.31	194.31	196.93	84.67	968.96
1156	183.48	183.48	190.34	86.56	969.05
1157	168.53	168.53	181.12	88.05	969.13
1158	148.13	148.13	168.38	89.36	969.20
1159	133.23	133.23	158.84	90.47	969.25
1160	121.42	121.42	151.07	91.44	969.31
1161	108.98	108.98	142.79	92.27	969.35
1162	97.80	97.80	135.19	92.98	969.39
1163	87.81	87.81	128.26	93.56	969.42
1164	79.69	79.69	122.44	94.04	969.44
1165	71.94	71.94	116.79	94.42	969.46
1166	64.06	64.06	111.00	94.71	969.48
1167	56.88	56.88	105.61	94.92	969.49
1168	50.36	50.36	100.60	95.04	969.49
1169	44.90	44.90	96.26	95.09	969.50
1170	40.86	40.86	92.85	95.08	969.49
1171	38.35	38.35	90.44	95.03	969.49
1172	36.26	36.26	88.32	94.95	969.49
1173	34.33	34.33	86.31	94.83	969.48
1174	32.60	32.60	84.43	94.69	969.47
1175	31.49	31.49	82.98	94.52	969.47
1176	30.35	30.35	81.51	94.34	969.46
1177	28.68	28.68	79.68	94.13	969.45
1178	27.23	27.23	78.00	93.90	969.43
1179	25.77	25.77	76.31	93.65	969.42
1180	24.06	24.06	74.44	93.38	969.41
1181	22.70	22.70	72.83	93.08	969.39
1182	21.96	21.96	71.67	92.77	969.37
1183	21.33	21.33	70.59	92.44	969.36
1184	20.57	20.57	69.43	92.11	969.34
1185	20.08	20.08	68.46	91.76	969.32

Proposed Condtion 100-year

TIME (min)	PRE-ADJ (cfs)	PRE-FAT (cfs)	INFLOW (cfs)	OUTFLOW (cfs)	ELEVATION (feet)
1186	19.76	19.76	67.63	91.40	969.30
1187	19.34	19.34	66.73	91.04	969.28
1188	18.85	18.85	65.80	90.67	969.27
1189	18.22	18.22	64.76	90.28	969.25
1190	17.24	17.24	63.47	89.89	969.22
1191	16.15	16.15	62.10	89.48	969.20
1192	15.10	15.10	60.76	89.06	969.18
1193	14.24	14.24	59.57	88.63	969.16
1194	13.57	13.57	58.53	88.18	969.14
1195	13.16	13.16	57.69	87.73	969.11
1196	12.71	12.71	56.84	87.28	969.09
1197	12.31	12.31	56.02	86.81	969.06
1198	11.94	11.94	55.23	86.34	969.04
1199	11.74	11.74	54.59	85.87	969.02
1200	11.58	11.58	53.97	85.33	968.99
1201	11.34	11.34	53.31	84.66	968.96
1202	11.14	11.14	52.68	83.99	968.94
1203	10.94	10.94	52.06	83.32	968.91
1204	10.63	10.63	51.36	82.66	968.88
1205	10.35	10.35	50.69	81.99	968.86
1206	10.21	10.21	50.14	81.33	968.83
1207	10.06	10.06	49.59	80.66	968.80
1208	9.94	9.94	49.06	80.00	968.78
1209	9.85	9.85	48.56	79.34	968.75
1210	9.76	9.76	48.08	78.69	968.73
1211	9.69	9.69	47.61	78.04	968.70
1212	9.63	9.63	47.17	77.39	968.67
1213	9.59	9.59	46.73	76.75	968.65
1214	9.55	9.55	46.31	76.11	968.62
1215	9.52	9.52	45.90	75.48	968.60
1216	9.48	9.48	45.50	74.85	968.57
1217	9.45	9.45	45.10	74.23	968.55
1218	9.43	9.43	44.71	73.61	968.52
1219	9.56	9.56	44.46	73.00	968.50
1220	9.68	9.68	44.20	72.40	968.47
1221	9.67	9.67	43.85	71.80	968.45
1222	9.68	9.68	43.51	71.21	968.43
1223	9.70	9.70	43.19	70.62	968.40
1224	9.58	9.58	42.75	70.03	968.38
1225	9.12	9.12	42.05	69.45	968.36
1226	8.56	8.56	41.26	68.87	968.33
1227	8.02	8.02	40.49	68.28	968.31
1228	7.42	7.42	39.67	67.68	968.29
1229	6.79	6.79	38.83	67.08	968.26
1230	6.33	6.33	38.14	66.48	968.24
1231	6.14	6.14	37.67	65.88	968.21
1232	5.98	5.98	37.24	65.28	968.19
1233	5.81	5.81	36.80	64.68	968.17
1234	5.70	5.70	36.41	64.09	968.14
1235	5.60	5.60	36.04	63.50	968.12
1236	5.44	5.44	35.62	62.92	968.10
1237	5.29	5.29	35.20	62.34	968.07
1238	5.19	5.19	34.85	61.76	968.05
1239	5.16	5.16	34.55	61.19	968.03
1240	5.14	5.14	34.26	60.63	968.00
1241	5.06	5.06	33.93	60.16	967.98
1242	4.99	4.99	33.61	59.71	967.95
1243	4.93	4.93	33.29	59.26	967.93
1244	4.82	4.82	32.94	58.82	967.90
1245	4.71	4.71	32.60	58.38	967.88
1246	4.66	4.66	32.31	57.94	967.86
1247	4.62	4.62	32.03	57.50	967.83

1248	4.64	4.64	31.80	57.07	967.81
1249	4.68	4.68	31.60	56.64	967.78
1250	4.67	4.67	31.35	56.22	967.76
1251	4.65	4.65	31.10	55.79	967.73
1252	4.63	4.63	30.86	55.37	967.71
1253	4.56	4.56	30.57	54.95	967.69
1254	4.49	4.49	30.29	54.54	967.66
1255	4.48	4.48	30.06	54.13	967.64
1256	4.47	4.47	29.83	53.72	967.62

Hydrograph Printouts

TIME (min)	PRE-ADJ (cfs)	PRE-FAT (cfs)	INFLOW (cfs)	OUTFLOW (cfs)	ELEVATION (feet)
1257	4.51	4.51	29.65	53.31	967.59
1258	4.57	4.57	29.49	52.91	967.57
1259	4.58	4.58	29.29	52.51	967.55
1260	4.57	4.57	29.08	52.12	967.53
1261	4.57	4.57	28.87	51.72	967.50
1262	4.51	4.51	28.62	51.34	967.48
1263	4.45	4.45	28.37	50.95	967.46
1264	4.44	4.44	28.16	50.56	967.44
1265	4.43	4.43	27.96	50.18	967.42
1266	4.48	4.48	27.81	49.81	967.40
1267	4.55	4.55	27.69	49.43	967.38
1268	4.56	4.56	27.51	49.06	967.35
1269	4.56	4.56	27.32	48.70	967.33
1270	4.56	4.56	27.14	48.33	967.31
1271	4.50	4.50	26.91	47.97	967.29
1272	4.44	4.44	26.68	47.61	967.27
1273	4.43	4.43	26.50	47.26	967.25
1274	4.43	4.43	26.32	46.90	967.23
1275	4.47	4.47	26.19	46.55	967.21
1276	4.54	4.54	26.09	46.21	967.19
1277	4.55	4.55	25.93	45.87	967.17
1278	4.55	4.55	25.76	45.53	967.15
1279	4.55	4.55	25.60	45.19	967.14
1280	4.50	4.50	25.39	44.86	967.12
1281	4.44	4.44	25.18	44.53	967.10
1282	4.43	4.43	25.02	44.20	967.08
1283	4.48	4.48	24.91	43.87	967.06
1284	4.55	4.55	24.81	43.55	967.04
1285	4.55	4.55	24.67	43.23	967.03
1286	4.55	4.55	24.52	42.92	967.01
1287	4.55	4.55	24.37	42.51	966.99
1288	4.50	4.50	24.17	42.04	966.97
1289	4.44	4.44	23.97	41.57	966.94
1290	4.43	4.43	23.82	41.11	966.92
1291	4.42	4.42	23.68	40.66	966.90
1292	4.47	4.47	23.58	40.22	966.88
1293	4.54	4.54	23.51	39.78	966.86
1294	4.55	4.55	23.38	39.36	966.84
1295	4.55	4.55	23.24	38.94	966.82
1296	4.55	4.55	23.11	38.53	966.80
1297	4.38	4.38	22.82	38.13	966.78
1298	4.11	4.11	22.45	37.73	966.76
1299	3.88	3.88	22.12	37.33	966.75
1300	3.66	3.66	21.78	36.93	966.73
1310	3.20	3.20	20.16	33.32	966.56
1320	3.22	3.22	19.09	30.20	966.41
1330	3.20	3.20	18.09	27.56	966.29

1340	3.21	3.21	17.21	25.31	966.18
1350	3.20	3.20	16.39	23.39	966.09
1360	3.21	3.21	15.67	21.72	966.02
1370	3.20	3.20	14.99	19.79	965.93
1380	3.20	3.20	14.37	18.15	965.85
1390	3.21	3.21	13.82	16.86	965.79
1400	3.20	3.20	13.29	15.81	965.74
1420	3.21	3.21	12.38	14.28	965.67
1440	3.20	3.20	11.58	13.11	965.61
1460	3.20	3.20	10.89	12.16	965.57
1500	3.20	3.20	9.76	10.86	965.51

Stage - Storage - Discharge Curve for Reservoir at 18A

STAGE (ft)	STORAGE (ac-ft)	DISCHARGE (cfs)
965.00	0.000	0.00
966.00	0.740	21.39
967.00	1.860	42.78
968.00	3.290	60.51
969.00	4.910	85.57
970.00	6.660	104.80
971.00	8.500	121.01
972.00	10.400	135.30

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 19A

TOTAL AREA TO HYDROGRAPH: 96 acres
HYDROGRAPH PEAK: 95 cfs
TIME OF PEAK: 1169 minutes
HYDROGRAPH VOLUME: 34.72 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.36	200	3.74	300	4.19	400	4.42
500	4.74	600	5.32	700	6.58	800	8.35	900	10.85
1000	17.31	1050	25.56	1100	38.78	1110	43.79	1120	48.91
1130	55.16	1131	55.84	1132	56.51	1133	57.20	1134	57.88
1135	58.58	1136	59.27	1137	59.97	1138	60.71	1139	61.59
1140	62.46	1141	63.34	1142	64.23	1143	65.15	1144	66.10
1145	67.09	1146	68.15	1147	69.27	1148	70.46	1149	71.79
1150	73.36	1151	75.19	1152	77.30	1153	79.68	1154	82.21
1155	84.67	1156	86.56	1157	88.05	1158	89.36	1159	90.47
1160	91.44	1161	92.27	1162	92.98	1163	93.56	1164	94.04
1165	94.42	1166	94.71	1167	94.92	1168	95.04	1169	95.09
1170	95.08	1171	95.03	1172	94.95	1173	94.83	1174	94.69
1175	94.52	1176	94.34	1177	94.13	1178	93.90	1179	93.65
1180	93.38	1181	93.08	1182	92.77	1183	92.44	1184	92.11
1185	91.76	1186	91.40	1187	91.04	1188	90.67	1189	90.28
1190	89.89	1191	89.48	1192	89.06	1193	88.63	1194	88.18
1195	87.73	1196	87.28	1197	86.81	1198	86.34	1199	85.87
1200	85.33	1201	84.66	1202	83.99	1203	83.32	1204	82.66
1205	81.99	1206	81.33	1207	80.66	1208	80.00	1209	79.34
1210	78.69	1211	78.04	1212	77.39	1213	76.75	1214	76.11
1215	75.48	1216	74.85	1217	74.23	1218	73.61	1219	73.00
1220	72.40	1221	71.80	1222	71.21	1223	70.62	1224	70.03
1225	69.45	1226	68.87	1227	68.28	1228	67.68	1229	67.08
1230	66.48	1231	65.88	1232	65.28	1233	64.68	1234	64.09

1235	63.50	1236	62.92	1237	62.34	1238	61.76	1239	61.19
1240	60.63	1241	60.16	1242	59.71	1243	59.26	1244	58.82
1245	58.38	1246	57.94	1247	57.50	1248	57.07	1249	56.64
1250	56.22	1251	55.79	1252	55.37	1253	54.95	1254	54.54
1255	54.13	1256	53.72	1257	53.31	1258	52.91	1259	52.51
1260	52.12	1261	51.72	1262	51.34	1263	50.95	1264	50.56
1265	50.18	1266	49.81	1267	49.43	1268	49.06	1269	48.70
1270	48.33	1271	47.97	1272	47.61	1273	47.26	1274	46.90
1275	46.55	1276	46.21	1277	45.87	1278	45.53	1279	45.19
1280	44.86	1281	44.53	1282	44.20	1283	43.87	1284	43.55
1285	43.23	1286	42.92	1287	42.51	1288	42.04	1289	41.57
1290	41.11	1291	40.66	1292	40.22	1293	39.78	1294	39.36
1295	38.94	1296	38.53	1297	38.13	1298	37.73	1299	37.33
1300	36.93	1310	33.32	1320	30.20	1330	27.56	1340	25.31
1350	23.39	1360	21.72	1370	19.79	1380	18.15	1390	16.86
1400	15.81	1420	14.28	1440	13.11	1460	12.16	1500	10.86

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 22A

DESCRIPTION: 3C
TOTAL AREA TO HYDROGRAPH: 44 acres
HYDROGRAPH PEAK: 84 cfs
TIME OF PEAK: 1156 minutes
HYDROGRAPH VOLUME: 5.00 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.61
1000	3.09	1050	5.80	1100	9.57	1110	15.19	1120	20.15
1130	21.31	1131	21.44	1132	21.58	1133	21.72	1134	21.86
1135	22.02	1136	22.18	1137	22.35	1138	22.52	1139	22.69
1140	22.75	1141	23.33	1142	23.92	1143	24.67	1144	25.37
1145	27.36	1146	29.39	1147	31.71	1148	34.20	1149	41.75
1150	49.41	1151	57.77	1152	67.00	1153	77.08	1154	81.16
1155	83.77	1156	84.17	1157	82.56	1158	74.56	1159	65.49
1160	56.05	1161	46.55	1162	37.41	1163	33.29	1164	30.26
1165	27.31	1166	24.60	1167	21.73	1168	19.42	1169	17.60
1170	16.00	1171	14.66	1172	13.50	1173	12.19	1174	11.75
1175	11.39	1176	11.09	1177	10.51	1178	10.05	1179	9.62
1180	9.14	1181	8.69	1182	8.45	1183	8.02	1184	7.57
1185	7.22	1186	7.18	1187	6.95	1188	6.84	1189	6.54
1190	6.23	1191	5.83	1192	5.53	1193	5.23	1194	4.92
1195	4.50	1196	4.19	1197	3.85	1198	3.73	1199	3.71
1200	3.60	1201	3.51	1202	3.42	1203	3.35	1204	3.30
1205	3.27	1206	3.26	1207	3.25	1208	3.14	1209	3.13
1210	3.12	1211	3.12	1212	3.11	1213	3.10	1214	3.09
1215	3.08	1216	3.07	1217	3.07	1218	3.07	1219	3.17
1220	3.17	1221	3.18	1222	3.18	1223	3.19	1224	3.20
1225	2.89	1226	2.58	1227	2.25	1228	1.80	1229	1.43
1230	1.04	1231	0.96	1232	0.87	1233	0.79	1234	0.70
1235	0.62	1236	0.54	1237	0.50	1238	0.46	1239	0.44
1240	0.43	1241	0.42	1242	0.41	1243	0.41	1244	0.41
1245	0.41	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40

Proposed Condtion 100-year

1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 23B

DESCRIPTION: 3D
23B : Clearing Hydrograph Bank: B
TOTAL AREA TO HYDROGRAPH: 9 acres
HYDROGRAPH PEAK: 21 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.88 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.05
1000	0.64	1050	1.21	1100	1.98	1110	3.40	1120	4.31
1130	4.38	1131	4.42	1132	4.47	1133	4.51	1134	4.56
1135	4.60	1136	4.65	1137	4.69	1138	4.69	1139	4.69
1140	4.69	1141	4.92	1142	5.14	1143	5.40	1144	5.62
1145	6.37	1146	7.08	1147	7.83	1148	8.36	1149	11.00
1150	13.61	1151	16.25	1152	18.39	1153	20.57	1154	20.52
1155	20.04	1156	17.18	1157	14.24	1158	11.40	1159	8.45
1160	5.54	1161	4.79	1162	4.47	1163	4.38	1164	4.38
1165	4.01	1166	3.70	1167	3.34	1168	3.02	1169	2.71
1170	2.40	1171	2.09	1172	2.09	1173	2.04	1174	2.09
1175	2.09	1176	2.04	1177	1.96	1178	1.87	1179	1.74
1180	1.65	1181	1.51	1182	1.43	1183	1.34	1184	1.34
1185	1.29	1186	1.34	1187	1.34	1188	1.34	1189	1.21
1190	1.12	1191	1.03	1192	0.94	1193	0.81	1194	0.72
1195	0.63	1196	0.63	1197	0.63	1198	0.63	1199	0.67
1200	0.67	1201	0.67	1202	0.67	1203	0.67	1204	0.67
1205	0.67	1206	0.63	1207	0.63	1208	0.63	1209	0.63
1210	0.63	1211	0.63	1212	0.63	1213	0.63	1214	0.63
1215	0.63	1216	0.63	1217	0.63	1218	0.63	1219	0.67
1220	0.67	1221	0.67	1222	0.67	1223	0.67	1224	0.67
1225	0.54	1226	0.36	1227	0.22	1228	0.09	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00

1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 26C

DESCRIPTION: 3F
26C : Clearing Hydrograph Bank: C
TOTAL AREA TO HYDROGRAPH: 14 acres
HYDROGRAPH PEAK: 37 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 1.02 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.18	1050	1.04	1100	2.20	1110	4.40	1120	5.76
1130	5.86	1131	5.95	1132	6.04	1133	6.13	1134	6.23
1135	6.32	1136	6.32	1137	6.32	1138	6.32	1139	6.32
1140	6.32	1141	6.78	1142	7.23	1143	7.77	1144	8.22
1145	9.75	1146	10.74	1147	11.81	1148	12.81	1149	18.29
1150	22.81	1151	27.44	1152	31.98	1153	36.51	1154	31.98
1155	26.37	1156	20.26	1157	14.11	1158	8.22	1159	6.69
1160	6.04	1161	5.95	1162	5.95	1163	5.76	1164	5.76
1165	5.11	1166	4.45	1167	3.66	1168	3.07	1169	2.40
1170	2.31	1171	2.31	1172	2.40	1173	2.31	1174	2.31
1175	2.40	1176	2.31	1177	2.03	1178	1.93	1179	1.65
1180	1.37	1181	1.19	1182	1.28	1183	1.19	1184	1.19
1185	1.19	1186	1.28	1187	1.19	1188	1.19	1189	1.00
1190	0.81	1191	0.53	1192	0.34	1193	0.16	1194	0.16
1195	0.16	1196	0.16	1197	0.16	1198	0.16	1199	0.25
1200	0.25	1201	0.25	1202	0.25	1203	0.25	1204	0.16
1205	0.16	1206	0.16	1207	0.16	1208	0.16	1209	0.16
1210	0.16	1211	0.16	1212	0.16	1213	0.16	1214	0.16
1215	0.16	1216	0.16	1217	0.16	1218	0.16	1219	0.25
1220	0.25	1221	0.25	1222	0.25	1223	0.25	1224	0.16
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Proposed Condtion 100-year

TT5658A-Proposed_100yr

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: Tentative Tract No. 5658-A Proposed Conditions
Page: 15

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 30E

DESCRIPTION: 3K
30E : Clearing Hydrograph Bank: E
TOTAL AREA TO HYDROGRAPH: 8 acres
HYDROGRAPH PEAK: 16 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.59 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.10	1050	0.59	1100	1.26	1110	2.51	1120	3.29
1130	3.35	1131	3.38	1132	3.41	1133	3.45	1134	3.48
1135	3.51	1136	3.54	1137	3.58	1138	3.61	1139	3.61
1140	3.61	1141	3.78	1142	3.94	1143	4.13	1144	4.29
1145	4.84	1146	5.35	1147	5.90	1148	6.44	1149	8.37
1150	10.37	1151	12.31	1152	14.36	1153	16.02	1154	16.02
1155	15.64	1156	15.05	1157	12.82	1158	10.64	1159	8.47
1160	6.31	1161	4.20	1162	3.64	1163	3.38	1164	3.35
1165	3.11	1166	2.85	1167	2.58	1168	2.33	1169	2.09
1170	1.81	1171	1.60	1172	1.36	1173	1.33	1174	1.33
1175	1.36	1176	1.33	1177	1.23	1178	1.19	1179	1.09
1180	0.99	1181	0.92	1182	0.86	1183	0.76	1184	0.69
1185	0.69	1186	0.69	1187	0.69	1188	0.69	1189	0.62
1190	0.52	1191	0.46	1192	0.39	1193	0.32	1194	0.22
1195	0.16	1196	0.09	1197	0.09	1198	0.09	1199	0.12
1200	0.12	1201	0.12	1202	0.12	1203	0.12	1204	0.12
1205	0.12	1206	0.12	1207	0.09	1208	0.09	1209	0.09
1210	0.09	1211	0.09	1212	0.09	1213	0.09	1214	0.09
1215	0.09	1216	0.09	1217	0.09	1218	0.09	1219	0.12
1220	0.12	1221	0.12	1222	0.12	1223	0.12	1224	0.12
1225	0.02	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

RESERVOIR ROUTING AT 34A

DESCRIPTION: 36" Outlet Pipe

INCOMING HYDROGRAPH	PEAK (cfs):	197.14	VOLUME (acre-ft):	16.15	
NO HYDROGRAPH ADJUSTMENT					
RUNOFF FACTOR(in):	4.25				
FATTENED HYDROGRAPH	PEAK (cfs):	197.14	VOLUME (acre-ft):	32.93	
RESERVOIR INFLOW:	PEAK (cfs):	197.14 @ 1155	VOLUME (acre-ft):	32.93	
MAXIMUM ELEVATION:	STAGE (ft):	963.06 @ 1176	VOLUME (acre-ft):	6.38	
EMERGENCY SPILLWAY:	ELEV (ft):	966.00	VOLUME (acre-ft):	10.87	
DIFFERENCE:	IN STAGE (ft):	-2.94	IN VOLUME (acre-ft):	4.49	
NO SPILL EXPECTED.	PERCNT OF VOLUME REMAINING TO SPILLWAY:			41.3%	
TOP OF DAM:	ELEV (ft):	968.00	VOLUME (acre-ft):	14.30	
DIFFERENCE	IN STAGE (ft):	-4.94	IN VOLUME (acre-ft):	7.92	
NO OVERTOP EXPECTED.	PERCNT OF VOLUME REMAINING TO TOP OF DAM:			55.4%	
RESERVOIR OUTFLOW:	PEAK (cfs):	72.66 @ 1176	VOLUME (acre-ft):	31.08	

Hydrograph Printouts

TIME (min)	PRE-ADJ (cfs)	PRE-FAT (cfs)	INFLOW (cfs)	OUTFLOW (cfs)	ELEVATION (feet)
0	0.00	0.00	0.00	0.00	957.00
100	2.96	2.96	3.28	1.19	957.09
200	2.97	2.97	3.73	3.38	957.24
300	2.96	2.96	3.89	3.78	957.27
400	2.96	2.96	4.12	3.97	957.29
500	2.97	2.97	4.45	4.24	957.31
600	3.23	3.23	5.20	4.72	957.34
700	4.08	4.08	6.81	5.77	957.42
800	4.13	4.13	8.17	7.27	957.52
900	5.04	5.04	11.61	9.39	957.68
1000	9.33	9.33	21.57	14.82	958.07
1050	14.85	14.85	32.92	21.74	958.56
1100	23.40	23.40	52.44	32.42	959.33
1110	34.00	34.00	64.79	36.30	959.61
1120	46.89	46.89	79.12	41.67	960.00
1130	50.23	50.23	86.33	46.85	960.43
1131	50.41	50.41	86.97	47.40	960.47
1132	50.70	50.70	87.70	47.96	960.52
1133	51.10	51.10	88.53	48.52	960.56
1134	51.55	51.55	89.40	49.08	960.61
1135	52.03	52.03	90.30	49.65	960.66
1136	52.45	52.45	91.16	50.22	960.70
1137	52.81	52.81	91.99	50.80	960.75
1138	53.11	53.11	92.78	51.38	960.80
1139	53.34	53.34	93.53	51.96	960.85
1140	53.54	53.54	94.27	52.55	960.90
1141	54.14	54.14	95.30	53.13	960.94
1142	55.14	55.14	96.63	53.73	960.99
1143	56.77	56.77	98.40	54.21	961.04
1144	58.84	58.84	100.48	54.69	961.09
1145	62.23	62.23	103.48	55.19	961.14
1146	66.38	66.38	106.97	55.72	961.19
1147	71.69	71.69	111.23	56.28	961.25
1148	77.61	77.61	115.87	56.89	961.31
1149	88.42	88.42	123.76	57.55	961.38
1150	103.61	103.61	134.49	58.30	961.46
1151	124.29	124.29	148.72	59.18	961.55
1152	148.13	148.13	164.83	60.21	961.65

1153	172.72	172.72	181.18	61.40	961.77
1154	188.87	188.87	191.78	62.72	961.90
1155	197.14	197.14	197.14	64.03	962.04
1156	195.47	195.47	196.06	65.16	962.17
1157	184.72	184.72	189.02	66.25	962.30
1158	166.38	166.38	176.89	67.25	962.42
1159	146.85	146.85	163.76	68.13	962.52
1160	127.90	127.90	150.84	68.89	962.61
1161	112.16	112.16	139.91	69.54	962.69
1162	98.47	98.47	130.21	70.10	962.75
1163	87.36	87.36	122.16	70.58	962.81
1164	77.83	77.83	115.10	70.99	962.86
1165	69.77	69.77	108.99	71.34	962.90
1166	62.97	62.97	103.69	71.64	962.93
1167	57.14	57.14	99.02	71.89	962.96
1168	51.79	51.79	94.66	72.11	962.99
1169	46.76	46.76	90.49	72.27	963.01
1170	42.29	42.29	86.70	72.39	963.02
1171	38.46	38.46	83.33	72.48	963.04
1172	35.40	35.40	80.50	72.55	963.05
1173	33.01	33.01	78.16	72.59	963.05
1174	31.31	31.31	76.30	72.63	963.06
1175	29.94	29.94	74.69	72.65	963.06
1176	28.70	28.70	73.18	72.66	963.06
1177	27.53	27.53	71.71	72.66	963.06
1178	26.51	26.51	70.37	72.64	963.06
1179	25.39	25.39	68.96	72.62	963.06
1180	24.23	24.23	67.51	72.59	963.05
1181	23.01	23.01	66.03	72.55	963.05
1182	21.99	21.99	64.71	72.50	963.04
1183	20.99	20.99	63.39	72.44	963.03
1184	20.20	20.20	62.25	72.37	963.02
1185	19.54	19.54	61.21	72.29	963.01

Hydrograph Printouts

TIME (min)	PRE-ADJ (cfs)	PRE-FAT (cfs)	INFLOW (cfs)	OUTFLOW (cfs)	ELEVATION (feet)
1186	19.06	19.06	60.31	72.21	963.00
1187	18.57	18.57	59.42	72.10	962.99
1188	18.20	18.20	58.62	71.99	962.98
1189	17.71	17.71	57.74	71.87	962.96
1190	17.17	17.17	56.82	71.75	962.95
1191	16.47	16.47	55.79	71.62	962.93
1192	15.69	15.69	54.69	71.48	962.92
1193	14.80	14.80	53.52	71.33	962.90
1194	14.04	14.04	52.45	71.17	962.88
1195	13.37	13.37	51.46	71.01	962.86
1196	12.81	12.81	50.56	70.84	962.84
1197	12.35	12.35	49.75	70.66	962.82
1198	11.93	11.93	48.97	70.48	962.80
1199	11.60	11.60	48.27	70.29	962.78
1200	11.26	11.26	47.57	70.10	962.75
1201	10.98	10.98	46.93	69.91	962.73
1202	10.75	10.75	46.33	69.71	962.71
1203	10.58	10.58	45.78	69.51	962.68
1204	10.39	10.39	45.23	69.30	962.66
1205	10.26	10.26	44.73	69.09	962.64
1206	10.12	10.12	44.23	68.88	962.61
1207	10.00	10.00	43.75	68.67	962.59
1208	9.91	9.91	43.30	68.46	962.56

1209	9.84	9.84	42.87	68.24	962.54
1210	9.78	9.78	42.46	68.02	962.51
1211	9.73	9.73	42.07	67.80	962.48
1212	9.69	9.69	41.68	67.58	962.46
1213	9.65	9.65	41.30	67.36	962.43
1214	9.61	9.61	40.93	67.13	962.41
1215	9.59	9.59	40.58	66.91	962.38
1216	9.57	9.57	40.23	66.68	962.35
1217	9.56	9.56	39.90	66.45	962.33
1218	9.55	9.55	39.57	66.23	962.30
1219	9.60	9.60	39.30	66.00	962.27
1220	9.61	9.61	39.00	65.77	962.25
1221	9.65	9.65	38.73	65.54	962.22
1222	9.70	9.70	38.47	65.31	962.19
1223	9.74	9.74	38.21	65.08	962.16
1224	9.72	9.72	37.91	64.85	962.14
1225	9.56	9.56	37.49	64.61	962.11
1226	9.35	9.35	37.03	64.38	962.08
1227	9.02	9.02	36.47	64.15	962.06
1228	8.62	8.62	35.85	63.91	962.03
1229	8.13	8.13	35.16	63.66	962.00
1230	7.67	7.67	34.51	63.36	961.97
1231	7.22	7.22	33.86	63.05	961.94
1232	6.74	6.74	33.19	62.74	961.91
1233	6.33	6.33	32.57	62.42	961.87
1234	5.95	5.95	32.00	62.11	961.84
1235	5.61	5.61	31.45	61.78	961.81
1236	5.27	5.27	30.91	61.46	961.78
1237	5.03	5.03	30.46	61.14	961.74
1238	4.83	4.83	30.04	60.81	961.71
1239	4.74	4.74	29.72	60.48	961.68
1240	4.63	4.63	29.39	60.16	961.64
1241	4.54	4.54	29.09	59.83	961.61
1242	4.49	4.49	28.82	59.51	961.58
1243	4.44	4.44	28.55	59.18	961.54
1244	4.35	4.35	28.25	58.86	961.51
1245	4.31	4.31	28.00	58.53	961.48
1246	4.26	4.26	27.74	58.21	961.45
1247	4.20	4.20	27.48	57.88	961.41
1248	4.20	4.20	27.27	57.56	961.38
1249	4.18	4.18	27.04	57.24	961.35
1250	4.17	4.17	26.83	56.92	961.32
1251	4.18	4.18	26.64	56.60	961.28
1252	4.18	4.18	26.44	56.29	961.25
1253	4.14	4.14	26.21	55.97	961.22
1254	4.13	4.13	26.01	55.65	961.19
1255	4.11	4.11	25.81	55.34	961.16
1256	4.09	4.09	25.59	55.03	961.12

Hydrograph Printouts

TIME (min)	PRE-ADJ (cfs)	PRE-FAT (cfs)	INFLOW (cfs)	OUTFLOW (cfs)	ELEVATION (feet)
1257	4.11	4.11	25.43	54.72	961.09
1258	4.11	4.11	25.24	54.41	961.06
1259	4.11	4.11	25.07	54.10	961.03
1260	4.14	4.14	24.91	53.78	961.00
1261	4.15	4.15	24.75	53.38	960.96
1262	4.11	4.11	24.54	52.98	960.93
1263	4.11	4.11	24.38	52.58	960.90
1264	4.10	4.10	24.19	52.19	960.87

Proposed Condtion 100-year

1265	4.08	4.08	24.01	51.80	960.83
1266	4.11	4.11	23.87	51.41	960.80
1267	4.10	4.10	23.70	51.02	960.77
1268	4.11	4.11	23.55	50.64	960.74
1269	4.13	4.13	23.41	50.26	960.71
1270	4.15	4.15	23.27	49.89	960.68
1271	4.11	4.11	23.08	49.51	960.65
1272	4.11	4.11	22.93	49.14	960.62
1273	4.10	4.10	22.77	48.78	960.59
1274	4.08	4.08	22.60	48.41	960.56
1275	4.11	4.11	22.48	48.05	960.53
1276	4.10	4.10	22.33	47.70	960.50
1277	4.11	4.11	22.20	47.34	960.47
1278	4.13	4.13	22.08	46.99	960.44
1279	4.15	4.15	21.95	46.64	960.41
1280	4.11	4.11	21.78	46.30	960.38
1281	4.11	4.11	21.65	45.95	960.35
1282	4.10	4.10	21.50	45.61	960.32
1283	4.12	4.12	21.39	45.28	960.30
1284	4.11	4.11	21.25	44.94	960.27
1285	4.12	4.12	21.12	44.61	960.24
1286	4.14	4.14	21.01	44.28	960.21
1287	4.15	4.15	20.90	43.96	960.19
1288	4.11	4.11	20.74	43.64	960.16
1289	4.11	4.11	20.62	43.32	960.13
1290	4.10	4.10	20.48	43.00	960.11
1291	4.08	4.08	20.34	42.68	960.08
1292	4.11	4.11	20.25	42.37	960.06
1293	4.10	4.10	20.12	42.06	960.03
1294	4.11	4.11	20.02	41.75	960.01
1295	4.13	4.13	19.92	41.39	959.98
1296	4.15	4.15	19.82	41.00	959.95
1297	4.02	4.02	19.59	40.62	959.92
1298	3.96	3.96	19.43	40.24	959.90
1299	3.82	3.82	19.19	39.87	959.87
1300	3.67	3.67	18.94	39.50	959.84
1310	3.01	3.01	17.30	36.03	959.59
1320	2.97	2.97	16.34	32.89	959.37
1330	2.97	2.97	15.50	30.12	959.17
1340	2.97	2.97	14.75	27.64	958.99
1350	2.97	2.97	14.07	24.97	958.80
1360	2.97	2.97	13.45	22.71	958.63
1370	2.94	2.94	12.85	20.79	958.50
1380	2.97	2.97	12.35	19.14	958.38
1390	2.97	2.97	11.88	17.73	958.28
1400	2.97	2.97	11.44	16.51	958.19
1420	2.97	2.97	10.66	14.58	958.05
1440	2.97	2.97	9.99	12.72	957.92
1460	2.38	2.38	8.84	11.19	957.81
1500	2.38	2.38	7.89	9.20	957.66

Hydrograph Printouts

Stage - Storage - Discharge Curve for Reservoir at 34A

STAGE (ft)	STORAGE (ac-ft)	DISCHARGE (cfs)
957.00	0.000	0.00
958.00	0.550	13.89
959.00	1.390	27.79
960.00	2.450	41.68
961.00	3.640	53.81
962.00	4.920	63.67

963.00	6.290	72.20
964.00	7.740	79.82
965.00	9.270	86.77
966.00	10.870	93.21
967.00	12.540	99.23
968.00	14.300	104.90

HYDROGRAPH PRINTOUT AT: 35A

TOTAL AREA TO HYDROGRAPH: 93 acres
HYDROGRAPH PEAK: 73 cfs
TIME OF PEAK: 1176 minutes
HYDROGRAPH VOLUME: 31.08 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.19	200	3.38	300	3.78	400	3.97
500	4.24	600	4.72	700	5.77	800	7.27	900	9.39
1000	14.82	1050	21.74	1100	32.42	1110	36.30	1120	41.67
1130	46.85	1131	47.40	1132	47.96	1133	48.52	1134	49.08
1135	49.65	1136	50.22	1137	50.80	1138	51.38	1139	51.96
1140	52.55	1141	53.13	1142	53.73	1143	54.21	1144	54.69
1145	55.19	1146	55.72	1147	56.28	1148	56.89	1149	57.55
1150	58.30	1151	59.18	1152	60.21	1153	61.40	1154	62.72
1155	64.03	1156	65.16	1157	66.25	1158	67.25	1159	68.13
1160	68.89	1161	69.54	1162	70.10	1163	70.58	1164	70.99
1165	71.34	1166	71.64	1167	71.89	1168	72.11	1169	72.27
1170	72.39	1171	72.48	1172	72.55	1173	72.59	1174	72.63
1175	72.65	1176	72.66	1177	72.66	1178	72.64	1179	72.62
1180	72.59	1181	72.55	1182	72.50	1183	72.44	1184	72.37
1185	72.29	1186	72.21	1187	72.10	1188	71.99	1189	71.87
1190	71.75	1191	71.62	1192	71.48	1193	71.33	1194	71.17
1195	71.01	1196	70.84	1197	70.66	1198	70.48	1199	70.29
1200	70.10	1201	69.91	1202	69.71	1203	69.51	1204	69.30
1205	69.09	1206	68.88	1207	68.67	1208	68.46	1209	68.24
1210	68.02	1211	67.80	1212	67.58	1213	67.36	1214	67.13
1215	66.91	1216	66.68	1217	66.45	1218	66.23	1219	66.00
1220	65.77	1221	65.54	1222	65.31	1223	65.08	1224	64.85
1225	64.61	1226	64.38	1227	64.15	1228	63.91	1229	63.66
1230	63.36	1231	63.05	1232	62.74	1233	62.42	1234	62.11
1235	61.78	1236	61.46	1237	61.14	1238	60.81	1239	60.48
1240	60.16	1241	59.83	1242	59.51	1243	59.18	1244	58.86
1245	58.53	1246	58.21	1247	57.88	1248	57.56	1249	57.24
1250	56.92	1251	56.60	1252	56.29	1253	55.97	1254	55.65
1255	55.34	1256	55.03	1257	54.72	1258	54.41	1259	54.10
1260	53.78	1261	53.38	1262	52.98	1263	52.58	1264	52.19
1265	51.80	1266	51.41	1267	51.02	1268	50.64	1269	50.26
1270	49.89	1271	49.51	1272	49.14	1273	48.78	1274	48.41
1275	48.05	1276	47.70	1277	47.34	1278	46.99	1279	46.64
1280	46.30	1281	45.95	1282	45.61	1283	45.28	1284	44.94
1285	44.61	1286	44.28	1287	43.96	1288	43.64	1289	43.32
1290	43.00	1291	42.68	1292	42.37	1293	42.06	1294	41.75
1295	41.39	1296	41.00	1297	40.62	1298	40.24	1299	39.87
1300	39.50	1310	36.03	1320	32.89	1330	30.12	1340	27.64
1350	24.97	1360	22.71	1370	20.79	1380	19.14	1390	17.73
1400	16.51	1420	14.58	1440	12.72	1460	11.19	1500	9.20

Proposed Condtion 100-year


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Model Lines
-----------------------------------------------------------------------------------------------------
005     1  001A Header place holder
005     1  003A Header place holder
005     1  006B Header place holder
005     1  008C Header place holder
005     1  016C Header place holder
005     1  018A Header place holder
005     1  019A Header place holder
005     1  022A Header place holder
005     1  023B Header place holder
005     1  026C Header place holder
005     1  030E Header place holder
005     1  034A Header place holder
005     1  035A Header place holder
999
999
006     1  001A 010000000806A97200533008369                    G1
006     1  002A 010000001205A97200873005846
006     1  003A 020000001412A97201040003641                 1
006     1  004A 020038000705A97
006     1  005A 010      099A97
006     1  006B 010000001708A97401345007168                 1
006     1  007B 020038001405A97
006     1  008C 020000000805A97400026004348                 1
006     1  009D 020038000705A97
006     1  010CD010         A97400177016890                  1
006     1  011C 010      099A97
006     1  012BC010         A97
006     1  013B 010      099A97
006     1  014AB010         A97400215009066                  1
006     1  015A 010      099A97
006     1  016C 010038000908A97400238004624                 1
006     1  017AC010         A97                              1
006     1  018A 010      099A97                              1
110
111  970.00    1.00000    4.60
112  965.00  966.00  967.00  968.00  969.00  970.00  971.00  972.00
113   0.000   0.740   1.860   3.290   4.910   6.660   8.500  10.400
114    0.00   21.39   42.78   60.51   85.57  104.80  121.01  135.30
110
006     1  019A 010      099A97                              1
006     1  020A 010000000705A97200634005553                   A
006     1  021A 010000001013A97200426003135
006     1  022A 010000002709A97200257007551                 1
006     1  023B 010000000907A97                              1 B
006     1  024AB010         A97400630003162                  1
006     1  025A 020069001205A97
006     1  026C 020000001405A97400314005654                 1 C
006     1  027C 010      099A97
006     1  028AC010         A97400432000288
006     1  029A 010      099A97
006     1  030E 020000000808A97400102001220                 1 E
006     1  031AE010         A97400091010788
006     1  032F 020069000605A97
006     1  033AF010         A97
006     1  034A 010      099A97                              1
110
111  966.00    1.00000    4.25
112  957.00  958.00  959.00  960.00  961.00  962.00  963.00  964.00  965.00  966.00
112  967.00  968.00
113   0.000   0.550   1.390   2.450   3.640   4.920   6.290   7.740   9.270  10.870
113  12.540  14.300
114    0.00   13.89   27.79   41.68   53.81   63.67   72.20   79.82   86.77   93.21
114   99.23  104.90
110
006     1  035A 010      099A97                              1  2
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Proposed Condtion 100-year

TT5658A-Proposed_100yr

999

East Basin

	Existing Conditions		Proposed Conditions		
East Basin	Inflow		Inflow		
Qpeak (cfs)	105.02	198.78	122.19	200.82	200.82
Time (min)	Q_{10} (cfs)	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	$Q_{100\ (fatten)}$
0	0	0	0	0	0
100	0.8	0.8	2.56	3.2	3.58
200	0.8	0.8	2.56	3.2	4.12
300	0.8	0.8	2.56	3.2	4.32
400	0.8	0.8	2.56	3.2	4.59
500	0.8	0.8	2.56	3.2	4.99
600	0.8	0.8	2.71	3.51	5.88
700	0.8	0.8	3.35	4.49	7.77
800	0.8	0.8	3.35	4.51	9.37
900	0.8	0.8	3.35	4.51	9.37
1000	0.8	0.88	3.91	5.41	13.32
1050	0.8	2.94	4.93	9.2	23.98
1100	1.15	9.31	6.43	15.11	36.86
1110	4.47	19.04	10.57	24.03	58.81
1120	9.55	30.06	17.73	35.89	72.47
1130	9.55	30.06	17.73	35.89	72.47
1131	17.74	43.54	25.16	48.03	86.47
1132	22.91	49.22	27.86	51.59	94.48
1133	23.18	49.51	28.21	52.1	95.43
1134	23.46	49.81	28.48	52.54	96.34
1135	23.72	50.13	28.79	53.06	97.32
1136	23.72	50.13	28.79	53.06	97.32
1137	23.98	50.44	29.08	53.56	98.28
1138	24.2	50.77	29.38	54.06	99.26
1139	24.41	51.12	29.57	54.37	100.12
1140	24.6	51.48	29.69	54.58	100.91
1141	24.78	51.85	29.82	54.82	101.73
1142	24.78	51.85	29.82	54.82	101.73
1143	25.05	52.25	30.13	55.03	102.55
1144	25.22	52.66	30.4	55.22	103.37
1145	25.66	53.54	31.09	56.43	104.87
1146	26.21	54.41	32.52	58.4	106.88
1147	26.71	55.47	33.9	60.58	109.02
1148	26.71	55.47	33.9	60.58	109.02
1149	27.42	56.66	35.27	62.93	111.25
1150	28.78	59.32	38.33	67.68	115.03
1151	30.21	62.12	42.17	73.36	119.37
1152	31.87	65.64	45.48	78.57	123.36
1153	33.87	69.97	49.33	84.68	127.87
1154	33.87	69.97	49.33	84.68	127.87
1155	38.59	79.97	59.7	101.39	138.93
1156	43.58	91.48	74.05	124.17	153.55
1157	49.58	105.67	87.79	145.96	167.31

East Basin

1158	57.45	123.59	103.54	171.09	182.84
1159	66.53	144.07	119.47	196.25	198.08
1160	66.53	144.07	119.47	196.25	198.08
1161	74.61	161.68	122.19	200.82	200.82
1162	82.85	177.45	117.65	194.31	196.93
1163	90.35	189.52	110.42	183.48	190.34
1164	96.73	196.71	101.55	168.53	181.12
1165	101.47	198.78	89.62	148.13	168.38
1166	101.47	198.78	89.62	148.13	168.38
1167	104.1	191.68	80.91	133.23	158.84
1168	105.02	179.25	74.38	121.42	151.07
1169	104.07	160.45	67.63	108.98	142.79
1170	100.73	139.05	61.1	97.8	135.19
1171	94.15	117.21	54.92	87.81	128.26
1172	94.15	117.21	54.92	87.81	128.26
1173	86.07	99.71	49.95	79.69	122.44
1174	76.58	83.99	45	71.94	116.79
1175	65.46	73.06	39.54	64.06	111
1176	54.63	64.78	34.67	56.88	105.61
1177	46.03	58.29	30.42	50.36	100.6
1178	46.03	58.29	30.42	50.36	100.6
1179	38.55	53.01	26.29	44.9	96.26
1180	32.43	48.32	23.38	40.86	92.85
1181	28.3	44.32	21.72	38.35	90.44
1182	25.06	40.65	20.15	36.26	88.32
1183	22.39	37.16	18.63	34.33	86.31
1184	22.39	37.16	18.63	34.33	86.31
1185	20.16	33.92	17.54	32.6	84.43
1186	18.11	31.36	16.73	31.49	82.98
1187	16.34	28.93	15.9	30.35	81.51
1188	14.5	27.02	14.95	28.68	79.68
1189	12.73	25.46	13.97	27.23	78
1190	12.73	25.46	13.97	27.23	78
1191	11.33	24.07	13.01	25.77	76.31
1192	10.06	22.81	12.01	24.06	74.44
1193	8.84	21.59	11.19	22.7	72.83
1194	7.89	20.57	10.59	21.96	71.67
1195	7.21	19.5	10.23	21.33	70.59
1196	7.21	19.5	10.23	21.33	70.59
1197	6.47	18.41	9.88	20.57	69.43
1198	5.76	17.42	9.5	20.08	68.46
1199	5.2	16.57	9.18	19.76	67.63
1200	4.67	15.79	8.89	19.34	66.73
1201	4.24	15.01	8.55	18.85	65.8
1202	4.24	15.01	8.55	18.85	65.8
1203	3.9	14.24	8.18	18.22	64.76
1204	3.59	13.5	7.82	17.24	63.47

East Basin

1205	3.32	12.85	7.4	16.15	62.1
1206	3.11	12.13	6.98	15.1	60.76
1207	2.91	11.45	6.56	14.24	59.57
1208	2.91	11.45	6.56	14.24	59.57
1209	2.73	10.71	6.22	13.57	58.53
1210	2.57	10	6.04	13.16	57.69
1211	2.43	9.21	5.88	12.71	56.84
1212	2.3	8.47	5.76	12.31	56.02
1213	2.18	7.69	5.72	11.94	55.23
1214	2.18	7.69	5.72	11.94	55.23
1215	2.06	7.22	5.64	11.74	54.59
1216	1.96	6.65	5.51	11.58	53.97
1217	1.85	6.19	5.5	11.34	53.31
1218	1.75	5.78	5.44	11.14	52.68
1219	1.66	5.44	5.31	10.94	52.06
1220	1.66	5.44	5.31	10.94	52.06
1221	1.56	5.14	5.31	10.63	51.36
1222	1.47	4.88	5.26	10.35	50.69
1223	1.4	4.66	5.16	10.21	50.14
1224	1.33	4.46	5.18	10.06	49.59
1225	1.26	4.3	5.16	9.94	49.06
1226	1.26	4.3	5.16	9.94	49.06
1227	1.2	4.11	5.07	9.85	48.56
1228	1.15	3.99	5.1	9.76	48.08
1229	1.1	3.83	5.09	9.69	47.61
1230	1.07	3.73	5	9.63	47.17
1231	1.04	3.63	5.05	9.59	46.73
1232	1.04	3.63	5.05	9.59	46.73
1233	1.01	3.55	5.04	9.55	46.31
1234	0.98	3.48	4.96	9.52	45.9
1235	0.96	3.41	5.01	9.48	45.5
1236	0.94	3.36	5.01	9.45	45.1
1237	0.92	3.32	4.94	9.43	44.71
1238	0.92	3.32	4.94	9.43	44.71
1239	0.91	3.39	4.99	9.56	44.46
1240	0.89	3.36	4.99	9.68	44.2
1241	0.88	3.33	4.92	9.67	43.85
1242	0.87	3.32	4.91	9.68	43.51
1243	0.86	3.34	4.91	9.7	43.19
1244	0.86	3.34	4.91	9.7	43.19
1245	0.85	3.35	4.91	9.58	42.75
1246	0.84	3.04	4.77	9.12	42.05
1247	0.84	2.87	4.5	8.56	41.26
1248	0.83	2.88	4.27	8.02	40.49
1249	0.83	2.86	4.04	7.42	39.67
1250	0.83	2.86	4.04	7.42	39.67
1251	0.82	2.78	3.7	6.79	38.83

East Basin

1252	0.82	2.66	3.52	6.33	38.14
1253	0.82	2.57	3.53	6.14	37.67
1254	0.82	2.5	3.42	5.98	37.24
1255	0.81	2.44	3.32	5.81	36.8
1256	0.81	2.44	3.32	5.81	36.8
1257	0.81	2.36	3.36	5.7	36.41
1258	0.81	2.28	3.37	5.6	36.04
1259	0.81	2.18	3.3	5.44	35.62
1260	0.81	2.08	3.35	5.29	35.2
1261	0.81	1.97	3.36	5.19	34.85
1262	0.81	1.97	3.36	5.19	34.85
1263	0.81	1.85	3.3	5.16	34.55
1264	0.8	1.74	3.35	5.14	34.26
1265	0.8	1.64	3.36	5.06	33.93
1266	0.8	1.54	3.3	4.99	33.61
1267	0.8	1.45	3.35	4.93	33.29
1268	0.8	1.45	3.35	4.93	33.29
1269	0.8	1.37	3.43	4.82	32.94
1270	0.8	1.3	3.37	4.71	32.6
1271	0.8	1.23	3.36	4.66	32.31
1272	0.8	1.18	3.43	4.62	32.03
1273	0.8	1.12	3.37	4.64	31.8
1274	0.8	1.12	3.37	4.64	31.8
1275	0.8	1.08	3.31	4.68	31.6
1276	0.8	1.04	3.36	4.67	31.35
1277	0.8	1.01	3.37	4.65	31.1
1278	0.8	0.98	3.3	4.63	30.86
1279	0.8	0.95	3.35	4.56	30.57
1280	0.8	0.95	3.35	4.56	30.57
1281	0.8	0.93	3.36	4.49	30.29
1282	0.8	0.91	3.3	4.48	30.06
1283	0.8	0.9	3.35	4.47	29.83
1284	0.8	0.88	3.36	4.51	29.65
1285	0.8	0.87	3.3	4.57	29.49
1286	0.8	0.87	3.3	4.57	29.49
1287	0.8	0.86	3.35	4.58	29.29
1288	0.8	0.85	3.43	4.57	29.08
1289	0.8	0.85	3.37	4.57	28.87
1290	0.8	0.84	3.36	4.51	28.62
1291	0.8	0.84	3.43	4.45	28.37
1292	0.8	0.84	3.43	4.45	28.37
1293	0.8	0.83	3.37	4.44	28.16
1294	0.8	0.83	3.31	4.43	27.96
1295	0.8	0.82	3.36	4.48	27.81
1296	0.8	0.82	3.37	4.55	27.69
1297	0.8	0.82	3.3	4.56	27.51
1298	0.8	0.82	3.3	4.56	27.51

East Basin

1299	0.8	0.82	3.35	4.56	27.32
1300	0.8	0.81	3.36	4.56	27.14
1310	0.8	0.81	3.3	4.5	26.91
1320	0.8	0.81	3.35	4.44	26.68
1330	0.8	0.81	3.36	4.43	26.5
1340	0.8	0.81	3.36	4.43	26.5
1350	0.8	0.81	3.3	4.43	26.32
1360	0.8	0.81	3.35	4.47	26.19
1370	0.8	0.81	3.36	4.54	26.09
1380	0.8	0.81	3.3	4.55	25.93
1390	0.8	0.8	3.35	4.55	25.76
1400	0.8	0.8	3.35	4.55	25.76
1420	0.8	0.8	3.43	4.55	25.6
1440	0.8	0.8	3.37	4.5	25.39
1460	0.8	0.8	3.36	4.44	25.18
1500	0.8	0.8	3.43	4.43	25.02

West Basin

	Existing Conditions		Proposed Conditions		
West Basin	Inflow		Inflow		
Qpeak (cfs)	90.68	159.27	121.28	197.14	197.14
Time (min)	Q_{10} (cfs)	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	$Q_{100\ (fatten)}$
0	0	0	0	0	0
100	0.4	0.4	2.32	2.96	3.28
200	0.4	0.4	2.32	2.97	3.73
300	0.4	0.4	2.32	2.96	3.89
400	0.4	0.4	2.32	2.96	4.12
500	0.4	0.4	2.32	2.97	4.45
600	0.4	0.4	2.5	3.23	5.2
700	0.4	0.4	3.08	4.08	6.81
800	0.4	0.4	3.08	4.08	6.81
900	0.4	0.4	3.11	4.13	8.17
1000	0.4	0.59	3.57	5.04	11.61
1050	0.4	3.34	4.49	9.33	21.57
1100	1.31	8.22	6.45	14.85	32.92
1110	4.6	15	10.57	23.4	52.44
1120	4.6	15	10.57	23.4	52.44
1130	10.26	24.44	16.66	34	64.79
1131	15.86	33.72	24.85	46.89	79.12
1132	18.08	36.56	27.41	50.23	86.33
1133	18.26	36.82	27.53	50.41	86.97
1134	18.44	37.11	27.7	50.7	87.7
1135	18.44	37.11	27.7	50.7	87.7
1136	18.62	37.42	27.93	51.1	88.53
1137	18.81	37.77	28.19	51.55	89.4
1138	19	38.13	28.45	52.03	90.3
1139	19.19	38.51	28.68	52.45	91.16
1140	19.38	38.7	28.89	52.81	91.99
1141	19.38	38.7	28.89	52.81	91.99
1142	19.48	38.89	29.05	53.11	92.78
1143	19.76	39.04	29.25	53.34	93.53
1144	19.84	39.15	29.43	53.54	94.27
1145	20.48	40.26	29.85	54.14	95.3
1146	21.32	41.39	30.55	55.14	96.63
1147	21.32	41.39	30.55	55.14	96.63
1148	22.02	42.92	31.53	56.77	98.4
1149	23.05	44.51	32.82	58.84	100.48
1150	25.48	48.65	34.88	62.23	103.48
1151	27.71	52.88	37.43	66.38	106.97
1152	30.41	56.93	40.69	71.69	111.23
1153	30.41	56.93	40.69	71.69	111.23
1154	32.96	61.55	44.51	77.61	115.87
1155	40.79	75.8	51.2	88.42	123.76
1156	49.33	91.89	60.31	103.61	134.49
1157	58.93	108.43	72.85	124.29	148.72

West Basin

1158	69.17	128	87.86	148.13	164.83
1159	69.17	128	87.86	148.13	164.83
1160	80.26	148.27	103.85	172.72	181.18
1161	86.33	159.27	115.05	188.87	191.78
1162	90.68	156.98	121.28	197.14	197.14
1163	87.31	147.36	120.68	195.47	196.06
1164	81.5	132.13	114.12	184.72	189.02
1165	81.5	132.13	114.12	184.72	189.02
1166	73.44	113.44	103.2	166.38	176.89
1167	63.2	92.97	91.9	146.85	163.76
1168	51.71	80.99	80.74	127.9	150.84
1169	45.27	71.37	70.99	112.16	139.91
1170	39.87	64.85	62.26	98.47	130.21
1171	39.87	64.85	62.26	98.47	130.21
1172	36.04	59.71	54.9	87.36	122.16
1173	33.55	55.5	48.6	77.83	115.1
1174	30.78	50.46	43.09	69.77	108.99
1175	28.26	45.65	38.3	62.97	103.69
1176	25.89	40.63	34.31	57.14	99.02
1177	25.89	40.63	34.31	57.14	99.02
1178	23.17	35.94	30.74	51.79	94.66
1179	20.43	31.78	27.3	46.76	90.49
1180	17.85	27.61	24.42	42.29	86.7
1181	15.15	25.5	21.84	38.46	83.33
1182	13.49	23.65	19.73	35.4	80.5
1183	13.49	23.65	19.73	35.4	80.5
1184	12.02	22.1	18.03	33.01	78.16
1185	10.79	20.98	16.75	31.31	76.3
1186	9.85	20.13	15.73	29.94	74.69
1187	9.28	19.48	14.92	28.7	73.18
1188	8.33	18.29	14.09	27.53	71.71
1189	8.33	18.29	14.09	27.53	71.71
1190	7.5	17.37	13.42	26.51	70.37
1191	6.75	16.42	12.72	25.39	68.96
1192	6.2	15.23	12.06	24.23	67.51
1193	5.55	14.05	11.4	23.01	66.03
1194	5.14	13.29	10.82	21.99	64.71
1195	5.14	13.29	10.82	21.99	64.71
1196	4.74	12.73	10.33	20.99	63.39
1197	4.35	12.05	9.92	20.2	62.25
1198	3.96	11.65	9.58	19.54	61.21
1199	3.62	11.52	9.28	19.06	60.31
1200	3.37	11.23	8.99	18.57	59.42
1201	3.37	11.23	8.99	18.57	59.42
1202	3.16	10.8	8.68	18.2	58.62
1203	2.98	10.23	8.38	17.71	57.74
1204	2.83	9.65	8.06	17.17	56.82

West Basin

1205	2.7	9.02	7.71	16.47	55.79
1206	2.57	8.12	7.42	15.69	54.69
1207	2.57	8.12	7.42	15.69	54.69
1208	2.41	7.4	7.05	14.8	53.52
1209	2.21	6.63	6.75	14.04	52.45
1210	2	6.24	6.42	13.37	51.46
1211	1.78	5.87	6.14	12.81	50.56
1212	1.57	5.53	5.9	12.35	49.75
1213	1.57	5.53	5.9	12.35	49.75
1214	1.39	5.24	5.72	11.93	48.97
1215	1.27	5.21	5.47	11.6	48.27
1216	1.16	5.01	5.29	11.26	47.57
1217	1.06	4.85	5.18	10.98	46.93
1218	0.98	4.72	4.99	10.75	46.33
1219	0.98	4.72	4.99	10.75	46.33
1220	0.9	4.62	4.9	10.58	45.78
1221	0.84	4.51	4.86	10.39	45.23
1222	0.77	4.2	4.74	10.26	44.73
1223	0.72	4.11	4.69	10.12	44.23
1224	0.67	4.02	4.7	10	43.75
1225	0.67	4.02	4.7	10	43.75
1226	0.63	3.92	4.6	9.91	43.3
1227	0.59	3.83	4.58	9.84	42.87
1228	0.56	3.76	4.61	9.78	42.46
1229	0.53	3.71	4.53	9.73	42.07
1230	0.51	3.66	4.52	9.69	41.68
1231	0.51	3.66	4.52	9.69	41.68
1232	0.49	3.63	4.56	9.65	41.3
1233	0.47	3.61	4.5	9.61	40.93
1234	0.46	3.59	4.5	9.59	40.58
1235	0.45	3.57	4.55	9.57	40.23
1236	0.44	3.55	4.49	9.56	39.9
1237	0.44	3.55	4.49	9.56	39.9
1238	0.43	3.54	4.49	9.55	39.57
1239	0.43	3.73	4.54	9.6	39.3
1240	0.42	3.72	4.48	9.61	39
1241	0.42	3.72	4.49	9.65	38.73
1242	0.41	3.74	4.49	9.7	38.47
1243	0.41	3.74	4.49	9.7	38.47
1244	0.41	3.77	4.48	9.74	38.21
1245	0.41	3.79	4.47	9.72	37.91
1246	0.41	3.19	4.37	9.56	37.49
1247	0.41	3.21	4.26	9.35	37.03
1248	0.4	3.2	4.16	9.02	36.47
1249	0.4	3.2	4.16	9.02	36.47
1250	0.4	3.09	3.96	8.62	35.85
1251	0.4	2.89	3.69	8.13	35.16

West Basin

1252	0.4	2.66	3.61	7.67	34.51
1253	0.4	2.39	3.45	7.22	33.86
1254	0.4	2.1	3.28	6.74	33.19
1255	0.4	2.1	3.28	6.74	33.19
1256	0.4	1.86	3.21	6.33	32.57
1257	0.4	1.66	3.22	5.95	32
1258	0.4	1.49	3.12	5.61	31.45
1259	0.4	1.35	3.1	5.27	30.91
1260	0.4	1.22	3.14	5.03	30.46
1261	0.4	1.22	3.14	5.03	30.46
1262	0.4	1.1	3.08	4.83	30.04
1263	0.4	0.99	3.08	4.74	29.72
1264	0.4	0.89	3.13	4.63	29.39
1265	0.4	0.81	3.07	4.54	29.09
1266	0.4	0.73	3.07	4.49	28.82
1267	0.4	0.73	3.07	4.49	28.82
1268	0.4	0.67	3.13	4.44	28.55
1269	0.4	0.62	3.12	4.35	28.25
1270	0.4	0.59	3.07	4.31	28
1271	0.4	0.56	3.14	4.26	27.74
1272	0.4	0.53	3.14	4.2	27.48
1273	0.4	0.53	3.14	4.2	27.48
1274	0.4	0.51	3.09	4.2	27.27
1275	0.4	0.49	3.1	4.18	27.04
1276	0.4	0.48	3.15	4.17	26.83
1277	0.4	0.47	3.08	4.18	26.64
1278	0.4	0.45	3.08	4.18	26.44
1279	0.4	0.45	3.08	4.18	26.44
1280	0.4	0.45	3.13	4.14	26.21
1281	0.4	0.44	3.07	4.13	26.01
1282	0.4	0.43	3.07	4.11	25.81
1283	0.4	0.43	3.13	4.09	25.59
1284	0.4	0.42	3.07	4.11	25.43
1285	0.4	0.42	3.07	4.11	25.43
1286	0.4	0.42	3.07	4.11	25.24
1287	0.4	0.41	3.12	4.11	25.07
1288	0.4	0.41	3.12	4.14	24.91
1289	0.4	0.41	3.07	4.15	24.75
1290	0.4	0.41	3.14	4.11	24.54
1291	0.4	0.41	3.14	4.11	24.54
1292	0.4	0.41	3.14	4.11	24.38
1293	0.4	0.41	3.09	4.1	24.19
1294	0.4	0.4	3.1	4.08	24.01
1295	0.4	0.4	3.15	4.11	23.87
1296	0.4	0.4	3.08	4.1	23.7
1297	0.4	0.4	3.08	4.1	23.7
1298	0.4	0.4	3.08	4.11	23.55

West Basin

1299	0.4	0.4	3.13	4.13	23.41
1300	0.4	0.4	3.07	4.15	23.27
1310	0.4	0.4	3.07	4.11	23.08
1320	0.4	0.4	3.13	4.11	22.93
1330	0.4	0.4	3.13	4.11	22.93
1340	0.4	0.4	3.07	4.1	22.77
1350	0.4	0.4	3.07	4.08	22.6
1360	0.4	0.4	3.12	4.11	22.48
1370	0.4	0.4	3.07	4.1	22.33
1380	0.4	0.4	3.07	4.11	22.2
1390	0.4	0.4	3.07	4.11	22.2
1400	0.4	0.4	3.12	4.13	22.08
1420	0.4	0.4	3.12	4.15	21.95
1440	0.4	0.4	3.07	4.11	21.78
1460	0.4	0.4	3.14	4.11	21.65
1500	0.4	0.4	3.14	4.1	21.5

APPENDIX F
SELECTIONS FROM THE PALLER-ROBERT REPORT

DRAINAGE REPORT

FOR

SIMI VALLEY TOWN CENTER

AT

N. SIDE OF I-118 BETWEEN

FIRST STREET AND ERRINGER ROAD

CITY OF SIMI VALLEY

VENTURA COUNTY, CALIFORNIA

OCTOBER 22, 2002
Rev. January 31, 2003
Rev. June 16, 2003
Rev. March 1, 2004
Rev. May 25, 2004

Prepared For:

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H:/DWG/JN729/hydro/SIMICOVER118

INTRO / TR 5430

Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges from the **North Simi Regional Stormwater Detention Basin** for 10 yr. and 100 yr. frequency storms are as follows:

10 yr. = 514 cfs; 100 yr. = 683 cfs.

2. **NORTH SIMI SUB-BASIN 2** - is located north of the project site and contains approximately **59** acres. The discharged water currently flows across the site and also enters the existing 10'x10' reinforced concrete box at the Simi Valley Freeway (I-118).

   Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges for 10 yr. and 100 yr. frequency storms are as follows:

   10 yr. = 107.0 cfs ; 100 yr. = 161.0 cfs.

3. **NORTH SIMI SUB-BASIN 3** - is also located north of the project site and contains approximately **57** acres. The discharged water currently flows across the site and also enters the existing 10'x10' reinforced concrete box culvert at the Simi Valley Freeway (I-118).

   Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges for 10 yr. And 100 yr. frequency storms are as follows:

   10 yr. = 114.0 cfs; 100 yr. = 167.0 cfs.

4. **CENTRAL SUB-BASIN 1** - The majority of this sub-basin is contained within the proposed development. It contains approximately **59** acres. The discharged water currently flows across the site and also enters the existing 10'x10' reinforced concrete box culvert at the Simi Valley Freeway (I-118).

   Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges for 10 yr. And 100 yr. frequency storms are as follows:

   10 yr. = 106.0 cfs; 100 yr. = 161 cfs.

5. **CENTRAL SUB-BASIN 2** - This sub-basin is also contained within the proposed development. It contains approximately **20** acres. The outlet for this sub-basin is the existing Simi Valley Freeway (I-118) underpass at Caldwell Avenue. The surface runoff sheet flows along Caldwell Avenue and then enters the North Simi Drain approximately 500 feet south of the freeway via two (2) curb inlets.

Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges for 10 yr. And 100 yr. frequency storms are as follows:

10 yr. = 38.0 cfs; 100 yr. = 58 cfs.

6. **WESTERN SUB-BASIN 1** - This watershed flows across the site to an area located adjacent to the First Street Off-ramp of the Simi Valley Freeway and contains approximately **69** acres. The existing flows are intercepted by a 6'x3' concrete open channel which discharges into a 72" CMP culvert under the Freeway. This in turn connects into a 42" RCP connected to the North Simi Drain.

Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges for 10 yr. And 100 yr. frequency storms are as follows:

10 yr. =132.0 cfs; 100 yr. = 199 cfs.

7. **WESTERN SUB-BASIN 2** - This watershed flows across the site to an area located adjacent to the First Street Off-ramp of the Simi Valley Freeway and contains approximately **51** acres. The existing flows are intercepted by a 6'x3' concrete open channel which discharges into a 72" CMP culvert under the Freeway. This in turn connects into a 42" RCP connected to the North Simi Drain.

Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges for 10 yr. And 100 yr. frequency storms are as follows:

10 yr. =78.0 cfs; 100 yr. = 119 cfs.

WESTERN SUB-BASIN 1 and 2 have a combine 100 yr. peak discharge of 287 cfs. However, the downstream piping is restricted from a 72" diameter to a 42" diameter pipe, downstream of 118 Freeway. The capacity of the 42" diameter pipe restriction is approximately 150 cfs. The County has therefore mandated that the outflow from the site the site to be restricted to 150 cfs.

8. **EASTERN SUB-BASIN** - This watershed is located southeast of the North Simi Drain watershed and west of Erringer Road. It contains approximately **49** acres. Runoff passes under the Simi Valley Freeway through three (3) 4'x2' reinforced concrete box culverts. This is then connected to a storm drain system south of the Freeway which outlets into the North Simi Drain at Cochran street.

Per **NORTH Simi Drain Hydrology Report** (dated August 2000) and **The Amended Calculations**, existing peak discharges for 10 yr. And 100 yr. frequency storms are as follows:

10 yr. = 83.0 cfs; 100 yr. = 124 cfs.

2. **NORTH SIMI SUB-BASIN 2** - contains approximately **59** acres. The off-site100 yr. runoff totaling **165** cfs from this watershed will be detained at the off-site **Detention Basin "NS23"**. Outflow from this basin will be restricted to the Maximum Allowable Release rate and be carried through the project site via 48" diameter storm drain piping system and discharged into the proposed 10'x8' RCBox portion of the North Simi Drain Main Channel described above. See Detention Basin Analysis.

3. **NORTH SIMI SUB-BASIN 3** - contains approximately **57** acres. The off-site100 yr. runoff totaling **169** cfs from this watershed will be detained at the off-site **Detention Basin "NS23"**. Outflow from this basin will be restricted to the Maximum Allowable Release rate and be carried through the project site via the 48" diameter piping system described above. See Detention Basin Analysis.

4. **EASTERN SUB-BASIN** - contains approximately **30** acres. The off-site 100 yr. runoff totaling **76** cfs from this watershed will be intercepted by an on-site catch basin and carried through the project site via a 36" and 42" diameter storm drain piping system and released to an existing ditch along the north side of the Simi Valley Freeway. The runoff will then pass under the Simi Valley Freeway through three (3) 4'x2' reinforced concrete box culverts. Then, via City existing storm drain systems outlets into the North Simi Drain at Cochran street.

The difference between the Peak Discharge and the Allowable Release rate will be deducted from **Detention Basin "NS23"** release rate. See Detention Basin Analysis.

5. **WESTERN SUB-BASIN 1** - contains approximately **69** acres. The off-site 100 yr. runoff totaling **203** cfs will be detained at the off-site **Detention Basin "Western"**. Outflow from this basin will be restricted to the Maximum Allowable Release rate and be carried through the project site via a 42" and 54" diameter storm drain piping system and discharged into an existing 72" CMP Culvert under the Freeway. Then, via the existing 42" storm drain piping, it outlets into the North Simi Drain. See Detention Basin Analysis.

6. **WESTERN SUB-BASIN 2** - contains approximately **18.8** acres. The off-site 100 yr. runoff totaling **51** cfs will be detained at the off-site **Detention Basin "Western"**. Outflow from this basin will be restricted to the Maximum Allowable Release rate and be carried through the project site via a 42" and 54" diameter storm drain piping system and discharged into an existing 72" CMP Culvert under the Freeway. Then, via the existing 42" storm drain piping, it outlets into the North Simi Drain. See Detention Basin Analysis.

7. **CENTRAL SUB-BASIN 1** – the off-site portion contains approximately **12.7** acres. The off-site 100 yr. runoff totaling **40** cfs will be intercepted by an on-site inlet structure and 8'x8' RC Box (and further downstream 10'x8' RC Box), which will carry the flow through the project site and discharge into the existing 10'x10' reinforced concrete box culvert at the Simi Valley Freeway (I-118).

The difference between the Peak Discharge and the Allowable Release rate will be deducted from **Detention Basin "NS23"** release rate. See Detention Basin Analysis.

ON-SITE DRAINAGE

There are six (6) proposed drainage areas where on-site runoff will be collected and carried through the site by a series of underground piping and inlets and discharged into proposed on-site detention basins. Outflows from the various basins will be restricted to the **Maximum Allowable Release Rates** shown in the tabulation. These drainage areas are described as follows, and are shown on the enclosed Proposed Hydrology Plan:

1. **DRAINAGE AREA "A"** - is located on the east portion of the project site (south of the **EASTERN SUB-BASIN**). This area contains approximately **13.2** acres and is planned for commercial use. The proposed 10 yr. and 100 yr. peak runoffs are **30.0** cfs and **43.0** cfs, respectively. The 100 yr. runoff will be collected and carried through the sub-area by a series of underground piping and inlets and released **without detention** to an existing ditch along the north side of the Simi Valley Freeway. The runoff will then pass under the Simi Valley Freeway through three (3) 4'x2' reinforced concrete box culverts. Then, via existing storm drain systems, it will outlet into the North Simi Drain at Cochran Street.

   We propose to offset the unrestricted flows from this area by further restricting outflows from the temporary basins located north of the project site. Additionally, a portion of flows from the on-site portion of Area A are being diverted into Area B reducing the on-site contribution from 18.8 acres to 13.2 acres resulting in a decrease of 5.6 acres. This combination of improvements results in a reduction of flows to the triple box culvert from 124 cfs (existing) to 119.4 cfs (proposed) in a 100 year frequency storm. In a 10 year event the flows decrease from 83 cfs (existing) to 81 cfs (proposed).

2. **DRAINAGE AREA "B"** – consists of the easterly portion of the shopping center site and public streets. It contains approximately **26.0** acres. The proposed 10 yr. and 100 yr. peak runoffs are **59.5** cfs and **85.5** cfs respectively. The 100 yr. runoff will be collected and carried through the sub-area by a series of underground piping and inlets and discharged into **Detention Basin "B"**. (See Detention Basin Analysis)

3. **DRAINAGE AREA "C"** – consists of the westerly portion of the shopping center site and public streets. It contains approximately **29.2** acres. The proposed 10 yr. and 100 yr. peak runoffs are **62.1** cfs and **90.7** cfs respectively. The 100 yr. runoff will be collected and carried through the sub-area by a series of underground piping and inlets and discharged into **Detention Basin "C"**. (See Detention Basin Analysis)

OFF-SITE DETENTION BASINS

The two detention basins described below are located on property owned by Unocal Land and Development Company and will be maintained by the Mall Owner. An agreement is currently being finalized between the two parties which allow these basins to be constructed and maintained. At such time as Unocal develops the property to the north of the project site, they will take over the responsibility for maintenance of the facilities. They may also relocate them to better accommodate their proposed site plan.

1. **DETENTION BASIN "NS23"** - It receives 100 yr. 24 hr. runoff from Off-site watersheds **North Simi Sub-basin 2 and 3.** The following is the summary of input and output data for this basin:

North Simi Sub-basin 2
100 yr. Peak inflow = 165.0 cfs.
Proposed Max. Release rate = 96.1 cfs

North Simi Sub-basin 3
100 yr. Peak inflow = 169.0 cfs.
Proposed Max. Release rate = 92.8 cfs

96.1 + 92.8 = 188.9 ≤ 266.4 (Q100 Lor.

Central Sub-basin 1 (Off-site)
100 yr. Peak inflow = 40.0 cfs.
Proposed Max. Release rate = 20.7 cfs
Difference = 19.3 cfs (to be deducted from basin NS23 outflow)

Eastern Sub-basin (Off-site)
100 yr. Peak inflow = 76.4 cfs.
Proposed Max. Release rate = 32.6 cfs
Difference = 43.8 cfs (to be deducted from basin NS23 outflow)

How is this determined?

Total deduction = 63.1 cfs (19.3 + 43.8)

Total 100 yr. Peak Inflow **(North Simi Sub-basin 2 and 3)** = 333.7 cfs
Total volume stored = 315,635 cu ft
Proposed Max. Release rate = 188.9 cfs (North Simi Sub-basin 2 and 3)
Proposed Max. Release rate = 125.8 cfs (after deduction)
Actual Release rate (48" outlet pipe) = 118.9 cfs — VERY CONSERVATIVE
Max. depth = 5.1 ft

Emergency Spillway
Above 100 yr. Peak Inflow = 166.9 cfs
Length = 60 ft.
Crest = 0.90 ft.

2. **DETENTION BASIN "Western"** - It receives 100 yr. 24 hr. runoff from Off-site watersheds **Western Sub-basin 1 and 2**. The following is the summary of input and output data for this basin:

Western Sub-basin 1
100 yr. Peak inflow = 203.0 cfs.
Proposed Max. Release rate = 86.3 cfs

Western Sub-basin 2
100 yr. Peak inflow = 51.0 cfs.
Proposed Max. Release rate = 23.5 cfs

Total 100 yr. Peak Inflow (Western Sub-basin 1 and 2) = 254.4 cfs
Total volume stored = 217,283 cu ft
Proposed Max. Release rate = 109.8 cfs (Western Sub-basin 1 and 2)
Actual Release rate (42" outlet pipe) = 92.6 cfs
Max. depth = 5.0 ft

Emergency Spillway
Above 100 yr. Peak Inflow = 127.2 cfs
Length = 45 ft.
Crest = 0.90 ft.

See Reservoir Reports and Hydrograph Reports contained in Technical Appendix No. 1 for calculations summarized above.

EMERGENCY SPILLWAY

The criteria used for design of the emergency spillway was established to be equal to the maximum release rate of the basin or 50% of the Q100 inflow, whichever is greater. **This was established so that the spillway would provide the required outflow if the normal outflow pipe was not functioning.**

EXISTING DISCHARGES FROM SIMI VALLEY TOWN CENTER

G71 / BC

Q_{100} @ regional Basin $Q_{100} = 683$ cfs A = 699 ac

Q_{100} @ 118 FWY (10x10 Box) $Q_{100} = 968$ cfs A = 874 ac

$\Delta Q = 968 - 683 = 285$ cfs $\Delta A = 874 - 699 = 175$ ac

$Q_{out} = 285$ cfs

G73 / BC

Q_{100} @ 118 FWY (10x10 box) $Q_{100} = 968$ cfs A = 874 ac

Q_{100} @ CALDWELL AVE. $Q_{100} = 1007$ cfs A = 894 ac

$\Delta Q = 1007 - 968 = 39$ cfs $\Delta A = 894 - 874 = 20$ ac

$Q_{out} = 39$ cfs

G74 / B

Q_{100} @ CALDWELL AVE. $Q_{100} = 1007$ cfs A = 894 ac

Q_{100} @ South of 118 FWY $Q_{100} = 1058$ cfs A = 925 ac

$\Delta Q = 1058 - 1007 = 51$ cfs $\Delta A = 925 - 894 = 31$ ac

$Q_{out} = 51$ cfs (South of 118-FWY)

G78 / BD

Q_{100} @ South of 118 FWY $Q_{100} = 1058$ cfs A = 925 ac

Q_{100} @ 42" pipe (72" @ 118 FWY) $Q_{100} = 1208$ cfs A = 1045 ac

$\Delta Q = 1208 - 1058 = 150$ cfs $\Delta A = 1045 - 925 = 120$ ac

$Q_{out} = 150$ cfs

G84 / BD

Q_{100} @ 42" pipe (72" @ 118 FWY) $Q_{100} = 1208$ cfs A = 1045 ac

Q_{100} @ Cochran St. - 48" pipe $Q_{100} = 1357$ cfs A = 1183 ac

$\Delta Q = 1357 - 1208 = 149$ cfs $\Delta A = 1183 - 1045 = 138$ ac

Drainage area N/O 118 Fwy (Eastern)

A = 49 ac.

$Q_{100} = (49/138)(149)$

$Q_{100} = 52.9$ cfs

$Q_{out} = 52.9$ cfs

SUMMARY OF EXISTING Q_{100} FROM SIMI VALLEY TOWN CENTER

A. (18.8/49)(52.0) = 20.3 cfs

B. (46.3/175)(285) = 75.4 cfs

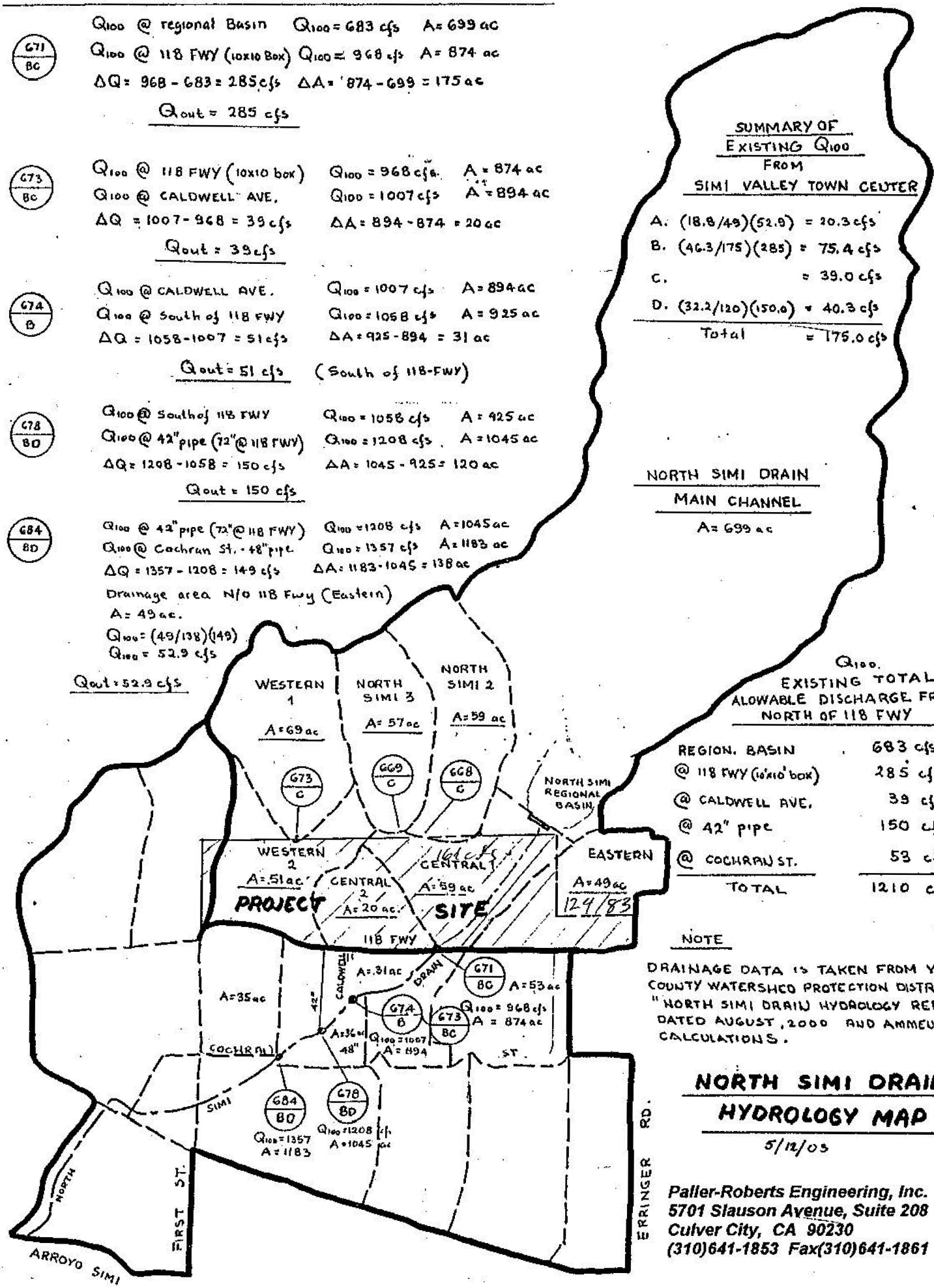
C. = 39.0 cfs

D. (32.2/120)(150.0) = 40.3 cfs

Total = 175.0 cfs

NORTH SIMI DRAIN MAIN CHANNEL

A = 699 ac



Q_{100} EXISTING TOTAL ALOWABLE DISCHARGE FROM NORTH OF 118 FWY

REGION. BASIN	683 cfs
@ 118 FWY (10'x10' box)	285 cfs
@ CALDWELL AVE.	39 cfs
@ 42" pipe	150 cfs
@ COCHRAN ST.	53 cfs
TOTAL	1210 cfs

NOTE

DRAINAGE DATA IS TAKEN FROM VENTURA COUNTY WATERSHED PROTECTION DISTRICT, "NORTH SIMI DRAIN HYDROLOGY REPORT" DATED AUGUST, 2000 AND AMMENDED CALCULATIONS.

NORTH SIMI DRAIN HYDROLOGY MAP

5/11/05

Paller-Roberts Engineering, Inc.
5701 Slauson Avenue, Suite 208
Culver City, CA 90230
(310)641-1853 Fax(310)641-1861

EXISTING PEAK DISCHARGES

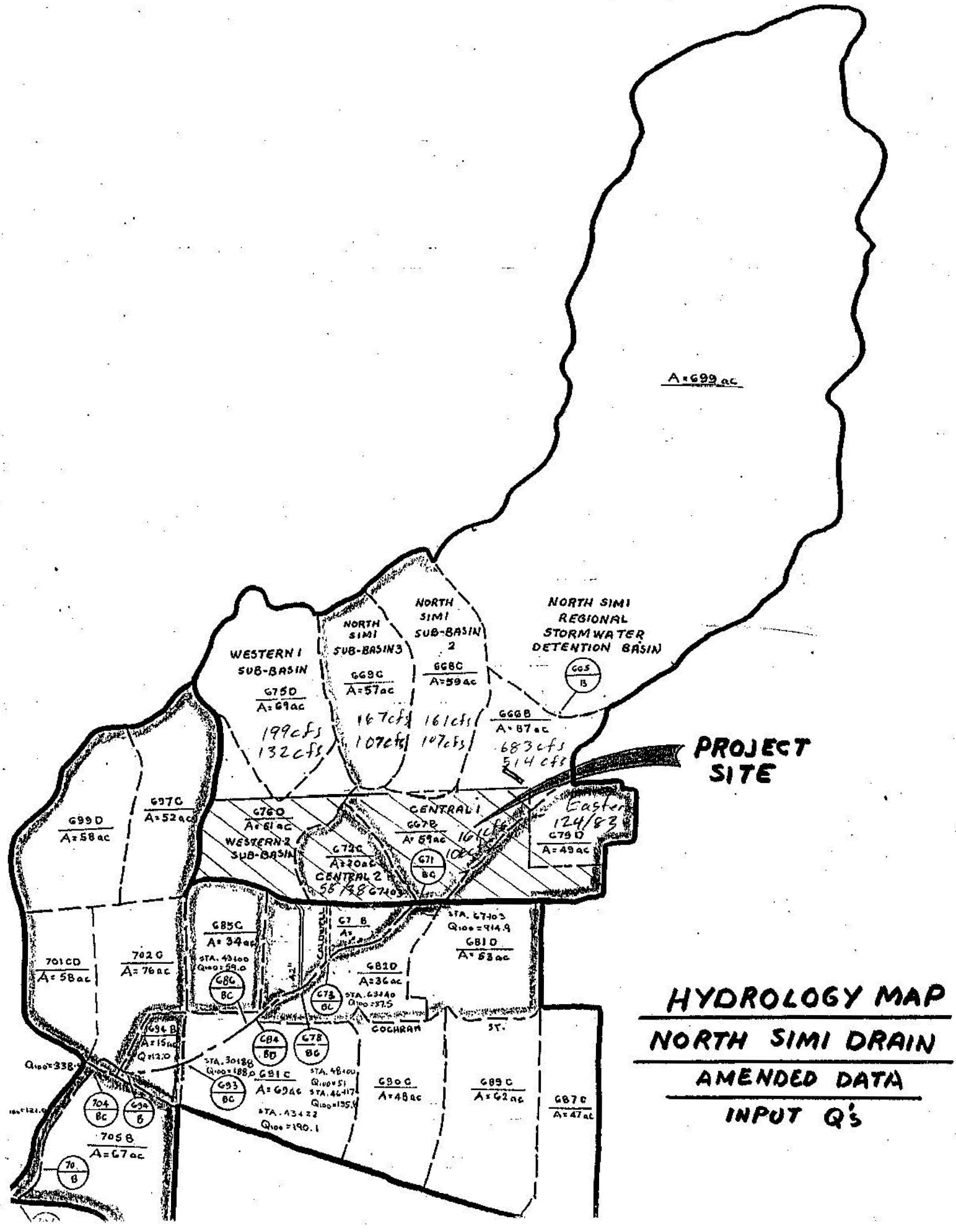
DRAINAGE AREA	HYDRO NODE	TOTAL FLOWS AREA	TOTAL FLOWS Q100	TOTAL FLOWS Q10	OFF-SITE FLOWS AREA	OFF-SITE FLOWS Q100	OFF-SITE FLOWS Q10	ON-SITE FLOWS AREA	ON-SITE FLOWS Q100	ON-SITE FLOWS Q10
EXISTING FLOWS										
REGION. BASIN	666B	645.0	683.0	514.0	645.0	683.0	514.0			
EASTERN	679D	49.0	124.0	83.0	30.2	76.4	51.2	18.8	47.6	31.8
NORTH SIMI 2	668C	59.0	161.0	107.0	59.0	161.0	107.0	0	0	0
NORTH SIMI 3	669C	57.0	167.0	114.0	57.0	167.0	114.0	0	0	0
WESTERN 1	675C	69.0	199.0	132.0	69.0	199.0	132.0	0	0	0
WESTERN 2	676C	51.0	119.0	78.0	18.8	43.9	28.8	32.2	75.1	49.2
CENTRAL 1	667B	59.0	161.0	106.0	12.7	34.7	22.8	46.3	126.3	83.2
CENTRAL 2	672C	20.0	58.0	38.0				20.0	58.0	38.0
SUB-TOTAL		1009.0	1672.0	1172.0	891.7	1365.0	969.8	117.3	307.0	202.2

NOTES

1. Total Q100 flows were taken from North Simi Drain Hydrology Report amended by V.C.W.P.D. (See Attachment). Split between On-Site and Off-Site flows were prorated by area.

2. Alamos Sub-basin is not included in the above tabulation because the area is small (4 ac.) and 50% of its area is being diverted into Western Sub-basin.

3. Q10 value for the Regional Basin is taken from North Simi Drain Hydrology Report by V.C.W.P.D.



HYDROLOGY MAP

NORTH SIMI DRAIN

AMENDED DATA

INPUT Q's

MAXIMUM ALLOWABLE RELEASE RATES

1. Release rate @ Node 671BC
(Total flow less Regional Basin)

Qout = 285 cfs (Total) **Drainage Area = 175 ac (Total)**

A. NORTH SIMI SUBAREA 2 and 3 (Node 668C and 669C)

NORTH SIMI SUBAREA 2	= 59.0 ac.
NORTH SIMI SUBAREA 3	= 57.0 ac.
Total Area	= 116.0 ac

PRORATED BY AREAS:
NORTH SIMI SUBAREA 2 release Q = (59/175)(285) = 96.1 cfs
NORTH SIMI SUBAREA 3 release Q = (57/175)(285) = 92.8 cfs

Total release Q =(116/175)(285) = 188.9 cfs

B. CENTRAL 1 SUBBASIN (Node 667B)

116 + 59 = 175

Offsite flow area	= 12.7 ac
Onsite flow area	= 46.3 ac
Total area	= 59.0 ac

PRORATED BY AREAS:
Offsite release Q = (12.7/175)(285) = 20.7 cfs
Onsite release Q = (46.3/175)(285) = 75.4 cfs

Total release Q = (59/175)(285) = 96.1 cfs

Total of A and B = 188.9 + 96.1 = 285.0 cfs

2. Release rate @ Node 673BC

CENTRAL 2 SUBBASIN (Onsite)

Qout = 39 cfs (Total) **Drainage Area = 20 ac (Total)**

Total release Q = 39.0 cfs

3. Release rate @ Node 678BD

Qout = 150.0 cfs (Total) **Drainage Area = 120 ac (Total)**

Offsite flow area (Western 1)	= 69.0 ac	
Offsite flow area (Western 2)	= 18.8 ac	(51 ac. - 32.2 ac.)
Sub-total	= 87.8 ac.	
Onsite flow area (Western 2)	= 32.2 ac	
Total Area (Western 1 and 2)	= 120.0 ac	

Max. Release by County due to ex. downstream pipe restrictions

PRORATED BY AREAS:

Offsite release Q = (87.8/120)(150.0) = 109.8 cfs

Onsite release Q = (32.2/120)(150.0) = 40.2 cfs

Total release Q = 150.0 cfs

4. Release rate @ Node 684BD

Drainage area north of Fwy 118

Offsite flow area	= 30.2 ac
Onsite flow area	= 18.8 ac
Total area	= 49.0 ac

Total release Q = 52.9 cfs

PRORATED BY AREAS:

Offsite release Q = (30.2/49)(52.9) = 32.6 cfs

Onsite release Q = (18.8/49)(52.9) = 20.3 cfs

Total release Q = 52.9 cfs

VENTURA COUNTY FLOOD CONTROL DISTRICT
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NO.SIMI DRN.W/GIS CKD REACHES/AREAS Q-100P W/ DAM DDT/DL/SH 3/03 STORM DAY 4

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV. TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
15031	652B	73.	209.	73.	209.	1	1050.	0.04760	0.00	0.00	0.	20	11	B98	0.00
15031	653C	0.	0.	0.	0.	0	0.	0.00000	0.00	0.00	0.	10	99	B98	0.00
15031	654C	77.	209.	77.	209.	1	900.	0.06700	0.00	0.00	0.	20	12	B98	0.00
15031	655BC	77.	205.	150.	404.	1	2100.	0.04300	0.00	0.00	0.	10	0	B98	0.00
15031	656B	87.	208.	237.	486.	0	0.	0.00000	0.00	0.00	0.	40	12	B98	0.00
15031	657B	0.	0.	237.	486.	0	0.	0.00000	0.00	0.00	0.	10	99	B98	0.00
15031	658B	52.	126.	289.	592.	1	636.	0.03800	0.00	0.00	0.	30	13	B98	0.00
15031	659B	81.	188.	370.	742.	1	675.	0.02500	0.00	0.00	0.	30	14	B98	0.00
15031	660B	89.	227.	459.	881.	1	1456.	0.03800	0.00	0.00	0.	30	12	B98	0.00
15031	661B	50.	121.	509.	936.	1	539.	0.04500	0.00	0.00	0.	40	12	B98	0.05
15031	662C	63.	153.	63.	153.	1	986.	0.01600	0.00	0.00	0.	30	13	B98	0.00

CONFLUENCE Q'S

15031 663B TB 1163 QB 931. QBC 1070. QC 139. 15031 663C TC 1162 QC 140. QCB 1065. QB 926.
15031 663BC TBC 1163 QBC 1070. QB 931. QC 139.

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
15031	663BC	63.	140.	572.	1070.	1	1531.	0.02350	0.00	0.00	0.	10	0	B98	0.00
15031	664B	63.	171.	635.	1066.	1	926.	0.03100	0.00	0.00	0.	30	11	B98	0.05
15031	665B	64.	160.	699.	1091.	0	0.	0.00000	0.00	0.00	0.	20	14	B98	0.05
15031	666B	699.	683.	699.	683.	1	2060.	0.03100	0.00	0.00	0.	10	0	B98	0.00
15031	667B	59.	161.	758.	687.	0	0.	0.00000	0.00	0.00	0.	30	11	B98	0.05
15031	668C	59.	161.	59.	161.	0	0.	0.00000	0.00	0.00	0.	20	12	B98	0.05
15031	669C	57.	167.	116.	328.	1	1129.	0.05260	0.00	0.00	0.	10	12	B98	0.05
15031	670C	0.	0.	116.	320.	0	0.	0.00000	0.00	0.00	0.	10	99	B98	0.00

CONFLUENCE Q'S

15031 671B TB 1204 QB 687. QBC 715. QC 28. 15031 671C TC 1158 QC 320. QCB 967. QB 648.
15031 671BC TBC 1159 QBC 968. QB 650. QC 318.

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
15031	671BC	116.	320.	874.	968.	5	1304.	0.01900	20.00	2.00	0.	10	0	B98	0.00
15031	672C	20.	58.	20.	58.	3	675.	0.04000	0.00	0.00	0.	30	10	B98	0.05

CONFLUENCE Q'S

15031 673B TB 1161 QB 959. QBC 1005. QC 46. 15031 673C TC 1157 QC 55. QCB 939. QB 884.
15031 673BC TBC 1160 QBC 1007. QB 956. QC 51.

LOCATION		SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
15031	673BC	20.	55.	894.	1007.	5	680.	0.01900	20.00	2.00	0.	30	0	B98	0.00
15031	674B	31.	87.	925.	1058.	0	0.	0.00000	0.00	0.00	0.	40	11	B98	0.40
15031	675D	69.	199.	69.	199.	1	1553.	0.04520	0.00	0.00	0.	20	11	B98	0.05
15031	676D	51.	119.	120.	287.	0	0.	0.00000	0.00	0.00	0.	40	13	B98	0.10

VENTURA COUNTY FLOOD CONTROL DISTRICT
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NO.SIMI DRN.W/GIS CKD REACHES/AREAS Q-100P W/ DAM DDT/DL/SH 3/03 STORM DAY 4

LOCATION	SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
CONFLUENCE Q'S														
15031 677D TD 1160 QD	287. QDF	150. QF	137.	15031 677F TF 1160 QF	137. QFD	150. QD	287.							
15031 677DF TDF 1152 QDF	150. QD	177. QF	27.											
15031 677DF	0.	137.	120.	150.	4	1262.	0.04000	3.25	0.00	150.	10	0	B98	0.00
15031 677F	0.	0.	0.	137.	0	0.	0.00000	0.00	0.00	0.	10	99	B98	0.00
CONFLUENCE Q'S														
15031 678B TB 1162 QB	1058. QBD	1208. QD	150.	15031 678D TD 1163 QD	150. QDB	1178. QB	1028.							
15031 678BD TBD 1162 QBD	1208. QB	1058. QD	150.											
15031 678BD	120.	150.	1045.	1208.	5	507.	0.02500	20.00	0.00	0.	10	0	B98	0.06
15031 679D	49.	124.	49.	124.	4	1300.	0.01600	3.50	0.00	0.	50	12	B98	0.37
CONFLUENCE Q'S														
15031 680D TD 1158 QD	122. QDF	83. QF	39.	15031 680F TF 1158 QF	39. QFD	83. QD	122.							
15031 680DF TDF 1153 QDF	83. QD	84. QF	1.											
15031 680DF	0.	39.	49.	83.	4	840.	0.00380	4.00	0.00	83.	50	0	B98	0.00
15031 680F	0.	0.	0.	39.	3	1700.	0.01600	40.00	0.00	0.	50	99	B98	0.00
15031 681D	53.	135.	102.	213.	4	1300.	0.00380	5.50	0.00	0.	50	12	B98	0.40
15031 682D	36.	93.	138.	287.	0	0.	0.00000	0.00	0.00	0.	40	12	B98	0.30
CONFLUENCE Q'S														
15031 683D TD 1160 QD	287. QDF	150. QF	137.	15031 683F TF 1160 QF	137. QFD	150. QD	287.							
15031 683DF TDF 1151 QDF	150. QD	158. QF	8.											
15031 683DF	0.	137.	138.	150.	4	870.	0.01560	3.75	0.00	150.	50	0	B98	0.00
15031 683F	0.	0.	0.	137.	0	0.	0.00000	0.00	0.00	0.	50	99	B98	0.00
CONFLUENCE Q'S														
15031 684B TB 1162 QB	1207. QBD	1357. QD	150.	15031 684D TD 1162 QD	150. QDB	1357. QB	1207.							
15031 684BD TBD 1162 QBD	1357. QB	1207. QD	150.											
15031 684BD	138.	150.	1183.	1357.	5	1030.	0.02730	10.00	0.00	0.	40	0	B98	0.00

15031	685C	34.	102.	34.	102.	4	608.	0.04500	2.75	0.00	0.	40	10	B98	0.45

VENTURA COUNTY FLOOD CONTROL DISTRICT
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LOCATION	SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV. TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
CONFLUENCE Q'S														
15031 686B TB 1162 QB	1356.	QBC	1413.	QC	57.	15031 686C TC 1155 QC	102.	QCB	1192.	QB	1090.			
15031 686BC TBC 1161 QBC	1416.	QB	1348.	QC	68.									
15031 686BC	34.	102.	1217.	1416.	0	0.	0.00000	0.00	0.00	0.	10	0	B98	0.00
15031 687C	47.	127.	47.	127.	3	1400.	0.01000	40.00	0.00	0.	50	10	B98	0.23
15031 688C	0.	0.	47.	104.	0	0.	0.00000	0.00	0.00	0.	10	99	B98	0.00
15031 689C	62.	158.	109.	236.	3	1158.	0.01000	40.00	0.00	0.	40	12	B98	0.23
15031 690C	48.	136.	157.	291.	3	2415.	0.00500	40.00	0.00	0.	40	10	B98	0.20
15031 691C	69.	179.	226.	262.	0	0.	0.00000	0.00	0.00	0.	40	12	B98	0.30
CONFLUENCE Q'S														
15031 692C TC 1160 QC	262.	QCF	188.	QF	74.	15031 692F TF 1160 QF	74.	QFC	188.	QC	262.			
15031 692CF TCF 1152 QCF	188.	QC	219.	QF	31.									
15031 692CF	0.	74.	226.	188.	4	200.	0.00500	5.00	0.00	188.	40	0	B98	0.00
15031 692F	0.	0.	0.	74.	0	0.	0.00000	0.00	0.00	0.	40	99	B98	0.00
CONFLUENCE Q'S														
15031 693B TB 1161 QB	1416.	QBC	1604.	QC	188.	15031 693C TC 1154 QC	188.	QCB	1334.	QB	1146.			
15031 693BC TBC 1161 QBC	1604.	QB	1416.	QC	188.									
15031 693BC	226.	188.	1443.	1604.	5	850.	0.02050	10.00	0.00	0.	10	0	B98	0.00
15031 694B	15.	50.	1458.	1616.	5	333.	0.02050	12.00	0.00	0.	40	9	B98	0.70
15031 695B	0.	0.	1458.	1616.	0	0.	0.00000	0.00	0.00	0.	40	99	B98	0.00
15031 696B	0.	0.	1458.	1616.	0	0.	0.00000	0.00	0.00	0.	40	99	B98	0.00
15031 697C	52.	128.	52.	128.	0	0.	0.00000	0.00	0.00	0.	40	13	B98	0.29
CONFLUENCE Q'S														
15031 698C TC 1154 QC	128.	QCF	89.	QF	39.	15031 698F TF 1154 QF	39.	QFC	89.	QC	128.			
15031 698CF TCF 1152 QCF	89.	QC	113.	QF	24.									
15031 698CF	0.	39.	52.	89.	4	800.	0.02600	2.75	0.00	89.	40	0	B98	0.00
15031 698F	0.	0.	0.	39.	0	0.	0.00000	0.00	0.00	0.	40	99	B98	0.00
15031 699D	58.	163.	58.	163.	0	0.	0.00000	0.00	0.00	0.	30	12	B98	0.49
CONFLUENCE Q'S														

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*  15031  700D  TD 1154 QD     163. QDF      92. QF      71.   15031  700F  TF 1154 QF      71. QFD      92. QD      163.   *
*                              15031  700DF TDF 1149 QDF      92. QD      92. QF       0.                                    *
*********************************************************************************************************************************
                SUBAREA  SUBAREA     TOTAL     TOTAL  CONV    CONV      CONV      CONV   CONV   CONTROL SOIL       RAIN  PCT
    LOCATION      AREA       Q         AREA        Q    TYPE.  LNGTH    SLOPE     SIZE     Z        Q    NAME  TC  ZONE  IMPV
```

VENTURA COUNTY FLOOD CONTROL DISTRICT
MODIFIED RATIONAL METHOD HYDROLOGY / PC 2.2-EXP

NO.SIMI DRN.W/GIS CKD REACHES/AREAS Q-100P W/ DAM DDT/DL/SH 3/03 STORM DAY 4

LOCATION	SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
15031 700DF	0.	71.	58.	92.	4	210.	0.06000	2.50	0.00	92.	30	0	B98	0.00
15031 700F	0.	0.	0.	71.	0	0.	0.00000	0.00	0.00	0.	30	99	B98	0.00

CONFLUENCE Q'S

15031 701C TC 1162 QC 89. QCD 181. QD 92. 15031 701D TD 1150 QD 92. QDC 158. QC 66.
15031 701CD TCD 1162 QCD 181. QC 89. QD 92.

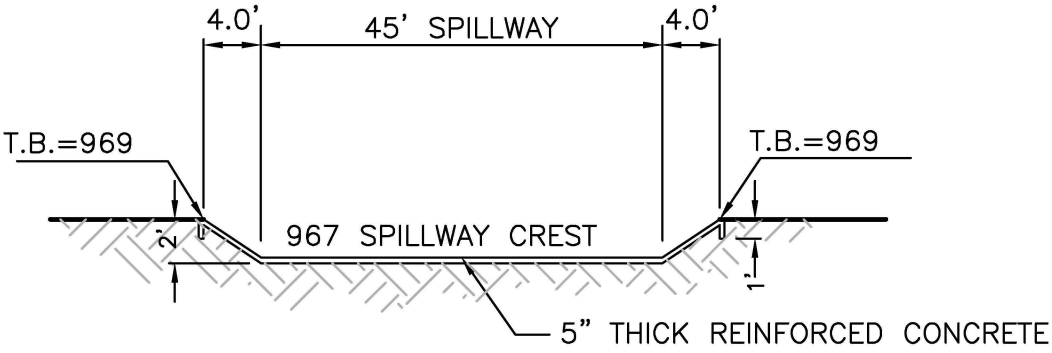
LOCATION	SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
15031 701CD	58.	92.	110.	181.	4	1863.	0.04000	3.50	0.00	0.	30	0	B98	0.00
15031 702C	76.	199.	186.	377.	0	0.	0.00000	0.00	0.00	0.	60	12	B98	0.66
15031 703C	0.	0.	186.	377.	0	0.	0.00000	0.00	0.00	0.	40	99	B98	0.00

CONFLUENCE Q'S

15031 704B TB 1162 QB 1616. QBC 1926. QC 310. 15031 704C TC 1156 QC 377. QCB 1806. QB 1429.
15031 704BC TBC 1160 QBC 1954. QB 1597. QC 357.

LOCATION	SUBAREA AREA	SUBAREA Q	TOTAL AREA	TOTAL Q	CONV TYPE	CONV LNGTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN ZONE	PCT IMPV
15031 704BC	186.	377.	1644.	1954.	5	1992.	0.02300	12.00	0.00	0.	10	0	B98	0.00
15031 705B	67.	184.	1711.	2075.	0	0.	0.00000	0.00	0.00	0.	50	12	B98	0.62

APPENDIX G
EMERGENCY SPILLWAY DETAIL.



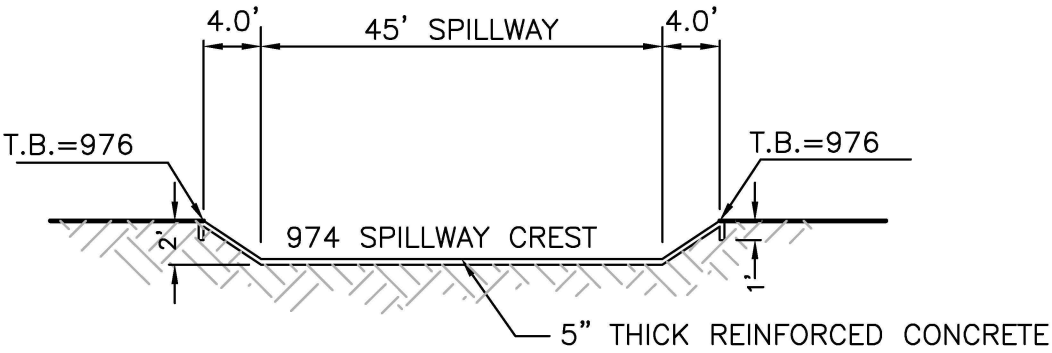
EMERGENCY SPILLWAY POND "A"

NTS

$$L = \frac{Q}{C \times h^{1.5}} = \frac{145.1}{3.2 \times 1.01^{1.5}} = 44.9' \text{ (EX. 45' SPILLWAY SHOULD WORK)}$$

PROTECT IN PLACE, TO BE VERIFIED DURING FINAL ENGINEERING. OTHERWISE REMOVE AND REPLACE AS SHOWN

WHERE,
C=3.2, h=1.01'
Q= 290.1/2 (HALF OF PEAK INFLOW) = 145.1 CFS



EMERGENCY SPILLWAY POND "B"

NTS

$$L = \frac{Q}{C \times h^{1.5}} = \frac{180.1}{3.2 \times 1.2^{1.5}} = 42.8' \text{ (EX. 45' SPILLWAY SHOULD WORK)}$$

PROTECT IN PLACE, TO BE VERIFIED DURING FINAL ENGINEERING. OTHERWISE REMOVE AND REPLACE AS SHOWN

WHERE,
C=3.2, h=1.2'
Q= 360/2 (HALF OF PEAK INFLOW) = 180.1 CFS

APPENDIX H
MS4 PERMIT CALCULATIONS

Sizing Worksheet

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	96	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	%
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	4.8	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	0.2	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	19.2	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	14.4	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.1	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p (1-imp)$	C=	0.27	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.0625	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV=	10,585	ft^3
Step 2: Determine the design percolation rate			
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$	$P_{measured}$ =	4	in/hr
2-2. Determine percolation rate correction factor, *S* based on suitability assessment (see Section 6 INF- 1)	S_A =	3	

2-3. Determine percolation rate correction factor, S based on design (see Section 6 INF-1)	S_b =	3.00	
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =	9.00	
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} =	0.44	in/hr
Step 3: Calculate the surface area			
3-1. Enter required drain time(hours,72 hrs max.), t	t =	72.00	hrs
3-2. Calculate max. depth of runoff that can be infiltrated within the t (ft), $d_{max} = P_{design}\, t/12$	d_{max} =	2.67	ft
3-3. For basins, select ponding depth (ft), d_p, such that $d_p \le d_{max}$	d_p =	1.30	ft
3-4. For trenches, enter trench fill aggregate porosity, n_t	n_t =	0.32	
3-5. For trenches, enter depth of trench fill (ft), d_t	d_t =	4.00	ft
3-5. For trenches, select ponding depth d_p such that $d_p \le d_{max} - n_t d_t$	d_p=	1.39	ft
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	T =	2.00	hrs
3-7. Calculate infiltrating surface area for infiltration basin (ft^2): $A_b = SQDV/(T\, P_{design}/12+d_p)$	A_b =	7,703	ft^2
OR Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells (ft^2): A_t = SQDV/(T Pdesign /12+ntdt+dp)	A_t =	3,862	ft^2
Design surface area: xxx' by xx'			
Step 4: Size the forebay (infiltration basins or trenches)			
If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4.			

4-1. Calculate the volume of the forebay (ft^3 $V_{forebay}$=0.25*SQDV	$V_{forebay}$=	2,646	ft^3
4-2. Determine forebay depth (ft), $d_{forebay}$	$d_{forebay}$=	1.5	ft
4-3. Calculate forebay bottom surface area (ft^2 $A_{forebay}=V_{forebay}/d_{forebay}$	$A_{forebay}$=	1,764	ft^2
4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.	Pipe Capacity =	4.41	ft^3/sec
	Pipe size =	?	
Step 5: Provide conveyance capacity for filter clogging			
5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.			

Sizing Worksheet

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	92.50	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	%
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	4.625	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	0.2	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	18.5	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	13.875	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.1	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p (1-imp)$	C=	0.27	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.0625	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV=	10,199	ft^3
Step 2: Determine the design percolation rate			
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$	$P_{measured}$ =	4	in/hr
2-2. Determine percolation rate correction factor, *S* based on suitability assessment (see Section 6 INF- 1)	S_A =	3	

2-3. Determine percolation rate correction factor, S based on design (see Section 6 INF-1)	S_b =	3.00	
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =	9.00	
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} =	0.44	in/hr
Step 3: Calculate the surface area			
3-1. Enter required drain time(hours,72 hrs max.), t	t =	72.00	hrs
3-2. Calculate max. depth of runoff that can be infiltrated within the t (ft), $d_{max} = P_{design}\, t/12$	d_{max} =	2.67	ft
3-3. For basins, select ponding depth (ft), d_p, such that $d_p \le d_{max}$	d_p =	1.30	ft
3-4. For trenches, enter trench fill aggregate porosity, n_t	n_t =	0.32	
3-5. For trenches, enter depth of trench fill (ft), d_t	d_t =	4.00	ft
3-5. For trenches, select ponding depth d_p such that $d_p \le d_{max} - n_t d_t$	d_p=	1.39	ft
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	T =	2.00	hrs
3-7. Calculate infiltrating surface area for infiltration basin (ft^2): $A_b = SQDV/(T\, P_{design}/12 + d_p)$	A_b =	7,423	ft^2
OR Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells (ft^2): A_t = SQDV/(T Pdesign /12+ntdt+dp)	A_t =	3,721	ft^2
Design surface area: xxx' by xx'			
Step 4: Size the forebay (infiltration basins or trenches)			
If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4.			

4-1. Calculate the volume of the forebay (ft^3 $V_{forebay}$=0.25*SQDV	$V_{forebay}$=	2,550	ft^3
4-2. Determine forebay depth (ft), $d_{forebay}$	$d_{forebay}$=	1.5	ft
4-3. Calculate forebay bottom surface area (ft^2 $A_{forebay}=V_{forebay}/d_{forebay}$	$A_{forebay}$=	1,700	ft^2
4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.	Pipe Capacity =	4.25	ft^3/sec
	Pipe size =	?	
Step 5: Provide conveyance capacity for filter clogging			
5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.			

Table E-1: Pervious Runoff Coefficient Based on Ventura Soil Type

Ventura Soil Type (Soil Number)	Cp value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

Reference:
Ventura County Technical Guidance Manual for Stormwater Quality Control Measures

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